AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE,
L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE

CONTRATTI DELL'ENEA CON LA **COMMISSIONE EUROPEA**

DATI RIASSUNTIVI 2025

AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE,
L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE

DIREZIONE TRASFERIMENTO TECNOLOGICO
SERVIZIO PER LA PIANIFICAZIONE TECNICO OPERATIVA

CONTRATTI DELL'ENEA CON LA COMMISSIONE EUROPEA

Dati riassuntivi 2025

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Autori
Francesco Beone, Elena Bassano, Laura Brunetti, Guido De Angelis, Andrea Fidanza

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NOTA INTRODUTTIVA

Il Rapporto Annuale "Contratti dell'ENEA con la Commissione Europea" si consolida, anno dopo anno, come uno strumento fondamentale per mappare e valorizzare l'eccellenza scientifica e la capacità progettuale del nostro Ente nel contesto europeo. Il volume offre una panoramica rigorosa e completa delle attività di ricerca cofinanziate dall'Unione Europea, restituendo il quadro dei contratti attivi e delle tappe che scandiscono il posizionamento strategico di ENEA nello spazio comune della ricerca.

La storica e proficua partecipazione dell'Agenzia ai Programmi Quadro di Ricerca e Innovazione e al Programma Quadro Euratom testimonia la solidità del nostro contributo scientifico e rappresenta, al contempo, una vitale fonte di finanziamento esterno per le attività di Ricerca. In questo volume vengono analizzati i contratti in essere nel corso del 2025, creando un ideale ponte tra la precedente programmazione europea (2014-2020) e l'attuale ciclo 2021-2027. Proprio nell'ambito di quest'ultima programmazione, ENEA ha saputo esprimere una progettualità di alto profilo, confermando e superando gli eccellenti risultati delle tornate precedenti.

Il cuore documentale e analitico di questo Rapporto poggia sulla Banca Dati dei Progetti UE dell'ENEA, un'infrastruttura digitale strategica attiva online dal 2000 e curata dalla Direzione Trasferimento Tecnologico (TTEC). Attraverso il censimento omogeneo e strutturato di oltre 1.200 contratti — corredati da informazioni dettagliate su partenariati, ambiti di ricerca e responsabilità scientifiche —, la banca dati non solo favorisce la trasparenza e la circolazione delle conoscenze dentro e fuori l'Agenzia, ma supporta attivamente il lavoro dei nostri ricercatori. Questo patrimonio informativo permette infatti di elaborare analisi complesse e di estrarre quelle "referenze" istituzionali che si rivelano indispensabili per competere con successo nei tenders della Commissione Europea e nei call for proposal nazionali e internazionali.

Il 2025 ha rappresentato per l'ENEA un anno di profonde trasformazioni interne, segnato in modo decisivo dall'avvio alla conclusione del PNRR. Questo passaggio cruciale, se da un lato ha impegnato l'Agenzia in una complessa ed efficace attività di rendicontazione dei progetti in via di chiusura, dall'altro ha portato alla luce una chiara necessità strutturale: superare la dipendenza dai flussi di finanziamento straordinari. La fine della stagione emergenziale del PNRR ha così reso necessario l'evoluzione verso un modello di sostenibilità a lungo termine, strutturato sulla valorizzazione delle competenze interne e su una partecipazione sempre più attiva e competitiva nel mercato della ricerca finanziata.

In un simile scenario di transizione, la gestione strategica del dato e dell'informazione scientifica emerge come una risorsa cruciale per preservare la competitività dell'Agenzia e consolidare le alleanze con i nostri partner globali.

Il volume si articola in cinque sezioni chiave volte a esplorare questa complessa realtà: la partecipazione alla programmazione 2021-2027, i contratti stipulati nel 2025, i progetti attivi nel medesimo anno e, infine, l'importante focus dedicato al Consorzio EUROfusion.

Nel consegnare questo Rapporto ai lettori, ai decisori politici e alla comunità scientifica, l'auspicio è che esso possa offrire non solo un bilancio dei traguardi raggiunti, ma anche una chiara traccia della direzione futura che l'ENEA intende perseguire nel panorama della ricerca scientifica internazionale.

1. La partecipazione dell'ENEA ai bandi della programmazione europea 2021-2027 (dati aggiornati al 30 aprile 2026)

L'analisi è stata elaborata sulla base della lista delle proposte presentate dall'ENEA a valere sui bandi della programmazione europea 2021-2027, pubblicata sull'EC Funding and Tenders Portal, a cui accedono i designati LEAR e Account Administrator dell'ENEA. I dati elaborati sulla partecipazione dell'ENEA si riferiscono quindi ai soli programmi e proposte presenti nel suddetto portale.

I dati economici sui contratti stipulati da dall'ENEA sono estratti dalla Banca Dati Progetti UE, in accordo con le informazioni presenti in WPlan, ed includono anche quei progetti europei non presenti sul portale EC Funding and Tenders Portal.

Nel corso del 2025 l'ENEA ha presentato 113 proposte progettuali a valere sui bandi della programmazione europea 2021-2027, 36 in più rispetto al 2024 anno in cui le proposte presentate erano state 77, per un totale di 482 proposte predisposte e presentate nel corso dell'intero periodo di programmazione 2021-2027 (525, se si sommano anche quelle presentate nel corso del 2021 a valere sulla precedente programmazione di Horizon 2020).

Le 113 proposte presentate nel corso del 2025 sono state tutte valutate. Tredici progetti sono stati finanziati, e dieci sono attualmente in reserve list, in attesa quindi di finanziamento nel caso in cui si liberassero risorse sui bandi specifici.

Risultati della partecipazione ENEA ai bandi della programmazione europea 2021-2027 nell'anno 2025 (dati aggiornati al 30 aprile 2026) – Tabella 1

Programma	Presentati	Valutati	Finanziati	In Reserve List	NON Finanziati	Finanziati vs Valutati
CEF2027	1	1	0	1	0	0%
EDF	1	1	0	0	1	0%
ERASUMUS2027	5	5	1	0	4	20%
HORIZON	92	92	6	6	80	7%
I3	3	3	1	0	2	33%
LIFE2027	11	11	5	3	3	45%
Totale	**113**	**113**	**13**	**10**	**90**	**12%**

In 15 casi l'ENEA si è proposta come coordinatore, ed in 89 casi come beneficiario o associato, confermando una cautela da parte dell'Agenzia nel presentare i progetti in qualità di coordinatore.
Con il finanziamento dei 13 progetti presentati nel 2025 si incrementa il contributo acquisito dall'ENEA di 3 Meuro circa, portando a 37,6 Meuro il totale delle risorse acquisite dall'ENEA su progetti nell'ambito della programmazione 2021-2027.

È importante tener presente che il numero di progetti finanziati e l'entità del contributo acquisito dall'ENEA per ciascun anno sono condizionati, oltre che da scelte strategiche dell'Agenzia, anche dal susseguirsi delle scadenze dei bandi, dal budget stanziato dai singoli

programmi e dal costo orario dei ricercatori/tecnologi dell'ENEA (significatamene inferiore rispetto alla media europea).

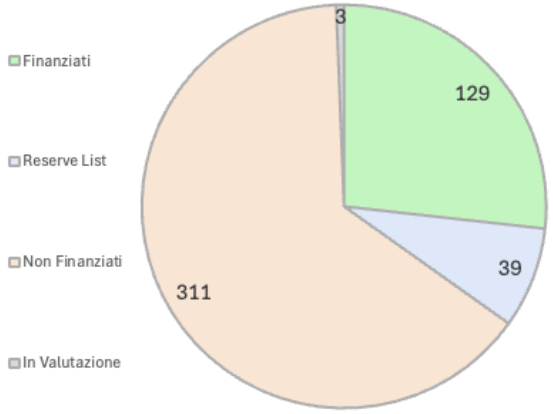
Negli anni che vanno dal 2021 al 2025, a valere sui bandi della programmazione 2021-2027, la partecipazione dell'ENEA ha totalizzato 482 proposte presentate, di cui complessivamente 129 giudicate finanziabili e 39 ammissibili al finanziamento, ma non finanziate per mancanza di fondi, con un tasso di successo per l'intero periodo (progetti finanziati su progetti valutati), per tutti i programmi monitorati dal portale, pari a circa il 27%, come riportato nella Tabella 2.

Risultati della partecipazione ENEA ai bandi della nuova programmazione europea 2021-2027 (dati complessivi per gli anni dal 2021 al 2025 - aggiornati al 30 aprile 2026) - Tabella 2

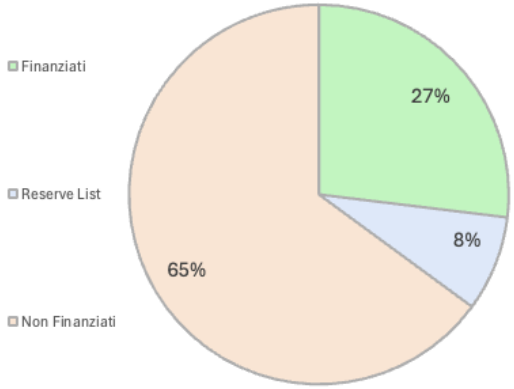
Programma	Presentati	Valutati	Finanziati	In Reserve List	Non Finanziati	Finanziati vs Valutati
CEF2027	1	1	0	1	0	0%
DIGITAL	6	6	3	0	3	50%
EDF	8	7	2	1	4	29%
ERASMUS2027	9	9	3	0	6	33%
EURATOM2027	26	25	21	0	4	84%
HORIZON	369	368	74	30	264	20%
I3	7	7	3	1	3	43%
ISF	2	2	1	0	1	50%
LIFE2027	51	51	19	6	26	37%
SMP	2	2	2	0	0	100%
UCPM2027	1	1	1	0	0	100%
Totale	**482**	**479**	**129**	**39**	**311**	**27%**

L'attuale stato di valutazione e tasso di successo delle complessive 482 proposte presentate, nell'intero periodo (dati complessivi aggiornati al 30 aprile 2026), sono riportati nelle Figure 1 e 2.

Stato di valutazione - Figura 1



Tasso di successo - Figura 2



2. Analisi di Sostenibilità Economica e Strumenti Semantici a Supporto della Progettazione Europea per l'ENEA

2.1 Premessa e ambito di analisi

La partecipazione ai Programmi Quadro europei (2021-2027) richiede all'ENEA un investimento rilevante in termini di tempo e risorse. Gran parte di questo sforzo si concentra nella fase pre-valutativa, configurandosi come un costo a fondo perduto, in quanto generalmente non rendicontabile.

In questo contesto si può quindi parlare di "costo-opportunità", ovvero di un costo che rientra nella sfera della valutazione economica e decisionale. In altre parole, la scelta di partecipare a un bando europeo deve prendere in considerazione il valore della migliore alternativa scientifica o economica a cui si rinuncia per dedicare tempo e risorse umane alla scrittura di una proposta (la quale comporta sempre un margine di rischio di insuccesso). D'altro canto, è necessario tenere presente che le call competitive (nazionali, europee o internazionali) sono fondamentali per l'ENEA: esse, infatti, ne qualificano l'autorevolezza scientifica e contribuiscono al bilancio dell'ente. Come è noto, l'ENEA vede coperta solo una parte dei propri costi tramite il Contributo Ordinario dello Stato (COS), pari mediamente a circa il 50% nell'ultimo quinquennio.

Se da un lato è necessario tenere presente che ogni progetto presentato deve mirare a massimizzare il rapporto benefici/costi per l'ENEA, dall'altro la mancata candidatura del cospicuo numero di progetti che l'Ente sarebbe in grado di proporre nell'ambito dei programmi di finanziamento comunitari rappresenta una rinuncia importante. Tali finanziamenti, infatti, permetterebbero in futuro di integrare, talvolta anche in modo consistente, le scarse risorse su cui oggi l'ENEA può contare per portare avanti le proprie attività di ricerca.

Per tale motivo, a cinque anni dall'inizio dell'ultima programmazione (a partire dal 2020), è stato avviato un attento monitoraggio sulla capacità di ENEA di ottenere finanziamenti tramite call competitive. Tale analisi tiene in considerazione il tasso di successo risultante dalla partecipazione ai bandi, con analisi di tipo won/lost e sensitivity analysis mirate a ricavare importanti indicazioni sugli elementi su cui focalizzare gli sforzi in ottica di sottomissione dei progetti.

Parallelamente, è stato avviato lo sviluppo sperimentale di un sistema di analisi semantica e linguistica basato sui testi (abstract) dei progetti presentati nella memoria storica dell'Ente (FP7, Horizon 2020, Horizon Europe, Euratom). L'obiettivo è fornire ai ricercatori uno strumento agile per verificare la bontà e l'allineamento delle proposte, disponendo così di modelli utili a ottimizzarne l'impostazione prima di investire centinaia di ore di lavoro nella loro preparazione.

2.2 La stima dei costi di stesura di un progetto

La stima dei costi di stesura di un una proposta di "progetto finanziato", ha preso in considerazione i costi delle risorse umane impiegate per tale attività, ovvero figure di primo e secondo livello tra ricercatori e tecnologi, e i tempi medi di elaborazione delle proposte progettuali.

Con riferimento ai costi delle risorse umane la stima parte dalle tariffe orarie per le due tipologie di figure considerate, ovvero: 83 €/ora per le figure di primo livello e 47 €/ora per quelle di secondo livello, valori prudenziali se confrontati con i 97,14 €/ora con cui ENEA rendiconta il suo personale nella convenzione per le attività di supporto e gestione dell'intervento agevolativo "Economia Circolare" MISE del 2020. Per arrivare ad una quotazione media si è ipotizzato che la stesura di una proposta sia per un terzo a carico di figure di primo livello, e per due terzi a carico di figure di secondo livello, portando a 59 €/ora il costo medio orario di stesura, prudenzialmente ribassato a 55 €/ora.

Per quello che riguarda il tempo dedicato alla stesura della proposta progettuale, analisi condotte di recente, confermate da studi[1] e statistiche simili europee, si può affermare che, in fase di progettazione, servano almeno 80 ore/uomo per ciascun partner, ed almeno 300 ore/uomo per il soggetto coordinatore.

Tali ipotesi permettono di quantificare il costo per la presentazione di una proposta, distinguendo in base al ruolo che l'Ente assume nel partenariato: 16.500 euro nel caso in cui l'ENEA funga da coordinatore, e 4.400 euro qualora partecipi in qualità di partner.

Applicando tali stime alla programmazione 2021-2027 (si vedano le Tabelle 3, 4 e 5), emerge una tendenza significativa e poco confortante in merito alle risorse impegnate dall'ENEA per la partecipazione alle call, se rapportate al numero di progetti vinti e al finanziamento ottenuto.

In particolare, l'incidenza del costo di presentazione dei progetti rispetto al finanziamento effettivamente acquisito dall'ENEA attraverso i progetti vinti ha avuto un andamento altalenante negli anni. Si registra tuttavia un incremento notevole nel 2025, anno in cui tale valore ha raggiunto il 36% a fronte di una media del periodo pari al 12%.

Dinamica dei Costi di Presentazione vs Contributo Acquisito: totale progetti presentati – Tabella 3

Anno	Numero progetti		Contributo		Costo presentazione	Costo / Contributo
	Presentati	Finanziati	Richiesto	Concesso		
2021	77	28	36.063.312	9.289.757	712.000	8%
2022	117	30	47.545.225	7.511.915	1.128.000	15%
2023	99	40	40.393.738	13.047.090	984.000	8%
2024	76	18	23.945.349	4.738.741	716.000	15%
2025	113	13	43.806.083	3.012.956	1.084.000	36%
Totale	**482**	**129**	**191.753.707**	**37.600.459**	**4.624.000**	**12%**

[1] https://www.linq-consulting.com/post/timeline-for-writing-a-horizon-europe-proposal

Analizzando i risultati in funzione del ruolo dell'ENEA nel partenariato (ovvero come coordinatore o partner), il quadro si modifica leggermente: nel corso degli anni il rapporto tra il costo di presentazione dei progetti e il finanziamento ottenuto è stato mediamente superiore nei casi in cui l'ENEA si è presentata come coordinatore di progetto (16% contro l'11% dei casi in cui ha partecipato in qualità di partner).

Dettaglio ENEA coordinatore – Tabella 4

Anno	Numero progetti		Contributo		Costo presentazione	Costo / Contributo
	Presentati	Finanziati	Richiesto	Concesso		
2021	8	1	10.750.491	342.656	160.000	39%
2022	16	2	15.751.628	694.160	320.000	38%
2023	16	6	19.921.385	5.082.630	320.000	5%
2024	9	2	7.089.733	765.688	180.000	19%
2025	15	1	10.500.849	917.456	300.000	27%
Totale	**64**	**12**	**64.014.087**	**7.802.590**	**1.280.000**	**16%**

Dettaglio ENEA Partner / Beneficiario /Associato – Tabella 5

Anno	Numero progetti		Contributo		Costo presentazione	Costo / Contributo
	Presentati	Finanziati	Richiesto	Concesso		
2021	69	27	25.312.821	8.947.101	552.000	6%
2022	101	28	31.793.597	6.817.755	808.000	12%
2023	83	34	20.472.352	7.964.460	664.000	8%
2024	67	16	16.855.616	3.973.053	536.000	13%
2025	98	12	33.305.234	2.095.500	784.000	37%
Totale	**418**	**117**	**127.739.620**	**29.797.869**	**3.344.000**	**11%**

I dati evidenziano una tendenza critica nel tasso di successo dei progetti dal 2024 in poi e, di conseguenza, un incremento dei costi sostenuti dall'ENEA per la partecipazione ai bandi europei. Tali elementi vanno però analizzati anche in funzione della tipologia e della dimensione finanziaria dei progetti presentati, delle opportunità in termini di partnership e di nuovi ambiti di ricerca ad essi correlati, nonché dei cambiamenti organizzativi nelle strutture dedicate al supporto delle attività di funding.

Questo scenario rappresenta certamente uno stimolo a individuare correttivi mirati a invertire una tendenza che rischia di diventare insostenibile nel lungo periodo. Tali azioni potrebbero basarsi su un'analisi delle progettualità presentate, finalizzata a evidenziare i fattori di successo o insuccesso; ciò fornirebbe elementi utili sia per incrementare la qualità progettuale, sia per facilitare il lavoro di ricercatori e tecnologi impegnati nella stesura delle proposte.

2.3 Strumenti Semantici come Soluzione Strategica

Per contribuire a mitigare questo rischio economico e ridurre i costi improduttivi, l'ENEA ha avviato, tra le varie iniziative, lo sviluppo sperimentale di un sistema di analisi semantica e linguistica basato sui testi (abstract) della memoria storica dell'Ente (FP7, Horizon 2020, Horizon Europe, Euratom).

La tesi alla base di questo strumento si fonda sul riscontro che il registro linguistico impiegato negli abstract delle proposte di successo risulta strettamente allineato alla terminologia del bando di riferimento. Una rapida verifica di questa coerenza testuale, nelle fasi iniziali di redazione, può fornire indicazioni preziose per ottimizzare la proposta progettuale, uniformandola al linguaggio e ai criteri che i valutatori si aspettano di riscontrare.

L'obiettivo ultimo è quindi fornire ai ricercatori uno strumento agile per verificare la validità e l'allineamento di una proposta, prima di investire centinaia di ore di lavoro nella sua scrittura.

Funzionalità dell'Ambiente Semantico

- **Analisi dei Landscape 3D:** Mappatura dei progetti in cluster tematico-narrativi (es. Societal Impact, Technological Innovation, Fundamental Research).
- **Interrogazione Semantica Rapida:** Inserendo parole chiave (es. "green"), il sistema estrae istantaneamente i progetti storici simili e il loro grado di correlazione (es. KijaniBox, similarity 0.222), permettendo di riutilizzare competenze e strutture già premiate dalla Commissione Europea.
- **Correlazione Retorica-Economica:** Il sistema incrocia la chiarezza narrativa con le variabili economiche (budget complessivo e dimensioni del consorzio), dimostrando graficamente che i progetti con strutture narrative più strutturate e orientate all'impatto sono statisticamente associati a budget più elevati e migliori tassi di successo.

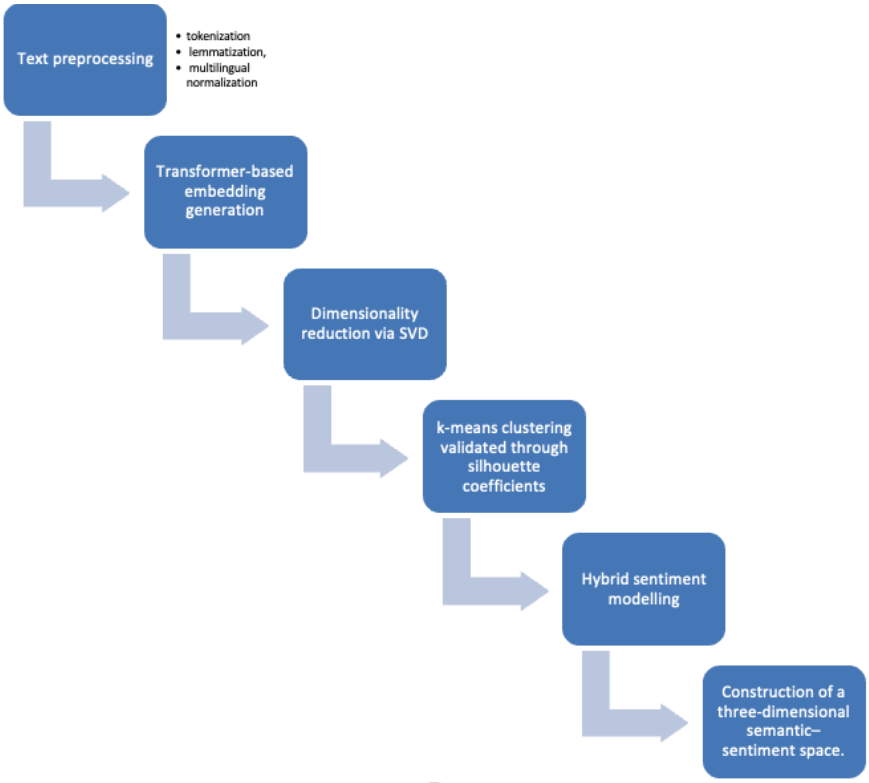
Il sistema è stato sviluppato come ambiente sperimentale interno, destinato a supportare le attività di analisi e proposal management.

Il processo inizia con una fase di preprocessing testuale (vedi Figura 3), comprendente tokenizzazione, lemmatizzazione e normalizzazione multilingue dei testi. Successivamente, vengono generati embedding semantici mediante modelli transformer, in grado di rappresentare il contenuto testuale in forma vettoriale ad alta dimensionalità.

Nella fase seguente, la dimensionalità degli embedding viene ridotta tramite Singular Value Decomposition (SVD), al fine di preservare le componenti informative più rilevanti e semplificare l'analisi. I vettori ridotti vengono poi sottoposti a clustering mediante algoritmo k-means, con validazione della qualità dei cluster attraverso i coefficienti di silhouette.

Infine, il framework integra un modello ibrido di sentiment analysis che combina informazione semantica ed emotiva, permettendo la costruzione di uno spazio tridimensionale semantico-sentimentale, utile per rappresentare e interpretare le relazioni tra contenuti, polarità emotive e distribuzione dei cluster.

Analytical pipeline - Figura 3



L'analisi costi-benefici può essere rappresentata graficamente mettendo in relazione le componenti semantiche con il budget. L'asse z rappresenta il budget ponderato rispetto al numero di partecipanti, mentre il diametro delle sfere rappresenta il budget complessivo del progetto.

Spazio tridimensionale semantico-sentimentale - Figura 4

2.4 Sviluppi futuri e proposal Management

Il sistema, che attualmente si trova in una fase di sviluppo strettamente sperimentale, è destinato a essere progressivamente potenziato con l'obiettivo di trasformarlo in un vero e proprio sistema di supporto alle decisioni istituzionali (Decision Support System - DSS).

Tale piattaforma consentirà di orientare le scelte strategiche di partecipazione, riducendo l'allocazione di risorse su proposte a basso potenziale di successo.

Al fine di traguardare questo obiettivo di lungo periodo, le prossime fasi della ricerca e dello sviluppo metodologico prevedono la realizzazione dei seguenti interventi:

- **Estensione e scalabilità dei modelli linguistici**: si prevede il passaggio dall'analisi focalizzata sui soli abstract all'elaborazione massiva dei testi completi delle proposte progettuali, consentendo una valutazione semantica molto più profonda e dettagliata dell'intera architettura del progetto.
- **Integrazione automatica degli Evaluation Summary Reports (ESR)**: l'algoritmo verrà addestrato integrando i dati storici dei feedback e dei giudizi formali rilasciati dai valutatori della Commissione Europea, allo scopo di mappare in modo oggettivo le criticità ricorrenti e le migliori pratiche di scrittura.
- **Sviluppo di indicatori sintetici di allineamento e conformità**: verranno create metriche avanzate e cruscotti di valutazione in grado di stimare preventivamente l'ampiezza dell'impegno (effort) e delle modifiche necessarie per conformare il linguaggio della proposta ai requisiti stringenti espressi nei testi dei bandi.

3. La partecipazione dell'ENEA a Eurofusion

La collaborazione europea sulla fusione nucleare risale agli anni '70 con la costruzione del JET (Joint European Thorus). Nel 1999 è stato creato l'European Fusion Development Agreement (EFDA), sostituito nel 2014 da EUROfusion[2] sotto l'egida della Commissione Europea. EUROfusion rappresenta oggi uno dei principali protagonisti globali nella ricerca sulla fusione nucleare.

Dopo una prima fase di attività di EUROfusion nel corso del programma quadro Horizon 2020, nel 2021 è stato sottoscritto il Grant Agreement (n. 101052200) di Horizon Europe relativo alle attività con arco temporale fino al 2027, salvo atti aggiuntivi successivi.

EUROfusion è incaricato dell'attuazione della Roadmap europea sulla fusione; in particolare, l'attività di ricerca del Consorzio è orientata alla prosecuzione delle attività del progetto ITER (International Thermonuclear Experimental Reactor), alla gestione delle ultime fasi dell'operazione di JET e al supporto alla realizzazione del reattore dimostrativo DEMO (Demonstration Fusion Power Reactor), previsto intorno al 2050. Il consorzio gestisce anche altri dispositivi di fusione nucleare in Europa, tra cui tokamak (come ASDEX Upgrade in Germania) e stellarator (come Wendelstein 7-X in Germania).

Le ricerche condotte da EUROfusion hanno generato tecnologie applicabili in altri settori, come la medicina, le scienze dei materiali e l'astrofisica. Inoltre, il consorzio contribuisce all'integrazione europea attraverso una rete dinamica che coinvolge scienza, ingegneria e industria.

EUROfusion si configura come un paradigma unico di integrazione scientifica e tecnologica in Europa per realizzare il sogno della fusione nucleare come fonte energetica sostenibile.

Fanno parte del consorzio organizzazioni provenienti da 25 Stati membri, oltre a Norvegia, Regno Unito, Svizzera e Ucraina, coordinate dal Max-Planck Institute für Plasmaphysik.

Partecipano alle attività di ricerca del Consorzio EUROfusion anche 'affilitated entities' collegate a un 'Programme Manager' che coordina le attività delle organizzazioni del proprio Paese.

Per l'Italia, è stata designata l'ENEA al ruolo di 'Programme Manager', che coordina i seguenti 21 partner:

[2] https://www.euro-fusion.org

ANN, Ansaldo Nucleare S.p.a.
CINECA Consorzio
CNR, Consiglio Nazionale delle Ricerche
Consorzio Create
Consorzio per l'attuazione del progetto "Divertor Tokamak Test" (DTT S.c.a.r.l.)
Consorzio RFX
ENI Corporate
INFN, Istituto Nazionale di Fisica Nucleare
LT Calcoli
Politecnico di Milano
Politecnico di Torino
RINA Consulting - Centro Sviluppo Materiali S.p.A.
Università degli Studi della Tuscia
Università degli Studi di Cagliari
Università di Catania
Università di Milano Bicocca
Università di Palermo
Università di Pisa
Università di Roma La Sapienza
Università Roma Tre
Università Tor Vergata

Per il 2025, il bilancio del Grant Agreement assegna complessivamente ai partecipanti italiani un contributo complessivo massimo di 26 Meuro circa, di cui 6.5 Meuro circa previsti per le attività dell'ENEA.

4. Contratti stipulati nel 2025

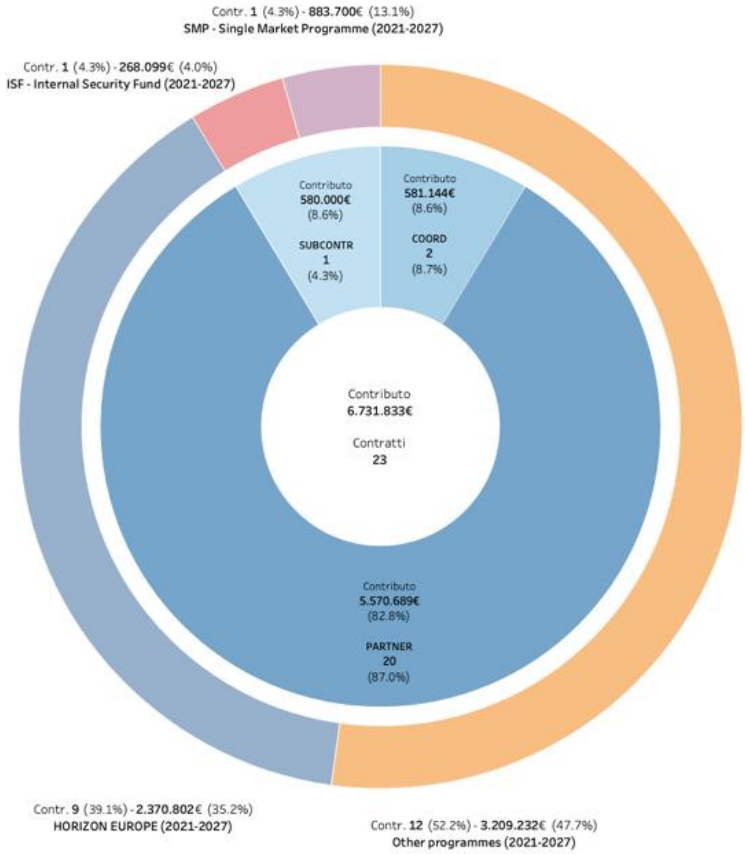
Nel 2025, complessivamente, l'ENEA ha stipulato con la Commissione Europea (CE) 23 contratti, relativi ad altrettanti progetti cofinanziati nell'ambito di programmi diversi, per un contributo totale assegnato all'ENEA di circa 6.73 milioni di euro, da ripartire nell'arco di validità pluriennale di ciascun contratto. Tale importo risulta in linea con la media annuale dei contributi acquisiti dall'Agenzia relativi a periodi dei precedenti tre cicli di programmazione europea (Tabella 6).

Contributo totale acquisito da ENEA nel periodo temporale di riferimento - Tabella 6

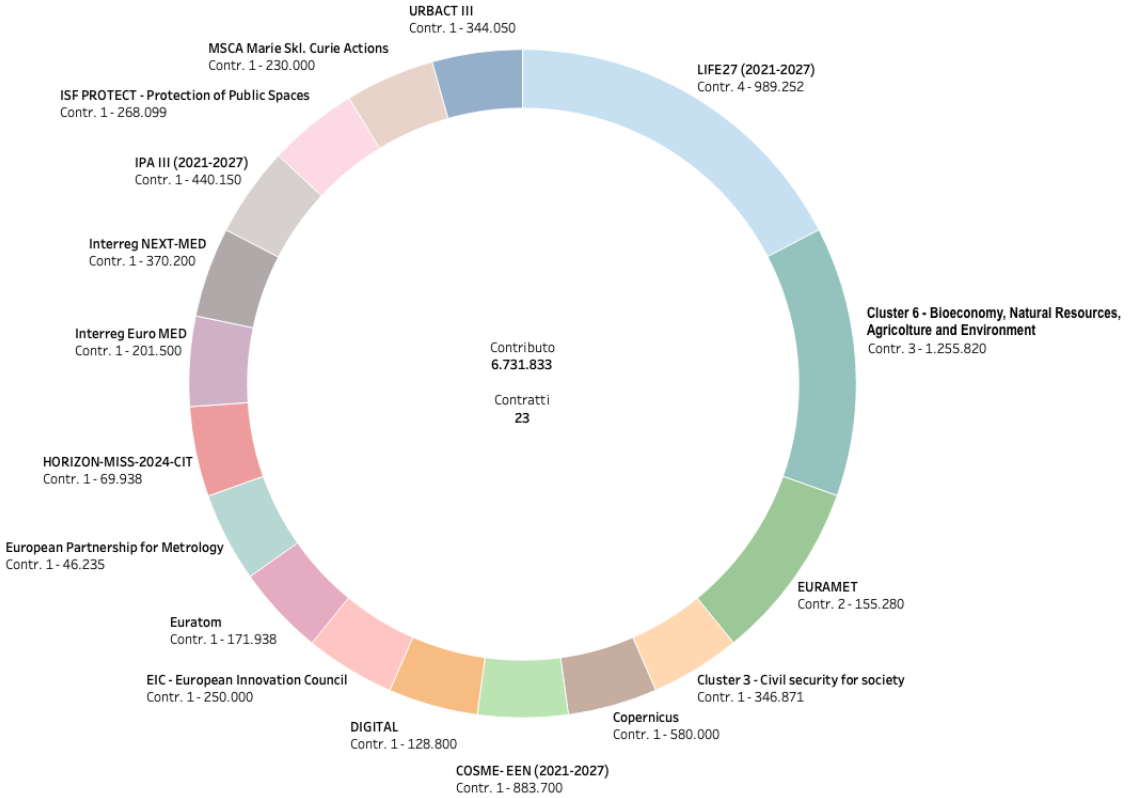
Periodo	milioni di euro/anno
2000 - 2006	5.32
2007 - 2013	10.68
2014 – 2020	12.36
2021 - 2025	9.14

Il contributo acquisito dall'ENEA nel 2025 deriva essenzialmente dai programmi Horizon Europe per il 35.2% e da altri programmi per il 47.7%, percentuali marginali del 13,1% per SMP (Single Market Programme) e 4% per ISF (International Security Fund), vedi Figura 5 e 5b.

Contratti stipulati nel 2025, ripartizione percentuale per programma del contributo acquisito dall'ENEA per l'intero periodo di validità contrattuale - Figura 5

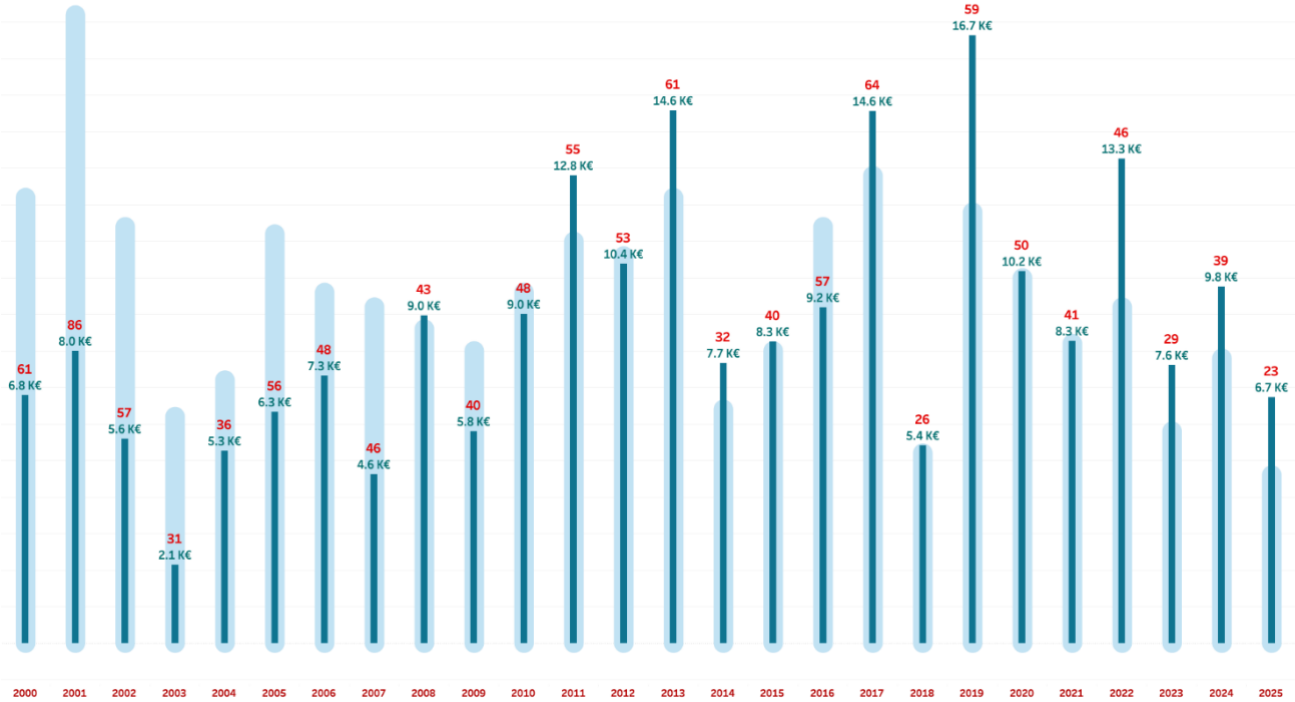


Contratti stipulati nel 2025, ripartizione percentuale per programma del contributo acquisito dall'ENEA per l'intero periodo di validità contrattuale - Figura 5b



La Figura 6 mostra complessivamente il numero di progetti stipulati ed il contributo acquisito dall'ENEA dal 2000 al 2025; il numero di progetti finanziati e l'entità del contributo all'ENEA per anno sono influenzati anche dal susseguirsi delle scadenze dei bandi e dal budget stanziato dai singoli programmi.

Numero di contratti stipulati dal 2000 al 2025 e relativo contributo all'ENEA - Figura 6

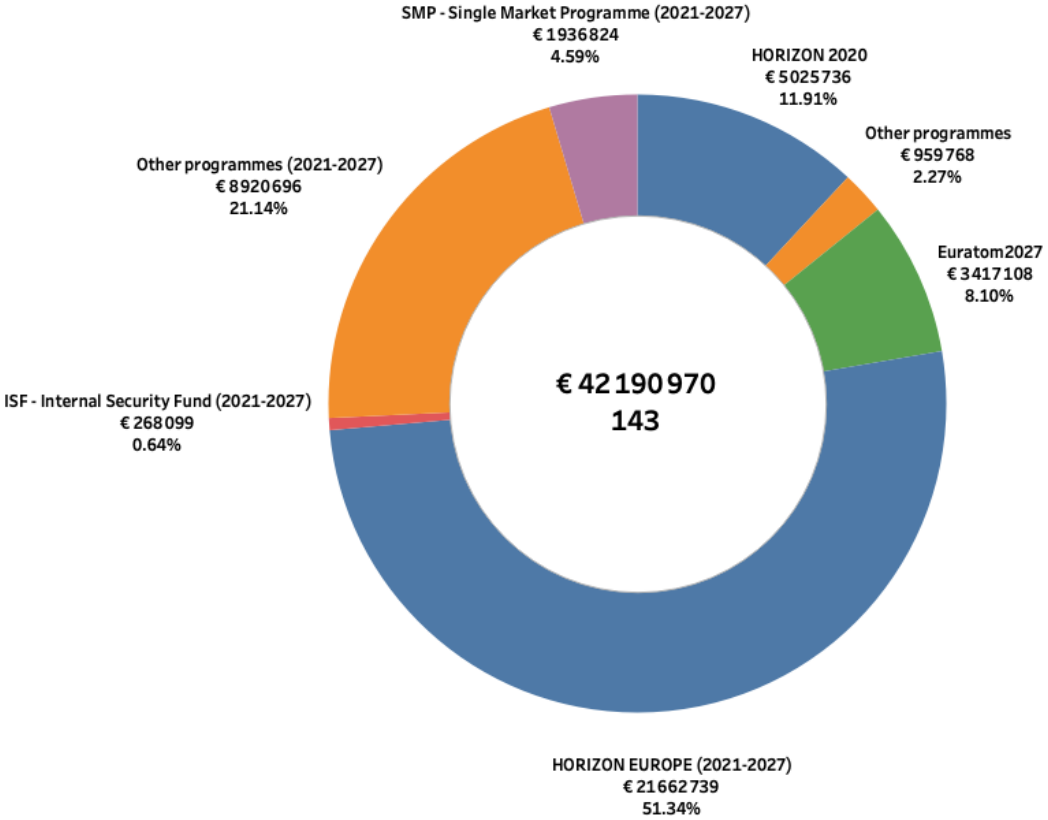


5. Contratti in corso nel 2025

Le attività dell'ENEA in corso nel 2025, cofinanziate da programmi dell'UE, sono riconducibili a 143 contratti, di cui 23 stipulati nello stesso anno. Il cofinanziamento comunitario totale assegnato all'Agenzia è di circa 42,2 milioni di euro, da ripartire nell'arco pluriennale di validità di ciascun contratto.

Nel corso del 2025 le attività ancora in corso finanziate dalla programmazione europea 2014-2020 sono state affiancate da quelle finanziate attraverso la nuova programmazione 2021-2027 (Horizon Europe, Euratom e Altri Programmi) rappresentando la gran parte del contributo totale assegnato all'ENEA (Figura 7).

Contratti in corso nel 2025 - Ripartizione percentuale del contributo per programma - Figura 7

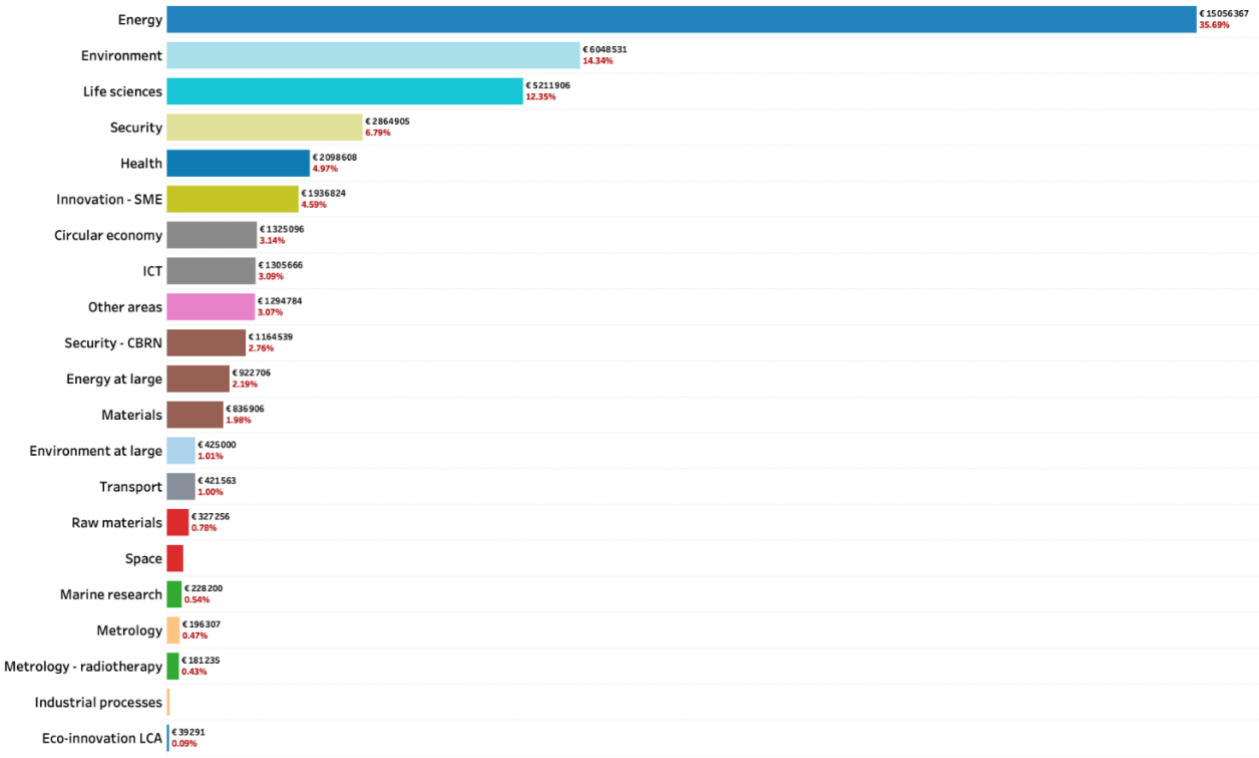


5.1 Aree tematiche

Allo scopo di fornire ulteriori elementi di analisi, tutti i progetti presenti nella banca dati sono stati classificati anche in base all'area tematica in cui ricade l'attività progettuale, identificata indipendentemente dallo strumento di finanziamento.

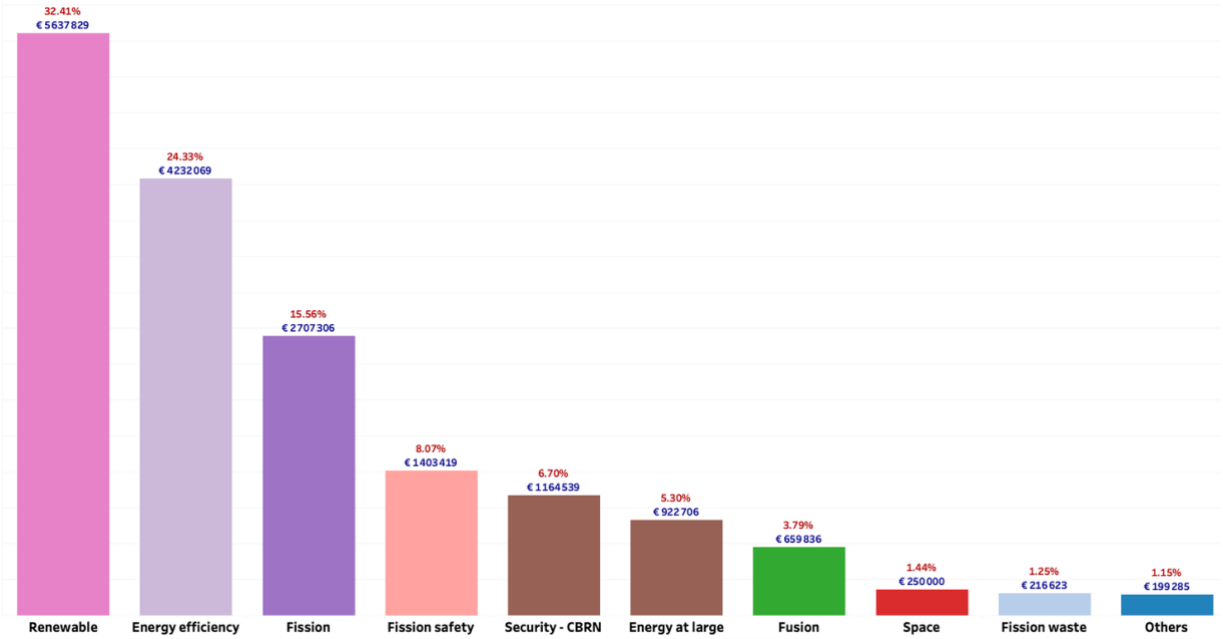
La Figura 8 mostra l'aggregazione per aree tematiche dei progetti in corso nel 2025 ed evidenzia che circa il 35.7% del contributo ottenuto dall'Agenzia deriva da progetti ricadenti nell'area energia, a cui seguono le aree Ambiente (14.34%) e Scienze della vita (12.35%), con un incremento percentuale di queste ultime due rispetto lo scorso anno.

Contratti in corso nel 2025 - Ripartizione percentuale del contributo per aree tematiche - Figura 8



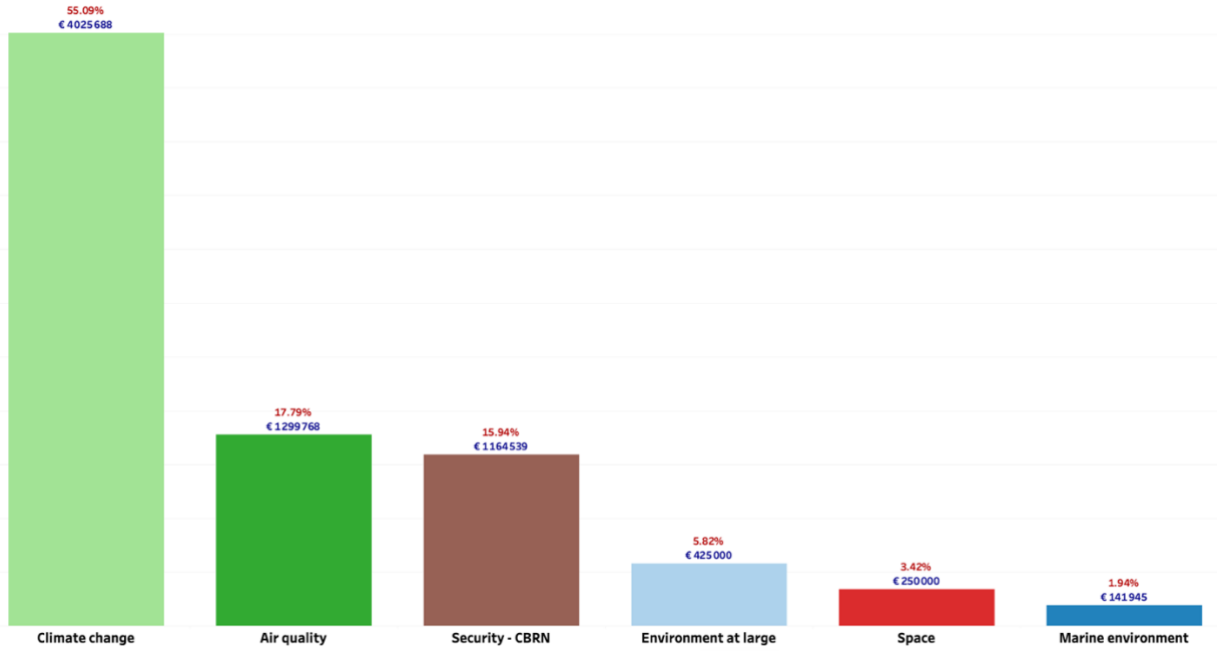
Per quanto attiene alla sola area Energia, quasi il 32.4% del relativo contributo ricevuto dall'ENEA proviene da progetti nel settore delle Rinnovabili, il 15.6% dal settore della Fissione e il 24.3% dal settore dell'efficienza energetica, quest'ultimo in forte crescita rispetto lo scorso anno (Figura 9).

Contratti in corso nel 2025 - Ripartizione percentuale del contributo, area tematica "Energy" - Figura 9



Con riferimento all'area tematica Ambiente, il 55% del contributo assegnato all'Agenzia deriva da progetti nel settore del Cambiamento Climatico e circa il 17.8% da quelli relativi alla Qualità dell'aria (Figura 10).

Contratti in corso nel 2025 - Ripartizione percentuale del contributo, area tematica "Environment" - Figura 10



In accordo con le aperture delle varie call, rispetto al 2021, si può notare una certa polarizzazione delle attività dell'ENEA (Tabella 7):

Contributi nei settori dal 2021 al 2025 - Tabella 7

	2021	2022	2023	2024	2025
Ambito Energia					
Rinnovabili	29.7%	31.4%	35.2%	35.9%	32,4%
Fissione	7.0%	12.9%	12.3%	16.1%	15,5%
Efficienza Energetica	20.9%	19.1%	22.0%	14.0%	24,3%
Ambito Ambiente					
Cambiamenti Climatici	45.5%	52.0%	60.4%	61.8%	50,1%
Qualità dell'aria	19.6%	23.3%	18.7%	16.1%	17,8%

Se esaminiamo anche la serie storica dal 2021 della ripartizione percentuale del contributo per aree tematiche dei contratti in corso, possiamo notare come nel tempo l'area tematica energia sia rimasta costantemente centrale nelle strategie dell'ENEA (Tabella 8)

Contributi per area tematica dal 2021 al ~~2024~~ 2025 - Tabella 8

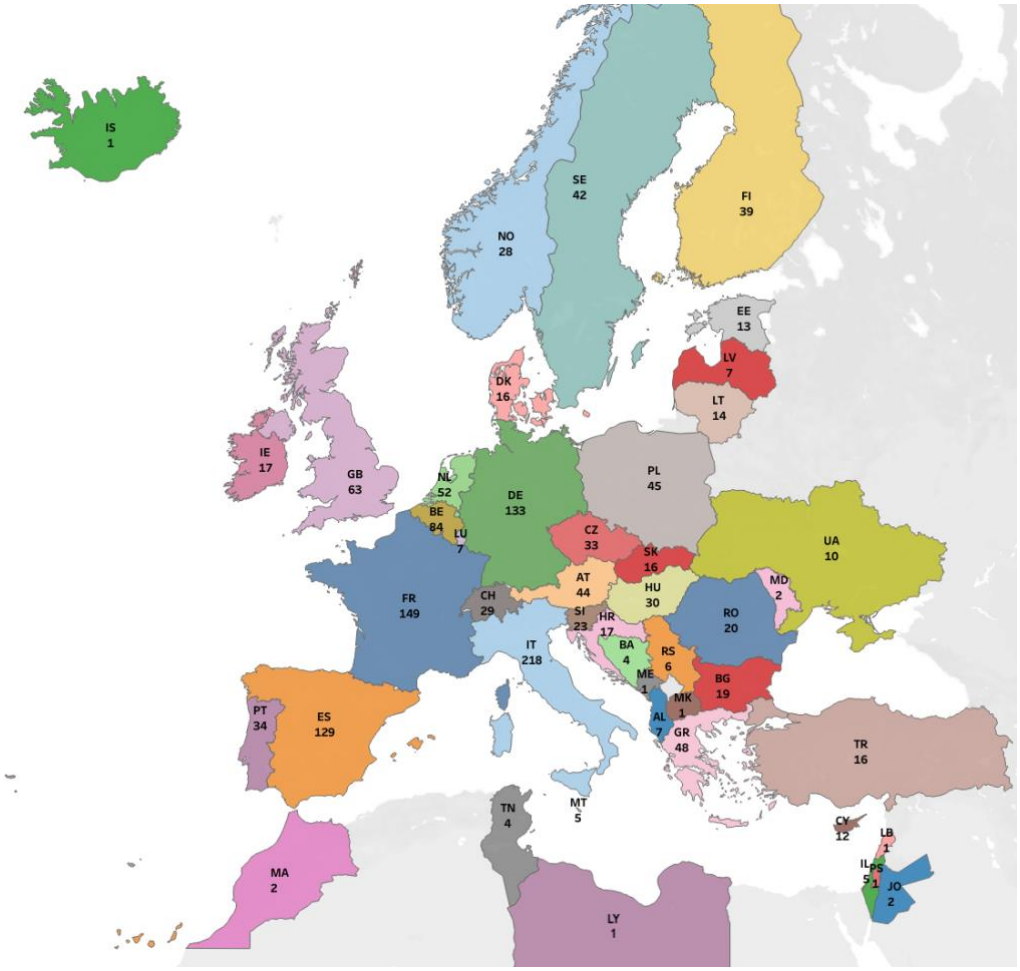
	2021	2022	2023	2024	2025
Aree Tematiche					
Energia	36.2%	41.0%	43.8%	40.1%	35,7%
Ambiente	18.5%	13.3%	10.4%	11.8%	14,3%
Scienza della vita	8.4%	10.4%	11.6%	9.6%	12,3%
Sicurezza	4.0%	3.7%	6.8%	8.1%	6,8%

5.2 Partenariato

I progetti finanziati da programmi dell'Unione Europea sono tipicamente multi-partner e transnazionali. Nei Programmi Quadro, i requisiti minimi di partecipazione prevedono almeno tre partner di tre diversi Stati membri o Stati associati, con alcune eccezioni per azioni specifiche. Le organizzazioni di Paesi membri dell'Unione Europea ricevono dall'UE il cofinanziamento previsto dalla tipologia di azione, così come i partecipanti dei Paesi che hanno concluso un accordo di associazione al Programma Quadro3. I partner di Paesi terzi non associati, invece, non accedono al finanziamento UE; tuttavia, in alcuni casi, sono i governi dei Paesi Terzi a sostenerne la loro partecipazione. Inoltre, un Paese terzo può essere finanziato dall'UE soltanto se è considerato a reddito medio-basso, se è stato previsto nel programma di lavoro e se la partecipazione del soggetto è ritenuta essenziale dalla Commissione Europea per l'esecuzione del progetto.

Nel 2025 l'ENEA ha partecipato a 143 progetti, che hanno coinvolto complessivamente circa 1500 partner di 62 diversi Paesi e organizzazioni internazionali per quasi 3000 partecipazioni (Tabella 9). Le mappe di seguito mostrano la distribuzione geografica dei partner dell'ENEA nei progetti in corso nel 2025 (Figure 11, 12, 13, 14).

Contratti in corso nel 2025- Partner europei e area mediterranea - Figura 11

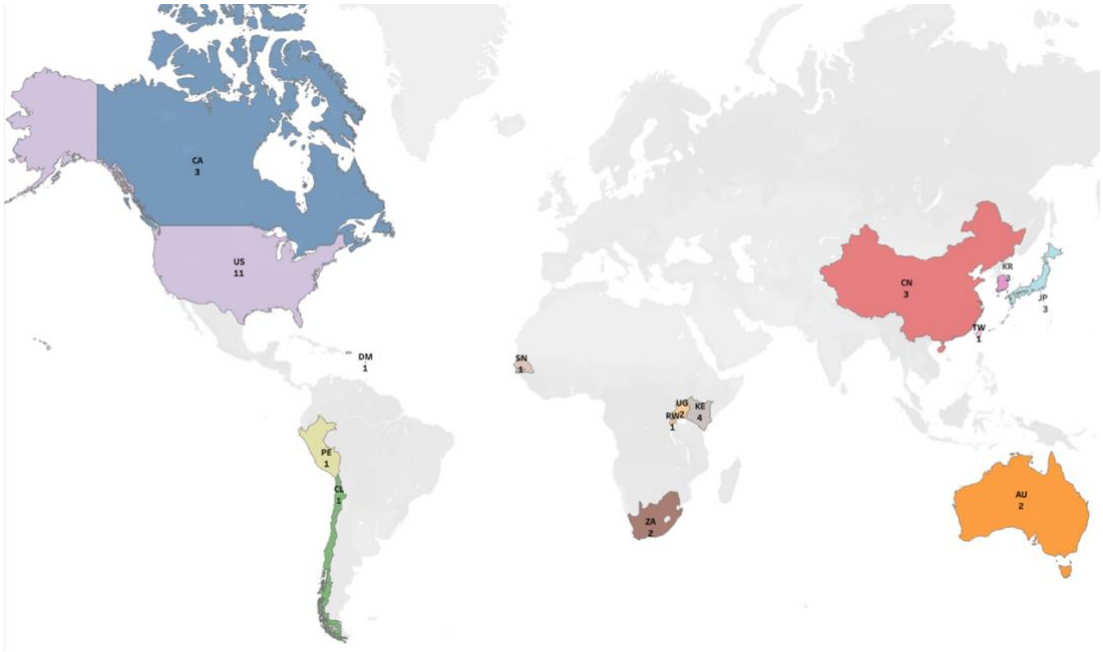


[3] Updates on the association of third countries to Horizon Europe

Contratti in corso nel 2025 - Partecipazioni di partner europei e area mediterranea - Figura 12

Contratti in corso nel 2025 - Partner del resto del mondo - Figura 13

Contratti in corso nel 2025 - Partecipazioni di partner del resto del mondo – Figura 14



La Tabella 9 riporta il numero di contratti, di partner e di partecipazioni per Paese; i Paesi con il maggior numero di partecipazioni, dopo l'Italia (542), sono la Francia (286), la Germania (263), la Spagna (224) e il Belgio (155).

Tra i Paesi candidati all'adesione all'UE, e già associati a Horizon Europe, Ucraina e Turchia sono quelli con cui l'ENEA collabora maggiormente (19 e 22 partecipazioni rispettivamente); di rilevo, la Serbia ha 8 partecipazioni, a seguire l'Albania con 7, la Bosnia-Erzegovina con 5. Nell'area mediterranea non UE, si nota Israele conta 6 partecipazioni e la Tunisia con 4.

Tra i Paesi europei extra UE, le partecipazioni più numerose sono con il Regno Unito (105), associato a Horizon Europe dal 1° gennaio 2024, seguito dalla Svizzera (71), ad oggi associata a H2020 ma non ancora a Horizon Europe, dalla Norvegia (44), associata a entrambi i Programmi Quadro.

Significative sono anche le partecipazioni dal resto del mondo a cominciare dagli Stati Uniti d'America (11).

Da notare come, dal 2021 ad oggi, siano costantemente cresciute le collaborazioni con Francia, Germania, Spagna e Belgio ma anche Regno Unito, Stati Uniti d'America e Svizzera.

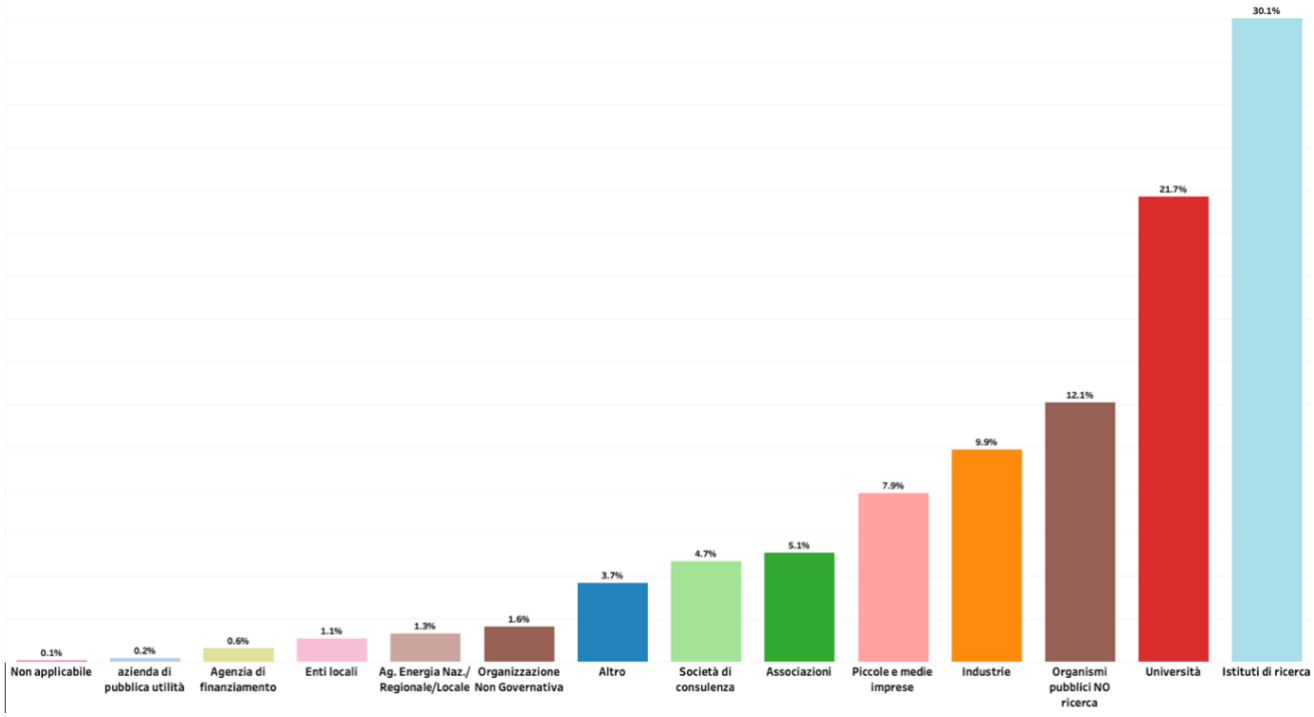
La natura dei partner internazionali dell'ENEA è evincibile nella Figura 15. L'analisi storica mostra un rapporto costante nel tempo con gli istituti di ricerca, le università e le industrie.

Contratti in corso nel 2025 - Numero di contratti, partner e partecipazioni per Paese – Tabella 9

Gruppi Paesi (politico)	Paese	N. Contratti	N. Partner	N. Partecipazioni
	Totale complessivo	**143**	**1.499**	**2.681**
Membri UE	Austria	41	44	66
	Belgio	75	84	155
	Bulgaria	22	19	26
	Cipro	16	12	19
	Croazia	18	17	26
	Danimarca	32	16	39
	Estonia	14	13	19
	Finlandia	46	39	79
	Francia	91	149	286
	Germania	105	133	263
	Grecia	57	48	93
	Irlanda	19	17	24
	Italia	111	217	399
	Lettonia	11	7	11
	Lituania	20	14	22
	Lussemburgo	7	7	10
	Malta	9	5	9
	Paesi Bassi	58	52	106
	Polonia	49	45	68
	Portogallo	34	34	58
	Repubblica Ceca	47	33	69
	Romania	29	20	37
	Slovacchia	21	16	23
	Slovenia	34	23	44
	Spagna	92	129	224
	Svezia	45	42	81
	Ungheria	34	30	48
Candidati adesione UE	Albania (*)	5	7	7
	Bosnia-Erzegovina (*)	4	4	5
	Macedonia (*)	1	1	1
	Moldavia (*)	3	2	3
	Montenegro (*)	1	1	1
	Serbia (*)	7	6	8
	Turchia (*)	19	16	22
	Ucraina (*)	12	10	19
Mediterraneo non UE	Giordania	2	2	2
	Israele (*)	5	5	6
	Libano	2	1	2
	Marocco	1	2	2
	Palestina	1	1	1
	Tunisia (*)	2	4	4
Europei non UE	Islanda	1	1	1
	Norvegia (*)	31	28	44
	Regno Unito (*)	49	63	105
	Svizzera (*)	43	29	71
Resto del mondo	Australia	2	2	2
	Canada (*)	3	3	3
	Cile	1	1	1
	Cina	2	3	3
	Corea del Sud (*)	3	3	3
	Dominica	1	1	1
	Giappone	3	3	3
	Kenya	1	4	4
	Libia	1	1	1
	Peru'	1	1	1
	Ruanda	1	1	1
	Senegal	1	1	1
	Stati Uniti D'america	7	9	11
	Sudafrica	2	1	2
	Taiwan	1	1	1
	Uganda	1	2	2
Organ. Internazionali	Organ. Internazionali	27	14	33

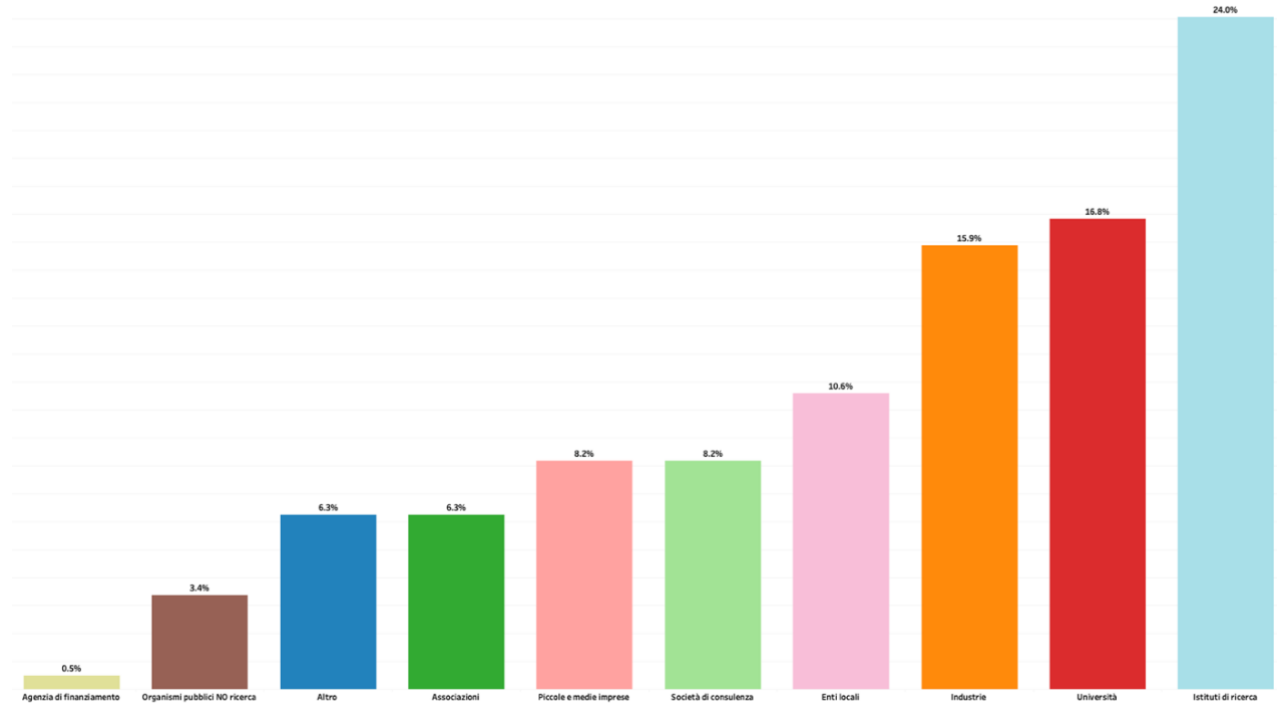
(*) *Ott 2025 - 22 paesi terzi associati a Horizon Europe, inclusi quelli Spazio economico europeo (SEE) e'Agenzia europea dell'ambiente (EFTA).*

Contratti in corso nel 2025 - Natura dei partner internazionali di ENEA - Figura 15



I dati nazionali della Figura 16 mostrano sempre un rapporto preferenziale con il mondo della ricerca ma con un coinvolgimento del comparto industriale nazionale maggiore rispetto a quello internazionale.

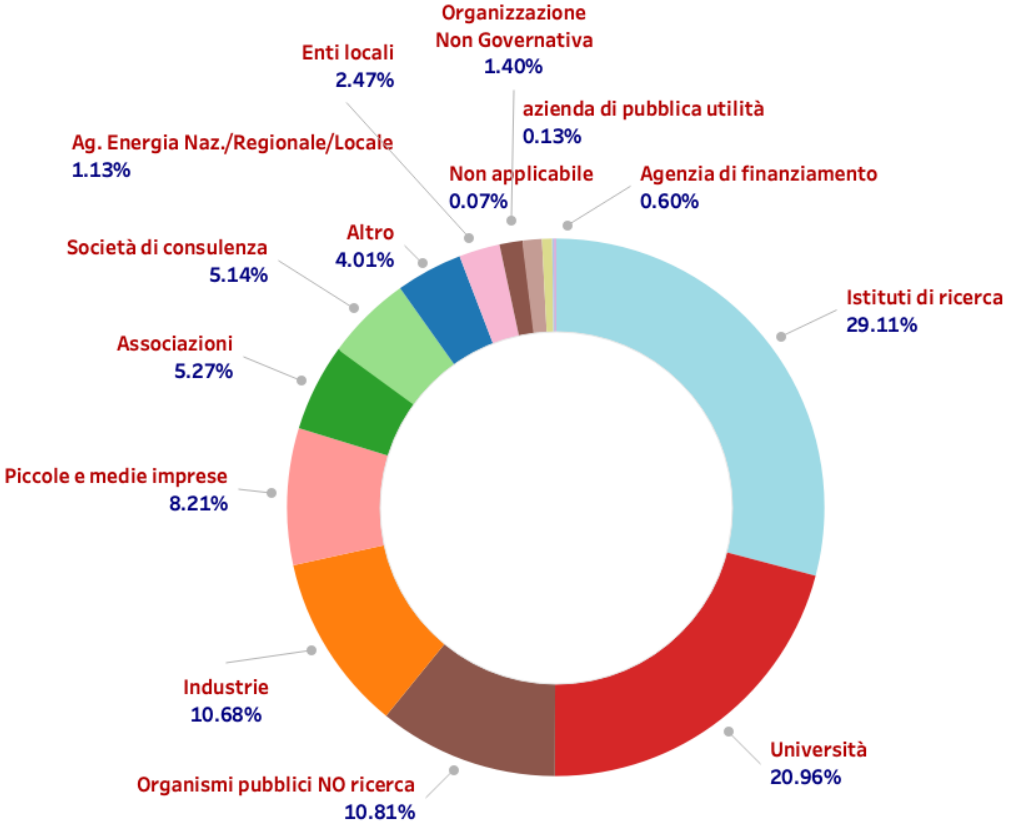
Contratti in corso nel 2025 - Natura dei partner nazionali di ENEA - Figura 16



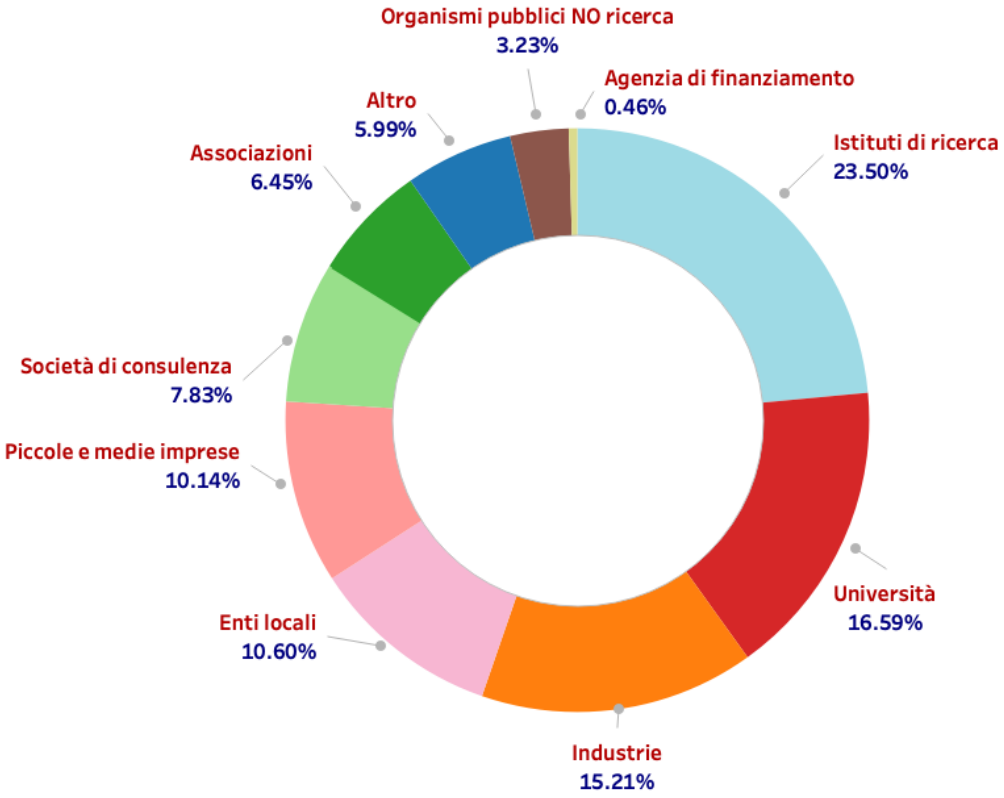
Se ora esaminiamo la natura dei partner internazionali (Figura 17) e nazionali (Figura 18) di ENEA nei contratti in essere al 2025, in entrambi i casi, gli istituti di ricerca (29,1% e 23.5%) sono i partner principali dellENEA. Interessante notare come, a livello nazionale, i rapporti con il

mondo industriale nazionale siano pari a quelli universitari (il dato è confermato anche dall'analisi della serie storica a partire dal 2021).

Contratti in corso nel 2025 - Tipologia dei partner internazionali - Figura 17



Contratti in corso nel 2025 - Tipologia dei partner nazionali Figura 18



Secondo i requisiti stabiliti dalla UE4, le piccole e medie imprese (PMI) costituiscono circa il 10.1% dei partner italiani (dato in costante aumento nel tempo a partire dal 2000 ma accelerato sensibilmente nell'ultima programmazione).

5.3 Coordinamento

Nel 2025 l'ENEA ha il coordinamento di 13 dei 143 progetti in corso, pari al 9% (dato in calo costante rispetto agli anni precedenti). Il budget complessivo assegnato all'ENEA nei progetti che coordina è di circa 6.6 milioni di euro (anche questo dato è in significativo calo rispetto all'anno precedente). Con riferimento, invece, ai progetti in cui l'ENEA partecipa come partner o altra veste (130, pari al 91%), il contributo all'ENEA è stato di circa 35.6 milioni di euro.

La Tabella 10 mostra l'elenco dei 13 progetti a coordinamento dell'Agenzia in corso nel 2025, indicando per ciascuno il programma di finanziamento e l'area tematica in cui ricade l'attività. Ulteriori informazioni di dettaglio sono disponibili nelle schede sintetiche di ciascun progetto (Allegato 1).

Contratti in corso nel 2024 – Progetti a coordinamento ENEA – Tabella 10

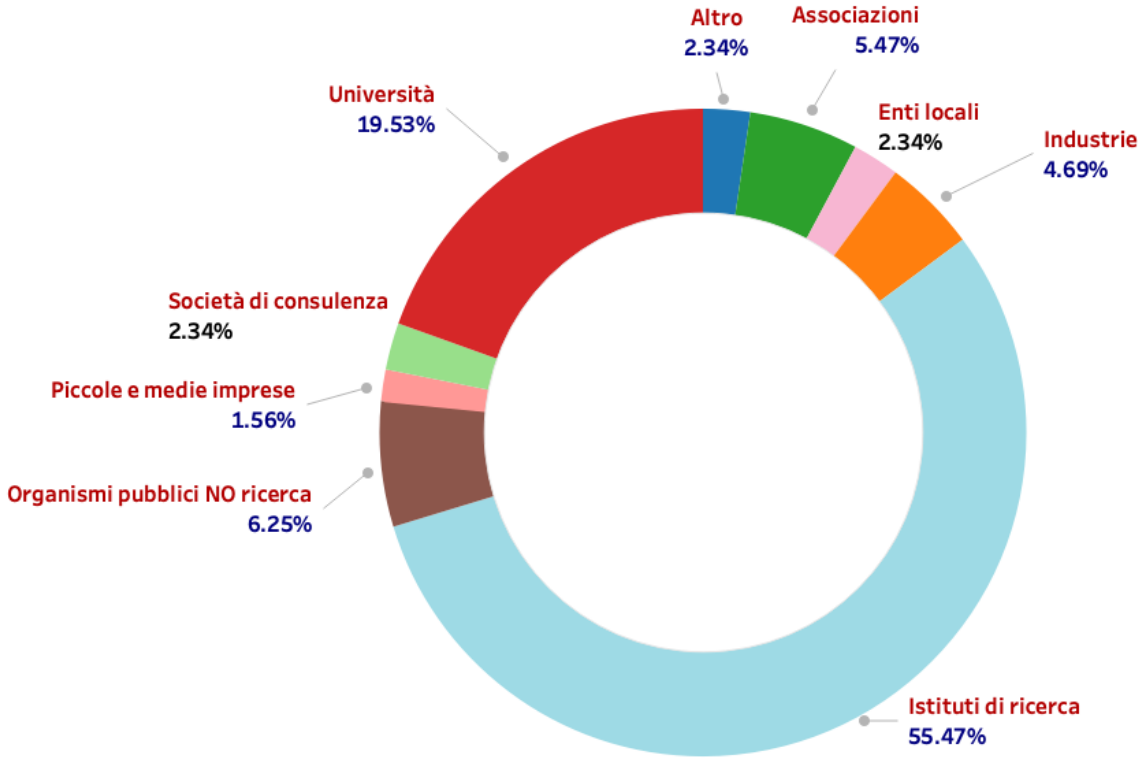
PQ	Acronimo	Data Fine	Area Tematica	Programma UE	Costo Totale Progetto	Contributo Totale Progetto	Contributo Totale Enea	N. Contratti
Totale complessivo					72.506.732,00 €	65.658.360,00 €	6.583.820,00 €	13
Euratom2027	SASPAM-SA	30/09/2026	Energy - fission	Euratom fissione	4.276.039,00 €	2.991.694,00 €	342.656,00 €	1
HORIZON EUROPE (2021-2027)	ALRIGH2T	31/12/2027	Energy - hydrogen	Cluster 5 - D5 Clean and competitive solutions transport modes	12.920.388,00 €	9.999.720,00 €	400.000,00 €	1
	DISCOVER	31/01/2027	Radioprotection	Euratom radioprotezione	1.344.970,00 €	847.331,00 €	472.481,00 €	1
	EIT Raw materials FENICE_23	31/12/2025	Raw materials	EIT - Raw Materials KIC	2.996.579,00 €	2.094.683,00 €	230.506,00 €	1
	GO4FUSION	14/01/2027	Energy - fusion	Euratom	1.500.000,00 €	1.500.000,00 €	171.938,00 €	1
	LESTO	31/10/2028	Energy - fission	Euratom	4.734.756,00 €	3.998.638,00 €	797.813,00 €	1
	NARCOSIS	31/10/2027	Security	Cluster 3 - Civil security for society	4.635.295,00 €	4.410.856,00 €	704.730,00 €	1
	PRO-GRACE	31/10/2025	Life sciences - food genetic	Research Infrastructures (2021-2027)	2.847.250,00 €	2.847.250,00 €	290.000,00 €	1
	REPRODIVAC	31/08/2025	Life sciences	Cluster 6 - Food, Bioeconomy, Natural Resources, Agriculture and Environment	3.136.284,00 €	3.125.324,00 €	874.526,00 €	1
Other programmes (2021-2027)	LIFE22-CET-LEAPto11	31/01/2027	Energy - efficiency	LIFE27 (2021-2027)	1.775.291,00 €	1.686.526,00 €	404.160,00 €	1
	LIFE24-CET-EEFINH	30/06/2029	Energy - efficiency	LIFE27 (2021-2027)	3.670.832,00 €	3.487.290,00 €	409.206,00 €	1
	P104	25/11/2027	Security - CBRN	NDICI - GLOBAL EUROPE	1.968.000,00 €	1.968.000,00 €	490.000,00 €	1
	RescEU-CBRN-DSIM-IT	29/09/2026	Security	UCPM - Union Civil Protection Mechanism	26.701.048,00 €	26.701.048,00 €	995.804,00 €	1

Nei 23 nuovi progetti stipulati nel 2025, il coordinamento rimane saldamente nelle mani degli istituti di ricerca (55.5%) e delle Università (19.5%), dato pressoché stabile nel tempo.

Nella Figura 19 si può vedere la distribuzione della tipologia dei coordinatori dei 143 progetti a cui partecipa ENEA nel 2025

[4] La categoria delle microimprese, delle piccole imprese e delle medie imprese (PMI) è costituita da quelle che occupano meno di 250 persone, il cui fatturato annuo non supera i 50 milioni di EUR e/o il cui totale di bilancio annuo non supera i 43 milioni di EUR (estratto dell'articolo 2 dell'allegato alla raccomandazione 2003/361/CE).

Contratti in corso nel 2025 – Ripartizione percentuale per tipologia dei coordinatori – Figura 19



Anche questa serie temporale dal 2021, ad oggi, non mostra significative variazioni nella natura dei partner. Anche l'analisi della stessa serie storica della ripartizione del contributo totale per paese mostra analoga tendenza.

La percentuale degli importi gestiti e la numerosità dei progetti, secondo la distribuzione geografica dei coordinatori nei 143 progetti, sono mostrati nelle Figure 20 e 21.

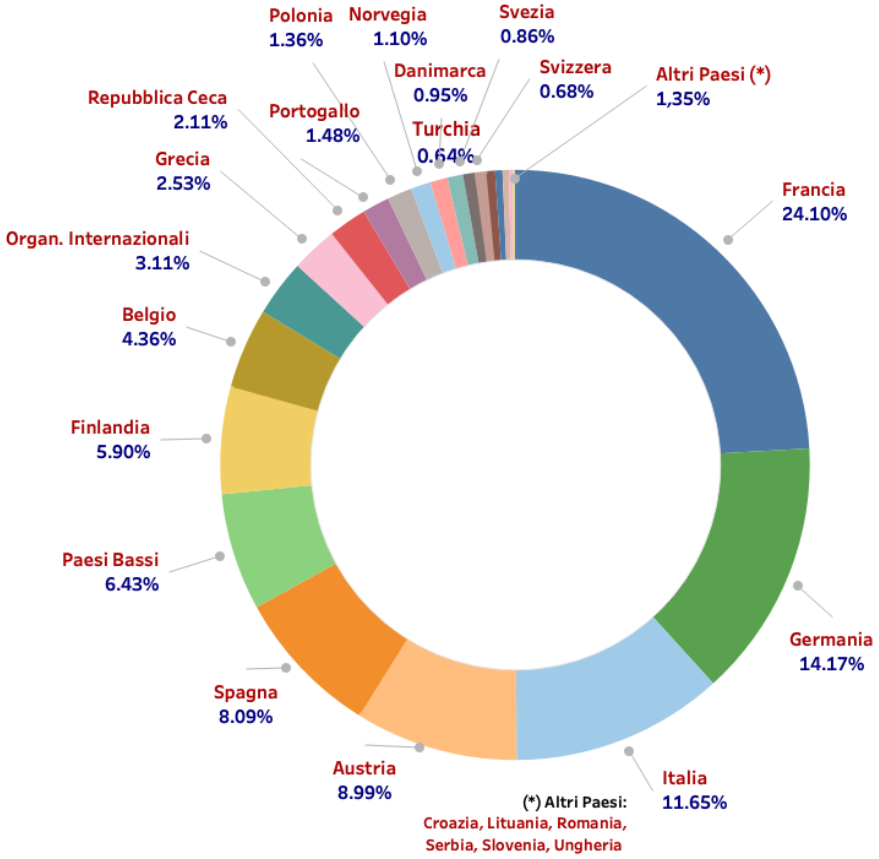
La serie storica dal 2021 ad oggi mostra come la Francia sia il Paese che storicamente ha il maggior numero di coordinatori, con una percentuale quasi costante. Al contrario, nello stesso arco temporale, l'Italia tende costantemente ad avere meno coordinamenti.

Nei progetti in cui l'ENEA è uno dei partner, osservando il contributo totale gestito dai coordinatori, notiamo che i budget totali più alti sono gestiti dai francesi (24.1%), dai tedeschi (14.7%), dagli italiani (11.6%).

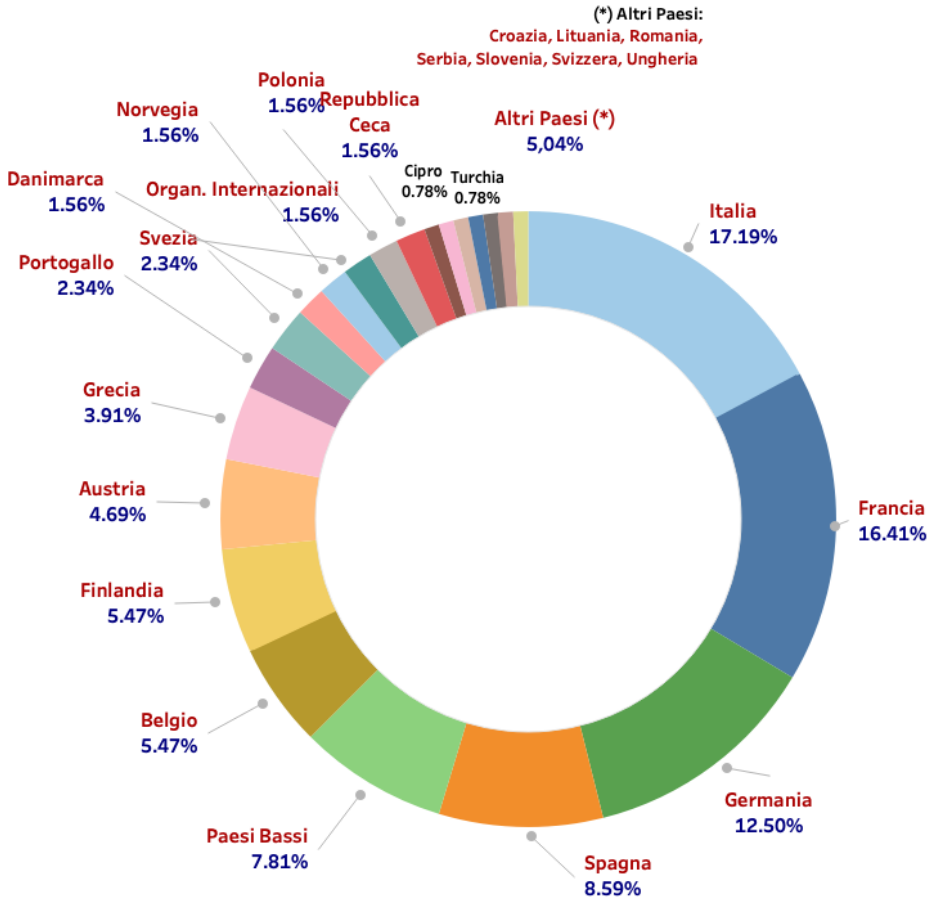
Con riferimento al numero di progetti, sono sempre le organizzazioni italiane e francesi a coordinare il numero maggiore (17.2% e 16.4% rispettivamente), seguite da quelle tedesche (12.5%).

Pertanto, si osserva che, relativamente ai contratti in corso nel 2025, il posizionamento nazionale risulta sostanzialmente invariato in termini di progetti gestiti dai coordinatori italiani e budget totale.

Contratti in corso nel 2025 – Ripartizione percentuale del contributo per paese coordinatore – Figura 20



Ripartizione percentuale del numero di progetti per paese coordinatore – Figura 21



6. Elenco delle schede sintetiche dei progetti

2B-BLUE
AgroServ
AlphaMet
ALRIGH2T
AMIGDALA
ANSELMUS
APRENDE
ASSASS
B2030 CSA3
BEST
Beyond EPICA
BILATERAL AGREEMENT NEAR/ANK/2023/EA-RP/0104
BIOcean5D
BIOMETHAVERSE
BRIDGeconomies 2022
BRIDGeconomies 2025
CA EED3
CAMAERA
CAMEO
CAMS2_40
CAMS2_40_bis_MF
CapaCITIES 2.0
CBRNe4rail
CETMA-DIHSME
CHemPGM
CO2OLHEAT
CoCliCo
CONNECT-NM
CRBN SoS
CRISTAL
CST4ALL
DeliSoil
DISCOVER
DONES-ConP1
DRG4Food
DUT
EASI-SMR
ECO-READY
EEPLIANT4
EIT Raw materials FENICE_23
EJP SOIL
ENEN2plus
Energy2Act
EoCoE-III
EOSC-Beyond
ERN-ApuliaMED
ESFR-SIMPLE
EU-DREAM
EuPRAXIA
EURAD-2
EVERPV
FHERITALE
FISHIMPACT
FLASH-DOSE
ForestNavigator
FREDMANS
FRUITPRINT
FuelSOME
gEneSys
GO4FUSION
GUARDIANS
GuideRadPROS
H2Excellence
HARMONISE
HARPERS
HASTA
HealthRiskADAPT
HyMetBat
HyPEF
HYPER-AI
HySelect
I-NEST
IMAGEOMICS
IMPROVE
INDICATE LIFE
InnCoCells
INNUMAT
IRISCC
KijaniBox
KNOWING
LANDFEED
LEAPS-INNOV
LESTO
LIFE MODERn (NEC)
LIFE21-CET-CA-CAEPBD6
LIFE21-CET-POLICY-OdysseeMure fit-4-55
LIFE22-CET-ENEFIRST PLUS
LIFE22-CET-EPBD.wise
LIFE22-CET-EU Peers
LIFE22-CET-LEAPto11
LIFE22-CET-SEED MICAT
LIFE24-CET-BREEZE
LIFE24-CET-EEFINH
LIFE24-CET-ODYSSEE-MURE - EED
LIFE24-CET-RENOVA
MEDWISE
MetHIR
MINKE
MOIRAI
MoSaiC
MSA-Trough
MULTICLIMACT
MultiSoil
NARCOSIS
NET
NHyRA
NiCE
OBSERVE
OperaHPC
P104
PANORAIMA
PIANOFORTE
POLYRISK
PRO-GRACE
PROMEDLIFE
PROTOSTACK
RADNEXT
REHOUSE
ReMade-at-ARI
REPRODIVAC
RescEU-CBRN-DSIM-IT
RISEnergy
SALTOpower
SASPAM-SA
SCRREEN3
SEAKNOT
SEAWave
SECURE
SEETIP Ocean
SHARE.MedWATER
SMILE CITY
SOLARIZE
SPECTRA
StoRIES
STYX
SULPHURREAL
SYMBIOSYST
TANDEM
THOTH2
THREAD
TITANS
TraMeXI
tunES

Interreg Euro-MED

2B-BLUE

2B-BLUE

Boosting the Blue Biotechnology community in the Mediterranean

Coordinatore: UNIV. MURCIA (UMU) (Spagna) N. Partner: 21

Abstract:

The Blue Biotechnology (BBt) sector can have a significant impact on the environment, human wellbeing and economic growth, however in the Mediterranean basin it is currently in its infancy. B- BLUE project has built a preliminary network of actors related to BBt and analyzed best practices, key drivers, barriers and readiness factors of EuroMed companies for adopting blue biotechnologies, concluding with the most promising value chains for EuroMed area. The project allowed the establishment of 5 interactive Blue Biotechnology Hubs (BHHs) to facilitate collaborations, knowledge transfer and spill-over effects to spur innovation and business within the marine biotechnology value chains and address the challenges detected. At once, a digital community has been developed, using an ICT tool called B-Blue MatchMaking Tool, to support new joint initiatives. Moreover, the MedIA - Mediterranean Innovation Alliance for Sustainable BlueBioeconomy - has been set-up in collaboration with Blue Bio Med and 2 specific collaborative working groups on BBt. 2B- BLUE aims to capitalize on B-Blue positive results to: 1) Exemplify evidence-based best practices identified to help communities turn BBt research into practice, 2)Build national demonstration sites (DS) to experiment emerging technologies or practices in local field conditions and bridge the gap among BBt research and industry for new technologies adaptation while help improve marine environment, 3) Establish strategic alliances of 5-helix stakeholders for the uptake of advanced blue biotechnologies by Med industries and 4)improve regional policies for enhancing sustainability, research and innovation capacities in Euro-Med area. Thus, the main challenges detected in the B- Blue work - most related to funding, normative and public and private collaboration- can be transformed into opportunities in 2B-Blue and result in more sustainable and efficient practices as well as better structuring of the BBt sector in the Mediterranean.

Attività ENEA:

L'ENEA rivestirà il ruolo di co-leader (insieme all'Università di Murcia, coordinatore di progetto) del WP3 'Set-up of the BBt innovation ecosystem in the Mediterranean', ed è leader delle seguenti task: •Carbon footprint monitoring •Coordination and dialogue with thematic community and institutional dialogue projects

Responsabile:	DE CAROLIS ROBERTA	**Unità:**	SSPT-USER
Anno Stipula:	2024		
PQ:	Other programmes (2021-2027)	**Programma UE:**	Interreg Euro MED
		Tipo Progetto:	N/A - Non applicabile
Data Inizio:	01-01-2024	**Data Fine:**	30-09-2026
Doc. approvazione:	98/2024/SSPT/USER	**Codice atto:**	PS6AEQ
Contributo Totale:	€ 2.331.149	**Costo eleggibile:**	€ 2.913.936
Contributo ENEA:	**€ 228.200**	**Costo ENEA:**	**€ 282.250**

AgroServ

Integrated SERVices supporting a sustainable AGROecological transition

Coordinatore: CNRS - FRENCH NATIONAL CENTRE FOR SCIENTIFIC RESEARCH (Francia)

N. Partner:

Abstract:

Developing a resilient and sustainable agriculture system, and the agroecological transitions requires a deep understanding of agroecosystems, their interactions with the environment, and management practices. AgroServ features a large consortium of research infrastructures, most of them being on the EU roadmap, and a vast offer of services at all scales, from the molecule to the organism, to the ecosystem, to the society. AgroServ will facilitate a systemic and holistic approach to understand the threats and challenges agriculture is facing, towards the implementation of a resilient and sustainable agri-food system. We propose a transdisciplinary offer of services, integrating the actors of the agriculture system in the research process, of which the farmers are the first, thanks to a wide offer of living labs across Europe. Most of the relevant field of sciences are represented in AgroServ, from natural to social sciences. We will develop a wider catalogue of integrated and customized services, thanks to a specific approach of service pipelines designed from a gap analysis, stakeholder and user demands. A strong community building and training program for access managers and users will be implemented to facilitate multi- and transdisciplinary research with all relevant actors. Results from the research performed under AgroServ will be synthetized to be used in the scope of evidence-based policy making. Data from AgroServ will be open and compliant with FAIR practices, and made available on the long-term to the communities, and be linked with the main European initiatives, as the EOSC. Strong links will be established with existing or future programs under H2020 and Horizon Europe, such as the partnerships agroecology, living labs and research infrastructures, and agriculture of data, as well as the two CSA AE4EU and ALL-READY, and the missions soil and plant health, and waters. AgroServ will collaborate with other relevant initiative in the Pillar II to of HE.

Attività ENEA:

ENEA è à coinvolto in 6 dei 9 WPs “tecnici” nei quali si articola il progetto e nella fornitura di servizi integrati per il TNA. In particolare, ENEA partecipa ai seguenti WP: WP2 - AgroServ integration and customisation of services WP5 - Community building and user’s engagement WP6 - Open innovation hub (WP Leader) WP7 - Developing a roadmap for long-term sustainability beyond 2027 WP8 - Outreach, dissemination, exploitation of results WP9 - Project management and monitoring WP14 - TA METROFOOD-RI

Responsabile:	ZOANI CLAUDIA	**Unità:**	SSPT-BIOAG
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Research Infrastructures (2021-2027)
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-09-2022	**Data Fine:**	31-08-2027
Doc. approvazione:	141/2022/SSPT-BIOAG	**Codice atto:**	PS1ACS
Contributo Totale:	€ 14.252.873	**Costo eleggibile:**	€ 14.252.873
Contributo ENEA:	**€ 493.245**	**Costo ENEA:**	**€ 493.245**

Metrology for emerging targeted alpha therapies

Coordinatore: CMI - CZECH METROLOGY INSTITUTE (Repubblica Ceca) N. Partner:

Abstract:

Targeted alpha therapy (TAT) is a rapidly growing cancer treatment modality, whereby alpha-emitting radiopharmaceuticals selectively target tumours whilst minimising the radiation to healthy tissues. Presently only 223RaCl2 has regulatory approval, but its success resulted in unprecedented levels of interest and investment in TAT for a variety of cancers. It is showing promising efficacy and increased survival in clinical trials; however, several unmet and unique measurement challenges remain a barrier to enable the safe and optimised implementation of emerging targeted alpha therapies. This project will provide the metrology needed to support end-to-end traceability before wide routine adoption.

Attività ENEA:

L'ENEA-INMRI, oltre alla partecipazione ai work package di impatto/comunicazione (WP5) e gestionale (WP6), parteciperà attivamente al WP1: Standards di attività e dati nucleari di decadimento per imaging e dosimetria per radionuclidi emettitori alfa. In questo work package l'ENEA-INMRI sarà impegnato soprattutto nello sviluppo, in collaborazione con altri partner europei, di un nuovo standard di Ac-225.

Responsabile:	CAPOGNI MARCO	**Unità:**	FSN-INMRI
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	EPM - European Partnership on Metrology
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-09-2023	**Data Fine:**	31-08-2026
Doc. approvazione:	123/2023/FSN	**Codice atto:**	PF5AAN
Contributo Totale:	€ 1.887.356	**Costo eleggibile:**	€ 1.887.356
Contributo ENEA:	**€ 50.000**	**Costo ENEA:**	**€ 50.000**

ALRIGH2T

ALRIGH2T

Airport-Level DemonstRatIon of Ground refuelling of Liquid Hydrogen for AviaTion

Coordinatore: ENEA (Italia) N. Partner:

Abstract:

ALRIGH2T responds in full to the “expected outcomes” and “scope” of the HORIZON-CL5-2023-D5-01-07 topic, by developing and demonstrating two alternative technologies for LH2 aircraft refuelling: - Direct LH2 refuelling, encompassing the definition of operational protocols for safe and rapid refuelling, the development and testing of a LH2 transfer pump and an instrumented tank, their integration in an iron bird laboratory for the execution of refuelling/defueling tests and the delivering of a digital twin model. - LH2 tanks swap refuelling, encompassing end-to-end logistic and supply chain of tank modules, the design of the associated on- and off-site infrastructure and its demonstration. Both concepts will achieve TRL 6 by the end of the project, undergoing a comprehensive technology evaluation informed by demonstration results in two major airports, i.e. Milan Malpensa and Paris (Orly or LeBourget) respectively. The two technology lines are complemented by transversal activities for the definition of technical and techno-economic boundary conditions, the demonstration of the use of H2 for ground operations (i.e. H2 powered tow vehicle, demonstrated at the Malpensa site) as well as environmental, safety and regulatory cross-cutting aspects. ALRIGH2T has the ambition of demonstrating, for the first time, LH2 refuelling in a scale compatible with airport operations, synergizing with the Clean Aviation research and development efforts at the aircraft level. The project is implemented by a consortium built on the competences of top European industrial players, positioned along entire hydrogen and aeronautic value chain, complemented by research and technology organisations and selected member of the Advisory Board, including the EASA. ALRIGH2T is expected to be a cornerstone in the path towards the deployment of LH2 as an aviation fuel, strengthening the European research and industry leadership and consolidating the role of green airports as hubs of the H2 economy.

Attività ENEA:

L'ENEA coordina il progetto ed è quindi leader del WP1 (Project Management); è inoltre coinvolta nel WP2 (Technical specifications and techno-economic boundary conditions), nel WP6 (Demonstration activities and technology evaluation), nel WP7 (Environmental, safety, regulatory and cross-cutting aspects) e nel WP8 (Dissemination, communication and exp).

Responsabile:	CIGOLOTTI VIVIANA	**Unità:**	TERIN-PSU-ABI
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D5 Clean and competitive solutions transport modes
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-01-2024	**Data Fine:**	31-12-2027
Doc. approvazione:	319/2023/TERIN	**Codice atto:**	PK4ABB
Contributo Totale:	€ 9.999.720	**Costo eleggibile:**	€ 12.920.388
Contributo ENEA:	**€ 400.000**	**Costo ENEA:**	**€ 400.000**

AMIGDALA

Alliance for Modelling Industries towards the Green Deal's objectives And circuLArity

Coordinatore: TNO - NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK (Paesi Bassi)

N. Partner:

Abstract:

The objective of the European Green Deal policy is to be climate-neutral by 2050. However, the key problem of the industry transition towards climate neutrality is that the combined response of demand, global trade and industrial production to policy measures is highly complex. The aim of the AMIGDALA project is to facilitate decision makers in governments and in the EU's industries to define and evaluate pathways towards climate neutrality, circularity and sustainability. In this project we combine insights in decision-making with integrated modelling of scenarios to analyze transformation pathways. We analyze decisions-making in government and in industry by the control options that they have such as incentives, regulatory measures and investments in capital projects to contribute to the Green Deal's objectives. We deliver an integrated model to represent EU industry's transformation pathways up to 2070 and cover historical developments from 1990. We develop a method to combine established models of separate domains and let them operate asone. Thisintegrated modelshowsthe combined effect of control options on economy, trade, energy, materialsflow, biomass and industrial production on an EU systems-level and within a global context. On a local-level we use models to analyze the decisions by industry clusters to invest in transformative solutions and utility operators to build infrastructure. With the integrated model we run scenarios that we develop on the basis of the control options of decisionmakers to achieve industrial transformation towards climate neutrality. The integrated model allows to analyze the effect of framework conditions on the uptake of transformative solutions and products and on energy demand, emissions, and material use. The AMIGDALA consortium has a deep and shared knowledge of technologies, economy, life cycle analysis and complex systems modelling and decision support analysis.

Attività ENEA:

Le attività svolte da ENEA sono di natura modellistica. In particolare, contribuirà a 7 task: • Task 1.4 Define & prioritize development needs per model; • Task 1.6 Develop data structure & define data needs; • Task 1.7 Define scenario structure & approach; • Task 2.4 Control levers, baseline scenario and sketching of other foreground scenarios; • Task 4.1 Finalizing models for all sectors and solutions; • Task 4.2 Finalize database and interactive data; • Task 4.5 Benchmark EU industry pathways against other pathways.

Responsabile:	AGOSTINI ALESSANDRO	**Unità:**	TERIN-PSU-ABI
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 4 - Digital, Industry and Space
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-01-2024	**Data Fine:**	31-12-2027
Doc. approvazione:	305/2023/TERIN	**Codice atto:**	PK4AAZ
Contributo Totale:	€ 6.913.126	**Costo eleggibile:**	€ 6.913.126
Contributo ENEA:	**€ 266.500**	**Costo ENEA:**	**€ 266.500**

ANSELMUS

ANSELMUS

Advanced Nuclear Safety Evaluation of Liquid Metal Using Systems

Coordinatore: SCK CEN - STUDIECENTRUM VOOR KERNENERGIE / CENTRE D'ETUDE DE L'ENERGIE NUCLEAIRE (Belgio)

N. Partner:

Abstract:

The importance of low carbon energy sources in the efforts against rapid climate change makes nuclear energy part of a sustainable energy mix. Although there have been years of experience feedback with water cooled reactors, fundamental improvement, particularly regarding intrinsic safety and reduced nuclear waste generation is possible using advanced nuclear designs. Heavy metal cooled systems such as the lead fast reactor (LFR) combine the advantages of a fast reactor system that reduces waste with the intrinsic safety related properties such as the high boiling point, chemical inertia and improved heat transfer. ANSELMUS responds to the Horizon-Euratom -2021-NRT-01-02 call Safety of advanced and innovative nuclear designs and fuels. Its objective is to contribute significantly to the safety assessment of heavy-liquid-metal (HLM) systems, in particular ALFRED and MYRRHA as these are included in the roadmap for the development of advanced systems in Europe. It will use the maturity of both designs to create two detailed phenomena identification and ranking tables (PIRT) that identify all verification and validation needs and are used for further safety evaluation. The project will also experimentally validate key safety related sub-systems including the safety rods, failed fuel pin detection and the coolant chemistry control system. We also will improve the validation of numerical models describing the fuel assembly through experiments and simulations and work on reactor safety monitoring and inspection of HLM systems focusing on high temperature vessel inspection. Moreover, ANSELMUS will look into the societal impact of HLM reactors by assessing the integration of LFR in a mixed energy landscape, including economical aspects, and by addressing social and ethical considerations of advanced nuclear technologies. Finally, a dedicated effort will be put into education and dissemination towards all stakeholders including policy makers and the general public.

Attività ENEA:

ENEA è coinvolta nei seguenti work package (WP): - WP1 PIRT on HLM systems; - WP2 Fuel assembly safety (12 PM) - WP3 Validation of safety systems (30 PM) - WP4 Reactor safety monitoring & inspection

Responsabile:	TARANTINO MARIANO	**Unità:**	FSN-PROIN
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-09-2022	**Data Fine:**	31-08-2026
Doc. approvazione:	081/2022/FSN	**Codice atto:**	PF0AAR
Contributo Totale:	€ 3.464.443	**Costo eleggibile:**	€ 4.509.865
Contributo ENEA:	**€ 682.969**	**Costo ENEA:**	**€ 921.875**

APRENDE

Addressing PRiorities of Evaluated Nuclear Data in Europe

Coordinatore: CIEMAT - CENTRO DE INVESTIGACIONES ENERGETICAS, MEDIOAMBIENTALES Y TECNOLOGICAS (Spagna)

N. Partner:

Abstract:

The conception, development, optimization, and safety evaluation of a broad range of nuclear energy (fission and fusion) and non-energy applications (radiation protection, radionuclide production, health, geosciences, space research, security, and industry) require reliable and accurate simulation tools. Such tools critically rely on accurate nuclear decay and reaction data. APRENDE has the ambition to improve nuclear data for modelling and simulation (M&S) tools used by European stakeholders in the application areas of the European Union and its member states that currently have the highest priority. The priority application areas identified by stakeholders of nuclear data and by national, European, and international projects and consultations are: A. All aspects of spent nuclear fuel (SNF), B. Reactor operational characteristics such as reactivity versus burnup, transients, and margins, C. Advanced reactor and fuel cycle development including small modular reactors (SMR) and GenIV systems based on lead and sodium coolants, molten salts, or an accelerator like MYRRHA, D. Criticality safety and shielding for safety assessments and safety assessment methodologies, E. Non-Energy applications, radiation protection. This ambition requires a comprehensive approach involving the eight objectives stated above, and a methodology and impact pathway as detailed below. The combination of this ambition, objectives, methodology and our pathway to create impact is what the proposers believe to be not only the best, but also an excellent response to the HORIZON-EURATOM-2023-NRT-01-06 call ‘Improved nuclear data for the safety of energy and non-energy applications of ionising radiation’. In the following, we break down and explain our ambition by each of the priority application areas.

Attività ENEA:

L'ENEA parteciperà attivamente al WP2 "New nuclear data measurements". In particolare, congiuntamente all'INFN, l'ENEA si farà carico delle attività legate alla predisposizione, conduzione ed interpretazione dei risultati, di una campagna sperimentale presso la facility n_TOF del CERN, relativa a nuove misure di sezioni d’urto per gli isotopi stabili del rame.

Responsabile:	GRASSO GIACOMO	**Unità:**	NUC-ENER-PRO
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Euratom
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-10-2024	**Data Fine:**	30-09-2028
Doc. approvazione:	107 (2024) NUC	**Codice atto:**	PF6ABE
Contributo Totale:	€ 3.999.900	**Costo eleggibile:**	€ 4.795.474
Contributo ENEA:	**€ 22.000**	**Costo ENEA:**	**€ 27.000**

ASSASS

Artificial intelligence for the Simulation of Severe AccidentS

Coordinatore: IRSN - INSTITUT DE RADIOPROTECTION ET DE SURETE NUCLEAIRE (Francia)

N. Partner:

Abstract:

The ASSAS project aims at developing a proof-of-concept SA (severe accident) simulator based on ASTEC (Accident Source Term Evaluation Code). The prototype basic-principle simulator will model a simplified generic Western-type pressurized light water reactor (PWR). It will have a graphical user interface to control the simulation and visualize the results. It will run in real-time and even much faster for some phases of the accident. The prototype will be able to show the main phenomena occurring during a SA, including invessel and ex-vessel phases. It is meant to train students, nuclear energy professionals and non-specialists. In addition to its direct use, the prototype will demonstrate the feasibility of developing different types of fast-running SA simulators, while keeping the accuracy of the underlying physical models. Thus, different computational solutions will be explored in parallel. Code optimisation and parallelisation will be implemented. Beside these reliable techniques, different machine-learning methods will be tested to develop fast surrogate models. This alternate path is riskier, but it could drastically enhance the performances of the code. A comprehensive review of ASTEC's structure and available algorithms will be performed to define the most relevant modelling strategies, which may include the replacement of specific calculations steps, entire modules of ASTEC or more global surrogate models. Solutions will be explored to extend the models developed for the PWR simulator to other reactor types and SA codes. The training data-base of SA sequences used for machine-learning will be made openly available. Developing an enhanced version of ASTEC and interfacing it with a commercial simulation environment will make it possible for the industry to develop engineering and full-scale simulators in the future. These can be used to design SA management guidelines, to develop new safety systems and to train operators to use them.

Attività ENEA:

ENEA è coinvolta nei seguenti work package: . WP1 dedicato alla definizione della strategia di modellazione ed al supporto degli altri WPs. . WP2 dedicato alla generazione del database necessario per il training degli algoritmi di machine learning per i modelli surrogati . WP3 dedicato all'esplorazione dell'applicabilità di diverse metodologie di machine learning e sviluppo di modelli surrogati . WP6 dedicato alla comunicazione ed alla disseminazione dei risultati del progetto, all'organizzazione delle attività di training e alle conclusioni del progetto.

Responsabile:	MASCARI FULVIO	**Unità:**	FSN-SICNUC-SIN
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-11-2022	**Data Fine:**	31-10-2026
Doc. approvazione:	078 /2022/FSN	**Codice atto:**	PF6AAU
Contributo Totale:	€ 3.008.132	**Costo eleggibile:**	€ 3.700.349
Contributo ENEA:	**€ 160.875**	**Costo ENEA:**	**€ 247.500**

B2030 CSA3

BATTERY 2030-CSA3 large-scale research initiative: At the heart of a connected green society

Coordinatore: UNIV. UPPSALA (Svezia) N. Partner:

Abstract:

Collaborative, long-term research on future battery technologies has since 2019 been supported by the European Commission with the BATTERY 2030+ initiative. This project, BATTERY 2030+ CSA3, builds on earlier CSA efforts to coordinate and monitor research projects earmarked BATTERY 2030+ to work together towards the goals in the BATTERY 2030+ roadmap. Other HE R&I projects are invited as associated. The overall aim of the BATTERY 2030+ initiative, is to invent the batteries of the future by providing breakthrough technologies to the European battery industry across the full value chain; to strengthen long-term European leadership in both existing markets (road transport, stationary energy storage), and future emerging applications (aerospace, medical devices, internet of things). In this third phase Accelerated Materials Discovery, Battery Interfaces, Smart Functionalities, Manufacturing and Recycling are covered. BATTERY 2030+ CSA3 builds on, and extends beyond, the earlier achievements of the BATTERY 2030+ initiative with five objectives: - Obj 1: Implementation and monitoring of the research activities contributing to the BATTERY 2030+ initiative - Obj 2: Update and develop the BATTERY 2030+ roadmap, by mapping ongoing R&I activities and identifying emerging obstacles and research needs - Obj 3: Accelerate the research by identifying and making available best practices and guidelines for ontology development, data sharing and standardizations - Obj 4: Contribute to European curricula in future battery technologies - Obj 5: Promote and communicate the objectives and the achievements of the BATTERY 2030+ initiative and strengthen collaboration with other EU R&I battery initiatives The CSA3 consortium consists of 19 leading European universities and research institutes (UU, AIT, CEA, CIC Energigune, CIDETEC, CNRS/LRCS, DTU, EMPA, ENEA, FRAUNHOFER, FZJ, KIT, WWU, NIC, POLITO, SINTEF, TU Delft, VUB, and WTU) and 4 Associations (Recharge, EASE, EMIRI, and VDI-VDE-T)

Attività ENEA:

Il consorzio Battery 2030+ è al suo terzo mandato e l'ENEA è presente in esso fin dalla prima costituzione. Da tal contesto sono scaturite ben due roadmap e una serie di call di H2020. In questa terza fase l'ENEA proseguirà con il suo ruolo attivo con l'obiettivo di continuare a rafforzare e coordinare i network nazionali da innestare a livello europeo. In questo progetto l'ENEA è coinvolta nelle seguenti task: 1. Task 1.2: Meetings with B2030+ associated projects to collaborate with the CSA3 and the B2030+ projects 2. Task 2.2: Research Vision and Research & Innovation Roadmap 3. Task 5.3: Communication and dissemination coordination within the European R&I landscape 4. Task 6.1: Strategic decision making

Responsabile:	AURORA ANNALISA	**Unità:**	TERIN-PSU-ABI
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D2 Cross-cutting solutions
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-09-2023	**Data Fine:**	31-08-2026
Doc. approvazione:	87/2023/TERIN	**Codice atto:**	PK4AAX
Contributo Totale:	€ 3.102.224	**Costo eleggibile:**	€ 3.102.224
Contributo ENEA:	**€ 30.500**	**Costo ENEA:**	**€ 30.500**

Batteries Europe Secretariat

BEST

Coordinatore: KIC INNOENERGY SE (Paesi Bassi) N. Partner:

Abstract:

Batteries Europe Secretariat (BEST) proposal aims to enrich, strengthen and extend the key role of Batteries Europe by gathering academia, industry and research expertise within the Secretariat to consolidate the Battery R&I community and assist the existing platform in the achievement of their ambitious goals. BEST consortium will engage in its experts working groups industry stakeholders, academia, policy makers, researchers and citizens from all the value chain, especially broadening involvement on underrepresented domains and countries. BEST will contribute to gain synergies among battery R&I stakeholders' landscape, consolidate the workflow among the initiatives, facilitate free and inclusive access to information, strength industry-research collaboration to push technology developments to reduce time to market of new solutions, reinforce European talent attraction capacity and provide fact-based orientations to policy makers. The Secretariat will gather expertise to develop Strategic R&I agenda, design updated roadmaps, establish KPIs per application (transport, stationary, portable, etc.) to nurture the SET Plan, contribute to standards and reporting methodologies harmonization, promote education on battery fields and rise social awareness. The Secretariat will organize workshops per objectives, complemented with experts' interviews, discussion forums, scientific papers review, etc. to confront current state of the art with future trends, considering international tendencies. BEST is formed by 11 partners and 4 affiliated entities, led by Innonergy, with ZABALA, CLERENS SINTEF, VDI/VDE INNOVATION, CICenergiGUNE INSTM (UNIMIB, UNIPV, POLITO), EERA, EASE and ENEA. The partners are promoters of main European initiatives related to batteries that has facilitated the establishment of collaboration flows to bring Batteries Europe Platform to next stage in 36 months.

Attività ENEA:

L'ENEA è coinvolta con peso differente in tutti i WP ad eccezione del secondo. Il maggior e considerevole contributo è nel WP3 (R&I for European Industrial Competitiveness) in cui fornirà supporto nella stesura della (i) SRIA (Strategic Research and Innovation Agenda), (ii) delle Roadmaps dei singoli WG di Batteries Europe, (iii) nella definizione delle KPI (Key Performance Indicators) e nella definizione delle linee guida per uniformare gli standard e le metodologie di reporting nell'ambito della letteratura scientifica inerente alle batterie. In quest'ultima task l'ENEA svolge il ruolo di coordinamento.

Responsabile:	AURORA ANNALISA	**Unità:**	TERIN-PSU-ABI
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D2 Cross-cutting solutions
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-05-2022	**Data Fine:**	30-04-2025
Doc. approvazione:	104/2022/TERIN	**Codice atto:**	PK4AAQ
Contributo Totale:	€ 2.999.886	**Costo eleggibile:**	€ 2.999.976
Contributo ENEA:	**€ 263.588**	**Costo ENEA:**	**€ 263.588**

BEYOND EPICA OLDEST ICE

Beyond EPICA

Beyond EPICA Oldest Ice Core: 1,5 Myr of greenhouse gas – climate feedbacks

Coordinatore: CNR - CONSIGLIO NAZIONALE DELLE RICERCHE (Italia) N. Partner:

Abstract:

To better constrain the long-term response of Earth's climate system to continuing greenhouse gas emissions, it is essential to turn to the past. A key advance would be to understand the shift in Earth's climate response to orbital forcing during the 'Mid-Pleistocene transition' [MPT, 900,000 (900 kyr) to 1.2 million years (1.2 Myr) ago], when a dominant 40 kyr cyclicity gave way to the current 100 kyr period. It is critical to understand the role of forcing factors and especially of greenhouse gases in this transition. Unravelling such key linkages between the carbon cycle, ice sheets, atmosphere and ocean behaviour is vital, assisting society to design an effective mitigation and adaptation strategy for climate change. Only ice cores contain direct and quantitative information about past climate forcing and atmospheric responses. However, the longest (EPICA) ice core record available to date covers only the last 800 kyr. The RIA Topic LC-CLA-08-2018 empowers the European ice core community to perform such an oldest ice core drilling and the project 'Beyond EPICA' is taking on this unique challenge and opportunity. The overarching scientific objective driving 'Beyond EPICA' is to obtain quantitative, high-resolution ice- core information on climate and environmental changes over the last 1.5 Myr. The cause and effect relationship that led to the enigmatic MPT change in the climate system is not understood yet, as important information on global changes in the climate system is still missing. Most of this information, including the phasing of these changes in the Earth System can only be derived from a continuous ice core from Antarctica covering the last 1.5 Myr. This proposal uses the planning derived during the recent BE-OI CSA, and offers an excellent team (the only team globally that could at present accept the challenge of the call), underpinned by excellent infrastructure and capacity, and is currently ensuring it has an excellent location for the core.

Attività ENEA:

L'ENEA è impegnata nel progetto attraverso l'Unità Tecnica Antartide che ha il compito di attuare le attività logistiche, integrandole nella più ampia e generale gestione delle spedizioni antartiche e della stazione concordia. Per gli aspetti scientifici del progetto l'Unità Tecnica Antartide si avvale del supporto del Dipartimento Sostenibilità dei sistemi produttivi e territoriali.

Responsabile:	FREZZOTTI MASSIMO	**Unità:**	SSPT-PROTER-OAC
Anno Stipula:	2019		
PQ:	HORIZON 2020	**Programma UE:**	Climate Action, Environment, Resource Efficiency and Raw Materials
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-06-2019	**Data Fine:**	31-05-2025
Doc. approvazione:	96/2019/PRES	**Codice atto:**	PA0AAK
Contributo Totale:	€ 10.999.942	**Costo eleggibile:**	€ 10.999.942
Contributo ENEA:	**€ 2.610.000**	**Costo ENEA:**	**€ 2.610.000**

BILATERAL AGREEMENT NEAR/ANK/2023/EA-RP/0104

LOT-0001: Strengthening the Energy Performance of Public Building Stock through Sustainable Strategies

Coordinatore: WEGLOBAL DANISMANLIK A. S. (Turchia) N. Partner:

Abstract:

The objective of the contract is to provide services to support the Energy Efficient transformation of existing public buildings conducted by the General Directorate of Construction Affairs to achieve the 2053 targets for Carbon Neutral Türkiye. In this context, the energy consumption of existing public buildings will be evaluated, and innovative solutions to improve energy performance will be searched. Using dedicated software, an energy passport system will be developed to increase the energy performance of public buildings. Within the scope of this contract, which aims to support the energy efficiency sector and to use financial mechanisms effectively, consultancy services will be provided to create a sustainable model for increasing the energy performance of existing public buildings with the cooperation of relevant stakeholders

Attività ENEA:

l'ENEA è coinvolta sulle attività A3.4, A4 e sulla PARTE B del Technical Proposal

Responsabile:	CALABRESE NICOLANDREA	**Unità:**	DUEE-SPS-ESU
Anno Stipula:	2025		
PQ:	Other programmes (2021-2027)	**Programma UE:**	IPA III (2021-2027)
		Tipo Progetto:	Service contract
Data Inizio:	19-12-2025	**Data Fine:**	18-12-2028
Doc. approvazione:	108/2025/DUEE-SPS	**Codice atto:**	PW3ABQ
Contributo Totale:	€ 4.700.000	**Costo eleggibile:**	€ 4.700.000
Contributo ENEA:	**€ 440.150**	**Costo ENEA:**	**€ 440.150**

BIOcean5D

BIOcean5D

MARINE BIODIVERSITY ASSESSMENT AND PREDICTION ACROSS SPATIAL, TEMPORAL AND HUMAN SCALES

Coordinatore: EMBL - EUROPEAN MOLECULAR BIOLOGY LABORATORY (Organ. Internazionali)

N. Partner:

Abstract:

Marine biodiversity sustains ecosystem services for planetary and human health. Recent surveys of marine ecosystems have unveiled our ignorance of the richness and functioning of marine life, which is changing in the Anthropocene at a faster pace than terrestrial life. BIOcean5D unites major European centers in molecular/cell biology (EMBL), marine biology (EMBRC), and sequencing (Genoscope), together with 26 partners from 11 countries, to build a unique suite of technologies, protocols, and models allowing holistic re-exploration of marine biodiversity, from viruses to mammals, from genomes to holobionts, across multiple spatial and temporal scales stretching from pre-industrial to today. A focus is to understand pan-European biodiversity land-to-sea gradients and ecosystem services, including marine exposomes, notably with an expedition (TREC, 2023/24) that will deploy mobile labs, research vessels including the Tara schooner, and innovative citizen science tools, across 21 coastal countries and 35 marine labs from the Mediterranean to Arctic seas. New data will be harmonized with existing data into an open-access data hub, leveraging international infrastructures, and generating transformative, crosstechnologies/cross-scales standard marine biodiversity knowledge at the socio-ecosystem level. Knowledge will inform and constrain (i) new theories and models of marine biodiversity ecological and evolutionary dynamics and drivers, at both taxonomic and functional scales, (ii) a portfolio of novel holistic indicators of marine ecosystem health, (iii) innovative methods and protocols for economic and legal valuations of marine biodiversity and services integrating the dynamical and functional complexity of marine life. BIOcean5D will create a unique opportunity to bridge molecular/subcellular biology to organismal biology, theoretical ecology and econometrics, and marine complex systems to social sciences, toward the sustainable preservation of our oceans and seas.

Attività ENEA:

Le attività ENEA prevedono la produzione di una simulazione di tipo hindcast (ricostruzione del clima passato) ad altissima risoluzione spaziale per il Mar Mediterraneo che tenga conto non solo delle variabili fisiche ma anche di tutte le variabili biogeochimiche. In particolare sono previste le seguenti attività: costruzione del modello fisico; implementazione della componente biogeochimica; produzione dei forzanti meteorologici; realizzazione della simulazione di hindcast.

Responsabile:	NAPOLITANO ERNESTO	**Unità:**	SSPT-MET-CLIM
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 6 - Food, Bioeconomy, Natural Resources, Agriculture and Environment
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-12-2022	**Data Fine:**	30-11-2026
Doc. approvazione:	126/2022/SSPT-MET	**Codice atto:**	PS2ACJ
Contributo Totale:	€ 15.449.903	**Costo eleggibile:**	€ 15.449.903
Contributo ENEA:	**€ 141.945**	**Costo ENEA:**	**€ 141.945**

BIOMETHAVERSE

Demonstrating and Connecting Production Innovations in the BIOMETHAne uniVERSE

Coordinatore: ISINNOVA - Istituto di Studi per l'Integrazione dei Sistemi (Italia) N. Partner:

Abstract:

BIOMETHAVERSE (Demonstrating and Connecting Production Innovations in the BIOMETHAne uniVERSE) aims to diversify the technology basis for biomethane production in Europe, to increase its cost-effectiveness, and to contribute both to the uptake of biomethane technologies and to the priorities of the SET Plan Action 8. To this aim five innovative biomethane production pathways will be demonstrated in five European countries: France, Greece, Italy, Sweden, and Ukraine. The project is based on the following founding pillars: Demonstration of innovative biomethane pathways; Technology optimisation and upscaling by technoeconomic flowsheeting; Environmental and social sustainability assessment; Replicability, market penetration, support to planning decisions of other investors and project developers, policy recommendations to policy makers; Dissemination, exploitation and communication of project results. BIOMETHAVERSE relates, within the Work Program 2021-2022 on Climate, Energy and Mobility, to the Call "Sustainable, secure and competitive energy supply", specifically to the topic HORIZON-CL5-2021-D3-03-16: Innovative biomethane production as an energy carrier and a fuel. The project production routes cover one or a combination of the following production pathways: thermochemical, biochemical, electrochemical, and biological. As a starting point, four demonstration plants use conventional anaerobic digestion (AD), and one uses conventional gasification. In the BIOMETHAVERSE demonstrators, CO2 effluents from AD or gasification and other intermediate products are combined with renewable hydrogen or renewable electricity directly to increase the overall biomethane yield. All demonstrated production routes go beyond conventional technologies, with a circular approach for energy and material, while aiming at reducing the overall biomethane production costs and increasing the biomethane production. The demonstrated technologies will reach TRL 6-7 at the end of the project.

Attività ENEA:

Le attività di pertinenza ENEA sono di natura modellistica pertanto non richiedono l'utilizzo di laboratori e prevedono come prodotti rapporti, pubblicazioni e databases. 1 - Supporto al coordinamento (WP1) 1.1 leadership task 1.2 ed elaborazione e aggiornamento Data Management Plan (Task 1.2) (6 PM) 3 – leadership della valutazione e ottimizzazione dei casi studio (WP3) 3.1 definizione della metodologia e strategia di raccolta dati (task 3.1) 3.2 modellazione dei casi studio e valutazione tecnoeconomica (task 3.2)

Responsabile:	AGOSTINI ALESSANDRO	**Unità:**	TERIN-PSU-ABI
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D3 Energy supply
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-10-2022	**Data Fine:**	31-03-2027
Doc. approvazione:	196/2022/TERIN	**Codice atto:**	PK4AAS
Contributo Totale:	€ 9.871.769	**Costo eleggibile:**	€ 11.489.961
Contributo ENEA:	**€ 595.325**	**Costo ENEA:**	**€ 595.325**

BRIDGeconomies 2022

Business Relays for Innovation and Development Growing Economies

Coordinatore: S.I. IMPRESA - SERVIZI INTEGRATI IMPRESA (Italia) N. Partner:

Abstract:

The project “BRIDGeconomies_2022-2025 (Business Relays for Innovation and Development of Growing €conomies) proposed by this consortium covers the following regions of Southern Italy: Abruzzo, Basilicata, Calabria, Campania, Molise, Apulia and Sicily. The members of the consortium and their Host Structures include public/semi-public entities, whose activities are directly addressed to SMEs, guaranteeing an interregional coverage and services providing in all activity areas indicated in the call. The Consortium, already having a multi-annual experience in the Enterprise Europe Network, includes: the Italian Chamber of Commerce System - representing all entreprenurial associations and the labour/civil society - specialised in services to SMEs, including the Special Agency of Naples Chamber of Commerce (SI IMPRESA); - an industrial association at regional level, in Sicily (Sicindustria); - scientific and technological organisation, specialised in innovation/research services to SMEs, including the National government Agency for new technologies, energy and environment (ENEA). Consortium partner will support SMEs, to innovate, grow and scale in the single market and beyond, contributing to their triple transition towards: sustainability, digitalisation and resilience. The proposed Consortium has 12 partners, involved since 2008 in the Enterprise Europe Network and one new partner which is a public/private organisation participated by ENEA (CETMA).

Attività ENEA:

Le attività di pertinenza ENEA riguarderanno la partecipazione al nodo della rete Enterprise Europe Networdk (EEN) denominato BRIDGeconomies, nelle regioni del Sud Italia. In particolare ENEA parteciperà alle attività del nodo EEN BRIDGeconomies per le regioni Campania e Puglia. Unità ENEA coinvolte: ISV-DST-KES, ISV-STP, ISV-MARK; ISER-POR; TERIN, TERIN-ICT, TERIN-STSN-SGRE; SSPT-SEC, SSPT, SSPT-USER-RISE, SSPT-USER-T4RM

Responsabile:	AMERIGHI OSCAR	**Unità:**	ISV-DST-KES
Anno Stipula:	2022		
PQ:	SMP - Single Market Programme (2021-2027)	**Programma UE:**	COSME- EEN (2021-2027)
		Tipo Progetto:	SA - Azioni di supporto
Data Inizio:	01-01-2022	**Data Fine:**	30-06-2025
Doc. approvazione:	10/2022/ISV	**Codice atto:**	PZ1AAC
Contributo Totale:	€ 7.088.722	**Costo eleggibile:**	€ 11.764.210
Contributo ENEA:	**€ 1.053.124**	**Costo ENEA:**	**€ 1.755.207**

BRIDGeconomies 2025

Business Relays for Innovation and Development Growing Economies

Coordinatore: S.I. IMPRESA - SERVIZI INTEGRATI IMPRESA (Italia) N. Partner:

Abstract:

BRIGeconomies - Business Relays for Innovation and Development Growing Economies The BRIDGeconomies project proposed by this Consortium covers the following regions of Southern Italy: Abruzzo, Apulia, Basilicata, Calabria, Campania, Molise and Sicily. The members of the Consortium and their Host Structures include public / semi-public and private entities, whose activities are directly addressed to SMEs, guaranteeing an interregional coverage and services providing in all activity areas indicated in the call. The Consortium, already having a multi-annual experience in the Enterprise Europe Network, includes: - the Italian Chamber of Commerce System – representing all entrepreneurial associations and the labour/ civil society - specialised in services to SMEs, including the Special Agency of Naples Chamber of Commerce (S.I. IMPRESA), with multi annual experience as partner (since 2008) and as coordinator of the EEN Consortium (since 2015); - an industrial association at regional level, in Sicily (Sicindustria); - scientific and technological organisations, specialised in innovation/research services to SMEs, including the national government agency for new technologies, energy and sustainable economic development (ENEA), a public/private organisation participated by ENEA (CETMA – Research Center for Technologies, Design and Materials), the University of Palermo and SPIN – Ricerca Innovazione e Trasferimento Tecnologico S.r.l. Consortium partners will support SMEs to innovate, grow and scale in the single market and beyond, contributing to their triple transition towards: sustanaibility, digitalisation and resilience. The proposed Consortium has 13 partners mostly involved since 2008 in the Enterprise Europe Network.

Attività ENEA:

Le attività di pertinenza ENEA riguarderanno: • Partecipazione alle attività del nodo della rete Enterprise Europe Network (EEN), denominato BRIDGeconomies, nelle regioni del Sud Italia; in particolare, ENEA parteciperà alle attività del nodo EEN BRIDGeconomies per le regioni Campania e Puglia. • Analisi e valutazione delle necessità tecnologiche e dell'evoluzione strategica dei principali settori produttivi delle regioni coinvolte, identificazione delle relative risposte tecnologiche e loro indirizzamento alla rete EEN. • Potenziamento delle capacità dei fornitori di tecnologia locali nella promozione e sfruttamento dei loro risultati di ricerca verso l'ambiente europeo. • Organizzazione di seminari, workshop e giornate informative su diverse tematiche di interesse per le PMI quali, ad esempio, innovazione e trasferimento tecnologico, sostenibilità ed economia circolare, smartizzazione e adozione di tecnologie intelligenti, digitalizzazione, ecc. • Promozione e pubblicizzazione delle attività mediante l'invio di newsletter, l'utilizzo di social network, nonché articoli di stampa e altri supporti multimediali. • Organizzazione di visite e audit tecnologici ad aziende innovative e a fornitori di tecnologia. • Scambi di visite transnazionali con imprese innovative, centri di ricerca e altri stakeholder europei. • Fornitura di servizi, consulenza e supporto ad aziende e centri di ricerca delle regioni di competenza per la realizzazione e la promozione di casi esemplari di successo nei diversi ambiti di competenza dell'ENEA (trasferimento tecnologico, sostenibilità, smartizzazione e digitalizzazione).

Responsabile:	AMERIGHI OSCAR	**Unità:**	TTEC-KTM
Anno Stipula:	2025		
PQ:	SMP - Single Market Programme (2021-2027)	**Programma UE:**	COSME- EEN (2021-2027)
		Tipo Progetto:	SMP-COSME-EEN
Data Inizio:	01-07-2025	**Data Fine:**	31-12-2028
Doc. approvazione:	25/2025/TTEC	**Codice atto:**	PZ1AAH
Contributo Totale:	€ 7.097.981	**Costo eleggibile:**	€ 11.666.302
Contributo ENEA:	**€ 883.700**	**Costo ENEA:**	**€ 1.472.833**

CONCERTED ACTION ENERGY EFFICIENCY DIRECTIVE

CA EED3

Concerted Action on the Energy Efficiency Directive

Coordinatore: MINISTRY OF ECONOMIC AFFAIRS AND CLIMATE POLICY (Paesi Bassi)

N. Partner:

Abstract:

The objective of the 3rd Concerted Action on the Energy Efficiency Directive (CA EED3) is to foster exchange of information and experience among Member States and other participating countries (Norway) with a view to facilitating the implementation of the Directive of 2018/2002 amending Directive 2012/27/EU of the European Parliament and of the Council on energy efficiency (EED), including the implementation of the foreseen recast of this Directive . The Action follows on from the CA ESD, CA EED and CA-EED 2 which has helped MS with the interpretation of the legislation, the implementation options and support via detailed information and access to experts on mature policies and practices. The specific objectives of the Action are: • To enhance and structure the sharing of information and experiences from national implementation whilst promoting good practice concepts in activities to improve and strengthen MS implementation of the EED. • To encourage dialogue between MS on common approaches for the effective implementation of particular parts of the EED and synergies with RED and EPBD. • To complement the work of the EED Committee assisting the European Commission. The expected impact of the Action consists of a more harmonized approach and improved implementation of the EED in MS, as well as the transfer of good practices between countries and strengthened cross fertilisation with CA EPBD and CA RES. The CA EED3 brings together a unique group of experts and policy makers, it is the only informal group with full representation of all Member States and Norway and by its very nature provides MS, DG Energy and CINEA with a unique opportunity to communicate in an informal way on a technical level with relevant experts. The Concerted Action community has developed during the course of the CA ESD, CA EED and CA-EED 2 making it easy to find entry points in MS where without the Action contacts would be difficult. In turn the road is paved for bilateral cooperation.

Attività ENEA:

L'ENEA partecipa contribuendo alle attività di tutti i WP (sotto riportati) ma in particolare a quelle dei WP 3, 4, 5 e 7: . WP1: Coordinamento . WP2: Team di Gestione de l Progetto (Management Team) . WP3: Aree di Esperti e Settori Tematici (Domains) . WP4: Gruppi di Lavoro . WP5: Riunioni Plenarie di Progetto, Riunioni dei Punti di Contatto Nazionali e Visite Studio . WP6: comunicazione e divulgazione dei risultati . WP7: attività di reporting.

Responsabile:	SALAMA ANNA MARIA	**Unità:**	DUEE-SPS-MPE
Anno Stipula:	2022		
PQ:	HORIZON 2020	**Programma UE:**	Energy
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-01-2022	**Data Fine:**	31-12-2027
Doc. approvazione:	26/2021/DUEE-SPS	**Codice atto:**	PW3ABA
Contributo Totale:	€ 4.999.770	**Costo eleggibile:**	€ 4.999.770
Contributo ENEA:	**€ 70.490**	**Costo ENEA:**	**€ 70.490**

CAMAERA

CAMS AERosol Advancement

CAMAERA

Coordinatore: HYGEOS SARL (Francia)

N. Partner:

Abstract:

The European Union's flagship Space programme Copernicus provides a key service to the European society, turning investments in space-infrastructure into high-quality information products. The Copernicus Atmosphere Monitoring Service (CAMS) exploits the information content of Earth-Observation data to monitor the composition of the atmosphere. By combining satellite observations with numerical modelling by means of data assimilation and inversion techniques, CAMS provides in near-real time a wealth of information to answer questions related to air quality, climate change and air pollution and its mitigation, energy, agriculture, etc. CAMS provides both global atmospheric composition products, using the Integrated Forecasting System (IFS) of ECMWF - hereafter denoted the global production system - , and regional European products, provided by an ensemble of eleven regional models - the regional production system. The CAMS AERosol Advancement (CAMAERA) project will provide strong improvements of the aerosol modelling capabilities of the regional and global systems, on the assimilation of new sources of data, and on a better representation of secondary aerosols and their precursor gases. In this way CAMAERA will enhance the quality of key products of the CAMS service and therefore help CAMS to better respond to user needs such as air pollutant monitoring, along with the fulfilment of sustainable development goals. To achieve this purpose CAMAERA will develop new prototype service elements of CAMS, beyond the current state-of-art. It will do so in very close collaboration with the CAMS service providers, as well as other tier-3 projects. In particular CAMAERA will complement research topics addressed in CAMEO, which focuses on the preparation for novel satellite data, improvements of the data assimilation and inversion capabilities of the CAMS production system, and the provision of uncertainty information of CAMS products.

Attività ENEA:

L'ENEA rivestirà il ruolo di partner di progetto. L'ENEA dovrà sviluppare all'interno del sistema modellistico MINNI il modello di deposizione secca delle particelle di aerosol per includere al meglio l'effetto del "land-use", in particolare della vegetazione. In particolare, l'attività prevedrà: - di innovare il codice delle deposizioni secche già esistente considerando nuove parametrizzazioni e nuovi dati di input; - di verificare i risultati del sistema modellistico MINNI partecipando a esercizi di "intercomparison" di produrre report periodici sulle attività svolte.

Responsabile:	MIRCEA MIHAELA	**Unità:**	SSPT-MET-INAT
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 4 - Digital, Industry and Space
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-01-2024	**Data Fine:**	31-12-2026
Doc. approvazione:	296/2023/SSPT-MET	**Codice atto:**	PS2ACU
Contributo Totale:	€ 2.998.418	**Costo eleggibile:**	€ 2.998.418
Contributo ENEA:	**€ 37.380**	**Costo ENEA:**	**€ 37.380**

CAMS EvOlution

CAMEO

Coordinatore: ECMWF - EUROPEAN CENTRE FOR MEDIUM-RANGE WEATHER FORECASTS (Organ. Internazionali)

N. Partner:

Abstract:

Monitoring the composition of the atmosphere is a key objective of the European Union's flagship Space programme Copernicus, with the Copernicus Atmosphere Monitoring Service (CAMS) providing free and continuous data and information on atmospheric composition. The CAMS Service Evolution (CAMEO) project will enhance the quality and efficiency of the CAMS service and help CAMS to better respond to policy needs such as air pollutant and greenhouse gases monitoring, the fulfilment of sustainable development goals, and sustainable and clean energy. CAMEO will help prepare CAMS for the uptake of forthcoming satellite data, including Sentinel-4, -5 and 3MI, and advance the aerosol and trace gas data assimilation methods and inversion capacity of the global and regional CAMS production systems. CAMEO will develop methods to provide uncertainty information for users of CAMS emissions, policy, solar radiation and deposition products in response to prominent requests from current CAMS users. CAMEO will contribute to the medium to long-term evolution of the CAMS production systems and products. The transfer of developments from CAMEO into subsequent improvements of CAMS operational service elements is a main driver for the project and is the main pathway to impact for CAMEO. The CAMEO consortium, led by ECMWF, the entity entrusted to operate CAMS, includes several CAMS partners thus allowing CAMEO developments to be carried out directly within the CAMS production systems and facilitating the transition of CAMEO results to future upgrades of the CAMS service. This will maximise the impact and outcomes of CAMEO as it can make full use of the existing CAMS infrastructure for data sharing, data delivery and communication, thus supporting policymakers, business and citizens with enhanced atmospheric environmental information.

Attività ENEA:

Le attività previste dal progetto CAMEO costituiscono il naturale prosieguo del progetto CAMS50 (leader Meteo France), svolto insieme ad altri 9 istituti europei e del progetto CAMS2_40 che prevede la messa in operatività del modello MINNI al pari degli altri partner. L'attività proposta consente all'Italia e al modello di calcolo di ENEA (diffuso tra l'altro in molteplici Agenzie Regionali per l'Ambiente) di sviluppare nuove funzionalità utili ai servizi CAMS e mantenere un livello di sviluppo pari agli altri sistemi modellistici del progetto CAMS2_40. L'ENEA dovrà sviluppare all'interno del sistema modellistico MINNI la capacità di poter assimilare i prodotti del sensore satellitare Tropomi montato su uno dei satelliti costellazione Sentinel nell'ambito del programma Copernicus. In particolare l'attività prevede: • di innovare algoritmi di assimilazione già esistenti • di produrre esperimenti numerici di assimilazione per gli inquinanti CO, O3, SO2 e NO2 • di produrre report periodici sulle attività svolte

Responsabile:	ADANI MARIO	**Unità:**	SSPT-MET-INAT
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 4 - Digital, Industry and Space
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-01-2023	**Data Fine:**	31-12-2025
Doc. approvazione:	231/2022/SSPT-MET	**Codice atto:**	PS2ACM
Contributo Totale:	€ 7.499.953	**Costo eleggibile:**	€ 7.499.953
Contributo ENEA:	**€ 110.000**	**Costo ENEA:**	**€ 110.000**

CAMS2_40

MF for the provision of Regional Air Quality Products

Coordinatore: METEO-FRANCE CENTRE NATIONAL DE RECHERCHES METEOROLOGIQUES (Francia)

N. Partner:

Abstract:

This ITT, entitled 'Regional air quality products' is for the operational delivery of the European-scale air quality component of CAMS. It consists of a set of services, which are further detailed in the technical specification in ITT documents. The production must be based upon a geographically distributed ensemble of more than ten individual models and a central processing function to deliver three numerical data streams: on a daily basis, analyses for the previous day and forecasts for key air pollutants up to +96h with a temporal resolution of one hour; with a delay of a few weeks (in order to maximise the number of observations), interim reanalyses shall be produced daily with systems frozen in their configuration of January 1st every year; with a delay of up to two years (due to the delay in getting fully validated data), reanalyses shall be produced with frozen systems, which are only updated every few years. All the individual Regional Systems must be mature, well-validated and operated by their main developers. This aspect is essential so that the operators can directly maintain a continuous workflow of changes to the numerical systems, in order to include new research developments, to make corrections reflecting findings from verification and validation activities, as well as to implement changes to better meet user requirements. Acquisition of data, production of analyses, reanalyses and forecasts, data dissemination services and support to the users form the bulk of the operational delivery and development activities that are procured within this ITT.

Attività ENEA:

L'ENEA svolge in particolare le seguenti attività: . Congiuntamente con TERIN-ICT-HPC, mantenere attiva una versione operativa del modello previsionale nei termini del contratto CAMS2_40 Regional Air Quality Production, con: operazioni quotidiane di acquisizione delle previsioni meteorologiche operative ad alta risoluzione fornite da ECMWF; acquisizione del dataset di incendi e condizioni al contorno chimiche fornite dal programma Copernicus; acquisizione ed assimilazione delle osservazioni di qualità dell'aria fornite dall' European Environment Agency (EEA) e delle osservazioni avanzate sulla composizione chimica fornite dai programmi ACTRIS and EMEP; . Recepire gli sviluppi del modello così come richiesti dal committente a tutti gli 11 modelli operativi . Produrre report periodici di varia tipologia, secondo la tempistica indicata dal committente.

Responsabile:	ADANI MARIO	**Unità:**	SSPT-MET-INAT
Anno Stipula:	2021		
PQ:	Other programmes	**Programma UE:**	Copernicus
		Tipo Progetto:	Service contract
Data Inizio:	01-11-2021	**Data Fine:**	31-05-2025
Doc. approvazione:	316/2021/SSPT-MET	**Codice atto:**	CS2ACA
Contributo Totale:	€ 6.496.496	**Costo eleggibile:**	€ 6.496.496
Contributo ENEA:	**€ 466.000**	**Costo ENEA:**	**€ 466.000**

N. Contratto: ECMWF/ COPERNICUS/2024/CAMS2_40_bis_MF/SC1

CAMS2_40_bis_MF

MF for the Provision of Regional Air Quality Products

Coordinatore: N. Partner:

Abstract:

This contract is for the operational delivery of the European-scale air quality component of CAMS. The main purposes of the CAMS2_40_bis service are twofold: Firstly, the aim will be to continuously optimise products providing information on air quality and atmospheric composition on the European scale, with the aim of making it freely, easily accessible to the various user communities and addressing the current user needs. Météo-France as the main contractor, together with one of the subcontractors, Ineris, as co-leaders of the Regional Production service are committed to the development of eleven Regional Systems and to overseeing the delivery of the individual and centralised Regional Products. Secondly, the aim will be to align the Regional Production to the CAMS Service Evolution Strategy, defined in the medium and long-terms (beyond 2027). The mission of Météo-France and Ineris will be to support and supervise each Regional model and improve centralised productions and delivery service.

Attività ENEA:

L'ENEA è sub-contractor. Le attività prevedono l'esecuzione degli obbiettivi di CAMS2_40_bis che mirano alla fornitura e al miglioramento dei servizi a scala Europea relativi alla qualità dell'aria nell'ambito del programma Copernicus. In particolare, l'ENEA dovrà sviluppare le seguenti attività nell'ambito dei due Lotti previsti: - Lot 1 ("operational components"). Proseguimento delle attività operative avviate in CAMS2_40, comprendenti la fornitura, da parte di ciascun partner, di prodotti all'Atmospheric Monitoring Service del programma europeo Copernicus (CAMS) per le previsioni giornaliere di qualità dell'aria a scala europea. Tali prodotti consistono in un insieme di servizi, tra cui la produzione di tre flussi di dati numerici qualità dell'aria che deve essere assicurata da un insieme di modelli individuali, geograficamente distribuiti e operati dai vari partners; - Lot 2 ("development components"): l'obbiettivo centrale è quello di portare avanti, in accordo e in maniera coordinata tra i vari partners, attività preparatorie dedicate sia all'evoluzione del servizio durante l'attuale contratto e sia in prospettiva pensando ai possibili prodotti e servizi che si prevede verranno richiesti a partire dal successivo sviluppo di CAMS (CAMS3.0) che partirà dal 2028

Responsabile:	D'ISIDORO MASSIMO	**Unità:**	SSPT-CLIMAR-AOC
Anno Stipula:	2025		
PQ:	Other programmes (2021-2027)	**Programma UE:**	Copernicus
		Tipo Progetto:	Service contract
Data Inizio:	01-07-2025	**Data Fine:**	30-04-2028
Doc. approvazione:	120/2025/SSPT/CLIMAR	**Codice atto:**	CS2ACT
Contributo Totale:	€ 9.199.946	**Costo eleggibile:**	€ 9.199.946
Contributo ENEA:	**€ 580.000**	**Costo ENEA:**	**€ 580.000**

CapaCITIES 2.0

Fast-Tracking the National Narrative for Climate-Neutral Urban Futures

Coordinatore: UEFISCDI - EXECUTIVE UNIT FOR RESEARCH, DEVELOPMENT AND INNOVATION HIGHER EDUCATION FUNDING (Romania) N. Partner:

Abstract:

CapaCITIES 2.0 is designed as a support action for national and regional authorities to advance their governance structures for providing dedicated support for cities to achieve the EU Climate-Neutral and Smart Cities Mission (EU Cities Mission) - answering to the Call HORIZON-MISS-2024-CIT-02-01. As a central initiative to foster and strengthen national narratives for the EU Cities Mission, it will coordinate actions across climate-neutral initiatives for cities in Europe, align and speed up efforts towards the goals of the Mission. CapaCITIES 2.0 will further shape a European environment conducive to urban climate neutrality transitions for national, regional and local authorities. It will initiate and strengthen national change processes to establish and mature national networks and platforms as well as multi-level governance in the entire EU, building on the experience of the CapaCITIES that already started setting-up national platforms in 15 EU countries. It provides dedicated support for public authorities to put enabling conditions and measures for cities in place to achieve the EU Cities Mission. Thereby, it contributes to reach (1) Increased preparedness and capacity of national, regional and local authorities in EU Member States and countries associated to Horizon Europe to engage in cities' transition towards climate neutrality; (2) Improved ability to effectively address country-specific challenges and barriers for cities to achieve climate neutrality related to current regulatory frameworks, funding and financing, and governance structures and promotion of best-practices through transnational exchanges and sharing of experience and (3) Enhanced synergies with R&I national/international communities, relevant initiatives, and partnerships such as the 'Driving Urban Transitions to a Sustainable Future' Horizon Europe Partnership and the NetZeroCities – the EU Mission Platform(NZC) for the implementation of the Climate-Neutral and Smart Cities Mission.

Attività ENEA:

l'ENEA svolgerà le attività necessarie per il conseguimento degli obiettivi previsti dal progetto tramite il Dipartimento Tecnologie Energetiche e Fonti Rinnovabili, attraverso la Divisione Strumenti e Servizi per le Infrastrutture Critiche e le Comunità Energetiche Rinnovabili (TERIN-ICER) e la Direzione Generale servizio Affari Istituzionali e Relazioni UE (DIRIGEN-RELIST);

Responsabile:	CLERICI MAESTOSI PAOLA	**Unità:**	TERIN-ICER
Anno Stipula:	2025		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	HORIZON-MISS-2024-CIT
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-05-2025	**Data Fine:**	30-04-2027
Doc. approvazione:	60/2025/TERIN	**Codice atto:**	PK5AAU
Contributo Totale:	€ 2.994.408	**Costo eleggibile:**	€ 2.989.398
Contributo ENEA:	**€ 69.938**	**Costo ENEA:**	**€ 69.938**

CBRNe4rail

CBRNe preparedness for passenger rail transport hubs

Coordinatore: UIC - UNION INTERNATIONALE DES CHEMINS DE FER (Francia) N. Partner:

Abstract:

Since railways represent a highly vulnerable public space to Chemical, Biological, Radiological, Nuclear and explosive (CBRNe) attacks, railway companies urgently need to improve their preparedness and security levels against CBRNe threats. This project aims to enhance awareness and capabilities of railway critical infrastructure operators to effectively respond to CBRNe emergencies at railway stations by improving their CBRNe security plans and training railway staff. The core methodology is based on the active involvement of railway companies, Law Enforcement Agencies and First Responders in the co-design and implementation of all project activities. The project will also adapt key results of recent EU- and NATO-funded CBRNe projects to the specific constraints of railway infrastructure and needs of railway sector. Surveys, on-site expert field visits and workshops will be used to co-create and validate an effective railway CBRNe security concept. This will include security-by-design and will result in an actionable guideline for railway end-users. Next, a harmonised CBRNe training programme for the railway sector and for better cooperation with the involved First Responders will be designed and delivered in a controlled environment to railway staff coming from companies from at least 4 different Member States. The programme will include a theoretical module, innovative virtual reality training and practical sessions. Further, at least 4 in-situ training exercises will be organised by the same railway companies in four different countries to apply their staff's knowledge and skills in simulated incidents at railway stations. The project will develop a set of key exploitable results which will go beyond the implemented training activities, and which will enhance the preparedness and protection capabilities of the railway sector against CBRNe threats. Exploitation activities will also include the certification of the training programme to ensure sustainability and pave the way for enlarging the number of railway companies receiving certified training.

Attività ENEA:

ENEA è partner del progetto ed è leader del WP 4 "Design and delivery of in-situ training exercises", dedicato all'organizzazione di quattro esercitazioni in infrastrutture ferroviarie per validare le soluzioni innovative sviluppate dal progetto

Responsabile:	SPIZZICHINO VALERIA	**Unità:**	NUC-TECFIS-DIM
Anno Stipula:	2025		
PQ:	ISF - Internal Security Fund (2021-2027)	**Programma UE:**	ISF PROTECT - Protection of Public Spaces
		Tipo Progetto:	ISF Project Grants
Data Inizio:	01-06-2025	**Data Fine:**	30-11-2027
Doc. approvazione:	041 (2025) NUC	**Codice atto:**	PF7ACB
Contributo Totale:	€ 2.498.985	**Costo eleggibile:**	€ 2.776.650
Contributo ENEA:	**€ 268.099**	**Costo ENEA:**	**€ 297.888**

CETMA DIHSME
European Digital Innovation Hub

CETMA-DIHSME

CETMA-Digital Innovation Hub for SMEs

Coordinatore: CETMA - Centro di Ricerche Europeo di Tecnologie, Design e Materiali (Italia)

N. Partner:

Abstract:

The project proposes the creation of an EDIH by CETMA, a non-profit RTO with over 20 years of experience in innovation services to SMEs in Southern Italy. The project is strongly focused on the local economic and social reality (Apulia and Basilicata) where the partners are strongly rooted. It starts from the vision that AI, HPC and CS technologies can bring significant benefits to the development of the Territory, but this requires that all local actors are involved such as PA and SMEs, even the smallest and even those operating in more traditional sectors. Based on the experience of CETMA and analysis of innovation experts, CETMA-DIHSME starts from the consideration that to foster innovation in small businesses, in addition to "problem solving" services (technology consulting, research, engineering, etc.), it is necessary to support SMEs with "problem setting" services (strategic analysis, business planning, fundraising, supply chain relations, etc.). This is the way to break the vicious circle that grips them because they generally do not have their own resources to devote to these functions and are unable to seize the opportunities of new technologies. For this reason, the project foresees an integrated offer of "business and strategy setting" and technological services. An intensive promotional campaign has been planned to attract as much as possible the SMEs that are generally too busy in their daily routine. An integrated offer of demonstrations has been planned for all sectors of the local economy and for local administrations. The project aims to trigger synergies with the relevant opportunities offered by regional, national, and European innovation policies and funding. It also wants to exploit the great opportunities of the creation of a structured network of EDIH to promote cohesion between European territories to take advantage of social, economic, and environmental benefits.

Attività ENEA:

Il progetto coinvolge competenze già presenti in ENEA nei seguenti campi: • Applicazione di sistemi di calcolo ad alte prestazioni (HPC); • Integrazione di grandi moli di dati (Big Data) provenienti da sorgenti eterogenee e funzionalità di accesso agli stessi in modo distribuito; • Gestione di ambienti virtuali basati su cloud computing; • Intelligenza Artificiale • Cybersecurity

Responsabile:	MARIANO ANGELO	**Unità:**	TERIN-ICT
Anno Stipula:	2022		
PQ:	Other programmes (2021-2027)	**Programma UE:**	DIGITAL
		Tipo Progetto:	DIGITAL Simple Grants
Data Inizio:	01-09-2022	**Data Fine:**	30-09-2025
Doc. approvazione:	188 /2022/TERIN	**Codice atto:**	PK3AAF
Contributo Totale:	€ 2.924.738	**Costo eleggibile:**	€ 5.849.476
Contributo ENEA:	**€ 227.157**	**Costo ENEA:**	**€ 454.313**

CHemPGM

Chemistry of Platinum Group Metals

Coordinatore: MONOLITHOS RECYCLING TECHNOLOGIES (Grecia) N. Partner:

Abstract:

The CHemPGM project is a joint initiative of 7 expert organizations from the fields of chemistry, engineering, mining, metallurgy and materials science, designed to conduct fundamental research regarding the chemistry of platinum group metals (PGMs) and utilize the obtained knowledge to improve and secure the PGMs value chain. Specifically, the project aims: i) to establish fundamental knowledge regarding the chemistry of the PGMs, their reactions and complexation with other metals and chemical compounds, and the corresponding reactivities during leaching, separation and recovery processes; ii) to gain a complete understanding of the mechanisms associated with the above-mentioned processes, during the utilization of secondary materials to extract PGMs and incorporate them into new materials and processes such as nanomaterials, catalysis and CO2 capture; iii) to create knowledge, provide expertise and educate the public. This will lead to the upgrading of existing processes and the development of new ones, aligned with sustainable principles, to ensure a circular operation model of the relevant industries. Through the involvement of universities, RTOs and SMEs, CHemPGM is backed by a well-rounded team, with multiyear expertise in the relevant fields, capable to deliver high-quality results regarding the project objectives. The consortium approaches the challenge from a multidiscipline aspect and proposes a balanced number of secondments alongside trainings, workshops, seminars and events that guarantee a cross-sectorial synergy among them. As a result, CHemPGM will broaden the expertise of the organizations, contribute to the advancement of the secondees and enhance the potential for innovation to its stakeholders and those inter-related with it. Overall, the methodology for carrying out the tasks involved, guarantees the smooth running of the project and the successful fulfillment of the objectives to contribute towards a more efficient and sustainable future.

Attività ENEA:

L'obiettivo specifico dei ricercatori ENEA all'interno del progetto è quello della sintesi e caratterizzazione di materiali innovativi che utilizzano i metalli del gruppo del Pt, riciclati dagli altri partner, per lo sviluppo di materiali innovativi per la cattura e riutilizzo della CO2 e/o per l'implementazione di processi catalitici. Queste attività sono di importanza strategica per il gruppo e integreranno le attività già esistenti sulla cattura della CO2.

Responsabile:	GRILLI MARIA LUISA	**Unità:**	TERIN-PSU-IPSE
Anno Stipula:	2021		
PQ:	HORIZON 2020	**Programma UE:**	MSCA Marie Skl. Curie Actions
		Tipo Progetto:	MSCA RISE - Research and Innovation Staff Exchange
Data Inizio:	01-05-2021	**Data Fine:**	30-04-2025
Doc. approvazione:	430/2020/PRES	**Codice atto:**	PK4AAC
Contributo Totale:	€ 736.000	**Costo eleggibile:**	€ 736.000
Contributo ENEA:	**€ 110.400**	**Costo ENEA:**	**€ 110.400**

CO2OLHEAT

Supercritical CO2 power cycles demonstration in Operational environment Locally valorising industrial Waste Heat

Coordinatore: ETN - EUROPEAN TURBINE NETWORK A.I.S.B.L (Belgio) N. Partner:

Abstract:

CO2OLHEAT will demonstrate at TRL7 in the CEMEX cement manufacturing plant in Prachovice (CZ) the operation of a 2 MW Waste-Heat-to-power (WH2P) skid based on a 2MW-sCO2 cycle able to efficiently valorize local waste heat at a significant temperature of 400°C. Capitalizing consortium excellent knowledge coming from previous sCO2 turbomachinery design experience and EU funded projects on industrial waste heat valorisation (TASIO, i-THERM, sCO2-FLEX etc.) and stimulated by SPIRE roadmap and EU sCO2 R&D initiatives, CO2OLHEAT aims to valorize waste heat even at higher temperature if compared with the traditional steam/ORC solutions. The project will demonstrate the EU MW scale first-of-a-kind waste heat-sCO2 plant towards a cheaper/more flexible waste heat valorisation. The project will strengthen EU industrial leadership in both energy intensive industries (making them more competitive) and turbomachinery sectors, bridging the current gap on sCO2 turbomachinery that EU has with US and Japan-Korea. The project will analyse sCO2 WH2P potential from a technical, economic and environmental point of view, developing innovative models for the design of the cycle and of the turbomachinery as well as investigating CO2OLHEAT cycle benefits in the cement, glass, aluminium, power generation sectors via techno-economic and Life Cycle based replication feasibility studies, involving relevant EU industrial players (EDF, ENGIE, MYTH, CEMEX, SISECAM, CELSA). The project is coordinated by ETN and involves an industry driven consortium with key turbomachinery OEM (SIE-BH), energy intensive industries, energy utilities and R&D partners all committed to bring soon CO2OLHEAT sCO2 cycle technologies on the market. Thanks to its robust demonstration and replication campaign (also foreseeing extra-EU stakeholders collaboration), CO2OLHEAT can be considered a “demonstration to market” project, being keystone for EU sCO2 turbomachinery industry and for a more effective waste heat valorisation.

Attività ENEA:

Le attività che l’ENEA svolgerà all’interno del progetto “CO2OLHEAT” saranno inquadrate nei seguenti work packages: WP1 - analisi di scenario e definizione dei requisiti dell’impianto CO2OLHEAT; WP2 - unità turbo-expander: studi di scale-up del concetto e della tecnologia CO2OLHEAT per potenze maggiori di 5 MW; WP3 - turbina sCO2: studi di scale-up del concetto e della tecnologia CO2OLHEAT per potenze maggiori di 5 MW; WP6 – campagna presso il sito di dimostrazione Prachovice; WP 7 - analisi di replicabilità e di impatto; WP 8 - disseminazione, comunicazione e sfruttamento: ; WP9 - coordinamento e gestione del progetto: coinvolgimento nei Task di gestione del consorzio sotto la guida di ETN, nel monitoraggio del progresso delle attività, nella redazione di rapporti, e nella gestione del piano di garanzia della qualità scientifica e dei rischi.

Responsabile:	MESSINA GIUSEPPE	**Unità:**	DTE-PCU-IPSE
Anno Stipula:	2021		
PQ:	HORIZON 2020	**Programma UE:**	Energy
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-06-2021	**Data Fine:**	31-05-2025
Doc. approvazione:	53/2021/TERIN	**Codice atto:**	PK4AAG
Contributo Totale:	€ 13.999.996	**Costo eleggibile:**	€ 18.813.891
Contributo ENEA:	**€ 189.163**	**Costo ENEA:**	**€ 189.163**

CoCliCo

COASTAL CLIMATE CORE SERVICES

Coordinatore: BRGM - BUREAU DE RECHERCHES GEOLOGIQUES ET MINIERES (Francia)

N. Partner:

Abstract:

Even if climate change mitigation objectives agreed in Paris are met, sea level will rise at least by 0.3 to 0.6m in 2100 and then continue rising for centuries. The potential impacts for coastal flooding are a major source of concern for Europe because many infrastructures are located close to shorelines or in low-lying areas. Broad scale coastal climate services and platforms available today have successfully addressed the need to raise awareness on mitigation. However, an authoritative, consistent and decision oriented platform is still missing to meet the needs of adaptation practitioners concerned with (1) the routine identification of coastal territories at risk from innundation, (2) coastal land use planning or (3) maintaining coastal infastructure services. The Coastal Climate Core Service (CoCliCo) project aims at informing decision-making on coastal risk and adaptation, by delivering an open web-platform exploring dominant risk drivers, adjusting visualisation and analysis techniques to local decision contexts, and combining relevant and high-quality geospatial information layers. Through the platform, users will be able to visualize, download and analyse multiple decision-oriented coastal risk scenarios relevant to the rich user narratives of our Demonstration Case Studies addressing the three needs raised above. To meet this challenge, CoCliCo brings together European organizations and scholars that have proven track records of delivering broad-scale coastal risk and adaptation assessment, as well as leading research and technologies in interoperable geospatial data management, decision sciences and risk communication.

Attività ENEA:

ENEA sarà coinvolta in 7 degli 8 Work-packages del progetto. Nel corso del progetto ENEA si occuperà principalmente dell'esecuzione di simulazioni climatiche per la proiezione del livello del mare in area mediterranea e del Mar Nero ad alta risoluzione e la gestione dei rapporti con Federlogistica Italia e la divulgazione dei risultati presso gli stakeholder nazionali (autorità portuali, RFI, Confcommercio, ecc).

Responsabile:	SANNINO GIANMARIA	**Unità:**	SSPT-MET-CLIM
Anno Stipula:	2021		
PQ:	HORIZON 2020	**Programma UE:**	Climate Action, Environment, Resource Efficiency and Raw Materials
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-09-2021	**Data Fine:**	31-08-2025
Doc. approvazione:	105/2021/SSPT-MET	**Codice atto:**	PS2ABW
Contributo Totale:	€ 5.999.641	**Costo eleggibile:**	€ 5.999.641
Contributo ENEA:	**€ 297.125**	**Costo ENEA:**	**€ 297.125**

CONNECT-NM

Coordination of the European Research Community on Nuclear Materials for Energy Innovation

Coordinatore: CIEMAT - CENTRO DE INVESTIGACIONES ENERGETICAS, MEDIOAMBIENTALES Y TECNOLOGICAS (Spagna)

N. Partner:

Abstract:

CONNECT-NM is a co-funded European Partnership on nuclear materials for all reactor generations that applies modern digital technologies to materials science practices for the acceleration of innovation. It implements plans elaborated in the ORIENT-NM CSA with 5 strategic goals: (1) Nuclear materials (NM) acceleration platforms; (2) NM test-beds for accelerated qualification; (3) Intelligent materials health monitoring; (4) Advanced methodologies for prediction of materials behaviour in operation; (5) NM knowledge organisation system. Accordingly, the work will be organised in 5 research lines: (1) Advanced materials development & manufacturing; (2) Materials & component qualification: testing, standardization & design rules; (3) Non-destructive examination & materials health monitoring; (4) Advanced materials modelling and characterization; (5) Nuclear materials knowledge & data management. Each research line will coordinate call-selected Projects. CONNECT-NM will centralize transversal activities for the benefit of all Projects: e.g. coordination & management; E&T and infrastructure access; communication, dissemination & result exploitation; interaction with stakeholders; data management. Collaboration is foreseen with international organisations and bodies dealing with safety, standardisation, data management, as well as with fusion & non-nuclear energy communities. All activities align with national and European initiatives on nuclear materials, strengthening R&D&I and avoiding fragmentation and duplication, with direct involvement of industry, TSOs and regulatorsas active partners and end-users.

Attività ENEA:

ENEA coordina la RL3/WP6 “Materials and component qualification: testing, standardization and design rules”, Inoltre è impegnata nelle seguenti attività: linea di ricerca RL1/WP4 “Nuclear materials knowledge & data management”; WP1 “Coordination and Daily Management”, come subtask leader 1.7.1 “Gender Dimension”; e WP3 “Communication, Dissemination and Results Exploitation”.

Responsabile:	MARTELLI DANIELE	**Unità:**	NUC-ING-ITM
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Euratom
		Tipo Progetto:	Programme Cofund Actions
Data Inizio:	01-10-2024	**Data Fine:**	30-09-2029
Doc. approvazione:	Determinazione n.145/2024/NUC	**Codice atto:**	PF4AAS
Contributo Totale:	€ 20.000.000	**Costo eleggibile:**	€ 36.363.813
Contributo ENEA:	**€ 257.744**	**Costo ENEA:**	**€ 468.625**

CRBN SoS

Enhancing cross-border CBRN operational readiness and effectiveness through an overarching System of Systems approach

Coordinatore: AIT - AUSTRIAN INSTITUTE OF TECHNOLOGY (Austria) N. Partner:

Abstract:

The main idea of CBRN SoS (System of Systems) is to design an overarching information system that can integrate different existing national CBRN defence information systems and components in a modular and flexible way. It can be permanently stationed in a specific configuration of core components ready for on demand deployment. Additional elements from different Nations can be added dynamically depending on specific needs of the operation. CBRN SoS addresses Detection, Identification and Monitoring (DIM), Knowledge Management (KM), Physical Protection (PP), and Hazard Management (HM). First an EU CBRN solution inventory study for these components will be conducted. These results will be analysed to identify capability improvements in existing information systems and map out synergies between Member States to define potential entry points for the federated CBRN SoS. Subsequently, the detailed system architecture design will be derived, and key representative parts prototyped to validate the system through demonstrations. The main advantages of CBRN SoS result from the ability for multiple entities from different Member States to collaborate which enhances the overall situational awareness and leads to a faster and more efficient CBRN threat response. Using ATP 45 elements as key pillars for the distributed CBRN SoS software architecture, is an attempt to bring a well-established and known system structure into the fragmented landscape of isolated CBRN solutions. In this way different Nations can relate and map own structures to CBRN SoS more easily, which eventually improves the recognizability and identification of end-users with CBRN SoS. Rather than developing a completely new software solution from scratch, CBRN SoS uses the more efficient and more realistic approach to focus on interfaces to existing solutions and modules, as Member States want to continue using their own solutions and providers but still be able to cooperate in a federated way.

Attività ENEA:

L'ENEA è partner del progetto e partecipa ai seguenti Work Package: WP2 – EU CBRN systems and CONOPS study (task T2.5: Future technology readiness and European sovereignty,T2.6: Certification and standardisation study, T2.7: Civil interfaces study) WP4 – Knowledge Management (KM) System Design (task T4.8: Emulators design for test and demonstration purposes (CBRN SCC to CBRN ACC)) WP6 – SoS Prototype (Task T6.4: System integration) WP7 – Test & Demonstration (task T7.1: Demonstration scenario definition, T7.2: User training, T7.3: Demonstration execution)

Responsabile:	CIMINO MONICA	**Unità:**	NUC-TECFIS
Anno Stipula:	2024		
PQ:	Other programmes (2021-2027)	**Programma UE:**	EDF - European Defence Fund (2021-2027)
		Tipo Progetto:	EDF Development Actions
Data Inizio:	01-12-2024	**Data Fine:**	30-11-2027
Doc. approvazione:	215/2024/NUC	**Codice atto:**	PF7ACA
Contributo Totale:	€ 12.553.708	**Costo eleggibile:**	€ 14.052.330
Contributo ENEA:	**€ 406.440**	**Costo ENEA:**	**€ 443.250**

CRISTAL

Climate resilient and environmentally sustainable transport infrastructure, with a focus on inland waterways

Coordinatore: LUKASIEWICZ - POZNAN INSTITUTE OF TECHNOLOGY (Polonia) N. Partner:

Abstract:

It is the key objective of the project CRISTAL (36 months) to increase the share of freight transport on inland water transport (IWT) by a minimum of 20% and to demonstrate on its three pilot sites (Italy, Poland and France) strategies to improve reliability by 80%. CRISTAL project will assure IWT capacity at 50% even during extreme weather events. Towards that CRISTAL will co-create, test and implement integrated, cooperative and innovative solutions in its three pilot partners' areas identified in Italy, France and Poland. The project will include the aspects of technological Inovation/development and digitalization; further advancement towards the Physical Internet, governance solution and business models, will be proposed while targeting sustainability and infrastructure resilience requirements.

Attività ENEA:

ENEA sarà leader del workpackage WP2, denominato "Technologies" nel quale sarà responsabile delle seguenti Tasks: - Task 2.1 Technologies for improving the resilient and reliable navigability - Task 2.2 Technologies for the resilient management of engineered Inland waterway infrastructures - Task 2.3 Software architecture of CRISTAL acquisition - Task 2.4 End-users interfaces including ad-hoc defined dashboards and mobile Apps for navigability,preventive maintenance as well as to support corridor management ENEA contribuirà, inoltre, ad altri workpackages del progetto.

Responsabile:	GIOVINAZZI SONIA	**Unità:**	TERIN-SEN-APIC
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D6 Transport and Smart Mobility services
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-09-2022	**Data Fine:**	31-08-2025
Doc. approvazione:	112/2022/TERIN	**Codice atto:**	PK5AAH
Contributo Totale:	€ 6.371.049	**Costo eleggibile:**	€ 6.837.453
Contributo ENEA:	**€ 421.563**	**Costo ENEA:**	**€ 421.563**

CST4ALL

SUPPORT TO THE ACTIVITIES OF THE CONCENTRATED SOLAR THERMAL TECHNOLOGY AREA OF THE SET PLAN

Coordinatore: ESTELA EUROPEAN SOLAR THERMAL ELECTRICITY ASSOCIATION (Belgio) N. Partner:

Abstract:

The main hurdle the Concentrated Solar Thermal Technologies (CST) sector has been facing over the last decade in Europe is the assumed level of the costs of CSP power plants with a too narrow perception of its use as flexibility provider to the sole electricity systems. To mitigate this, the CST4ALL project identifies an array of hybridisation and cooperation initiatives at the interface between CST and other technologies for applications relevant to the 3 sectors (electricity, heat and fuels) incorporating the work products of various ETIPs. Well-aligned on current EU initiatives (Smart Sector Integration, Fit for 55, CETP) and specific energy strategies across the reviewed Member States to provide answers to the most urgent challenges of decarbonisation, the core deliverable of CST4ALL consists of an intertwined set of workshops with respective industry and R&I focus. These shall bring together, better coordinate and incentivise the interaction of main stakeholders at key technology interfaces with the CSP sector building on combined technological and non-technological improvements. Both the research and the industry perspectives are first analysed aiming primarily at supporting and enlarging the network of active stakeholders in the CSP Implementation Working Group in the SET Plan and to raise the general awareness about the role CST can play in a future sustainable energy mix. These workshops finally result in specific proposals at EUlevel from a cross-sector perspective to foster public/private funding for R&I and create the necessary political/regulatory framework conditions for the execution of the new CSP Implementation Plan.

Attività ENEA:

ENEA partecipa alle normali attività di progetto tra cui: partecipazione ed organizzazione a meeting e workshop di progetto, raccolta ed elaborazione delle informazioni prodotte in questi eventi e stesura di report. Le attività di progetto saranno svolte con la partecipazione del personale afferente a TERIN-STS.

Responsabile:	TURCHETTI LUCA	**Unità:**	TERIN-STSN-SCIS
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D3 Energy supply
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-10-2022	**Data Fine:**	30-09-2025
Doc. approvazione:	143/2022/TERIN	**Codice atto:**	PK7AAF
Contributo Totale:	€ 599.529	**Costo eleggibile:**	€ 599.529
Contributo ENEA:	**€ 50.625**	**Costo ENEA:**	**€ 50.625**

DeliSoil – Delivering Soil improvers through improved recycling and processing solutions for food industry residues streams

Coordinatore: LUKE - NATURAL RESOURCES INSTITUTE FINLAND (Finlandia) N. Partner:

Abstract:

DeliSoil will adopt a multi-actor, transdisciplinary approach to co-design processes that minimise food processing waste and valorise its by-products. We will apply a circular bioeconomy approach to the waste hierarchy, creating sustainable soil improvers in support of soil health in Europe. DeliSoil's 5 regional Living Labs (LLs), with actors along the entire food value chain, will use innovative technologies to convert residues from food processing and production industries into tailored soil improvers. Research partners and companies will evaluate the soil improvers in state-of-the-art laboratories, and landowners will test the project's solutions. The tailored soil improvers will be tested for stability, biosafety and molecular parameters, and their impacts on soil health, agronomical performance, and environmental risks will be evaluated. Environmental footprints will also be measured for selected products. We will identify technological, legislative, financial, and social barriers and enablers for the conversion of food processing residue streams into organic soil improvers and fertilising products, and use these results to analyse fairness throughout the LL value chains. Together with stakeholders, we will build communities and create networks to facilitate knowledge sharing of DeliSoil's key exploitable results, empower interdisciplinary design processes to improve soil health through the valorisation of food by-products, and increase societal soil literacy. The Living Labs will share their solutions for using side-streams from vegetable, meat, insect cultivation, mixed food, tomato, olive oil, and wine industry actors. Our proposed Lighthouses will allow inter-European partnering and demonstrate improved waste management sites integrating optimal practices in a circular bioeconomy framework. We will work in close cooperation with other EU projects and the European Soil Observatory (EUSO) to ensure coordinated delivery of Soil Mission goals.

Attività ENEA:

ENEA rivestirà il ruolo di Partner, Leader del WP2 'Soil health improvement' ed è coinvolto in tutti i 7 WP nei quali si articola il progetto: WP1: Food Industry processing residue streams WP2: Soil health improvement WP3: Enablers for the conversion of food by-products and waste to soil improvers and fertilising products WP4: Environmental care WP5: Multi-actors engagement and collaboration Tentative: "Lighthouses, multi-actors and socioeconomics" WP6: Dissemination, Exploitation & Communication WP7: Project Management & Coordination

Responsabile:	BEVIVINO ANNAMARIA	**Unità:**	SSPT-BIOAG-SOQUAS
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Mission Soil
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-06-2023	**Data Fine:**	31-05-2027
Doc. approvazione:	131/2023/SSPT-BIOAG	**Codice atto:**	PS1ADM
Contributo Totale:	€ 7.000.000	**Costo eleggibile:**	€ 7.000.000
Contributo ENEA:	**€ 681.840**	**Costo ENEA:**	**€ 681.840**

N. Contratto: IRSN LW 2024-0012

DISCOVER

Dissecting radIation effectS into the Cerebellum micrOenVironmEnt driving tumour pRomotion

Coordinatore: ENEA (Italia) N. Partner:

Abstract:

Radiation carcinogenesis has classically been attributed to unrepaired or misrepaired DNA damage. By now, there is increasing recognition that radiation can induce changes within the microenvironment and cause epigenetic modifications, which can also contribute to the development of cancer, challenging the conventional target theory in radiobiology. However, the interplay between DNA damage, microenvironmental changes, and epigenetic modifications in radiation-induced carcinogenesis is complex and not yet fully understood. DISCOVER will study the impact of radiation-induced changes in the microenvironment and the influence of related cell communication processes on carcinogenesis. The project will exploit a robust model of radiation-induced carcinogenesis, the Ptch1+/- mice, exhibiting a genetic predisposition for development of medulloblastoma (MB), a cerebellar tumour. Irradiation of these mice, even at low dose, increases MB incidence. The project aims to understand how different cerebellar populations, such as granule cell precursors, the MB cell of origin, and astrocytes, microglia and endothelium, representing microenvironmental components, respond to moderate (2 Gy) and low (0.1 Gy) radiation doses and contribute to tumour formation. Model systems of different complexity including (i) Ptch1+/- mice, (ii) ex-vivo cerebellum slices and (iii) in vitro cerebellar cell cultures, will be used to evaluate the effect of the microenvironment in transmitting radiation signals driving carcinogenesis. We will conduct a comprehensive analysis of various types of data, including morphology, function, tumourigenesis and omics data. We will also investigate secretome, as well as extracellular vesicles from exposed tissue and their specific bioactive cargo for their role in mediating radiation tumourigenesis. An integrated analysis of DISCOVER animal data and publicly available human brain cancer data aims to identify patterns/signatures for MB development. By adopting this comprehensive approach, DISCOVER aims to uncover the interactions between different cellular components of the cerebellar microenvironment and their role in radiation oncogenesis. Overall, these findings have the potential to improve our mechanistic understanding of the pathogenesis of radiation-induced cancer with important implications for human health risk assessment.

Attività ENEA:

L'ENEA coordina il progetto ed è leader del WP6 “Project Management” ed il WP7 “Training, Dissemination and Exploitation”, in stretta collaborazione con gli altri partner del progetto Il progetto prevede per ENEA l’esecuzione di esperimenti (in vitro, ex vivoe in vivo) per l’identificazione di segnali di danno e dei meccanismi molecolari che le cellule del microambiente potrebbero trasferire sulla cellula target, responsabile dell’insorgenza tumorale.

Responsabile:	PAZZAGLIA SIMONETTA	**Unità:**	SSPT-TECS-TEB
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Euratom radioprotezione
		Tipo Progetto:	Programme Cofund Actions
Data Inizio:	01-02-2024	**Data Fine:**	31-01-2027
Doc. approvazione:	23/2024/SSPT-TECS	**Codice atto:**	PS5ABH
Contributo Totale:	€ 847.331	**Costo eleggibile:**	€ 1.344.970
Contributo ENEA:	**€ 472.481**	**Costo ENEA:**	**€ 749.970**

DONES Consolidation Phase 1

DONES-ConP1

Coordinatore: esDONES - CONSORCIO IFMIF-DONES ESPAÑA (Spagna) N. Partner:

Abstract:

DONES-ConP1 is a project which answers to the call of support action for consolidating the IFMIF-DONES ESFRI facility. It will be linked to the brandnew DONES Programme serving as a transition for policy makers until funds are available, consolidate and expand the users community. The project will deal not only with the Construction Phase of the facility, but also with the operation and exploitation phase of the project. Although the Andalucia and the Spanish Government are ready to finance the investment to the extent of 50%, Croatia a 5%, and EURATOM through F4E are also ready to invest another 20%, negotiations with different partners are ongoing in order to secure and equilibrate the full construction budget and to assure the operation costs. This Consolidation support action is the ideal framework to ensure these contributions. The project will work on critical financial, legal and organisational issues related to the international character of the IFMIF-DONES facility during its construction and operation phases. The experience of the partners supplying in-kind procurements to other European and International facilities is a clear asset to benefit and developing update models for all the documentation and planning related with in-kind of commercial procurements at IFMIF-DONES. One of the main objectives of the project is to consolidate the scientific users community of both fusion and non-fusion experiments. The project shall consolidate the recently created community, developing cutting edge proposals in fields of nuclear physics, medicine or industry. The DONES Experimental Programme is one of the key objectives of the project. Finally, the project will update all the DONES Programme documentation in order to ensure they are ready for the start of the construction, and also the installation and commissioning phases. This will include an update of the documentation related to licensing of the proposal of experiments, and the transport to support facilities.

Attività ENEA:

L'ENEA è coinvolta su tutti i 4 Work-packages WP1 - Coordination & dissemination WP2 - Outreach, development and engagement of scien-tific and engineering user community WP3 - Development of in-kind & partnering agreements WP4 - Project Preparation for construction

Responsabile:	TARANTINO MARIANO	**Unità:**	FSN-SICNUC
Anno Stipula:	2023		
PQ:	Euratom2027	**Programma UE:**	Euratom fusione
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-11-2023	**Data Fine:**	31-10-2025
Doc. approvazione:	22/2024/FSN	**Codice atto:**	PF6ABC
Contributo Totale:	€ 1.249.820	**Costo eleggibile:**	€ 1.906.700
Contributo ENEA:	**€ 86.960**	**Costo ENEA:**	**€ 124.225**

DRG4Food

Empowering a fair and responsible European FoodRegister, fostering citizen sovereignty and creating a data-driven food system

Coordinatore: TWINDS (Belgio) N. Partner:

Abstract:

The overall goal of our project is to achieve trust in a data-driven food system by implementing Digital Responsibility Goals for the food sector. This will enable new levels of innovation for example in food safety, sustainability, personalized nutrition, reduction of food waste and fair conditions throughout the entire food chain. The programme works on a clear strategic roadmap (a new virtual food system), a set technological enablers, demonstration of solutions, a structured funding programme with open calls, and measures to guide and support the food ecosystem of third party beneficiaries, citizens, stakeholders. As a consortium, we maintain the perspective that technology is not a means to an end, but acts merely as an empowering enabler, providing the means to achieve a wide variety of innovative and valuable use cases. Use cases that promise to serve a broader audience, provided that adequate access also is considered as a prerequisite. Currently however, technology is primarily developed from the perspective and needs of corporations and / or authorities- a limitation that risks perpetuating or further exacerbating the above-mentioned lack of trust within the markets that they serve. With a more diverse and human-centric driven perspective we believe the new use cases that will emerge and the technology development required to realise them will contribute to a more sustainable ecosystem that is “trustworthy by default”. To truly design for trust, the entire chain of activities and underlying assumptions towards developing technology has to be based on fundamental values like responsibility, privacy and user control - especially when dealing with valuable and sensitive food data. The starting point of all assumptions needs to be the user and their values - not a business model or (legitimate) state interests.

Attività ENEA:

ENEA riveste il ruolo di Partner, partecipando alle attività di tutti i WP e svolgendo in particolare il ruolo di Task Leader per la Task 1.2 Scientific Coordination (WP Coordination & Project Management), monitoring and risk management e la Task 2.4 Policy Briefings (WP Virtual food system roadmap).

Responsabile:	ZOANI CLAUDIA	**Unità:**	SSPT-BIOAG
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 6 - Food, Bioeconomy, Natural Resources, Agriculture and Environment
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-12-2022	**Data Fine:**	30-11-2025
Doc. approvazione:	271/2022/SSPT-BIOAG	**Codice atto:**	PS1ADA
Contributo Totale:	€ 4.000.000	**Costo eleggibile:**	€ 4.000.000
Contributo ENEA:	**€ 326.250**	**Costo ENEA:**	**€ 326.250**

European Partnership Driving Urban Transitions

Coordinatore: BMK - FEDERAL MINISTRY FOR CLIMATE ACTION, ENVIRONMENT, ENERGY, MOBILITY, INNOVATION AND TECHNOLOGY (Austria)

N. Partner:

Abstract:

Driving Urban Transitions to a Sustainable Future (DUT) is the new programme of JPI Urban Europe starting in 2022. The DUT Partnership steps up the game to tackle urban challenges. Through research and innovation, we enable local authorities and municipalities, business, and citizens to translate global strategies into local action. We develop the skills and tools to make urban change happen and boost the urgently needed urban transformations towards a sustainable future with enhanced quality of life in cities. DUT is realised as a European partnership of more than 60 partners from 27 countries, involving national and regional policy makers, funders and urban-related policy agencies to invest in urban R&I and strengthen a European innovation eco-system for urban transitions. Building upon the JPI Urban Europe achievements, DUT aims to create a strong community around urban transitions and to establish a well-known research and innovation platform that will help cities become more sustainable, inclusive and liveable. DUT is one out of 49 European partnerships under Horizon Europe framework and the only one addressing urban development in its complexity, with a close link to the European mission of 100 climate-neutral and smart cities.

Attività ENEA:

ENEA coordina il WP6 'Capacity building for the Transition Pathways' e sarà inoltre impegnato ad eseguire le seguenti attività: Task 2.2 Strategic development of the 15-Minute City Transition Pathway Task 2.3 Strategic development of the Positive Energy Districts Transition Pathway Task 2.4 Strategic development of the Circular Urban Regenerative Economies Transition Pathway Task 6.2 Target group specific empowerment Task 7.2.2 Develop and implement a valorisation strategy: Neighbourhood Transformation Showcasing Task 7.3 Towards replication and mainstreaming

Responsabile:	CLERICI MAESTOSI PAOLA	**Unità:**	TERIN-SEN
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D2 Cross-cutting solutions
		Tipo Progetto:	Programme Cofund Actions
Data Inizio:	01-01-2022	**Data Fine:**	31-12-2028
Doc. approvazione:	113/2022/TERIN e 195/2023/TERIN	**Codice atto:**	PK5AAI
Contributo Totale:	€ 37.000.000	**Costo eleggibile:**	€ 172.369.768
Contributo ENEA:	**€ 578.125**	**Costo ENEA:**	**€ 578.125**

EASI SMR

EASI-SMR

Ensuring Assessment of Safety Innovations for SMR

Coordinatore: EDF - ELECTRICITE DE FRANCE SA (Francia) N. Partner:

Abstract:

The EASI-SMR project intends to address the safety issues related to the LW-SMR in order to provide advances that should support implementation of such technologies as soon as possible. The EASI SMR project activities are aimed at ensuring that these reactors will be designed, constructed, commissioned and operated in the safest possible way and in accordance with existing regulations. The consortium was carefully chosen so that the research entities can provide the necessary research teams and support facilities across the European Continent and beyond. EASI-SMR will address the safety issues associated with major LW-SMR innovations: • Passive systems • Soluble Boron-free cores • Co-generation and hybridation • Additive manufacturing to improve compactness of Nuclear Steam Supply System • Multi-units operation The work aims to provide insights for European LW-SMR projects, in particular: • NUWARD SMR, a French design of a reactor generating 170 MW of electricity production. • LDR-50, a Finnish design of a district heating reactor of 50 MW EASI-SMR is closely linked with NUGENIA TA6 and the European SMR pre-Partnership's WS5.

Attività ENEA:

L'ENEA è leader del WP3 (Code validation, Scaling) ed è coinvolta nei seguenti Work Package: WP1 Transverse topics for LW SMR acceptability and licensing, WP2 Experimental tests program, WP4 Reliability of passive systems e WP8 Communication, Education & Training. In particolare l'ENEA si farà carico delle attività legate allo sviluppo di codici di calcolo utili alla validazione di codici termoidraulici e di incidenti severi, nelle analisi di affidabilità dei sistemi passivi, e nel supporto alla progettazione di impianti sperimentali specificamente per gli SMR.

Responsabile:	MASCARI FULVIO	**Unità:**	NUC-ENER-SIC
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Euratom
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-09-2024	**Data Fine:**	31-08-2028
Doc. approvazione:	121 (2024) NUC	**Codice atto:**	PF6ABF
Contributo Totale:	€ 14.994.602	**Costo eleggibile:**	€ 19.934.031
Contributo ENEA:	**€ 528.150**	**Costo ENEA:**	**€ 754.500**

ECO-READY

Achieving Ecological Resilient Dynamism for the European food system through consumer-driven policies, socio-ecological challenges, biodiversity, data-driven policy, sustainable futures

Coordinatore: UNIV. CZECH OF LIFE SCIENCES PRAGUE (Repubblica Ceca) N. Partner:

Abstract:

The ECO-READY project will develop a real-time surveillance system, an Observatory offered as an e-platform and as a mobile application. This will function as the necessary singular source of information, provide real-time assessments for the food system, and update forecasts frequently and consistently. The Observatory will be available to society, policymakers, the scientific community, and the agri-food industry, and integrated with a network of 10 Living Labs, supported through the third party funding process, covering all bioclimatic regions in Europe, forming the ECO-READY project knowledge infrastructure. ECO-READY will produce knowledgebased resilience strategies, and develop tools that will be embedded on the Observatory. The underlining principle behind the ECOREADY approach is, resilient dynamism, or tackling immediate problems and long-term challenges at the same time. The Living Labs network will facilitate 'concept to action' through the co-creation of scenarios addressing their regional needs, the development of policy recommendations, contingency plans, and resilience strategies, and embed them on the Observatory. Furthermore, ECO-READY will develop an early warning system and decision support tools using innovative Artificial Intelligence based on holistic prediction models and Life Cycle Assessment results. ECO-READY will ensure that European farmers and society's interests be reflected in future policymaking and monitoring, through early-stage active engagement incorporating bottom-up recommendations, facilitated by the increased usership of the digital tools developed, and resulting in increased awareness for climate-adaptive and mitigating agri-food products. Furthermore, the Observatory smart application will include tools that will empower the citizens to actively engage in policy making, and interact directly with the scientific community, farmers, and industry and policy makers, thus driving change in consumption habits.

Attività ENEA:

ENEA riveste il ruolo di partner ed è coinvolto nei seguenti workpackage: WP1 - Scoping and outlining the extended European Food Social-Ecological system WP2 - Stakeholders' engagement and empowerment WP6 - Communication and post-project sustainability WP7 - Project management In particolare, parteciperà attivamente alle attività previste dal WP1 con un ruolo di leader della Task T1.2 "Connecting the project scope with CAP, Green Deal and other EC Frameworks & Policies". Nel WP2 contribuirà attraverso l'expertise e la capitalizzazione di progetti in corso che prevedono il coinvolgimento degli stakeholder. In WP6 sosterrà le principali attività di comunicazione e disseminazione ed in WP7 collaborerà alla gestione del progetto.

Responsabile:	BEVIVINO ANNAMARIA	**Unità:**	SSPT-BIOAG-SOQUAS
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 6 - Food, Bioeconomy, Natural Resources, Agriculture and Environment
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-12-2022	**Data Fine:**	30-11-2026
Doc. approvazione:	285/2022/SSPT-BIOAG	**Codice atto:**	PS1ADB
Contributo Totale:	€ 13.628.429	**Costo eleggibile:**	€ 13.628.429
Contributo ENEA:	**€ 267.000**	**Costo ENEA:**	**€ 267.000**

EEPLIANT4

Energy Efficiency Compliant Products 4

Coordinatore: PROSAFE - THE PRODUCT SAFETY ENFORCEMENT FORUM OF EUROPE (Paesi Bassi)

N. Partner:

Abstract:

The Energy Efficiency Compliant Products 4 (EEPLIANT4) is an EU co-funded Concerted Action that builds on the success, good practices, and lessons learned from the three former EEPLIANT Actions since 2015. The aim of this new Concerted Action is to support the implementation and enforcement of the EU Ecodesign and Energy Labelling regulations for energy-related products and durably improve market surveillance in these fields. These regulations set minimum requirements for the energy efficiency and environmental performance of products. They also provide consumers with clear information on their energy consumption and environmental impact. The EEPLIANT4 Concerted Action will check and test products from different product categories and market segments, such as household appliances (including refrigerating appliances, cooking appliances, dishwashers, vacuum cleaners), airheating and cooling equipment, solid fuel space heaters, car tyres, and electronic displays. EEPLIANT4 will analyse the results of inspections and testing, measure the impacts generated from its activities, identify new good practices and common challenges, and provide empirical recommendations to improve the level of compliance and market surveillance of energy-related products in the EU. In addition to market controls and compliance verification testing, the EEPLIANT4 Concerted Action aims to improve the skills and knowledge of EU/EEA Market Surveillance Authorities (MSAs). The Action will continue supporting the harmonisation of practices related to the application of Ecodesign and Energy Labelling rules across Europe through a number of capacity-building, methoddevelopment and dissemination activities, also in cooperation with EU Customs and third parties (i.e., economic operators).Finally, the project will develop and implement technology-based solutions and tools that can improve the efficiency of certain tasks in the market surveillance workflow.

Attività ENEA:

Il progetto è suddiviso in 13 Work Package (WP). ENEA è leader del WP11 "Emerging issues and challenges", per l'analisi sulle problematiche emergenti nella sorveglianza del mercato, ed è coinvolta nei seguent WP: wp1 "Management, Communication, Dissemination, Exploitation, Sustainability and Replication" per attività di management e coordinamento, WP2 "refrigerating appliances (household and refrigerators with direct sales function)" per la verifica della conformità degli apparecchi per la refrigerazione, il WP5 "domestic cooking appliances (electrical or gas ovens, hobs, and range hoods)" per la verifica della conformità degli apparecchi per la cottura, il WP6 "vacuum cleaners" per la verifica della conformità degli aspirapolvere, il WP7 "off-mode/network standby" per la verifica della conformità del consumo di energia in modalità "off" e del network standby, e il WP11 "joint activities with customs" per la collaborazione con le dogane

Responsabile:	PRESUTTO MILENA	**Unità:**	DUEE
Anno Stipula:	2024		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	LIFE ProJect Grants
Data Inizio:	01-05-2024	**Data Fine:**	30-04-2029
Doc. approvazione:	1/2024/DUEE-SPS	**Codice atto:**	PW0AAC
Contributo Totale:	€ 7.999.999	**Costo eleggibile:**	€ 8.421.053
Contributo ENEA:	**€ 107.635**	**Costo ENEA:**	**€ 113.300**

EIT Raw materials FENICE_23

Fire rEsistant eNvironmental frIendly CompositEs

Coordinatore: ENEA (Italia)

N. Partner:

Abstract:

FENICE is a TRL 8 upscaling project on recyclable & biobased Fibre Metal Laminates (FML) and other composites for lighter, more sustainable & safer battery box production, with higher fire resistance. By the end of 2025, FENICE will deliver (1) validated and precertified materials, with customisable characteristics, SDS and TDS; (2) battery box demonstrators & production optimisation; (3) LCA. By 2026, industrialisation in transports will start, aiming at producing 100k-1M battery boxes per year

Attività ENEA:

Attività finalizzate allo sviluppo di tecnologie di produzione di box batteria per la trazione elettrica in materiale a base FML (Fiber Metal Laminates).

Responsabile:	MINGAZZINI CLAUDIO	**Unità:**	SSPT-PROMAS-TEMAF
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	EIT - Raw Materials KIC
		Tipo Progetto:	N/A - Non applicabile
Data Inizio:	01-01-2023	**Data Fine:**	31-12-2025
Doc. approvazione:	154/2023/SSPT-PROMAS	**Codice atto:**	PS3ADX
Contributo Totale:	€ 2.094.683	**Costo eleggibile:**	€ 2.996.579
Contributo ENEA:	**€ 230.506**	**Costo ENEA:**	**€ 351.013**

EJP SOIL

Towards climate-smart and sustainable soil management

Coordinatore: INRAE - INSTITUT NATIONAL DE RECHERCHE POUR L'AGRICULTURE, L'ALIMENTATION ET L'ENVIRONNEMENT (Francia)

N. Partner:

Abstract:

The main objective of EJP SOIL is to create an enabling environment to enhance the contribution of agricultural soils to key societal challenges such as climate change adaptation and mitigation, sustainable agricultural production, ecosystem services provision and prevention and restoration of land and soil degradation. The EJP SOIL will build a sustainable European integrated research community on agricultural soils and will develop and deploy a roadmap on climate-smart sustainable agricultural soil management. The EJP SOIL roadmap is based on a knowledge framework with 4 interacting components. Knowledge development is set out in project calls with internal and external partners. Knowledge sharing & transfer is framed in capacity building for young scientists, enhancing general public awareness and fostering societal understanding and appreciation of agricultural soil management and its contribution to society. Knowledge harmonization, storage & organization supports harmonised soil information and reporting practices. Knowledge application deals with ways to overcome barriers for adoption of novel practices in a European context, co-developing adequate tools and providing evidence-based recommendations for EU policies. EJP SOIL activities in interaction with stakeholders, MSs and DG AGRI will pursue the long-term goal of promoting farmers as stewards of land and soil resources and support policy development and deployment, in particular the CAP and Climate policies. The EJP SOIL addresses 6 expected impacts with targeted activities in response to societal, scientific, policy and operational challenges. A first annual workplan based on the roadmap is provided as part of the proposal. The EJP Soil consortium unites a unique group of 26 leading European research institutes and universities in 24 countries. The consortium has developed this proposal in close collaboration with its programme owners and has secured over 40M€ in co-funding and 10M€ for external calls over 5 years.

Attività ENEA:

L'ENEA in qualità di parte terza (Linked Third Party) si prefigge di collaborare con il Beneficiario (CREA) per il raggiungimento degli obiettivi legati alle attività tecnico-scientifiche previste nel progetto, in particolare nei seguenti WP: WP2 - Roadmap for EU Agricultural Soil Management research WP3 - Research alignment. Internal calls WP6 - Supporting harmonised soil information and reporting WP9 - Dissemination and outreach for European scale impacts

Responsabile:	BEVIVINO ANNAMARIA	**Unità:**	SSPT-BIOAG-SOQUAS
Anno Stipula:	2021		
PQ:	HORIZON 2020	**Programma UE:**	Food Security, Sustainable Agriculture and the Bioeconomy
		Tipo Progetto:	COFUND-EJP European Joint Programme COFUND
Data Inizio:	18-03-2021	**Data Fine:**	31-01-2026
Doc. approvazione:	20/2021/SSPT-BIOAG	**Codice atto:**	PS1ABX
Contributo Totale:	€ 40.000.000	**Costo eleggibile:**	€ 80.000.000
Contributo ENEA:	**€ 74.406**	**Costo ENEA:**	**€ 148.813**

ENEN2plus

Building European Nuclear Competence through continuous Advanced and Structured Education and Training Actions

Coordinatore: ENEN - EUROPEAN NUCLEAR EDUCATION NETWORK (Belgio) N. Partner:

Abstract:

Nuclear power and non-power technologies are technically very complex facilities that operate in the increasingly challenging regulatory framework and market conditions. Development, construction, operation, decommissioning, waste management and oversight of these facilities require personnel with excellent education, skills and motivation: nuclear specialists, that are equipped to work in multidisciplinary, multicultural and competitive environments. ENEN# stands for the largest and most integrative nuclear Education and Training (E&T) efforts up to date. Attraction of excellent new talents followed by outstanding development through E&, crosscultural and cross-disciplinary activities are the overarching objectives. Excellent workforce should remain the basic enabler of safe longterm operation of existing and development of advanced facilities. A detailed insight into the EU supply and demand of nuclear human resources for power and non-power applications will be developed. This will include industries, academia, technical safety organizations and regulators. Higher number of nuclear talents will be achieved through dedicated career related events and competitions for high school pupils and teachers, students (BSc, MSC, PhD), postdocs and lifelong learners. A strong mobility program will support over 100 personyears of nuclear career enhancing experience to about 1.000 learners with over 2,5 million EUR. Cross-border and cross-disciplinary mobility within and beyond EU will be promoted in cooperation with JRC, OECD/NEA and partners from USA, China, Korea and Japan. A single hub will be established to provide information on available educational, training and job opportunities. Appropriate connections with the complementary NRT-12 project facilitating access to research infrastructures will be maintained. A centralized platform with coherent information on vocational training programs, developed during the project, will be established.

Attività ENEA:

L'ENEA partecipa ai seguenti work package (WP): WP1 – Human Resources analysis in the nuclear sector WP2 – Informing and attracting new talents WP3 – Enhancing nuclear competences: continuous E&T programs Le attività sono svolte presso i centri ENEA di Bologna e Brasimone.

Responsabile:	FERRUCCI BARBARA	**Unità:**	FSN-SICNUC-TNMT
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-06-2022	**Data Fine:**	31-05-2026
Doc. approvazione:	077/2022/FSN	**Codice atto:**	PF6AAX
Contributo Totale:	€ 6.819.707	**Costo eleggibile:**	€ 7.156.424
Contributo ENEA:	**€ 81.875**	**Costo ENEA:**	**€ 81.875**

URBACT Co-funded by the European Union Interreg

Energy2Act

Collaborative ENERGY TO ACTivate communities towards climate neutrality

Coordinatore: COMUNE DI CESENA (Italia) N. Partner:

Abstract:

ENERGY2ACT introduces the One Stop Shop for Climate Communities, which meets each neighborhood's comprehensive needs while fostering co-designed and bottom-up energy strategies. Central components of the solution include a trusted renovation value chain, a data-driven Multilayer Decision Support System leveraging citizen science, and the Climate Community Exchange System and Fund, promoting solidarity and inclusion, ensuring no one, including the energy poor, is left behind. Additionally, the Community Readiness Level model further assesses and enhances the community's preparedness to take action towards climate-neutrality. By engaging citizens and stakeholders, ENERGY2ACT will create a strong energy culture, provide communities with the tools to lead the energy transition, and prove the effectiveness of the solution in the Vigne Acceleration Neighborhood.

Attività ENEA:

ENEA coordinerà il WP7 "COMMUNITY EMPOWERMENT TO INCREASE AWARENESS ON ENERGY CULTURE CONCEPT AND LAY THE GROUNDWORK FOR COMMUNITY ACTIVISM AND COLLABORATION" e il TWG "community empowerment" e guiderà la creazione di nuove catene del valore e l'implementazione di strategie bottom-up, in particolare attività P2P/action learning. Enea inoltre parteciperà attivamente agli altri WP (da WP1 a WP9) insieme agli altri partner consolidando relazioni di ricerca già esistenti e stabilendone di nuove.

Responsabile:	BRANCHETTI SAMUELE	**Unità:**	TERIN-ICER-CROSS
Anno Stipula:	2025		
PQ:	Other programmes (2021-2027)	**Programma UE:**	URBACT III
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-10-2025	**Data Fine:**	31-03-2029
Doc. approvazione:	180/2025/TERIN	**Codice atto:**	PK5AAV
Contributo Totale:	€ 4.981.487	**Costo eleggibile:**	€ 6.226.858
Contributo ENEA:	**€ 344.050**	**Costo ENEA:**	**€ 430.063**

EoCoE-III

Fostering the European Energy Transition with Exascale

Coordinatore: CEA - COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES (Francia)

N. Partner:

Abstract:

The Energy-oriented Centre of Excellence for exascale HPC applications (EoCoE-III) applies cutting-edge computational methods in its mission to foster the transition to decarbonized energy in Europe. EoCoE-III is anchored both in the High Performance Computing (HPC) community and in the energy field. It will demonstrate the benefit of HPC for the net-zero energy transition for research institutes and also for key industry in the energy sector. The present project will draw the experience of two successful previous projects EoCoE-I and EoCoE-II, where a set of diverse computer applications from four energy domains achieved significant efficiency gains thanks to its multidisciplinary expertise in applied mathematics and supercomputing. During this 3rd round, EoCoE-III will channel its efforts into 5 exascale lighthouse applications covering the key domains of Energy Materials, Water, Wind and Fusion. A world-class consortium of 18 complementary partners from 6 countries will form a unique network of expertise in energy science, scientific computing and HPC, including 3 leading European supercomputing centres. This multidisciplinary effort will harness innovations in computer science and mathematical algorithms within a tightly integrated co-design approach to overcome performance bottlenecks, to deploy the lighthouse applications on the coming European exascale infrastructure and to anticipate future HPC hardware developments. New modelling capabilities will be created at unprecedented scale, demonstrating the potential benefits to the energy industry, such as accelerated design of photovoltaic devices, high-resolution wind farm modelling over complex terrains and quantitative understanding of plasma coreedge interactions in ITER-scale tokamaks. These lighthouse applications will provide a high-visibility platform for high-performance computational energy science, cross-fertilized through close working connections to the EERA consortium.

Attività ENEA:

• Realizzare versioni di codici che siano in grado di sfruttare la potenza di calcolo exascale nelle applicazioni energetiche: vento (Alya e waLBerla-Wind), materiali (LibNEGF), fusione (Gysela-X), acqua (Parflow). • Creare comunità di utenti dei codici sviluppati attraverso il coinvolgimento di Castiel, EuroCC e Inno4scale e altre iniziative EuroHPC. Il contributo di Enea al progetto sarà nelle seguenti linee di attività WP2-Materials, WP7-Communication, dissemination and traini e WP8-Management.

Responsabile:	CELINO MASSIMO	**Unità:**	TERIN-ICT
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	EuroHPC JU
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-01-2024	**Data Fine:**	31-12-2026
Doc. approvazione:	3/2024/TERIN	**Codice atto:**	PK3AAI
Contributo Totale:	€ 2.999.394	**Costo eleggibile:**	€ 5.998.791
Contributo ENEA:	**€ 100.750**	**Costo ENEA:**	**€ 201.500**

eosc | BEYOND

EOSC-Beyond

Advancing innovation and collaboration for research

Coordinatore: EGI FOUNDATION (Paesi Bassi) N. Partner:

Abstract:

EOSC Beyond overall objective is to advance Open Science and innovation in research in the context of the European Open Science Cloud (EOSC) by providing new EOSC Core capabilities allowing scientific applications to find, compose and access multiple Open Science resources and offer them as integrated capabilities to researchers. To do so, EOSC Beyond supports a new concept of EOSC: a federated and integrated network of Nodes operated at different levels, national, regional, international and thematic, to serve the specific scientific missions of their stakeholders. Further specific objectives of the project are to accelerate 'time to product' of new scientific applications with software adapters, enable Open Science with machine composability and dynamic deployment of shared resources, support innovation in EOSC with a testing and integration environment, and align the EOSC Core architecture and specifications to integrate with European dataspaces. The project extends the state of the art of the EOSC Core and adopts a co-design methodology, including requirements elicitation, software development and validation in collaboration with different use cases from EOSC national and regional initiatives (e-Infra CZ, Czechia, NFDI, Germany, and NI4OS, South East Europe region), thematic research infrastructures from Social Sciences and Humanities (CESSDA), Life Sciences (CNB-CSIC and Instruct-ERIC), Environmental Science (ENES and LifeWatch), and Health and Food (METROFood-RI). EOSC Beyond builds on the capacities of prospective EOSC Nodes and partners with multi-annual experience in developing solutions for large-scale federated digital infrastructures and aligns with the technical architecture and requirements of data spaces from different business sectors. Ultimately, EOSC Beyond supports Open Science in modern, data-intensive, and multidisciplinary research, facilitating resource discovery, access, and reuse across scientific communities, organisations, and countries.

Attività ENEA:

ENEA partecipa alla proposta come istituto coordinatore di METROFOOD-RI; in particolare, ENEA partecipa ai seguenti Work Package: WP15 – Co-design and initial integration of EOSC Nodes and Data Spaces WP16 – EOSC Nodes, Data Spaces, Testing and Validation

Responsabile:	ZOANI CLAUDIA	**Unità:**	SSPT
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Research Infrastructures (2021-2027)
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-04-2024	**Data Fine:**	31-03-2027
Doc. approvazione:	287/2023/SSPT-BIOAG	**Codice atto:**	PS1ADT
Contributo Totale:	€ 10.000.000	**Costo eleggibile:**	€ 10.000.000
Contributo ENEA:	**€ 47.935**	**Costo ENEA:**	**€ 47.935**

A Researchers

ERN-ApuliaMED

Coordinatore: UNIV. SALENTO (Italia) N. Partner:

Abstract:

ERN-Apulia+MED targets to bring Citizens cERN-Apulia+ targets to bring Apulian Citizens closer to Researchers and viceversa and further extend the initiatives outside the region in the Mediterranean Area and extra-EU countries (at no cost), involving major public universities and Public and Private Research Institutions and representative schools. The large capacity of beneficiaries was already demonstrated in the past EU-funded projects for 2018- 2021 Nights and the continuation of activities in the unfunded 2022-2023 Nights. Here the initiatives for Citizens involvement will be further scaled up. Main objectives are: - to implement pre-events, the 2024 and 2025 ERNs and some post-events, with particular attention to students, industrial and professional organizations, municipalities and public administrations, already actively involved in the past editions; - to increase public awareness and recognition of the importance and impact of research in daily life, with specific examples from ICT to health and life sciences, from elementary particle to cultural heritage, etc; - to stimulate curiosity and interest and explain the fascinating world and the opportunities in research, especially to the youngest as a mean to encourage them to embark scientific careers; - to establish a tight connection among population/institutions and researchers to continue during the year; - to prepare and publicize dissemination materials along with scientific games and site visits (including laboratories and sites of cultural interest) to be available during the whole year for the general public; - to explain the spirit and opportunities of the European Research Area, the Marie Sklodowska-Curie actions and the principles of “The European Charter for Researchers”; to reach a number of Facebook Impressions >1.5M and Reach >400k, Youtube Views > 30k and watch time > 1000h, followers close to 200k, participants > 100k (among all the various initiatives) and a participants to the ERN > 50k.

Attività ENEA:

L’attività proposta ERN-APULIA MED per il 2024-25 è la prosecuzione naturale delle edizioni "Notte Europea dei Ricercatori" edizione biennale 2018-2019, edizione annuale 2020 ed edizione annuale 2021. svolte in collaborazione con i partner del Sistema Accademico Pugliese e gli EPR operanti in Puglia. Il progetto riveste carattere di strategicità per l’Agenzia perché consente ad ENEA di essere presente sul territorio collaborando con i partner accademici ed EPR pugliesi, allargando la cooperazione nell’area del Mediterraneo (Albania, Spagna, Turchia). Le attività, che vedono coinvolto tutto il personale del Centro di Brindisi e più in generale del personale ENEA, consistono prevalentemente in attività sia in digitale che in presenza, se ci saranno le condizioni di sicurezza sanitaria. In particolare, visita guidata ai laboratori, allestimento di stand dimostrativi, presentazioni, discussioni, open desk, esperimenti didattici, esperienze multi-laboratoriali, giochi di ricerca con studenti, dibattiti, commenti a libri, conversazioni divulgative, illustrazione di dimostratori e prototipi, video esplicativi di scienza e tecnologia, video-collegamenti, tele-conferenze, interviste ad esperti. ENEA svolgerà il ruolo di coordinamento delle iniziative Notte Europea dei Ricercatori per la città di Brindisi

Responsabile:	PENZA MICHELE	**Unità:**	SSPT-PROMAS/MATAS
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	MSCA Marie Skl. Curie Actions
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-04-2024	**Data Fine:**	31-01-2026
Doc. approvazione:	51/2024/SSPT-PROMAS	**Codice atto:**	PS3AEL
Contributo Totale:	€ 209.000	**Costo eleggibile:**	€ 209.000
Contributo ENEA:	**€ 18.000**	**Costo ENEA:**	**€ 18.000**

ESFR-SIMPLE

European Sodium Fast Reactor - Safety by Innovative Monitoring, Power Level flexibility and Experimental research

Coordinatore: CEA - COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES (Francia) N. Partner:

Abstract:

To facilitate the integration of the future nuclear reactors into the European energy system, it is necessary to demonstrate that the reactors have uncompromised safety and meet the future societal needs. The ESFR-SIMPLE project aims at challenging the current European Sodium Fast Reactor (ESFR) design to improve its safety and economics through implementation of innovative technologies in accordance with the ESNII roadmap. The project has 5 specific objectives: 1) Rethink the ESFR design in order to simplify it and make it more cost-competitive, while still achieving resource sustainability and having safety reinforced by intrinsic behaviour. This can be accomplished through reducing the size of the reactor, which will also allow taking advantage of Small Modular Reactor features such as transportability, modularisation, standardisation, and flexible operation, all ultimately leading to improved economics. 2) Assess impact of alternative technologies, such as metallic fuel and compact secondary system design, for the large-size ESFR on the economics and safety. 3) Propose, develop and assess advanced methods of monitoring and processing operational data using Artificial Intelligence, e.g., to optimise fault detection in steam generators at an early stage. 4) Produce new experimental data in order to assist in qualification of innovative components, such as expansion bellows, core catcher and thermo-electric pumps. 5) Ensure that the knowledge generated in the project is shared not only among the project partner institutions, but also with a wide range of stakeholders in Europe and internationally. The project activities will also be informed by the public and other stakeholders' perception of risks and benefits of ESFR technology. Close interactions with EU safety regulator experts will enable continued review and recommendation of the solutions proposed and developed in the project.

Attività ENEA:

ENEA sarà coinvolta nei seguenti work package: WP4 dedicato a studi di sicurezza di SMR WP8 dedicato all'ottimizzazione dell'elemento di combustibile

Responsabile:	POLIDORI MASSIMILIANO	**Unità:**	FSN-SICNUC-SIN
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-10-2022	**Data Fine:**	30-09-2026
Doc. approvazione:	067/2022/FSN	**Codice atto:**	PF6AAR
Contributo Totale:	€ 3.046.561	**Costo eleggibile:**	€ 6.506.234
Contributo ENEA:	**€ 78.727**	**Costo ENEA:**	**€ 152.768**

EU-DREAM

Effective Uptake of Digital Services to Repower European Consumers and Communities as Active Participants in Energy Transition and Markets

Coordinatore: UNIV. PORTO (Portogallo) N. Partner:

Abstract:

EU-DREAM brings together a group of preeminent energy industry and research partners focused on accelerating innovation in digital tools and promoting the effective uptake of digital services. EU-DREAM is aligned with the EU Action Plan on the Digitalisation of the Energy System as it proposes to develop the next generation of energy services, solutions and products that really work for energy consumers, fully tested and demonstrated in 6 LLs in 6 EU countries (Portugal, Belgium, Italy, Ireland, Greece and Denmark. EU-DREAM will address the barriers, motivations, and drivers from the consumer's perspective, intertwining the new technological developments with SSH expertise. All EU-DREAM technical solutions will produce high-level TRL 6-7 results by the end of the project.

Attività ENEA:

L'ENEA è coinvolta in 8 dei 9 Work Packages: WP1 Data-Driven Cross-Sector Integrated Services, Solutions and Products; WP2 Digital Twin, AI-based Assistant Tool and NLP-based Intermediator; WP4 Digital Platforms, Tools and Technologies for Energy Services; WP5 Market Design for Digital Tools Uptake and Flexibility Services; WP6 Social Innovation, Consumers' Digital Empowerment and Energy Literacy; WP7 Living Labs, SSH Intertwining, Replicability and Business Innovation; WP8 Dissemination, Exploitation and Communication Activities; WP9 Project Management and Coordination

Responsabile:	VALENTI MARIA	**Unità:**	TERIN-SSI-SGRE
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D3 Energy supply
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-07-2024	**Data Fine:**	31-12-2027
Doc. approvazione:	77/2024/TERIN	**Codice atto:**	PK7AAL
Contributo Totale:	€ 3.999.992	**Costo eleggibile:**	€ 4.541.818
Contributo ENEA:	**€ 165.625**	**Costo ENEA:**	**€ 165.625**

EuPRAXIA Preparatory Phase Project

Coordinatore: INFN - ISTITUTO NAZIONALE DI FISICA NUCLEARE (Italia) N. Partner:

Abstract:

EuPRAXIA is a distributed, compact and innovative accelerator facility based on plasma technology. It has been selected for the 2021 Update of the ESFRI Roadmap. In its first phase, its consortium of 51 institutes and industry partners will construct an electron-beamdriven plasma accelerator in the metropolitan area of Rome, thus bringing innovation, potential for spin-off companies, state-of-the art scientific applications and a vibrant international user community to the middle of Italy. In its second phase, EuPRAXIA will build one laser-driven plasma accelerator at a site to be chosen between several options in Europe. EuPRAXIA will serve users in ultra-fast science, e.g. on high-resolution medical imaging, deeply penetrating positron annihilation spectroscopy for materials and with Europe's most southern free-electron laser (FEL). It will offer fascinating capabilities for research on biomolecules, viruses and microscopic processes. EuPRAXIA will thus be a transformative step in the development of ultra-compact accelerators and applications. The Preparatory Phase project EuPRAXIA-PP will prepare its full implementation.

Attività ENEA:

L'ENEA partecipa al Work Package 9 – RF, Magnets and Beamline Components, del quale è il Co-Leader.

Responsabile:	NGUYEN FEDERICO	**Unità:**	FSN-FUSPHY-TSM
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Research Infrastructures (2021-2027)
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-11-2022	**Data Fine:**	31-10-2026
Doc. approvazione:	114/2022/FSN	**Codice atto:**	PF2AAK
Contributo Totale:	€ 2.490.000	**Costo eleggibile:**	€ 2.490.000
Contributo ENEA:	**€ 30.000**	**Costo ENEA:**	**€ 30.000**

EURAD-2

EUROPEAN PARTNERSHIP ON RADIOACTIVE WASTE MANAGEMENT-2 (fase 2 a seguito di EURAD-1 2019-2024 sulla base dell

Coordinatore: ANDRA - AGENCE NATIONALE POUR LA GESTION DES DECHETS RADIOACTIFS (Francia) N. Partner: 141

Abstract:

Our Vision With the European Joint Programme on Radioactive Waste Management EURAD(-1) a step change in European collaboration was envisaged towards safe radioactive waste management (RWM), covering all phases including predisposal and disposal, through the development of a robust and sustained science, technology and knowledge management programme that supports timely implementation of RWM activities and serves to foster mutual understanding and trust between Joint Programme participants. EURAD-2 builds upon EURAD-1 and PREDIS to further implement a joint strategic programme of research, development and knowledge management activities at the European level, bringing together and complementing EU Member States programmes in order to ensure cutting edge knowledge creation and preservation in view of delivering safe, responsible and publicly acceptable solutions for the management of radioactive waste throughout all programme phases (from “cradle to grave”) across Europe now and in the future. EURAD-2 will support the implementation of the Waste Directive in EU Member States, taking into account the various stages of advancement of national programmes, the differences in capabilities and inventories. The main goals are to: - Support Member States in developing and implementing their national RD&D programmes for the safe long-term management of their full range of different types of radioactive waste through participation in the RWM Joint Programme; - Develop and consolidate existing knowledge for the safe start of operation of the first geological disposal facilities for spent fuel, high-level waste, and other long-lived radioactive waste, and supporting optimization linked with the stepwise implementation of geological disposal facilities; - Building on the achievements of EURAD-1 and PREDIS, maintain a knowledge management system that enhances transfer of knowledge between organisations, Member States and generations

Attività ENEA:

L’ENEA parteciperà, in qualità di beneficiario, ai seguenti Work Package: WP5 - ICARUS - Innovative characterisation techniques for large volumes; WP7 L'OPERA - Long-term performance of waste matrices, WP11 - CLIMATE - Impact of climate change on nuclear waste management

Responsabile:	LEVIZZARI RICCARDO	**Unità:**	NUC-IRAD
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Euratom
		Tipo Progetto:	Programme Cofund Actions
Data Inizio:	01-10-2024	**Data Fine:**	30-09-2029
Doc. approvazione:	132 (2024) NUC	**Codice atto:**	PF1AAN
Contributo Totale:	€ 20.000.000	**Costo eleggibile:**	€ 34.380.393
Contributo ENEA:	**€ 101.498**	**Costo ENEA:**	**€ 169.163**

Highly efficient delamination technologies to recover and reuse metals, glass, polymers from end-of-life photovoltaic panels

Coordinatore: CEA - COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES (Francia)

N. Partner:

Abstract:

EVERPV's objective is to provide EU with efficient solutions for a sustainable treatment of end-of-life PV panels and recovery of high purity and high integrity materials. Based on the grinding of PV panels waste from the backside and/or the use of IR lamps heating, EVERPV will demonstrate two innovative technologies to delaminate the different layers of the PV panel. Combined with recycling processes, it will enable to recover glass with less than 1% impurities, encapsulant and backsheet polymers with a purity over 99%, and silver with a purity of 99%. Besides, the project will cluster with other EU-funded consortia already addressing the recycling of silicon (e.g. PHOTORAMA) to provide with a global solution. The new delamination technologies will be respectively demonstrated at ENVIE recycling plant and at 9TECH to reach TRL7. The technology demonstrated during EVERPV project targets to process more than 3000 tons of solar panels per year, thus recovering enough raw materials recovered to produce more than 350 000 new panels per year by 2030. EVERPV will finally demonstrate the potential for reusability of recovered materials in several industrial value chains in particular in the PV industry. The project will lead a strategic analysis on the potential of new EoL panels circular value chains based on estimated PV waste generation together with environmental and societal impact assessments. EVERPV has gathered a consortium of 16 participants from 8 countries whose expertise ranges from solar PV materials and recycling processes (CEA, CSEM, ENEA, TEC), recyclers (ENVIE, 9TECH), process industries and materials suppliers (SGB, DTF, DPL, JBR), PV modules manufacturing (VAL), collecting and waste treatment organizations (SOREN, ERION), policy-making, business and training facilitators (SPE, UNITAR, BI).

Attività ENEA:

L'ENEA partecipa come Partner per attività sperimentali e di studi. In particolare: attività sperimentali su impianto prototipale in Casaccia per ottimizzare il processo di recupero di materie dai rifiuti composti da pannelli fotovoltaici a fine vita e basato su brevetto ENEA-BetaTech; sviluppo in laboratorio di processi di recupero dell'argento contenuto nelle matrici recuperate con il processo sopra descritto; valutazione impatto ambientale, mediante LCA/LCC, dei processi di trattamento e recupero oggetto del progetto

Responsabile:	TAMMARO MARCO	**Unità:**	SSPT-USER-T4RM
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D3 Energy supply
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-09-2023	**Data Fine:**	31-08-2026
Doc. approvazione:	199/2023/SSPT-USER	**Codice atto:**	PS6AEC
Contributo Totale:	€ 5.367.184	**Costo eleggibile:**	€ 5.367.184
Contributo ENEA:	**€ 634.263**	**Costo ENEA:**	**€ 634.263**

FHERITALE

Food, Health and Environment Research Infrastructures to Tackle Emerging Priorities

Coordinatore: CIRMMP - CONSORZIO INTERUNIVERSITARIO RISONANZE MAGNETICHE DI METALLO PROTEINE (Italia)

N. Partner:

Abstract:

This proposal systematically addresses the development, provision, and integration of services, across the European Research Infrastructures (RIs) landscape, that the scientific community can use to investigate the effects on health and the environment that artificial materials (including plastics, micro-, nano-, and biotechnological materials) can have. Exposure to such materials may occur as a result of their intended use (e.g., food packaging) or at the end of their lifecycle (e.g. plastic wear). These services, which are relevant to several areas of important societal and economic impact, are expected to span multiple scales and disciplines, including highquality metrology, structural biology, microbiology, and ecotoxicology. The main output of this proposal will be a thorough overview of extant service offer by European RIs with respect to questions from state-of-the-art of scientific research in the aforementioned domains. FHERITALE will identify common strategies for the coordination and optimization of services at different RIs geared towards increasing the accessibility of relevant technologies. In parallel, it will identifty those service and technology gaps that are hampering high-impact research and preventing a timely assessment of the repercussions of new materials on health and the environment. These gaps constitute high-priority areas for future development. FHERITALE will design a coordination framework for the RIs to drive these key technological developments. The technological focus of this application includes emerging areas of research for which international interest is rapidly growing. The interdisciplinary nature of the cluster of identified technologies will connect health, food, and environment research, constituting one of the first examples of practical application of the “One Health” approach. This coordination effort will also serve as a fertile ground for further interdisciplinary research among RIs from the H&F and other domains.

Attività ENEA:

Il progetto si inserisce nelle azioni condotte da ENEA per la realizzazione ed il coordinamento dell’Infrastruttura di Ricerca METROFOOD-RI, fa seguito ai progetti PRO-METROFOOD e METROFOOD-PP si integra con il progetto Horizon Europe METROFOOD-EPI. ENEA è leader del WP5 Thematic landscape and gap analysis e partecipa ai seguenti WP: WP1 - Project management, dissemination and outreach RP1 WP2 - Project management, dissemination and outreach RP2 WP6 - Enabling selected priorities (ENEA task leader Task 6.1: Gap analysis) WP7 - Strategies for technology development WP8 - Long term engagement and coordinated actions

Responsabile:	ZOANI CLAUDIA	**Unità:**	SSPT-BIOAG
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Research Infrastructures (2021-2027)
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-01-2024	**Data Fine:**	31-12-2026
Doc. approvazione:	213/2023/SSPT-BIOAG	**Codice atto:**	PS1ADR
Contributo Totale:	€ 2.002.190	**Costo eleggibile:**	€ 2.002.190
Contributo ENEA:	**€ 173.309**	**Costo ENEA:**	**€ 173.309**

N. Contratto: IPA ADRION 166

FISHIMPACT

Promoting ESG principles and healthy nutritional habits to increase competitiveness, market diversification and effective communication for consumers in Adriatic-Ionian aquaculture and fishery sectors

Coordinatore: UNIV. SPLIT (Croazia) N. Partner:

Abstract:

Aquaculture & capture fisheries are the source of healthy and nutritional products for human consumption, rich in proteins, essential omega-3 fatty acids and bioavailable micronutrients, as well as employment and economic benefits for all stakeholders involved. The Adriatic-Ionian region contributes around 3.4% of Europe's total fish and shellfish production with around 600 thousand tonnes produced in 2022, of which 52.8% was attributed by aquaculture sector. However, planning for sustainable future involves many environmental, social and governance (ESG) challenges. In the Adriatic-Ionian aquatic sectors there is a general lack of tools and methodologies to properly evaluate and communicate health, environment and social good practices and impacts to consumers. As aquatic resources in the region are shared across the Adriatic and Ionian seas, cooperation among states is an essential requirement to develop efficient management strategies. FISHIMPACT will promote actions supporting the development and modernization of micro, small and medium-sized enterprises in the fish industry through the introduction of quality and sustainable requirements. The project will collect information on available labels and certification systems concerning environmental, social and health performances of aquaculture products, develop key performance indicators (KPIs) regarding ESG standards and nutritional values, and incorporate all these in a self-evaluation online multi-lingual tool. Training schemes for the industry and wide-range dissemination activities will also be provided. The main outputs are in accordance with the EU Strategy for the Adriatic and Ionian Region and European Green Deal, and include: Transnational pilot action to test FISHIMPACT toolkit dedicated to improve fishery and aquaculture SMEs' competitiveness; Guidelines for SMEs to facilitate the introduction of nutritional and sustainability requirements in fishery and aquaculture sectors; Memorandum of Understanding on international cooperation in the Adriatic-Ionian regions to ensure long-term sustainability to FISHIMPACT outcomes. FISHIMPACT will increase general awareness on the importance of ESG smart businesses and instigate a change in consumers preferences towards more sustainable, healthy and nutritional choices. The policy recommendations paper prepared within the project will serve as a guideline tool in ESG oriented decision-making and planning for sustainable blue economy in the Adriatic-Ionian region.

Attività ENEA:

L'ENEA collabora a tutti i Work Package e le attività del progetto ed è leader dell'Activity 1.1 – State of art on the available labels/certification systems on the national, EU and IPA markets concerning ESGperformances of fisheries and aquaculture sector (WP1), dell'Activity 2.1 – Development of a Sustainability self-evaluation tool to improve fishery and aquaculture SMEs competitiveness leveraging ESGprinciples (WP2) e dell'Activity 2.3 – Development and creation of Sustainability Good Practices searchable tool

Responsabile:	CORTESI SARA	**Unità:**	SSPT-EC-SSC
Anno Stipula:	2024		
PQ:	Other programmes (2021-2027)	**Programma UE:**	Interreg IPA ADRION
		Tipo Progetto:	N/A - Non applicabile
Data Inizio:	01-09-2024	**Data Fine:**	31-08-2027
Doc. approvazione:	256/2024/SSPT/EC	**Codice atto:**	PS6AEZ
Contributo Totale:	€ 1.486.089	**Costo eleggibile:**	€ 1.748.340
Contributo ENEA:	**€ 249.507**	**Costo ENEA:**	**€ 249.507**

FLASH-DOSE

Traceable dosimetry for FLASH radiotherapy

Coordinatore: VSL B.V. DUTCH METROLOGY INSTITUTE (Paesi Bassi) N. Partner:

Abstract:

FLASH radiotherapy performed with ultra high dose rates (UHDR) or ultra high dose per pulse (UHDPP) beams has the potential to significantly reduce the side effects experienced by cancer patients, and to improve their quality of life. At present, new UHDPP electron and UHDR proton beam facilities are being installed or being upgraded to prepare for clinical FLASH radiotherapy. However, future widespread clinical introduction of FLASH radiotherapy requires reliable methods for traceable dosimetry under reference conditions (reference dosimetry). Further to this, development of Codes of Practice (CoP) for reference dosimetry in FLASH radiotherapy facilities is hampered by the lack of suited primary standards, characterised secondary standards, and solid methodology. This project will address these issues by developing traceable dosimetry, including upgraded primary and characterised secondary standards, to support the development of reference dosimetry CoPs required by UHDPP electron and UHDR proton beam facilities.

Attività ENEA:

ENEA parteciperà al progetto con l'obiettivo di: - determinare i fattori di correzione dei campioni secondari, per fasci clinici di protoni UHDR e fasci di elettroni UHDPP, mediante lo sviluppo di modelli di simulazione dedicati; - sviluppare una metodologia di dosimetria di riferimento per fasci elettronici UHDPP che trasferisca la riferibilità dai campioni primari a quelli secondari; - svolgere attività di disseminazione della tecnologia e della metodologia di misura sviluppate nel progetto;

Responsabile:	CICCOTELLI ALESSIA	**Unità:**	NUC-INMRI
Anno Stipula:	2025		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	European Partnership for Metrology
		Tipo Progetto:	JRP - Joint research project
Data Inizio:	01-06-2025	**Data Fine:**	31-05-2028
Doc. approvazione:	086/2025/NUC del 26-05-2025	**Codice atto:**	PF5AAP
Contributo Totale:	€ 1.299.904	**Costo eleggibile:**	€ 1.299.904
Contributo ENEA:	**€ 46.235**	**Costo ENEA:**	**€ 46.235**

ForestNavigator

Navigating European Forests and forest bioeconomy sustainably to EU climate neutrality

Coordinatore: IIASA - INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS (Austria)

N. Partner:

Abstract:

ForestNavigator aims at assessing the climate mitigation potential of European forests and forest-based sectors through modelling of policy pathways, consistent with the best standards of LULUCF reporting, and informing the public authorities on the most suitable approach to forest policy and bioeconomy. With a primarily European scope, ForestNavigator zooms into carefully selected EU Member States to enhance the consistency of the EU and national pathways, but the project also zooms out towards the global scale, and selected key EU trading partners, accounting for extra-EU future drivers and potential leakage effects. The project will rely on a newly developed integrated policy modelling framework for the EU forests and forest bioeconomy covering i) all relevant mitigation strategies from forest management to energy and material substitution, ii) climate change impacts, adaptation, and natural disturbances, iii) biophysical climate feedbacks, iv) systematically accounting for impacts on biodiversity, forest ecosystem services, and other forest functions, incl. jobs and green growth. To increase the accessibility of the models and pathways assessments, their understanding and transparency, a novel decision-making platform will be established consisting of the web-based ForestNavigator Portal, and a community of policymakers, national authorities, and modelers, the Forest Policy Modelling Forum. To reach its ambitious objectives, ForestNavigator will i) harmonize, integrate and continuously update existing datasets by, including national inventories with new remote sensing data and models ii) start from complex forest and climate models and through emulators build them into operational policy modelling tools, iii) integrate biophysical and socio-economic information, iv) consider EU forests and forest bioeconomy in the broader context of other land use and economic sectors, v) rely on input from policy makers and other stakeholders.

Attività ENEA:

Le attività ENEA prevedono il reperimento, la produzione e l'analisi di dati utili a: i) raccogliere le valutazioni di diversi portatori di interesse verso diverse combinazioni di gestione forestale; ii)valutare i trade-off tra diversi servizi ecosistemici forestali iii) produrre una metanalisi sul servizio ecosistemico culturale/ricreativo delle foreste. ENEA supporterà inoltre le attività di coinvolgimento di differenti categorie di stakeholder all'interno del progetto e la disseminazione dei risultati.

Responsabile:	MICHETTI MELANIA	**Unità:**	SSPT-MET
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D1 Climate Sciences
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-10-2022	**Data Fine:**	30-09-2026
Doc. approvazione:	93/2022/SSPT-MET	**Codice atto:**	PS2ACI
Contributo Totale:	€ 5.995.241	**Costo eleggibile:**	€ 5.995.241
Contributo ENEA:	**€ 212.653**	**Costo ENEA:**	**€ 212.653**

FREDMANS

Fuel Recycle and Experimentally Demonstrated Manufacturing of Advanced Nuclear Solutions for Safety

Coordinatore: UNIV. TECHNOLOGY CHALMERS (Svezia) N. Partner:

Abstract:

FREDMANS aims to increase safety and efficiency in both nuclear power production as well as the recycling of spent fuel. Changing from oxide fuel to a more fissile dense material with higher thermal conductivity can enhance both safety of operation and the economicimpact of nuclear power. At the same time, a transition to a greener society with respect to both the generation and usage of electricity will drastically increase consumption of finite materials. Generation is predicted to increase by 16?20 times, in particular as electrification replaces the direct use of fossil fuels for heating and transportation. The nuclear industry can mitigate their part of the resource use through the recycling of spent nuclear fuel. This can enhance the actual power output by about 20 times. However, today there has been no full industrial demonstration of the complete recycling of nuclear fuel, although one time recycling, including of plutonium, has been used on large scale for many years e.g. in France. The model fuel is nitride fuel. It may be more energy efficient/economically advantageous to recycle not only the fissile material, but also the required isotopically enriched N-15 that is otherwise currently a costly raw material. The project sets objectives that address the overall goals of the SET plan, SNETP and EERA JPNM SRA to answer the specific aims of this call relating to the safety of advanced fuels and their recyclability, in particular nitrides highlighted in the call. We will prove that advanced fuels are a viable option for industrial use that can enhance the safety, sustainability and economics of nuclear power operation. The work packages are: Advanced Manufacturing, Recyclability, Waste Management, and Industrial Applications. Across all these WPs, the crucial aspect of safety is held in high focus. As the real safety of future nuclear systems is achieved through well educated people, an extensive Training & Education work package is included.

Attività ENEA:

ENEA è coinvolta nei seguenti work package (WP): - WP4 dedicato al progetto concettuale dell'impianto di fabbricazione e riprocessamento di combustibile nitruro Task 4.2: Design concettuale della fabbrica di UN e relativo impianto di arricchimento di N-15. Il risultato sarà il layout preliminare dell'impianto, la definizione dei flussi di materiale e la descrizione concettuale dei principali componenti.

Responsabile:	LODI FRANCESCO	**Unità:**	FSN-SICNUC-PSSN
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-09-2022	**Data Fine:**	31-08-2026
Doc. approvazione:	080/2022/FSN	**Codice atto:**	PF6AAV
Contributo Totale:	€ 2.503.797	**Costo eleggibile:**	€ 2.904.416
Contributo ENEA:	**€ 22.000**	**Costo ENEA:**	**€ 24.375**

Marie Skłodowska-Curie Actions
Staff Exchanges

FRUITPRINT

Design of novel post-harvest technologies with low carbon footprint based on the discovery of active biomolecules

Coordinatore: INPT - INSTITUT POLYTECHNIQUE DE TOULOUSE (Francia) N. Partner:

Abstract:

A main challenge for human societies is to feed the ever-increasing world population while limiting the carbon footprint inherent in food production activities. These seemingly opposing challenges must be reconciled. Securing sufficient amount of food requires to master the post-harvest storage of fruit and vegetables, the main source of nutrient for human, especially if we aim to reduce meet consumption due to its high carbon footprint. Controlled atmosphere is the main technology used to extend shelf-life of fresh products. It is mainly based on low temperature and low oxygen that reduce metabolic activity of fruit and vegetables, but it is energy consuming with high carbon footprint impact. On the other hand, 1-MCP, a chemical that prevents plants from sensing the plant hormone Ethylene, is also widely used in post-harvest storage to block ripening and senescence. It has a non-discriminating effects on different ripening processes leading to some alteration of organoleptic traits. FRUITPRINT project aims to identify novel bioactive molecules to improve storage and limit post-harvest losses while reducing energy consumption. The project consists of 3 main steps: (1) identification of novel bioactive molecules inhibiting ripening and senescence by in silico and in vitro screens of large libraries of chemical compounds, (2) evaluation of the effectiveness of the selected bioactive molecules in post-harvest storage, and (3) uncovering the molecular underpinnings of their beneficial effects on fruit and vegetables physiology. FRUITPRINT project rely on multidisciplinary approaches and complementary expertise from partners on virtual screening, oxygen sensing, fruit physiology and post-harvest storage. It will build on original and innovative material such as high-throughput screening platform, Bioluminescent plants and protein biosensors allowing in vivo screening, and facilities for post-harvest storage.

Attività ENEA:

L'ENEA è leader del WP4 "Mode of action of identified bioactive molecule" che studierà il meccanismo di azione delle nuove molecole di interesse. Inoltre partecipa al WP2 "Identification of bioactive molecule", con attività di pathway discovery per selezionare le nuove molecole di interesse, e al WP3 "Screening of bioactive molecule far post-harvest storage".

Responsabile:	DIRETTO GIANFRANCO	**Unità:**	SSPT-BIOTEC-GREEN
Anno Stipula:	2025		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	MSCA Marie Skl. Curie Actions
		Tipo Progetto:	HORIZON TMA MSCA Staff Exchanges
Data Inizio:	01-01-2025	**Data Fine:**	31-12-2028
Doc. approvazione:	348/2024/DIRGEN	**Codice atto:**	PS5ABM
Contributo Totale:	€ 1.393.800	**Costo eleggibile:**	€ 1.393.800
Contributo ENEA:	**€ 230.000**	**Costo ENEA:**	**€ 230.000**

FuelSOME

FuelSOME

Multifuel SOFC system with Maritime Energy vectors

Coordinatore: AVL LIST GMBH (Austria) N. Partner:

Abstract:

Shipping is responsible for the emission of about 1 billion tons of carbon dioxide (CO2) and about 2.5% of global greenhouse gas (GHG) emissions worldwide. The drastic reduction of GHG emissions from ships has been set as one of the urgent targets to achieve the EU Green deal objectives. As a result, the maritime industry, which is a hard-to-decarbonize sector, is actively seeking for alternate solutions/technology which can make it more climate friendly but at the same time does not compromise on the current performance levels. Leveraging novel concepts as well as assets from former projects and initiatives, the project FuelSOME focuses on establishing the technological feasibility of a flexible, scalable, and multi-fuel capable energy generation system based on Solid Oxide Fuel Cells (SOFC) technology specially catered for long-distance maritime shipping. This system will be able to operate on Ammonia, Methanol and Hydrogen and their mixtures for which short and long-term sustainable supply pathways will be explored. Finally, on a broader level, an in-depth and detailed investigation on the environmental, social, and economic benefits of developing such a system for the European industry, the maritime sector and the citizens will be carried out. The future roadmap of the project is that the outcomes generated will not only benefit the maritime industry but can also serve as a blueprint/launchpad for implementing the same technology in other hard to abate emission sectors and/or, thereby enabling multi-fuel energy generators to become the norm in the future. The consortium comprises 8 partners: 7 partners from 6 European Member States and 1 partner from a non-associated third country (Switzerland). The FuelSOME consortium unites the necessary multidisciplinary knowledge, expertise, skills, and resources to constitute a representative value chain of actors, which together can achieve the project's ambitious objectives.

Attività ENEA:

ENEA svolgerà il ruolo di terza parte di ATENA e sarà coinvolta nei seguenti WP come supporto ad ATENA; in particolare le attività di competenza ENEA si possono riassumere e sintetizzare nei seguenti punti: • WP4-Task 4.1: System definition and overarching impact assessment framework for TEA and LCSA; • WP4-Task 4.2: Techno-economic analysis; • WP4-Task 4.3: Prospective Life Cycle Sustainability Assessment (LCSA) focusing on environmental, social and economic impacts, including biodiversity); • WP5-Dissemination, Communication and Exploitation.

Responsabile:	CIGOLOTTI VIVIANA	**Unità:**	TERIN-PSU-ABI
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D2 Cross-cutting solutions
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-09-2022	**Data Fine:**	31-08-2026
Doc. approvazione:	156/TERIN/	**Codice atto:**	PK4AAR
Contributo Totale:	€ 2.499.986	**Costo eleggibile:**	€ 2.687.486
Contributo ENEA:	**€ 25.000**	**Costo ENEA:**	**€ 25.000**

gEneSys

Transforming Gendered Interrelations of Power and Inequalities for Just Energy Systems

Coordinatore: CNR - CONSIGLIO NAZIONALE DELLE RICERCHE (Italia) N. Partner:

Abstract:

gEneSys advances understanding of gender & social inequalities in energy transition policies, processes & outcomes through new research & by closing knowledge gaps. The Group of the Chief Scientific Advisers to the EU recommend that “the transition to carbon-neutrality must be just and fair”. Just Transition Mechanism states that “in order to be successful and socially acceptable for all, the transition has to be fair and inclusive” & all possible mechanisms should be deployed to mitigate adverse consequences. The European Green Deal takes a narrow focus on mitigation: mostly male workers in the old fossil fuel sectors. EGD includes the goal of “Supplying clean, affordable and secure energy”, which parallels SDG7 to “ensure access to affordable, reliable, sustainable, and modern energy for all”. Like EGD, SDG7 is gender blind: it has no gender indicators or targets, even though “access” & “affordable” are concepts that hide multitude of power and gender inequality relations. gEneSys cooperate with partners in Africa to tackle the gender concerns in the EU’s and UN’s aims to transform energy & will show how to integrate gender perspectives into SDG7 for gender equality benefits. gEneSys will improve understanding of “intersectionality” through analysis of existing data and by collecting, analysing, and theorising original data collected through extensive surveys. gEneSys conceptualises energy transition as a dynamic, gendered, mission-oriented sociotechnical innovation ecosystem with technological, policy, social, environmental, governance, & economic subsystems, each with its own sustainability visions, values, and priorities, as well as change actors and stakeholder. The dynamic nature of energy transition ecosystem opens-up opportunities to give women & men the same chances to participate influence, & benefit from the changes.

Attività ENEA:

L’ENEA è coinvolta in qualità di leader nel WP1 (Gendered analysis of knowledge creation landscape for energy transition) e nei seguenti workpackage: . WP2 (Exploring gendered intersectional patterns in citizen's behaviours and orientations towards energy transition) . WP3 (Development of Concrete Solutions to Advance Women in Energy Transition) . WP4 (International cooperation between Europe and Africa) . WP5 (Development of credible pathways for equitable, just, and fair energy transitions) . WP6 (Dissemination and Impact) . WP7 (Management and Coordination)

Responsabile:	DE NICOLA ANTONIO	**Unità:**	TERIN-SEN-APIC
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 2 - Culture, creativity and inclusive society
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-02-2023	**Data Fine:**	31-01-2026
Doc. approvazione:	234/2022/TERIN	**Codice atto:**	PK5AAM
Contributo Totale:	€ 2.656.489	**Costo eleggibile:**	€ 2.656.489
Contributo ENEA:	**€ 425.000**	**Costo ENEA:**	**€ 425.000**

GO4FUSION

STRATEGIC ALLIANCE FOR BUILDING EUROPEAN FUSION ENERGY PARTNERSHIP

Coordinatore: ENEA (Italia) N. Partner:

Abstract:

The GO4FUSION project will lay the groundwork for a strong, collaborative European fusion energy community, preparing for the future establishment of a Public-Private Partnership (PPP). This PPP will facilitate funding for industrial and R&D activities. Key objectives include consolidating the European Fusion Stakeholder Network (EFSN), creating an industry-led association representing European fusion industries and research organizations, and developing a Strategic Research and Innovation Agenda (SRIA) to shape short, medium and long-term R&D in fusion. Additionally, GO4FUSION will explore the creation of a trade association to support the growth of the European fusion industry through advocacy, networking, and education. The project will also address intellectual property management and technology transfer, ensuring European innovations in the fusion sector are protected and effectively exploited. The future PPP must ensure the successful takeoff of fusion technology and support the accelerated advancement of research and innovation in this sector. This project will help enhance the visibility of fusion technology in Europe, targeting policymakers, citizens, industry, and researchers. The consortium will include major actors from the current fusion community, led by ENEA, the Italian agency for New Technologies, Energy and Sustainable Economic Development innovation. Major research institutes from France, Germany, Italy, and Spain will complement the consortium, alongside key industrial players. This consortium is well-suited to building the fusion community in Europe and possesses the necessary knowledge and network to engage the entire fusion value chain, driving the establishment of the future partnership and fostering Europe's strategic autonomy and competitiveness for the future commercial deployment of fusion energy.

Attività ENEA:

ENEA è WP Leader del WP1 - Management, communication and dissemination e parteciperà alle attività dei seguenti Work Package: • WP2 - Fusion community building • WP3 - Strategic Research and Innovation Agenda • WP4 - Industry-led association definition • WP5 - Governance, legal, and financial arrangements for PPP • WP6 - Launch of the PPP and its sustainability

Responsabile:	DI BASTIANO ALESSANDRA	**Unità:**	NUC-STS
Anno Stipula:	2025		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Euratom
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	15-01-2025	**Data Fine:**	14-01-2027
Doc. approvazione:	226 (2024) NUC	**Codice atto:**	PF0AAU
Contributo Totale:	€ 1.500.000	**Costo eleggibile:**	€ 1.500.000
Contributo ENEA:	**€ 171.938**	**Costo ENEA:**	**€ 171.938**

GUARDIANS

inteGrated Users-driven risks Assessment platfoRm for DecIsion mAkers in Nuclear crisis

Coordinatore: CEA - COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES (Francia)

N. Partner:

Abstract:

Increasing concerns about new threats related to a possible major accident on a nuclear power plant or a tactical nuclear explosion, linked with the war in Ukraine, impose to EU Countries to improve their current capabilities to prepare for and respond to these possible largescale accidents. The need for advanced technologies, interoperable risk assessment tools, and comprehensive emergency coordination strategies has never been more critical. GUARDIANS will deliver advanced, cost-effective technologies, and strategies to improve disaster emergency management in Europe. The project will enable the development of advanced radiological technologies (radioactive gas sensor, active dosimeter network), innovative and scalable strategies for triage (video analyses, digital triage), decontamination, and medical countermeasures (hydrogel, new strategy for stable iodine distribution). Autonomous means such as drones and robots equipped for radiological measurements and enhanced observation capabilities will increase overall responsiveness. A central web-platform GUARDNET, built upon existing operational tools, will facilitate real-time information processing, synthesis, mission management, and simulation services, to support decision-making. The active participation of first responders/receivers and decision-makers, along with the execution of two field tests and the assessment of the alignment between population needs and authorities' response strategies will ensure that GUARDIANS produces a new and enhanced operational capability to respond effectively to a radiological or nuclear emergency. GUARDIANS will significantly enhance European Member States' ability by providing stakeholders with state-of-the-art capabilities, innovative technologies, and effective coordination strategies. This will accelerate the decision-making process, reduce intervention times, and mitigate human and environmental impacts through improved protection of populations and infrastructures.

Attività ENEA:

- WP1 Expression of specific needs, resources, strategies to effectively respond to a large-scale emergency - 4PM - WP2 Innovative technologies and advanced radiation sensors for emergencies -5PM - WP3 Development and Integration of Ground and Aerial Robotics - 5PM - WP4 Tools and Methods for Risk Assessment and Crisis Management - 5PM - WP5 Triage/Recommendations for population decontamination/Medical countermeasure - 7PM - WP6 Validation of project solutions with Field Tests - 6PM - WP7 Communication, dissemination and exploitation of GUARDIANS results - 3PM ENEA coordinerà le azioni del WP5. Inoltre, nell'ambito del WP4 è previsto l'ulteriore sviluppo dell'applicativo BEAMS, per la gestione digitale del triage in situazione emergenziale.

Responsabile:	ANGELINI FEDERICO	**Unità:**	NUC-TECFIS-DIM
Anno Stipula:	2025		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 3 - Civil security for society
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-10-2025	**Data Fine:**	30-09-2029
Doc. approvazione:	125 (2025) NUC	**Codice atto:**	PF7ACD
Contributo Totale:	€ 5.997.174	**Costo eleggibile:**	€ 5.997.174
Contributo ENEA:	**€ 346.871**	**Costo ENEA:**	**€ 346.871**

GuideRadPROS

Harmonisation, update and implementation of standards related to radiation protection dosimeters for photon radiation

Coordinatore: STUK RADIATION AND NUCLEAR SAFETY AUTHORITY (Finlandia) N. Partner:

Abstract:

The recent update of the basic standard for photon reference radiation fields, ISO 4037, presented huge challenges to calibration laboratories and industry in the field of radiation protection. To avoid a failure to implement ISO 4037, collaborative research is needed to solve several serious issues that became apparent during initial implementation. ISO 4037, in conjunction with the new quantities proposed in ICRU Report 95, provides the basis for type testing standards that must be harmonized early to ensure timely development of new dosimeters. This research, which is beyond the capabilities of a single NMI or country, will additionally provide metrology networks, IAEA, and policymakers with the necessary scientific data to guide a possible implementation in metrology institutes and industry.

Attività ENEA:

L'ENEA partecipa attivamente al WP 1 'Validation of requirements and methods related to reference fields according to ISO 4037 and guide for spectrometry' e al WP 2 'Training on requirements of ISO 4037 and calibration in reference fields'.

Responsabile:	PINTO MASSIMO	**Unità:**	FSN-INMRI
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	EPM - European Partnership on Metrology
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-06-2023	**Data Fine:**	31-05-2026
Doc. approvazione:	115/2023/FSN	**Codice atto:**	PF5AAL
Contributo Totale:	€ 973.834	**Costo eleggibile:**	€ 973.834
Contributo ENEA:	**€ 41.250**	**Costo ENEA:**	**€ 41.250**

H2Excellence: Fuel Cells and Green Hydrogen Centers of Vocational Excellence towards affordable, secure, and sustainable energy for Europe

Coordinatore: UNIV. OF APPLIED SCIENCES VAASA (VAMK) (Finlandia) N. Partner:

Abstract:

2Excellence aims to establish a platform of centres of vocational excellence (CoVEs) in the field of fuel cells and green hydrogen technologies that will forge a collaborative educational, training and development program designed to close the existing industry skills gaps. The CoVEs will bring together all key stakeholders such as universities, VET schools, industrial partners, and governmental bodies, forming strong links at European, national, and regional level. It is envisaged that different local clusters will be set up across countries with strong potential in the industry (e.g., PT, ES, FR, FI, PL, and IT), with foreseen extension across Europe and a joint focus on different aspects of the hydrogen value chain, from production to applications and cross-cutting issues. H2Excellence will create world-class reference points for training in green hydrogen technologies for both initial training of young people, engineers as well as for up-skilling and res-killing of adults, through flexible and timely offer of training for the skills needs of companies in the green hydrogen sector. The VET clusters will undertake activities such as developing transnational, joint curricula, and lifelong trainings; interaction with universities to understand the current state-of-the-art technologies; exchange of VET teachers, students, and staff; partnerships between companies and professionals; regional ecosystems mapping and integration within the national/regional economic and innovation ecosystems. H2Excellence brings together 24 partners from 8 different Erasmus+ EU countries (+ 1 international partner). Fully in line with the EU Green Deal goals and energy transition targets, the project intends to create the infrastructure necessary to embed vocational excellence in the European hydrogen sector, as well as to contribute to transforming the sector towards quality employment and career-long opportunities.

Attività ENEA:

L'ENEA porterà avanti un'analisi approfondita dello stato dell'arte delle tecnologie delle celle a combustibile e dell'idrogeno, indicando le roadmap europee, nazionali e regionali al fine di valutare il livello di maturità di questo ecosistema, le rispettive tabelle di marcia e lo stato di attuazione dei progetti sull'idrogeno che potrebbero avere un impatto sul mercato del lavoro negli anni a venire (Task 2.1). Inoltre, sosterrà le azioni di mobilità previste dal progetto, con interesse ad ospitare e formare insegnanti e studenti sulle tecnologie per la produzione di Idrogeno verde sulla base delle iniziative e progetti di ricerca esistenti nei suoi laboratori (Task 3.7), e provvederà a supportare i partner per l'organizzazione di visite in loco dedicate a mostrare i progetti dimostrativi su larga scala (Hydrogen Demo Valley),(Task 5.4). Infine, contribuirà come pilastro scientifico alla H2Excellence European Hydrogen Academy (Task 4.6), e alla ricerca e formazione di aziende (PMI) su temi specifici dell'Idrogeno (Task 4.4).

Responsabile:	SANTONI FRANCESCA	**Unità:**	TERIN-PSU-ABI
Anno Stipula:	2023		
PQ:	Other programmes (2021-2027)	**Programma UE:**	Erasmus +
		Tipo Progetto:	ERASMUS-LS ERASMUS Lump Sum Grants
Data Inizio:	15-06-2023	**Data Fine:**	14-06-2027
Doc. approvazione:	140/2023/TERIN	**Codice atto:**	PK4AAY
Contributo Totale:	€ 3.996.343	**Costo eleggibile:**	€ 4.995.436
Contributo ENEA:	**€ 184.992**	**Costo ENEA:**	**€ 231.239**

HARMONISE

Harmonisation of licensing procedures, codes and standards for future fission and fusion plants

Coordinatore: LEI - LITHUANIAN ENERGY INSTITUTE (Lituania) N. Partner:

Abstract:

HARMONISE puts forward a holistic approach for studying the body of knowledge required to accomplish harmonization and standardization of methodologies, codes and standards as well as the assessment of nuclear reactor components. Departure from a prescriptive-based to a performance-based approach in nuclear regulatory regimes is to be examined under the prism of conformity with the safety objectives of innovative fission and fusion facilities. To this end, data related to fusion installations is expected to stem from the ITER safety demonstrations, whereas data pertinent to advanced fission designs – such as fast breeder reactors and SMRs – will be extracted from relevant EC-funded projects. The basis for HARMONISE activities will be the outcomes of relevant research and cooperation activities in standardization and nuclear safety considering also the lessons learnt from the stress tests performed in the EU. HARMONISE will examine issues related to qualification, standardization, V&V and licensing of fission and fusion installations, while taking into account stakeholder involvement. The benefits of adopting digital twins of nuclear installations during the design phase will be reviewed, while also identifying the cross-cutting activities that contribute to collaborative research efforts between fission and fusion. HARMONISE will address issues related to the preliminary safety assessments and licensing needs of innovative fission and fusion installations; risk-informed, performance-based approaches in licensing reviews and regulatory decision-making; harmonisation and standardisation on component assessments, methodologies, codes and standards and draw lessons from earlier experience in harmonisation efforts. HARMONISE findings will be disseminated to the nuclear safety regulators of EU MSs along with the State Nuclear Regulatory Inspectorate of Ukraine as material to be considered during safety verification and licensing of future fission and fusion installations.

Attività ENEA:

ENEA è coinvolta con ruolo di leader nel work package (WP2) dedicato all'individuazione delle necessità legate alla sicurezza di impianti innovativi e alle relative sfide di armonizzazione. È inoltre coinvolta con ruolo di supporto nei seguenti work package: • WP1 dedicato alla creazione di un network con tutti gli stakeholder i cui risultati del progetto possono essere di interesse; • WP3 dedicato allo sviluppo concettuale di un nuovo contesto di licensing basato su metriche di rischio e performance • WP4 dedicato alla individuazione dei gap presenti nelle attuali norme ingegneristiche (codes and standards) per applicazione a reattori innovativi • WP5 dedicato a disseminazione e comunicazione dei risultati per promuovere le attività del progetto

Responsabile:	LODI FRANCESCO	**Unità:**	FSN-SICNUC-PSSN
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-06-2022	**Data Fine:**	31-05-2025
Doc. approvazione:	072/2022/FSN	**Codice atto:**	PF6AAW
Contributo Totale:	€ 2.500.000	**Costo eleggibile:**	€ 2.843.500
Contributo ENEA:	**€ 177.750**	**Costo ENEA:**	**€ 197.500**

HARPERS

HARmonised PracticEs, Regulations and Standards in waste management and decommissioning

Coordinatore: SCK CEN - STUDIECENTRUM VOOR KERNENERGIE / CENTRE D'ETUDE DE L'ENERGIE NUCLEAIRE (Belgio)

N. Partner:

Abstract:

The project aims to establish and clarify the benefits and added value of more aligned and harmonised regulations and standards for prioritised topics related to decommissioning and initial phases of radioactive waste handling, including shared processing facilities between Member States (MS). The project has a two-phase approach: first engaging with Stakeholders to assess needs and pros/cons for harmonisation and identify priority areas for deeper analysis (WP2). The second phase will pursue deeper engagement with Stakeholders to further assess the highest ranked priority areas in Work Packages (WP) focusing on (i) cross border services and cooperation (WP3), (ii) circular economy (WP4), and (iii) advanced technologies (WP5). These WPs will review (inter)national practices, capture lessons learned, and assess opportunities. WP6 on Regulatory Framework will identify regulatory differences between MS and evaluate strengths, weaknesses, opportunities, and threats associated with harmonisation, while quantifying the benefits of aligned regulations and proposing harmonisation methodologies. The project will: - support coordination between Stakeholders, - enhance existing commitments to facilitate sharing and exchange of knowledge and experience, - develop strategies for shared treatment and storage facilities, cross border services and cooperation, and explore additional mechanisms to build capacity in MS, - assess and clarify the benefits and any disadvantages of harmonisation, - deliver S&T-based solutions and share best practices by engaging and supporting coordination between different actors through the TSOs and regulators, - define conditions and opportunities of a high safety circular economy. The action will reinforce the activities of the EURAD, PREDIS, and SHARE projects, while encompassing MS national programs and the wider European Community, including i.e. ERDO, ENSREG, WENRA, IAEA, OECD NEA, IGDTP, SNETP, DigiDecom.

Attività ENEA:

L'ENEA sarà leader del WP7 "Engagement and Dissemination", il cui scopo è coinvolgere la comunità nucleare e comunicare, diffondere e sfruttare i risultati generati nel progetto e identificare le parti interessate che trarrebbero maggior beneficio dalle attività del progetto. Inoltre, l'Agenzia sarà coinvolta nel WP1 "Project Management" e in 3 dei 5 Work Package tecnici: WP2 "Strategic Tasks", WP5 "Advanced Technologies" e WP6 "Regulatory Framework".

Responsabile:	GANDOLFO GIADA	**Unità:**	FSN-FISS-CRGR
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-06-2022	**Data Fine:**	31-05-2025
Doc. approvazione:	069/2022/FSN	**Codice atto:**	PF1AAK
Contributo Totale:	€ 2.434.460	**Costo eleggibile:**	€ 2.434.460
Contributo ENEA:	**€ 115.125**	**Costo ENEA:**	**€ 115.125**

Hydrogen Aircraft Sloshing Tank Advancement

Coordinatore: UNIV. POLITECNICA MADRID (Spagna) N. Partner:

Abstract:

Environmental concerns motivate a transition to liquid hydrogen aviation fuel in coming decades, and for this technology the size, placement and connections of the hydrogen tank on an aircraft are key decisions. The Hydrogen Aircraft Sloshing Tank Advancement project (HASTA) aims to experimentally and computationally investigate the storage of liquid hydrogen (LH2) for airborne use as fuel in civil aircraft applications. Size and position of a LH2 tank inside an aircraft are limiting factors for range, payload and aircraft size, and consequently play a crucial role in the environmental impact. The goal of facilitating tank design will be achieved through creation of design criteria for LH2 aircraft tanks; these design guidelines will be based on the different tools and models of derived during the project, in particular those aimed at complex cryogenic sloshing. The experimentally validated design tools developed during HASTA are to be used for both conceptual and detailed design in the aircraft industry, and therefore span a range of fidelities from reduced order models to full computational methods. The primary focus of this project will be the development of LH2 capabilities, and particularly the extension of mature capabilities already available for sloshing of standard civil aircraft fuel (kerosene) to the cryogenic temperatures associated with LH2. These capabilities are well reflected in the composition of the consortium, which includes partners with both experimental and modelling experience of fuel slosh, as well as cryogenics for space applications. The ultimate goal of the project is development of experimentally validated numerical and analytical simulation tools to model the complex thermo-fluid-dynamics of cryogenic LH2 coupled to the thermo–mechanical behavior of a tank and its operational environment.

Attività ENEA:

L'ENEA partecipa alle attività del WP3 Thermo-Fluid Dynamics (Task 3.2 – “Single phase thermal convection”) e WP5 Thermal-Fluid-Structure Coupling (Task 5.1 – “Algorithm design for TFI, FSI and TFSI”; Task 5.2 – “Implementation of coupled solutions"; Task 5.4 – “Verification and validation”).

Responsabile:	AGRESTA ANTONIO	**Unità:**	TERIN-DEC-H2V
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D6 Transport and Smart Mobility services
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-09-2024	**Data Fine:**	31-08-2027
Doc. approvazione:	Determinazione n. 163/2024/TERIN	**Codice atto:**	PK4ABD
Contributo Totale:	€ 3.294.824	**Costo eleggibile:**	€ 3.294.824
Contributo ENEA:	**€ 118.450**	**Costo ENEA:**	**€ 118.450**

HealthRiskADAPT

User-driven Health risk Assessment Services and Innovative ADAPTation options against Threats from Heatwaves, Air Pollution, Wildfire Emission and Pollen

Coordinatore: STIFTELSEN NILU - NORWEGIAN INSTITUTE FOR AIR RESEARCH (Norvegia)

N. Partner:

Abstract:

Transformative adaptation is gaining recognition as the appropriate response to climate change as the current adaptive measures reach their limits. In addressing health risks associated with heat waves, air pollution, wildfire emission and pollen, the implementation of comprehensive transformative adaptation remains largely unreported in Europe. healthRiskADAPT's objective is to develop and implement a health risk assessment system for Mediterranean, Alpine and Continental regions. Its contents and tools will be in line with Climate-ADAPT described Urban adaptation support tool. This will support empowerment of local and regional authorities to make informed decisions in strategic planning, management and daily operational mitigation of health challenges related to climate change. healthRiskADAPT will address the fundamental causes of vulnerability and implement concrete adaptation measures aiming to mitigate the health impacts of climate change. The key details of this approach include: 1) Co-creation with users of integrated transformative adaptation options encompassing technical, nature based, and social solutions, reducing the impact of climate-related risks on human health in both indoor and outdoor environments. 2) Vulnerability assessments, health indicators, and risk indices related to climate change impact on health, considering different temporal and spatial scales. 3) Interactive and user-friendly toolkit for local & regional authorities to assess hazards, vulnerability, and risks specific to their regions. These toolkits will facilitate the prioritization, planning, and evaluation of adaptation options. healthRiskADAPT will use various communication techniques to actively engage with all stakeholders involved in the adaptation process, and develop an upscaling strategy to meet the ambitions of the Climate mission. Furthermore, we seek to enhance the preparedness of the healthcare system to respond effectively to the challenges posed by the effects of climate change.

Attività ENEA:

ENEA (SSPT) è partner del progetto, che si articola in otto work packages (WPs). Nello specifico, ENEA parteciperà ai seguenti work package: WP1 (roadmap): definire scenari, misure, analizzare informazioni disponibili; WP2 (hazards): fornire indicatori legati ad ondate di calore, inquinamento atmosferico, incendi e pollini; WP3 (health and social vulnerability): valutazione indicatori sanitario e fattori di rischio; WP6 (full pilots, impact and scaling up): test delle soluzioni individuate e valutazione nelle città pilota; WP7 (dissemination, exploitation and communication): comunicazione e disseminazione dei dati.

Responsabile:	D'ELIA ILARIA	**Unità:**	SSPT-MET-INAT
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Mission Climate neutral and smart cities
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-11-2024	**Data Fine:**	31-10-2028
Doc. approvazione:	129/2024/SSPT/MET	**Codice atto:**	PS2ACZ
Contributo Totale:	€ 5.633.151	**Costo eleggibile:**	€ 5.881.451
Contributo ENEA:	**€ 308.843**	**Costo ENEA:**	**€ 308.843**

HyMetBat

Hybrid metrology for sustainable and low-carbon footprint battery materials

Coordinatore: PTB PHYSIKALISCH TECHNISCHE BUNDESANSTALT (Germania) N. Partner:

Abstract:

The European battery industry is under increasing pressure to improve the economic and environmental sustainability of the manufacturing supply chain. Existing high-capacity energy storage technologies such as Li-ion batteries rely on critical elements with low earth abundance, are produced via energy intensive and environmentally unfriendly processes and are difficult to recycle. New metrology is urgently required to support the transition to more sustainable battery chemistries and low carbon-footprint manufacturing processes. This project aims to develop a new hybrid metrology platform bringing together a combination of traceable analytical techniques for both ex situ and operando characterisation of battery materials, to enable innovation in next generation energy storage technologies.

Attività ENEA:

L'attività è suddivisa in 6 work package. ENEA partecipa principalmente ai WP1 e WP2, focalizzandosi sulla caratterizzazione strutturale e chimica di anodi a base di carbonio duro da biomassa e materiali da riciclo. Attività esecutive ENEA contribuirà principalmente a: - WP1 – Caratterizzazione termica e strutturale di materiali anodici per batterie Na-ion - WP2 – Studio di materiali da riciclo, inclusa l'analisi tracciabile di contaminanti metallici

Responsabile:	GRECO GIORGIA	**Unità:**	TERIN-DEC-ACEL
Anno Stipula:	2025		
PQ:	Other programmes (2021-2027)	**Programma UE:**	EURAMET
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-07-2025	**Data Fine:**	30-06-2028
Doc. approvazione:	71/2025/TERIN	**Codice atto:**	PK4ABF
Contributo Totale:	€ 3.488.293	**Costo eleggibile:**	€ 3.514.418
Contributo ENEA:	**€ 55.280**	**Costo ENEA:**	**€ 55.280**

HyPEF

Promoting an environmentally-responsible Hydrogen economy by enabling Product Environmental Footprint studies

Coordinatore: FUNDACION IMDEA ENERGIA (Spagna) N. Partner:

Abstract:

Fuel cells and hydrogen (FCH) systems are increasingly considered in energy and climate policies, roadmaps and plans all over the world. In order to avoid past criticalities, such as those leading to a climate emergency situation, sustainability criteria are being progressively implemented in these initiatives, e.g., by promoting low-carbon renewable hydrogen in Europe. In this regard, science-based criteria and procedures are required to guarantee the environmental suitability of FCH products, reporting their life-cycle environmental profile according to the principles of transparency, traceability, reproducibility, and consistency for comparability. While these principles are aligned with those of the general methodological guidance for Product Environmental Footprint (PEF) studies, further specification is required to effectively implement them when addressing FCH products. Hence, the HyPEF project aspires to support and promote the establishment of an environmentally-responsible hydrogen economy by developing and testing the first Product Environmental Footprint Category Rules (PEFCRs) specific to FCH products, while paving the way for subsequent related initiatives in the FCH sector. HyPEF is conceptualised as the natural step forward in methodological specification towards policy- and market-relevant lifecycle environmental assessment and benchmarking of FCH products. The interdisciplinary approach behind HyPEF leads to crucial advancements regarding (i) the first development and application of well-accepted PEFCRs tailored to three pre-selected FCH product categories (electrolysers for hydrogen production, tanks for hydrogen storage, and fuel cells for hydrogen stationary use), (ii) increased high-quality data availability for consistent environmental assessment and benchmarking of FCH products, and (iii) first PEF-oriented policy recommendations towards official qualification of an FCH product as an environmentally-responsible investment.

Attività ENEA:

ENEA è responsabile dei task 2.4 – Screening PEF of the three representative products (WP2 - Setting the Ground for FCH-PEFCRs) - e 4.2 - Application in case studies on hydrogen storage units (WP4 - Application of the FCH-PEFCRs in Case Studies)- finalizzati allo screening delle PEF di tre prodotti rappresentativi definiti nell'ambito del progetto, e l'applicazione delle PEF ad un caso studio sui serbatoi di stoccaggio dell'idrogeno. ENEA sarà anche leader della Subtask 3.2.2 - Development of the first draft of PEFCRs for tanks for hydrogen storage (WP3 - Development of PEFCRs for Three FCH Product Categories). ENEA inoltre contribuisce alle seguenti attività scientifiche: Task 2.1. Analysis of relevant existing (PEF)CRs, Task 2.3. Selection of FCH product categories and definition of the 3 representative products, Task 3.1. Set-up and management of the FCH-PEFCRs development process, Task 3.2. Development of three sets of FCH-PEFCRs, Task 3.3. Refinement and consolidation of FCH-PEFCRs. ENEA avrà anche la responsabilità di produrre 2 deliverable (Reports): D2.3: Screening LCA of the three representative products e D4.2: Report on case studies on hydrogen tanks.

Responsabile:	CARBONE CLAUDIO	**Unità:**	TERIN-PSU-ABI
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Clean Hydrogen JU
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-01-2024	**Data Fine:**	31-12-2026
Doc. approvazione:	320/2023/TERIN	**Codice atto:**	PK4ABC
Contributo Totale:	€ 1.499.431	**Costo eleggibile:**	€ 1.499.431
Contributo ENEA:	**€ 119.700**	**Costo ENEA:**	**€ 119.700**

HYPER-AI

Hyper-Distributed Artificial Intelligence Platform for Network Resources Automation and Management Towards More Efficient Data Processing Applications

Coordinatore: CERTH - CENTRE FOR RESEARCH AND TECHNOLOGY HELLAS (Grecia)

N. Partner:

Abstract:

In HYPER-AI, we work with smart virtual computing entities (nodes) that come from a variety of infrastructures that span all three of the so-called computing continuum's layers: the Cloud, the Edge, and IoT. It focuses on intensive data-processing applications that present the potential to improve their footprint when hyper-distributed in an optimized manner. In order to give targeted applications access to computational, storage, or network services, HYPER-AI implements the idea of computing swarms as autonomous, selforganized, and opportunistic networks of smart nodes. These networks may offer a diverse and heterogeneous set of resources processing, storage, data, communication) at all levels and have the ability to dynamically connect, interact, and cooperate. HYPER-AI proposes semantic representation concepts to enable heterogeneous resources' abstraction in a homogeneous way, under a common annotation (computing node), across the whole range of network infrastructures. The main orchestration and control concept of HYPER-AI is inspired by autonomic systems (self-CHOP principles) which employ swarmed computing schemes. Its objective is to make smart multinode (swarm) deployment scenario design, execution, and monitoring easier, through appropriate AIs for self-configuration (nodes assigned resources), self-healing (swarmed nodes lifecycle), self-optimizing (exploiting built-in situation awareness mechanisms) and self-protecting (intrusion detection, privacy, security, encryption and identity management) at application runtime. In order to support dynamic and data-driven application workflows, HYPER-AI suggests the flexible integration of resources at the edge, the core cloud, and along the big data processing and communication channel, enabling their energy, time and cost-efficient execution. Finally, distributed ledger concepts for security, privacy, and encryption as well as AI-based intrusion detection are also considered

Attività ENEA:

ENEA partecipa al progetto con lo sviluppo di uno "Use Case" legato al reattore di ricerca TRIGA operato da NUC-IRAD e con tecniche di IA sviluppate da NUC-TECFIS-ACP l'ENEA partecipa attivamente a sette WPs: WP1 Project Management Phase 1; WP2 Project Management Phase 2; WP3 State Requirement Definition; WP7 Prototyping, Verticals Preparation and IDE; WP8 Applications, Verticals and Evaluation; WP9 Dissemination, Communication and Exploitation Phase1; WP10 Dissemination, Communication and Exploitation Phase1

Responsabile:	RAO MARCO	**Unità:**	NUC-TECFIS-ACP
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 4 - Digital, Industry and Space
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-04-2024	**Data Fine:**	31-03-2027
Doc. approvazione:	determinazione 96/2024/NUC	**Codice atto:**	PF7ABY
Contributo Totale:	€ 4.628.975	**Costo eleggibile:**	€ 4.628.975
Contributo ENEA:	**€ 228.875**	**Costo ENEA:**	**€ 228.875**

Efficient water splitting via a flexible solar-powered Hybrid thermochemical-Sulphur dioxide depolarized Electrolysis Cycle

Coordinatore: DLR - GERMAN AEROSPACE CENTER E.V. (Germania) N. Partner:

Abstract:

HySelect will demonstrate the production of hydrogen (H2) by splitting water via concentrated solar technologies (CST) with an attractive efficiency and cost, through the hybrid sulphur cycle (HyS). The HyS consists of two central steps: the high temperature - yet below-900C -decomposition of sulphuric acid forming sulphur dioxide (SO2) and the subsequent low temperature (50-80C) SO2 depolarised electrolysis (SDE) of water to produce H2. HySelect will introduce, develop and operate under real conditions a complete H2 production chain focusing on two innovative, full scale plant prototype core devices for both steps of the HyS cycle: an allothermally heated, spatially decoupled from a centrifugal particle solar receiver, sulphuric acid decomposition-sulphur trioxide splitting (SAD-STS) reactor and a sulphur dioxide depolarized electrolyser (SDE) without expensive Platinum Group Metals (PGMs). Furthermore, a heat recovery system will be integrated to exploit the temperature difference within the cycle and boost the overall process efficiency. In the course of the work, non-critical materials and catalysts will be developed, qualified and integrated into the plant scale prototype units for both the acid splitting reactor and the SDE unit. Experimental work will be accompanied by component modelling and overall process simulation and culminate with a demonstration of the complete process integrating its key units of a 750kWth centrifugal particle receiver, a hot particles storage system, a 250kWth SAD-STS and a 100kWe SDE into a pilot plant. Testing for a period of at least 6 months in a large-scale solar tower, driven with smart operation and control strategies, will establish the HySelect targeted efficiency and costs. Finally, an overall process evaluation will be carried out in order to assess the technical and economic prospects of the HySelecttechnology, directly linked to the know-how and developments of the sulphuric acid and water electolysers industries.

Attività ENEA:

ENEA è presente nei seguenti workpackage: WP1: attività di coordinamento WP2: focalizzato sulle attività di progettazione e simulazione di processo, oltre che sull'analisi tecnico-economica (ENEA Lead partner) WP8: dedicato alla definizione delle strategie operative e di controllo, all'interfacciamento del processo con la sorgente solare, all'integrazione dei componenti e al testing dell'impianto WP9: diffusione dei risultati della ricerca

Responsabile:	LANCHI MICHELA	**Unità:**	TERIN-STSN-SCIS
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Clean Hydrogen JU
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-01-2023	**Data Fine:**	31-12-2026
Doc. approvazione:	227/2022/TERIN	**Codice atto:**	PK7AAG
Contributo Totale:	€ 3.982.105	**Costo eleggibile:**	€ 3.982.105
Contributo ENEA:	**€ 314.063**	**Costo ENEA:**	**€ 314.063**

N. Contratto: IRSN LW 2024-0015

PIANOFORTE
EUROPEAN PARTNERSHIP FOR RADIATION PROTECTION RESEARCH

IMAGEOMICS

Optimizing Benefit/Risk Ratio in Breast Cancer Diagnosis and Radiotherapy: Identifying Molecular, Cellular and Imaging Signatures of Breast Cancer Heterogeneity to Improve Personalized Therapeutic Strategies for Synergistic Treatment Combinations

Coordinatore: NNGYK - NATIONAL CENTRE FOR PUBLIC HEALTH AND PHARMACY (Ungheria) N. Partner:

Abstract:

A major objective of PIANOFORTE is to innovate in ionising radiation based medical diagnostic and therapeutic applications combating cancer to improve patient health and safety. Combating cancer is in the focus of other EUinitiatives as well, such as the Samira action plan, Europe's Beating Cancer Plan and Horizon Europe Mission on Cancer. IMAGEOMICS adheres to these initiatives by proposing new imaging modality to improve cancer diagnosis and solutions to increase the benefit of cancer patients from radiotherapy. The main aims of IMAGEOMICS are to improve benefit/risk ratio of breast cancer (BC) patients by identifying patients with a predicted favourable response to combined radiotherapy (RT) and immunotherapy and to develop new imaging modality with increased diagnostic potential and reduced ionizing radiation exposure. These aims will be realized through the following specific objectives: a) investigate how RT influences immunogenic heterogeneity of BC cells of different molecular subtypes using in vitro and in vivo approaches; b) test the applicability of nanoparticles for X ray fluorescence computed tomography (XFCT) to be used for the detection of BC heterogeneity; c) to identify local and systemic signatures that predict patient benefit from combined RT and immunotherapy and test their clinical applicability; d) to integrate data retrieved from experimental models and human studies with epidemiological data to build up a protocol for optimal patient stratification. High-throughput techniques such as immunopeptidome analysis and spatial multiomics analysis coupled with single cell imaging will be used. The innovative aspects of the project rely on providing an integrative analysis based on in vitro (3D bioprints, organ-on-a-chip systems), in vivo and human studies on markers reflecting interactions between BC RT and immunotherapy as well as investigating the applicability of molecularly targeted nanoparticles to be used in XFCT, opening the possibility for further developments in their theranostic application. The successful completion of IMAGEOMICS tasks is guaranteed by its multidisciplinary team, involving radiation physicists, radiation oncologists, radiation and molecular biologists, as well as epidemiologists, all strongly committed to advance radiation protection research for the benefit of the public and patients.

Attività ENEA:

L'ENEA rivestirà il ruolo di Partner. Non sono previste attività tecnico-scientifiche: il progetto prevede che l'ENEA dovrà garantire esclusivamente la gestione dei rapporti con la UE e il trasferimento del flusso economico verso l'Affiliated Entity (AE) "Laboratorio di Biofisica delle Radiazioni e Radiobiologia dell'Università di Pavia"

Responsabile:	ANTONELLI FRANCESCA	**Unità:**	SSPT-TECS-TEB
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Euratom radioprotezione
		Tipo Progetto:	Programme Cofund Actions
Data Inizio:	01-02-2024	**Data Fine:**	31-05-2027
Doc. approvazione:	47/2024/SSPT-TECS	**Codice atto:**	PS5ABJ
Contributo Totale:	€ 885.295	**Costo eleggibile:**	€ 1.405.230
Contributo ENEA:	**€ 12.600**	**Costo ENEA:**	**€ 20.000**

IMPROVE

IMpact of alternative PROtein sources to improVE nutrition

Coordinatore: CENTRALESUPELEC (Francia) N. Partner:

Abstract:

IMPROVE aims at evaluating the nutritional, health, safety and quality aspects together with the environmental and socio-economic impacts of protein novel foods (NFs) obtained from unconventional sources. In order to close the project loop by maximizing the positive impact on the transition towards healthier, protein NFs, the overall approach to alternative protein production in IMPROVE is based on utilization of selected agri-food and fisheries&acquaculture by-products as primary feedstock as well as on the utilization of natural protein producers, i.e. fungi, bacteria, insects micro- and macroalgae. The secondary by-products formed along the value chain will be upcycled for their use in the food production cycle or for the production of process energy. The obtained proteins will undergo modification and functionalization followed by a sensory evaluation and testing in food human trials and in aquaculture as feed ingredients. The project will also test the feasibility of producing NF products by simulating realistic industrial scale, using different methods and tools such as LCA, LCC, RA, TEA and AO as well as Digital Twins and real time AI-driven monitoring and DSS tools. The optimization of parameters affecting the protein NF production will be evaluated at the end to increase protein content and the impact assessment evaluated on each single stage (extraction, characterization, modification/functionalization of protein rich fraction, production of NFs) and on the integrated processes. IMPROVE NF acceptance and social relevance –also through sensory evaluation actions- will be assessed in four markets (Europe, USA, Africa and Asia) to benchmark the European scenario with the rest of the world. Only by using an integrated approach like the one proposed in IMPROVE will it be possible to evaluate the correct feasibility in the use of alternative proteins in the food sector with a realistic sustainable approach.

Attività ENEA:

L'ENEA è partner di progetto, mentre è WP leader "Alternative proteins production and processing data gathered" ed, in tale contesto è task leader per il Task 2.4 Insect-based proteins: Tebrio molitor (TM) and TLW defatted and Circular feed system e Task 2.6 Micro and macroalgae protein. Partecipa inoltre a tutti i task di questo WP ed è inoltre impegnato al Work package WP3 – From proteins to novel foods per l'adattamento e funzionalizzazione degli outcome derivanti dal WP2. Le attività prevedono inoltre il supporto al Work package WP4 – Simulators of the industrial production of the proteins under the study per quanto attiene la valorizzazione dei risultati ottenuti su WP2 e WP3.Contribuisce inoltre al WP7 Ethics requirements per quanto attiene la salvaguardia dei principi etici nei paesi che saranno eventualmente soggetti alle attività di testing con particolare attenzione alle aree soggette a maggiore depressione socio-economica.

Responsabile:	MOLINO ANTONIO	**Unità:**	SSPT-AGROS-BIOEC
Anno Stipula:	2025		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 6 - Food, Bioeconomy, Natural Resources, Agriculture and Environment
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-01-2025	**Data Fine:**	31-12-2027
Doc. approvazione:	300/2024/SSPT-AGROS	**Codice atto:**	PS1AEG
Contributo Totale:	€ 5.273.375	**Costo eleggibile:**	€ 5.273.375
Contributo ENEA:	**€ 403.750**	**Costo ENEA:**	**€ 403.750**

INDICATE LIFE

natIoNal builDIng lCa dATa accElerator EU LIFE

Coordinatore: SMITH INNOVATION APS (Danimarca) N. Partner:

Abstract:

INDICATE LIFE generates the methodological and data foundations essential for developing national whole-life-carbon (WLC) across Europe. Reducing the lifecycle emission of buildings is indispensable to ensure the construction sector is on a path to reach carbon neutrality by 2050. On the more short term, the project prepares the ground for the effective implementation of the EPBD recast provisions on WLC (Art. 7 and Annex 3). Building on the success and mirroring the method of the "INDICATE – National Building LCA Data Accelerator" project in IE, SE and CZ, INDICATE LIFE aims to fill the gap in building Life Cycle Assessment data needed for the design and rollout of WLC regulations in other promising EU Member States. The consortium brings together leading European experts and national consortia with representatives from industry, academia, data-providers, and policy communities in Austria, Croatia, Italy, Luxembourg and Hungary. The objective is to develop WLC benchmarks on national level that support the development of science based decarbonisation pathways for new construction and renovations. Guidance and technical support are provided throughout the project by experts in the field of policymaking and implementation, building-LCA and WLC benchmark development, industry engagement and strategic dissemination, and coordination, community building and project exploitation. Beyond data collection and generation, INDICATE LIFE will collect market and policy insights that will enable the formulation of national and EU level WLC policy recommendations. INDICATE LIFE provides a peer-to-peer exchange platform for WLC experts in implementing countries and leading experts in the EU. INDICATE LIFE contributes to the much needed quantitative evidence based that EU and Member State level policymakers urgently require to agree on common guiding benchmarks, targets, thresholds and limit values which will be tightened over time in line with the 2050 decarbonisation trajectory

Attività ENEA:

ENEA è partner del progetto. Partecipa alle attività dei seguenti Work Package: WP5 Sustainability, replication, and exploitation of project results WP7 – National level INDICATE LIFE implementation, in particolare all'interno del WP7.3, ENEA coordinerà la task T7.3.5 "Sustainability, replication, and exploitation of project results".

Responsabile:	RINALDI CATERINA *	**Unità:**	SSPT-EC-SSC
Anno Stipula:	2024		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	LIFE ProJect Grants
Data Inizio:	01-10-2024	**Data Fine:**	30-11-2026
Doc. approvazione:	177/2024/SSPT/EC	**Codice atto:**	PS6AET
Contributo Totale:	€ 1.994.889	**Costo eleggibile:**	€ 2.164.088
Contributo ENEA:	**€ 39.291**	**Costo ENEA:**	**€ 41.360**

I-NEST

Italian National hub Enabling and Enhancing networked applications & Services for digitally Transforming SMEs and Public Administrations

Coordinatore: CNIT - CONSORZIO NAZIONALE INTERUNIVERSITARIO PER LE TELECOMUNICAZIONI (Italia)

N. Partner:

Abstract:

I-NEST (Italian National hub Enabling and enhancing networked applications and Services for digitally Transforming Small-Medium Enterprises and Public Administrations) provides a transversal, multi-sector digitalization support for connected businesses, administrations and other digital innovation hubs, exploiting fixed and mobile network infrastructures and cloud-native, intelligent, highperformance, secure services. The hub operates with a national coverage, thanks to a network of points-of-presence and demo-centers implemented at the 88 offices of the Italian Chambers of Commerce and in 5 National Research Laboratories of CNIT, a consortium of 38 Italian Universities. The hub is specialized in emerging intelligent and secure communication and computing infrastructures, exploiting 5G as a powerful innovation platform. These infrastructures can enable innovative applications in multiple fields, improve efficiency and sustainability of supply chains and industrial ecosystems, and create new opportunities for SMEs and PAs. The hub services are designed for addressing the knowledge, capability, demand-supply and financial gaps of stakeholders working in non-ICT vertical domains. Technology awareness will be built by presenting concrete 5G economical scenarios and use cases, showcasing innovative artificial intelligence applications and analysing cybersecurity threats. Training programs and consultancy services will exploit the hub testing facilities and prototyping platforms, including a high-performance-computing platform for process simulation. Multiple players will be encouraged to share tools and interact on these facilities for creating conditions for collaboration, circularity, and open innovation. Support will be provided not only for identifying and applying for funding opportunities, including the current National Plan for Resilience and Recovery, but also for effectively and efficiently utilizing the granted funds.

Attività ENEA:

L'ENEA ha la responsabilità del WP3 relativo al "Training and Skill Development" e partecipa a tutti gli organi direttivi del progetto (WP1 "EDIH Management and Sustainability"). Parteciperà prevalentemente al WP3 e WP4 "Test-Before-invest Innovation Support".

Responsabile:	D'AGOSTINO GREGORIO	**Unità:**	TERIN-SEN-APIC
Anno Stipula:	2022		
PQ:	Other programmes (2021-2027)	**Programma UE:**	DIGITAL
		Tipo Progetto:	DIGITAL Simple Grants
Data Inizio:	01-10-2022	**Data Fine:**	30-09-2025
Doc. approvazione:	180/2022/TERIN	**Codice atto:**	PK5AAL
Contributo Totale:	€ 2.878.550	**Costo eleggibile:**	€ 5.757.103
Contributo ENEA:	**€ 572.149**	**Costo ENEA:**	**€ 1.144.299**

InnCoCells

Innovative high-value cosmetic products from plants and plant cells

Coordinatore: VTT - TEKNOLOGIAN TUTKIMUSKESKUS VTT OY (Finlandia) N. Partner:

Abstract:

The InnCoCells project will develop innovative and sustainable plant-based production processes for the commercial exploitation of scientifically validated cosmetic ingredients based on underutilised plant resources. We will optimise these resources for profitable and sustainable production using cell cultures, aeroponics and greenhouse/field cultivation. We will apply systematic approaches including metabolic engineering tools to optimise growth conditions and the yields of valuable bioactive, small-molecule compounds and ingredients. The optimised processes will be demonstrated by pilot-scale production and subsequent product extraction/purification. We will bring at least ten cosmetic ingredients to the pre-commercial stage. InnCoCells includes a cascade biorefinery concept in which by-products and biowaste are utilised for the extraction of further bioactive molecules. The processes will be characterised by techno-economic assessment and life cycle analysis to ensure economic feasibility and a reduced environmental footprint. The ingredients and extracts will be evaluated using a unique panel of innovative enzyme-based and cell-based assays to ensure safety and validate claimed activities based on robust scientific data without animal testing. We will implement a unique stakeholder engagement strategy, including the assembly of a Stakeholder Group to guide our research program based on the needs of industry, academia, farmers, policymakers and consumers. The consortium includes eight SMEs and one large company from the cosmetic sector among the 17 partners to facilitate exploitation. We will develop bespoke communications strategies for different stakeholders and for public engagement. We will also interact closely with the regulatory authorities in Europe. This industry-driven and interdisciplinary project will ultimately increase the strength of the European bioeconomy by supporting the development of innovative biobased goods and markets.

Attività ENEA:

L'ENEA è coinvolto nei work package 1, 5, 7 e 8 del progetto, svolgendo attviità di ricerca inerenti la crescita di specie vegetali fuori suolo (coltivazione idroponica) e di metabolomica, caratterizzazione di prodotti bioattivi innovtivi, sostenibilità, disseminazione, comunicazione e management.

Responsabile:	DIRETTO GIANFRANCO	**Unità:**	SSPT-BIOAG-BIOTEC
Anno Stipula:	2021		
PQ:	HORIZON 2020	**Programma UE:**	Food Security, Sustainable Agriculture and the Bioeconomy
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-05-2021	**Data Fine:**	30-04-2025
Doc. approvazione:	57/2021/SSPT-BIOAG	**Codice atto:**	PS1ABZ
Contributo Totale:	€ 7.905.559	**Costo eleggibile:**	€ 7.905.559
Contributo ENEA:	**€ 339.063**	**Costo ENEA:**	**€ 339.063**

INNUMAT

Innovative Structural Materials for Fission and Fusion

Coordinatore: KIT - KARLSRUHER INSTITUTE OF TECHNOLOGY (Germania) N. Partner:

Abstract:

INNUMAT aims to develop innovative structural materials for nuclear applications and put them on track towards qualification for fission lead-cooled and molten salt fast reactors as well as fusion DEMO. High entropy alloys (HEAs), a new class of materials with a vast development potential and very promising properties, as well as alumina forming austenitic (AFA) steels, already identified as prospective structural materials for Gen IV and Small Modular Reactors, are in the main focus in which advanced material solutions are considered as well, in particular weld overlay and coated 15-15Ti for lead-cooled fast reactors, among others MYRRHA and ALFRED, and coated EUROFER and advanced oxide dispersion strengthened (ODS) steel for fusion DEMO. Some of these structural materials are of potential applicability also outside the nuclear field, e.g. in concentrated solar power and/or in H2 confinement. The project is thus cross-cutting because of the target applications as well as because of the accelerated methodologies for materials discovery, screening and qualification that it pursues, applied at different technology readiness levels (TRLs). The differences in TRL, application conditions and requirements of the considered materials result in different objectives and hence different research tracks through the project with even different efforts. Common goal is to rapidly increase the TRL for the desired nuclear applications towards requirements of corrosion resistance, high temperature strength, thermal stability and irradiation tolerance, which are not met by current structural materials. Therefore, computational and experimental high throughput material screening methods will be applied and roadmaps for accelerated qualification will be established paving a fast way to more efficient safe sustainable nuclear energy systems with considerable contribution to the overall mission of developing economic energy systems with reduced/zero CO2 emissions.

Attività ENEA:

L'ENEA partecipa ai seguenti work package: WP1. dedicato all'approvvigionamento ed alla sintesi dei materiali per tutte le linee di ricerca ed alle caratterizzazioni in ingresso WP2. Nel WP2 verrà studiata la compatibilità dei materiali sviluppati nel WP1 con l'ambiente applicativo (metalli liquidi pesanti e sali fusi) rispetto alla corrosione, erosione ed al deterioramento delle proprietà meccaniche. WP3. La caratterizzazione meccanica avanzata dei materiali considerati sarà condotta nel WP3 ben oltre la caratterizzazione di base prevista nel WP1. Il lavoro sperimentale del WP3 comprenderà anche prove di thermal aging WP4. Questo work package sarà dedicato ad esplorare la tolleranza all'irraggiamento neutronico dei materiali sviluppati attraverso programmi di irradiazione ionica e neutronica. WP5. Metodologie di qualifica e standardizzazione. WP7. Disseminazione dei risultati e gestione dei dati prodotti

Responsabile:	BASSINI SERENA	**Unità:**	FSN-ING-SMN
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-09-2022	**Data Fine:**	31-08-2026
Doc. approvazione:	Disp. 376/2022/PRES	**Codice atto:**	PF4AAR
Contributo Totale:	€ 7.815.063	**Costo eleggibile:**	€ 9.880.955
Contributo ENEA:	**€ 679.634**	**Costo ENEA:**	**€ 894.566**

IRISCC

IRISCC

INTEGRATED RESEARCH INFRASTRUCTURE SERVICES FOR CLIMATE CHANGE RISKS

Coordinatore: LUKE - NATURAL RESOURCES INSTITUTE FINLAND (Finlandia) N. Partner:

Abstract:

Adaptation to climate change requires in-depth understanding of climate change driven risks, including their determinants (hazards, exposure and vulnerabilities) and impacts to human, production and natural systems. Integrated Research Infrastructure Services for Climate Change Risks (IRISCC) is a consortium of diverse and complementary leading research infrastructures (RIs) covering disciplines from natural sciences to social sciences, across different domains and sectors. IRISCC provides scientific and knowledge services to foster cutting-edge research and evidence-based policymaking to improve Europe's resilience to climate change. IRISCC ensures a “one-stopshop” for various user communities on climate change risk related RI services by setting up a dedicated Catalogue of services and related access management system both for granting transnational (onsite and remote) and offering virtual access. The Catalogue of services will be built through three consecutive releases, each delivering increasingly integrated services to its user communities. The IRISCC service integration will include Service Design Labs employing co-design and transdisciplinary action, and Service Demonstrators benchmarking the integrated cross-RI services. In addition to services aimed towards the scientific community, IRISCC will offer knowledge services aimed towards policymakers and other stakeholders. This is done together with risk management platforms. The research enabled by IRISCC contributes to future reports on climate change effects (IPCC, IPBES) as well as policy- and decision-making to meet the targets of climate adaptation strategies. IRISCC contributes to training a new generation of scientists to efficiently use RI services and for data stewardship. Data from IRISCC will be open and made available in compliance with FAIR principles and linked to European initiatives such as EOSC. Strong links will be created between IRISCC and current and future efforts under Horizon Europe.

Attività ENEA:

Le attività ENEA prevedono la messa a disposizione e l’esecuzione di campagne di misura presso la Stazioni di Osservazioni Climatiche di Lampedusa realizzando così gli accessi transnazionali (TNA) in modalità di condivisione da remoto della strumentazione attiva presso le infrastrutture di ricerca di cui fa parte l’ENEA, in particolare l’infrastruttura ACTRIS (Aerosols, Clouds and Trace Gases Reasearch Infrastructure) col fine di promuovere la formazione di nuovi utenti e lo sviluppo di nuovi prodotti e servizi scientifici. Tali attività e accessi sono previsti nel WP10 – TA01 - Transnational access provision for climate change risk services.

Responsabile:	PACE GIANDOMENICO	**Unità:**	SSPT-PROTER-OEM
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Research Infrastructures (2021-2027)
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-04-2024	**Data Fine:**	30-09-2028
Doc. approvazione:	259/2023/SSPT-PROTER	**Codice atto:**	PS4ADQ
Contributo Totale:	€ 14.499.858	**Costo eleggibile:**	€ 14.499.858
Contributo ENEA:	**€ 38.851**	**Costo ENEA:**	**€ 38.851**

KijaniBox

Transforming African Organic Waste into Green Energy for Cooling

Coordinatore: UNIV. TECHNICAL DRESDEN (TU DRESDEN) (Germania) N. Partner:

Abstract:

KijaniBox is a highly innovative project that will accelerate the African green transition and provide energy access for small businesses along the food supply chain. The target is to leverage the organic waste and transform them into green energy for cooling and refrigeration applications in order to prevent food losses and sanitary risks. The project aims to demonstrate the concept in 3 pilot sites in partnership with local waste management companies, food value chain actors and cold supply chain industries. In order to implement the concept, the project proposes highly innovative approaches called “Green Transition Enablers”. These are i) KijaniBox System itself, a smallscale, off-grid, industrial-grade waste to cooling system ii) Application Solution Boxes (ASB), application specific KijaniBox solution for three use cases iii) Co-creation Factory, enabling the local manufacturing capabilities for cost-effective solution, and finally iv) Business-in-a-Box, a comprehensive toolkit for entrepreneurs and stakeholders business support in order to ensure successful take-up and commercialization of the solution. KijaniBox is a highly innovative driven consortium composed of fourteen (14) entities, 7 European and 7 African partners, coming from 6 different countries. The ultimate target of KijaniBox is to pave the way for long-term sustainable economic growth and job creation opportunities in Africa and Europe.

Attività ENEA:

ENEA è leader del WP2 - Development of application solution boxes, Task 4.4: Capacity building for local assembly and manufacturing ed è coinvolta nelle seguenti attività: progettazione e sviluppo del sistema KijaniBox (basato sul processo di digestione anaerobica) in base ai requisiti/esigenze e scenari identificati all'interno del WP1 (Sustainable design of the green transition solution); caratterizzazione delle biomasse disponibili e utilizzabili per il processo di conversione energetica; realizzazione di un prototipo iniziale del sistema, comprensivo degli adattamenti per i componenti ausiliari (biodigestore, unità di refrigerazione, ecc.); sperimentazione del prototipo presso i centri di ricerca ENEA, fino alla produzione di acqua calda risultante da una caldaia; .capacity building per gli operatori locali, per le fasi di realizzazione e assemblaggio del sistema.

Responsabile:	STOPPIELLO GIOVANNI	**Unità:**	TERIN-BBC
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D3 Energy supply
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-09-2024	**Data Fine:**	31-08-2028
Doc. approvazione:	Determinazione n. 129/2024/TERIN	**Codice atto:**	PK1AAJ
Contributo Totale:	€ 4.999.285	**Costo eleggibile:**	€ 5.550.685
Contributo ENEA:	**€ 614.500**	**Costo ENEA:**	**€ 614.500**

KNOWING

Framework for defining climate mitigation pathways based on understanding and integrated assessment of climate impacts, adaptation strategies and societal transformation

Coordinatore: AIT - AUSTRIAN INSTITUTE OF TECHNOLOGY (Austria) N. Partner:

Abstract:

According to the EU's Climate Adaptation Strategy (COM(2021) 82), "improving knowledge and managing uncertainty" is key for realising the vision of a climate neutral and climate-resilient Union, as "Climate change is having such a pervasive impact that our response to it must be systemic". Thus, there is an urgent need for an integrated approach for an enhanced understanding of the interaction, complementarity and trade-offs between adaptation and mitigation measures, especially regarding the expected increase in region-al mean temperature, precipitation and changing soil moisture (IPCC AR6 WG I). Furthermore, this understanding and knowledge needs to be provided to a broad audience to support local authorities in EU partner countries in developing regional programmes. KNOWING aims to develop a modelling framework to help understand and quantify the interactions between impacts and risks of climate change, mitigation pathways and adaptation strategies. The framework will be used to assess thAdvancing climate science and further broadening and deepening the knowledge base is essential to inform the societal transition towards a climate neutral and climate resilient society by 2050, as well as towards a more ambitious greenhouse gas reduction target by 2030. There is a need for research that furthers our understanding of past, present and expected future changes in climate and its implications on ecosystems and society, closing knowledge gaps, and develops the tools that support policy coherence and the implementation of effective mitigation and adaptation solutions. Currently, there is a lack of knowledge of the Earth system and the ability to predict and project its changes under different natural and socio-economic drivers, especially regarding complex interrelations, rebound effects and behavioural aspects. Therefore, a holistic,system-aware and behaviour centred approach is needed to identify and implement realistic and effective climate mitigation pathways.

Attività ENEA:

Le attività ENEA prevedono il reperimento, la produzione e l'analisi dei dati climatici necessari per il progetto e la partecipazione attiva alla definizione dei parametri critici. In particolare: la ricognizione delle analisi e dei dati esistenti e produzione dei dati aggiuntivi necessari attraverso simulazioni numeriche; la raccolta dei dati e loro organizzazione e selezione; la partecipazione alle attività di co-creazione con gli stakeholder, per la definizione dei sistemi dinamici di interesse e dei parametri critici che li descrivono; il calcolo e mappatura degli indicatori critici; la disseminazione dei risultati. Il laboratorio ENEA TERIN-ICT-HPC fornirà il supporto informatico necessario alla realizzazione delle simulazioni climatiche sull'infrastruttura HPC CRESCO6.

Responsabile:	PISACANE GIOVANNA	**Unità:**	SSPT-MET-CLIM
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D1 Climate Sciences
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-06-2022	**Data Fine:**	31-05-2026
Doc. approvazione:	88/2022/SSPT-MET	**Codice atto:**	PS2ACH
Contributo Totale:	€ 6.204.907	**Costo eleggibile:**	€ 6.204.910
Contributo ENEA:	**€ 260.146**	**Costo ENEA:**	**€ 260.146**

LANDFEED

LANDFEED

ENHANCING SOIL SUSTAINABILITY: UNLOCKING EFFICIENT BIO-BASED FERTILIZERS FROM UNDERUTILISED SIDE STREAMS

Coordinatore: NEIKER - INSTITUTO VASCO DE INVESTIGACION Y DESARROLLO AGRARIO SA (Spagna)

N. Partner:

Abstract:

LANDFEED will focus on creating value from under-utilised waste from the agro-food industry, forestry, urban and natural waste, implementing circular and local solutions that allow waste to be valorised by placing it in a circular framework, and producing innovative biofertilisers to improve Europe's self-sufficiency. In addition to optimising and implementing innovative nutrient recovery technologies, work will be carried out on a new generation of coatings for these bio-based fertilisers, capable of improving their efficiency through controlled nutrient release mechanisms. In this way LANDFEED will contribute to a better management of the fertiliser provided, we will contribute to lower greenhouse gas emissions and a reduced impact on the environment's water resources. LANDFEED will ensure that the solutions and results of the project are locally driven through the different use cases. The use cases will consider all links in the value chain that will participate as lighthouses, serving as demonstrators and disseminators of the technologies, results and applications developed during the project. These use cases will also contribute to the objectives of the Soil Strategy by enabling the restoration of soil health through the enhancement of its specific and functional biodiversity. At the global level, the business model will be defined in its entirety, with the aim of maximising the replicability of these Use Cases and facilitating their implementation in other European areas and regions

Attività ENEA:

L'ENEA riveste il ruolo di partner ed è Leader del WP5 "Multistakeholder engagement and Industrial Symbiosis (IS) Platform" Inoltre è coinvolta nel WP1 "Raw Materials Supply: Characterisation, Sourcing, Pretreatment And Transportation" Le attività ENEA prevedono l'implementazione di una piattaforma di gestione della filiera produttiva di biofertilizzante da varie matrici e la realizzazione di tavoli di lavoro di Simbiosi Industriale. ENEA implementerà una piattaforma web multiutente per facilitare la gestione dei residui agroindustriali e il loro utilizzo sostenibile per la produzione di fertilizzanti in un'ottica di simbiosi industriale. La piattaforma sarà implementata come potente strumento di gestione dell'intera catena del valore dei fertilizzanti di origine biologica e verrà implementato un sistema di passaporto digitale dei prodotti (DPPS).

Responsabile:	LUCIANO ANTONELLA	**Unità:**	SSPT
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 6 - Food, Bioeconomy, Natural Resources, Agriculture and Environment
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-09-2024	**Data Fine:**	31-08-2028
Doc. approvazione:	128/2024/SSPT-USER	**Codice atto:**	PS6AES
Contributo Totale:	€ 6.532.131	**Costo eleggibile:**	€ 7.997.753
Contributo ENEA:	**€ 350.154**	**Costo ENEA:**	**€ 380.603**

LEAPS-INNOV

LEAPS pilot to foster open innovation for accelerator-based light sources in Europe

Coordinatore: DESY - DEUTSCHES ELEKTRONEN SYNCHROTRON DESY (Germania)

N. Partner:

Abstract:

The European synchrotron radiation sources and free electron lasers serve a broad scientific community with more than 24000 users and play a vital role in most research fields from basic science in physics, chemistry and biology to applied areas in health, engineering, environment, cultural heritage and high-impact industrial applications. Rising international competition requires the European facilities to coordinate and combine complementary strengths and capabilities. Established in 2017, the League of European Accelerator-Based Photon Sources (LEAPS) seeks to realise synergies across Europe's light sources. The increasing complexity of technology and a shorter life cycle require the photon sources to open up innovation to their partner facilities, users and industrial suppliers to promote creativity, novelty and resource efficiency. The LEAPS-INNOV pilot project will contribute to solving key technological challenges for the light sources, over 50 facilities in Europe and worldwide, and in particular will support their newest generation - diffraction-limited storage rings and X-ray FELs. It will kick-start the implementation of the LEAPS Technology Roadmap and, at the same time, will enhance partnership with industry through open innovation by offering joint technological developments and advanced research capabilities for industry as collaborators, suppliers and users. Six technology work packages (WP) form the heart of LEAPS-INNOV, based on their potential for co-innovation and their ability to enhance European leadership of both, LEAPS facilities and industry. They integrate 50-some companies, are supported by an industry networking WP and complemented by pilot activities towards co-creation with the Horizon Europe clusters. In the context of open innovation, LEAPS-INNOV focusses on new approaches for partnership between industry and the photon science community, with the goal of accumulating a strategy for long-term industry engagement for LEAPS in Europe

Attività ENEA:

L'ENEA partecipa al Work Package 6 – LEAPS Insertion Devices, dispositivi d'inserzione, con esplicito riferimento agli ondulatori magnetici, nel Task 6.1 – Industry involvement.

Responsabile:	NGUYEN FEDERICO	**Unità:**	FSN-FUSPHY-TSM
Anno Stipula:	2021		
PQ:	HORIZON 2020	**Programma UE:**	European Research Infrastructures
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-04-2021	**Data Fine:**	31-03-2025
Doc. approvazione:	038/2021/FSN	**Codice atto:**	PF2AAJ
Contributo Totale:	€ 9.999.991	**Costo eleggibile:**	€ 10.000.000
Contributo ENEA:	**€ 27.500**	**Costo ENEA:**	**€ 27.500**

LESTO

LEad fast reactor Safety design and TOols

Coordinatore: ENEA (Italia) N. Partner:

Abstract:

Shortening the time-to market of the LFR technology is an ambitious, but undeniably important factor to attract additional investments, thanks to the lower initial risk, added flexibility, and faster return of experience. Industries and utilities sharing the vision of a competitive LFR of a small and medium-size with modular features will be attracted by the compressed deployment roadmap, and will play a leverage role at national and European level, strengthening synergies and creating public–private–partnership opportunities. In this context, the European community working on the LFR development and deployment assumed the commitment, among others, to highlight the technical open issues and existing research infrastructures, aiming to support the R&D phase through European, national and in-kind contribution of the involved partners. The aim of the LESTO project is moving on along the depicted roadmap, aiming at further developing the LFR technology, supporting the demonstration that LFRs can be designed, sited, constructed, commissioned and operated in line with the requirements of the actual safety standards, with particular focus on their safety features and passive safety systems. Along the project the most relevant facilities in Europe and UK will be adopted to implement a large and very comprehensive experimental database for code validation, safety assessment and component/system demonstration. Among the others, it is worth to mention the large-scale pool type ATHENA facility, being commissioned in Romania, the CIRCE pool in Italy, as well as MELECOR in UK. These facilities, with the support of research infrastructure in Belgium, Germany and Sweden represent the state of art for the LFR R&D. Large emphasis will be devoted to transient analysis in large pools, allowing the community to cross the death valley from laboratory to industry scale

Attività ENEA:

ENEA è leader del WP2 LFR Passive Systems e del WP6 Coordination and Management. Inoltre partecipa attivamente ai seguent WP: WP1 LFR Sustainability, in supporto alle analisi neutroniche per migliorare i modelli presenti in codici di performance del combustibile; WP3 LFR materials and coolant chemistry control, supportando RATEN-ICN nell'implementazione presso la facility ATHENA di un sistema di controllo dell'ossigeno nella cover gas e conducendo insieme a newcleo test di corrosione in piombo ad alta temperatura; WP4 Thermal-hydraulics of large-scale systems, operando le modifiche e i test nella facility CIRCE e conducendo relative analisi di pre-test e post-test insieme agli altri partner, conducendo analisi di pre-test e post-test insieme agli altri partner degli esperimenti nella facility ATHENA; WP5 Education, Training and Networking, supportando le attività di training e formazione previste per tutti i partner

Responsabile:	GIANFELICI SIMONE	**Unità:**	NUC-ENER-SIC
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Euratom
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-11-2024	**Data Fine:**	31-10-2028
Doc. approvazione:	Determinazione n. 288/2024/DIRGEN	**Codice atto:**	PF6ABG
Contributo Totale:	€ 3.998.638	**Costo eleggibile:**	€ 4.734.756
Contributo ENEA:	**€ 797.813**	**Costo ENEA:**	**€ 1.063.750**

LIFE MODERn (NEC)

new MOnitoring system to Detect the Effects of Reduced pollutants emissions resulting from NEC Directive adoption

Coordinatore: ARMA DEI CARABINIERI - Comando Unità Forestali, Ambientali e Agroalimentari (CUFAA) (Italia)

N. Partner:

Abstract:

The main objective of the LIFE MODERn (NEC) project is to comply with the NEC Directive and enhance the representativeness of sites and indicators, thus improving the Italian NEC network. In particular, the project aims to: Establish national emissions ceilings of certain atmospheric pollutants, linking them to the impacts on ecosystems; Expand the network of monitoring sites so that it is fully representative of the variety of Italian freshwater and forest ecosystems; Introduce and test a new set of indicators and develop new monitoring protocols to study the impacts of air pollution on biodiversity (plant functional groups, lichens, selected groups of fauna, and selected biological indicators in water bodies) and air pollution chemistry and transparency; Measure pollutant effects in remote areas that can provide the full background level for comparison with health-related impacts in urban areas; Assess mass balances of the major nutrient and pollutant flows through the atmosphere-forest-soil-water system, to quantify the long-term trends of the most relevant impacts; Distinguish between impacts resulting from pollutant emissions and those related to other drivers (climate change, management, land-use) by applying a multivariate statistical approach on NEC Directive target pollutants and on data collected during the 20-year environmental monitoring at ICP Forests and ICP Waters sites in Italy; Improve the awareness of experts in the Italian and European NEC network by promoting internet data dissemination through the FAIR (Findable, Accessible, Interoperable and Reusable) Data Principles and the development of specific software; Raise awareness among the Italian public about pollution sources and their impacts on ecosystems, including by promoting the NEC network; and Increase knowledge exchange between EU Member States involved in implementation of the NEC Directive to discuss and promote common strategies and solutions.

Attività ENEA:

Le attività di ENEA prevedono: . Interazione e contatto con la EU; . Valutazione della rete di monitoraggio per gli ecosistemi terrestri e acquatici e per gli impatti dell'ozono sulla vegetazione; . Messa a punto e validazione di metodologia per la quantificazione del "Visibility Index", che sarà pèro posto come nuovo indicatore per l'implementazione della direttiva NEC.

Responsabile:	DE MARCO ALESSANDRA *	**Unità:**	SSPT-PVS
Anno Stipula:	2021		
PQ:	Other programmes	**Programma UE:**	LIFE (2014-2020)
		Tipo Progetto:	N/A - Non applicabile
Data Inizio:	01-10-2021	**Data Fine:**	30-09-2025
Doc. approvazione:	9/2021/PRES	**Codice atto:**	PS0ABA
Contributo Totale:	€ 1.877.109	**Costo eleggibile:**	€ 3.414.809
Contributo ENEA:	**€ 143.768**	**Costo ENEA:**	**€ 287.536**

CONCERTED ACTION
ENERGY PERFORMANCE OF BUILDINGS

LIFE21-CET-CA-CAEPBD6

6th Concerted Action supporting Member States and participating countries in implementing the Energy Performance of Buildings Directive

Coordinatore: DEA DANISH ENERGY AUTHORITY (Danimarca) N. Partner:

Abstract:

The overall objective of the Concerted Action EPBD is to foster exchange of information and experience among Member States and other associated countries (Norway) with regards to the implementation of the specific European Union legislation and policy on the energy performance of buildings, and in particular with regards to the transposition and implementation of the EPBD (DIRECTIVE 2018/844/EU) and the on-going revision of this directive. The specific objectives of the CA are to: 1. Enhance and structure sharing of information and experience from national implementation and promote good practice in activities of Member States for implementation of the Energy Performance of Buildings Directive (EPBD). 2. Create favourable conditions for faster convergence of national procedures on EPBD-related matters. 3. Develop a direct collaboration with the other two buildings-related Concerted Actions that were established within the IEE programme: the CA-RES, focussing on transposition and implementation of the Renewable Energy Systems Directive (DIRECTIVE 2018/2001/EU); and the CA-EED, focusing on transposition and implementation of the Energy Efficiency Directive (DIRECTIVE 2018/2002/EU), where National Energy Plans are expexted o include initiatives towards building energy efficiency. 4. Supplement the work of the Article 26 Committee and establish a dialogue with the European Committee for Standardization (CEN) in their work and implementation of standards to support the implementation of the zero carbon and life cycle calculations. 5. Support for European Member States and Norway to use National Renovation Plans to support progress on the EPBD implementation and increased renovation activities. As with previous instalments of the Concerted Action, CAV_EPBD will strive to result in a more harmonized approach, improved implementation and actual application of the EPBD in all the countries involved, as well as helping to disseminate best practices between the countries.

Attività ENEA:

L'ENEA partecipa alle otto task del progetto e coordina la Task 2.5: Decarbonization/Zero emission buildings.

Responsabile:	AZZOLINI GABRIELLA	**Unità:**	DUEE-SPS-SAP
Anno Stipula:	2022		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	N/A - Non applicabile
Data Inizio:	01-11-2022	**Data Fine:**	31-10-2027
Doc. approvazione:	44/2022/DUEE-SPS	**Codice atto:**	PW3ABD
Contributo Totale:	€ 5.000.000	**Costo eleggibile:**	€ 5.263.175
Contributo ENEA:	**€ 141.964**	**Costo ENEA:**	**€ 149.436**

ODYSSEE-MURE

LIFE21-CET-POLICY-OdysseeMure fit-4-55

Odyssee-MURE – Monitoring the Energy Efficiency Pillar for Climate Neutrality

Coordinatore: ADEME - AGENCE DE L'ENVIRONNEMENT ET DE LAMAITRISE DE L'ENERGIE (Francia)

N. Partner:

Abstract:

ODYSSEE-MURE “Monitoring the Energy Efficiency Pillar for Climate Neutrality” aims at supporting policy makers in EU Commission, Member States (MS) and Energy Community (EnC) countries to implement the framework of the EU Energy Efficiency Directive (EED) as efficiently as possible at national level. It provides updated, well-experienced, user-friendly databases and web-tools for monitoring and evaluating impacts of EE policies. The ODYSSEE database and facilities contain and analyse latest available energy demand and energy efficiency indicators. The MURE database and facilities contain and analyse energy efficiency policies and measures. These tools have been successfully used in the past and will be extended from 27 EU MS to 9 EnC countries, supported by a specific buddy system from selected partners of the EU27. New tools, such as a web-based Energy Efficiency Policy Assessment Tool and a Policy Radar, will strengthen capabilities of EU MS and EnC. The project will enhance, update and modernise ODYSSEE-MURE tools and databases for support to EU MS and EnC through regional and national training events as well as dissemination channels such as country/sector profiles, newsletters, policy briefs, webinars and social media. In addition, we disseminate the analysis developed in this project, through cooperation with the European Council for an Energy Efficient Economy (eceee) that organisesthe most important energy efficiency events, and which gathers policy makers, researchers and industry. We further disseminate the results through cooperation with international/ regional organisations such as the Energy Community Secretariat, the International Energy Agency IEA, EEA, UNCepal/Eclac and OLADE. ODYSSEE-MURE has a decentral, though harmonised, approach combining a strong Technical Coordination (ADEME, Enerdata, Fraunhofer ISI) with a large number of National Teams(EE agencies), and an efficient project management structure adapted to the large number of partners.

Attività ENEA:

L'ENEA è l'unico partner italiano del progetto ed è coinvolto nelle attività previste nei WP1, 2, 3 e 6 che prevedono principalmente: . il monitoraggio dei progressi in materia di efficienza energetica (database e strumenti in ODYSSEE); . la valutazione delle misure di politica di efficienza energetica (database e strumenti in MURE); . l'organizzazione di un meeting di progetto per consentire il dialogo e lo scambio di esperienze tra i partner al fine di rafforzare le competenze interne.

Responsabile:	IORIO GIULIA	**Unità:**	DUEE-SPS-MPE
Anno Stipula:	2022		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	N/A - Non applicabile
Data Inizio:	01-10-2022	**Data Fine:**	31-03-2025
Doc. approvazione:	48/2022/DUEE-SPS	**Codice atto:**	PW3ABE
Contributo Totale:	€ 1.853.113	**Costo eleggibile:**	€ 1.950.645
Contributo ENEA:	**€ 35.163**	**Costo ENEA:**	**€ 36.986**

LIFE22-CET-ENEFIRST PLUS

Plug Energy Efficiency First In

Coordinatore: IEECP - INSTITUTE FOR EUROPEAN ENERGY AND CLIMATE POLICY STICHTING (Paesi Bassi) N. Partner:

Abstract:

The energy efficiency first (EE1st) principle is defined and endorsed in EU legislation. The purpose of EE1st is to consider the demandside resources, such as energy efficiency and demand-response as the other types of energy resources for energy planning, investment, and policy. However, the previous evaluations of the National Energy and Climate Plan (NECP) and similar projects, such as ENEFIRST show that implementing the EE1st is easier said than done. Therefore, the ENEFIRSTPLUS proposal aims to support the key stakeholders to complement the existing resources (from European commissions, ENEFIRST and other projects) for investment in energy infrastructure, energy planning, and designing incentives. Through this project, new practical guidelines and “real-life examples” are provided on implementing the EE1st. In addition, the ENEFIRSTPLUS pursues to test the resources for 8 “real-life” cases in 4 countries and extend the outcomes to 27 MS. Building capacity and stakeholders’ engagement through learning cycles are one of the core components of ENEFIRSTPLUS which results in a community of practice. Furthermore, one-stop-shop is developed to provide the most relevant information and resources about EE1st in a single place.

Attività ENEA:

ENEA partecipa a tutti i WP, in particolare sarà: - leader del WP 6 “Sustainability, Replication and Exploitation activities”; - leader del Task T.4.3 “Analysis and discussion of the pilot cases’ results and outputs”; - leader del Task T.6.3 “EE1st forum and Community of Practice"

Responsabile:	MATERA MAURIZIO	**Unità:**	DUEE-SIST-SUD
Anno Stipula:	2023		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	LIFE ProJect Grants
Data Inizio:	01-11-2023	**Data Fine:**	31-10-2026
Doc. approvazione:	26/2023/DUEE-SIST	**Codice atto:**	PW4ABA
Contributo Totale:	€ 1.493.437	**Costo eleggibile:**	€ 1.572.039
Contributo ENEA:	**€ 158.269**	**Costo ENEA:**	**€ 166.599**

EPBD.wise

LIFE22-CET-EPBD.wise

Effective implementation of the EPBD in line with short-term and long-term policy requirements

Coordinatore: UNIV. TECHNICAL WIEN (Austria) N. Partner:

Abstract:

Energy and climate targets require a radical increase in efforts for implementing and strengthening policies in the building sector. The proposal for a revised EPBD introduced several elements to reach these goals e.g., zero-emission buildings (ZEB), national building renovation plans (NBRP), minimum energy performance standards (MEPS). Other instruments are strengthened: building renovation passports (BRP) and energy performance certificates (EPC). Recent developments (gas/energy/economic crises) have triggered shortterm actions and objectives, leaving Member States (MS) with the challenging task to find solutions to implement them all at once and avoid lock-in effects. The project will achieve three objectives: 1) Support public authorities in six MS (focus countries) in the design, implementation and evaluation of instruments (re-) defined in the proposal of the EPBD (ZEB, NBRP, MEPS, BRPs, EPCs) 2) Adopt a consistent approach for the implementation of building policies stemming from the EPBD recast and use synergies with Fitfor55 and other EU strategies 3) Build a replicable model to support the implementation of EU legislation by closely engaging with CA-EPBD, network agencies, and national partners of the Renovate Europe Campaign as well as policy makers and stakeholders. We will analyse national examples, provide support and technical advice and develop tailored policy packages and tools adapted to the specific needs of focus countries. These will include guidelines on how to design policies and instruments, measure their effectiveness (monitoring, reporting and policy evaluation) and adjust to EU and national needs and objectives. The project will establish an intensive stakeholder engagement in focus countries, including policy fora and bilateral exchanges with implementing bodies. Selected activities and results will be provided to focus countries; replication and adaptation to EU-27 will be assured through a series of workshops at EU level.

Attività ENEA:

L'ENEA partecipa al WP1 di coordinamento ed è leader del Task 2.1, che si occuperà di investigare il concetto di "zero emission building" (ZEB). Partecipa anche ai seguenti work package: WP 3 (Minimum Energy Performance Standards); WP4 (Building Renovation Passport – per il monitoraggio dei policy needs, l'elaborazione di soluzioni per l'implementazione ed il monitoraggio nei Focus Country e per la realizzazione di linee guida per la replicabilità in altri Paesi membri UE; WP5 (Energy Performance Certificates): gruppo di lavoro policy needs e status quo degli EPC; WP6 per verificare e garantire che le soluzioni di policy individuate nei WP 2-5 siano coerenti ed armonizzate tra loro. WP7 (coinvolgimento degli stakeholder e comunicazione e disseminazione).

Responsabile:	ZANGHIRELLA FABIO	**Unità:**	DUEE-SIST-NORD
Anno Stipula:	2023		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	LIFE ProJect Grants
Data Inizio:	01-10-2023	**Data Fine:**	30-06-2026
Doc. approvazione:	25/2023/DUEE-SIST	**Codice atto:**	PW4AAZ
Contributo Totale:	€ 1.999.308	**Costo eleggibile:**	€ 2.104.535
Contributo ENEA:	**€ 84.022**	**Costo ENEA:**	**€ 88.444**

LIFE22-CET-EU Peers

European Practitioners for Integrated Home Renovation Services

Coordinatore: CLIMATE ALLIANCE - KLIMA-BUENDNIS - ALIANZA DEL CLIMA e.V. (Germania) N. Partner:

Abstract:

Integrated Home Renovation Services (IHRS) offer holistic solutions for home renovations and are part of the enabling framework breaking barriers to renovation. The overall objective of EU Peers is to support the development of IHRS as key instruments to accelerating residential energy renovation in the EU. By creating a European Community of Practice of IHRS practitioner, involving at least 615 members, including 175 IHRS, EU Peers will strengthen and upscale the IHRS concept. The inclusive Community will provide multiple entry points and opportunities to participate in order to provide the maximum benefit to its members. For this purpose, 7 Community platforms, for 6 priority countries (IT, FR, ES, LV, HU, IRE) as well as for other EU countries, will be established. At least 45 exchange & collaboration meetings will take place at national and European level. The first generation of IHRS will strongly benefit from exchange of experience and convergence to foster residential retrofit: Beside an online knowledge repository and digital collaboration tool to network among peers, EU Peers will offer 3 types of capacity-building, consisting of at least 34 capacity building sessions. EU Peers will contribute to a faster and better implementation of IHRS models across Europe, providing a start-up aid to at least emerging IHRS initiatives. The project will advocate for improved framework conditions: European and national policy recommendations will be developed and be subject of 7 public policy debates. EU Peers will tackle improvements in the collaboration among actors along the renovation journey by organising 12 stakeholder dialogues. In addition, a campaign to engage public authorities to support the IHRS deployment in their area will target 150 public authorities across Europe. Creating a strong effect within the Community and beyond, EU Peers will provide data-based evidence that will illustrate the results and impact of its members and the IHRS movement in general.

Attività ENEA:

L'ENEA è coinvolta in tutti i WP; in particolare nel WP4 – "Tackling Community challenges through capacity building", di cui è responsabile, e nel WP6 'Towards improved framework conditions for the deployment of IHRS'.

Responsabile:	HUGONY FRANCESCA	**Unità:**	DUEE-SIST-NORD
Anno Stipula:	2023		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	LIFE ProJect Grants
Data Inizio:	01-09-2023	**Data Fine:**	31-08-2026
Doc. approvazione:	18/2023/DUEE-SIST	**Codice atto:**	PW4AAY
Contributo Totale:	€ 2.438.812	**Costo eleggibile:**	€ 2.567.171
Contributo ENEA:	**€ 242.791**	**Costo ENEA:**	**€ 255.570**

LIFE22-CET-LEAPto11

Linking Energy Audit and EnMS Policies towards new EED article 11

Coordinatore: ENEA (Italia) N. Partner:

Abstract:

The LEAPto11 project aims to support European Member States during the transposition and rollout phase of the new article 11 of the EED recast through a joint action of cooperation of their respective National Energy Agencies. The project main goal is to contribute to a comprehensive improvement of the quality framework for Energy audits and Energy management systems (EnMs) through the evaluation, update, upgrade and optimisation of current national programmes. The project will also investigate other parts of the Recast EED dealing with energy savings in the business sector, to promote synergies among energy audits, EnMS, Energy Efficiency Obligation Schemes and alternative measures, information programmes. Such goal will be reached through the following specific objectives: • Improving the effectiveness of National programmes for a better data management and Key Performance Indicators production, with benefits for the Public and the Private sector. • Supporting Ministries, Business actors (business associations, networks), auditors and National Agencies during the art.11 transposition with data-driven and knowledge-based high-level policy advice, to get all stakeholders ready when National legislations will enter in force. • Spreading the culture, use and uptake of Standards and Protocols to increase the implementation of the energy efficiency measures recommended in audits and EnMS.

Attività ENEA:

L'ENEA è coordinatore del progetto e Leader del WP1 "Management and coordination" e del WP4 "Towards the policy implementation of the provisions on “Energy management systems and energy audits” in the recast EED. In particolare: WP1: L'ENEA si occuperà di tutti gli aspetti trasversali relativi alla gestione e alle procedure. Tali attività comprendono la pianificazione e la gestione del progetto, la programmazione e l'emissione della documentazione e della reportistica interna ed esterna, la gestione finanziaria e della qualità. WP4: l'ENEA avrà il compito di svolgere tutte le attività atte a costruire il quadro di riferimento per un'efficace attuazione del nuovo articolo 11 nei Paesi delle Agenzie partecipanti. Inoltre l'ENEA contribuirà al: WP 3 "Resource Efficiency and Pilot cases" con attività dedicate allo sviluppo di tre case studies e all'organizzazione di un workshop sulla gestione dell'efficienza delle risorse WP5 "Sustainability, communication, replication, and exploitation of project results" con attività relative alla sostenibilità, replicabilità e valorizzazione dei risultati del progetto

Responsabile:	BIELE ENRICO	**Unità:**	DUEE-SPS-ESE
Anno Stipula:	2024		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	LIFE ProJect Grants
Data Inizio:	01-02-2024	**Data Fine:**	31-01-2027
Doc. approvazione:	41/2023/DUEE-SPS	**Codice atto:**	PW3ABH
Contributo Totale:	€ 1.686.526	**Costo eleggibile:**	€ 1.775.291
Contributo ENEA:	**€ 404.160**	**Costo ENEA:**	**€ 425.432**

LIFE22-CET-SEED MICAT

Support Energy Efficiency Deployment with the Multiple Impacts CAlculation Tool

Coordinatore: FHG - FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V. (Germania)

N. Partner:

Abstract:

SEED MICAT supports EU and member states at national, regional and local governance levels in including Multiple Impacts (MI) of carbon neutrality pathways in their operationalisation and implementation of the Energy Efficiency First (EE1) principle, "sowing thus the seeds" for a broad application of the principle. Considering MI in target setting (such as impacts on health, on supply security, on area use and on biodiversity) argues for a fast phase-out of fossil fuels but also for a careful analysis of MI related to different pathways to climate neutrality, with varying contributions from energy demand and energy supply options. This requires in particular extending the MI framework (previously developed in the MICAT project for energy efficiency) to renewable energy sources (and other climate neutrality pathways such as hydrogen). It further advocates the integration of policy modules (as developed in the ODYSSEE-MURE and REFEREE projects) to allow for an assessment of single and cross-sectoral policies, broadening the potential applications of the MI framework and the MICATool (a modular tool developed previously in MICAT and which allows to adapt the MI framework flexibly to different climate neutrality pathways). Further, new MI need to be considered in the MI framework, such as the impacts of climate neutrality pathways on on biodiversity. Through showcases of the MI framework at European, national, regional and local levels, as well as thematic showcases (on import dependency, on energy system resilience and on impacts on biodiversity), we demonstrate the ability of the MI concept to implement the EE1 principle based on an analytical approach. SEED MICAT accompanies these showcases with a replication analysis (notably at national level), a capacity building component on the MI framework and the MICATool, as well as a strong dissemination approach for spreading knowledge on how the MI framework supports implementing the EE1 principle.

Attività ENEA:

L'ENEA è coinvolta nei seguenti work package: WP1 - Project management and coordination WP4 - Analysing and showcasing Multiple Impacts of energy efficiency and climate neutrality pathways at national, regional and local levels WP7 - Communication and dissemination

Responsabile:	TAMBURRINO SALVATORE	**Unità:**	DUEE-SIST-SUD
Anno Stipula:	2023		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	LIFE ProJect Grants
Data Inizio:	01-12-2023	**Data Fine:**	30-11-2026
Doc. approvazione:	17/2023/DUEE-SIST	**Codice atto:**	PW4AAX
Contributo Totale:	€ 1.494.151	**Costo eleggibile:**	€ 1.572.791
Contributo ENEA:	**€ 114.458**	**Costo ENEA:**	**€ 120.482**

LIFE24-CET-BREEZE

Building Renovation Efforts for Zero Emission Buildings

Coordinatore: WIP - WIRTSCHAFT UND INFRASTRUKTUR GMBH & CO PLANUNGS KG (Germania) N. Partner:

Abstract:

BREEZE aims to support Member States in advancing their building renovation strategies by enhancing national databases for building energy performance. The project will gather and harmonize building stock data from Poland, Italy, and France, while developing open software tools for cost-optimal renovation calculations and building renovation scenario planning. A key focus is identifying representative reference buildings and applying cost-optimal renovation methods, with results extrapolated to other Member States. The project addresses the EPBD Recast, ensuring renovations not only improve energy efficiency but also comply with Indoor Environmental Quality (IEQ) standards. Case studies will integrate Solar Mandates by assessing the potential for solar photovoltaic (PV) deployment in renovations. BREEZE's standardized methodologies will guide Member States in meeting EPBD objectives, fostering a coherent approach to energy performance certification, smart readiness, and IEQ metrics. Capacity-building and technical assistance activities will further ensure the successful implementation of these strategies across the EU.

Attività ENEA:

L'ENEA è coinvolta come leader nel WP5 e fornirà contributi anche agli altri Work Package. IL WP5, "EPBD-Enhanced Renovation Plans", ha l'obiettivo di sviluppare una metodologia replicabile per lo sviluppo dei piani nazionali di ristrutturazione degli edifici, utilizzando i Paesi pilota (Polonia, Italia e Francia) come casi studio, fornendo strumenti open source e linee guida.

Responsabile:	CALABRESE NICOLANDREA	**Unità:**	DUEE-SPS-ESU
Anno Stipula:	2025		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	LIFE ProJect Grants
Data Inizio:	01-09-2025	**Data Fine:**	31-08-2028
Doc. approvazione:	30/2025/DUEE-SPS	**Codice atto:**	PW3ABO
Contributo Totale:	€ 1.642.593	**Costo eleggibile:**	€ 1.729.045
Contributo ENEA:	**€ 246.021**	**Costo ENEA:**	**€ 258.970**

LIFE24-CET-EEFINH

Energy Efficiency Financing National Hubs

Coordinatore: ENEA (Italia) N. Partner:

Abstract:

The project aims at supporting the establishment and management of the National Hubs of the European Energy Efficiency Financing Coaltion in the partner countries.

Attività ENEA:

Le attività di ENEA sono legate ai seguenti WP: WP1 Coordination: WP legato all'attività di coordinamento. L'ENEA svolgerà il ruolo di coordinatore per l'intero progetto. Trattandosi di un grant diretto voluto proposto dalla CE per finanziare la creazione dei National Hub nei diversi stati membri che aderiscono, il coordinamento previsto e concordato con la CE non è un coordinamento sulle attività progettuali portate avanti in autonomia dagli altri stati membri ma si limita al solo coordinamento amministrativo/tecnico del grant; WP2 National Hub activities: questo WP riguarda l'attività principale del progetto che consiste nella creazione da parte di ciascuno dei partecipanti del National Hub della EEEFC nel proprio paese. Ogni partner sarà libero di organizzare e gestire il National Hub in base alle proprie specifiche esigenze nazionali. L'ENEA è responsabile per creazione e implementazione del National Hub in Italia; WP3 European exchanges and communication, replication and exploitation of project results: questo WP riguarda prevalentemente la partecipazione ad eventi organizzati dalla CE per il coordinamento dei lavori dei diversi National Hub;

Responsabile:	PANDOLFI EDOARDO	**Unità:**	DUEE-SPS-MPE
Anno Stipula:	2025		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	LIFE ProJect Grants
Data Inizio:	01-07-2025	**Data Fine:**	30-06-2029
Doc. approvazione:	37/2025/DUEE-SPS	**Codice atto:**	PW3ABP
Contributo Totale:	€ 3.487.290	**Costo eleggibile:**	€ 3.670.832
Contributo ENEA:	**€ 409.206**	**Costo ENEA:**	**€ 430.743**

LIFE24-CET-ODYSSEE-MURE - EED

ODYSSEE-MURE - Monitoring the EED-Recast

Coordinatore: FHG - FRAUNHOFER GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V. (Germania)

N. Partner:

Abstract:

Building on its 30-year history, ODYSSEE-MURE EED “Monitoring the EED-Recast” monitors energy consumption and efficiency trends and evaluates the impact of national energy efficiency policy measures in EU countries, Switzerland and Energy Community countries. The project will specifically support the national implementation and monitoring of key provisions of the revised Energy Efficiency Directive. ODYSSEE-MURE offers a unique platform for researchers and policy makers to access comprehensive data, analytical tools, and expertise on energy efficiency. The project relies on two databases: ODYSSEE displays the latest data on energy demand and 300 energy efficiency indicators by sector, end-use, mode or branch and MURE captures more than 3200 national energy efficiency measures by sector. The project's innovative flagship products, including the European Energy Efficiency Scoreboard and decomposition tools combined with short-term projections, offer national, regional, and local administrations precious insights to optimise policy implementation and unlock significant energy savings. The project will also introduce or further develop new features such as linking top-down and bottom-up analyses, the role of behavior and energy sufficiency policies in target achievement, and the analysis of Multiple Benefits of Energy Efficiency Trends and Policies. ODYSSEE MURE EED also places a strong emphasis on capacity building, with a series of seminars and workshops planned to support the development of energy efficiency policies and measures. The project's results will be widely disseminated through various channels, including a dedicated website, social media, and scientific publications. The project gathers an experienced team comprising a strong Technical Coordination (Fraunhofer ISI, IEECP, Enerdata) and National Teams (mainly energy efficiency agencies). Through its collaborative approach, partnering with the European Council for an Energy Efficient Economy (ECEEE), and international organisations like the Energy Community Secretariat, the ODYSSEE-MURE project fosters a community of over 80,000 users per year, spanning Europe and beyond.

Attività ENEA:

L’ENEA è coinvolto in WP1, WP2, WP3 e WP6.

Responsabile:	IORIO GIULIA	**Unità:**	DUEE-SPS-MPE
Anno Stipula:	2025		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	LIFE ProJect Grants
Data Inizio:	01-05-2025	**Data Fine:**	31-10-2027
Doc. approvazione:	17/2025/DUEE-SPS	**Codice atto:**	PW3ABM
Contributo Totale:	€ 2.050.220	**Costo eleggibile:**	€ 2.158.126
Contributo ENEA:	**€ 25.269**	**Costo ENEA:**	**€ 26.599**

LIFE24-CET-RENOVA

Public Building Renovation Accelerator Network

Coordinatore: EURAC - ACCADEMIA EUROPEA DI BOLZANO (Italia) N. Partner:

Abstract:

In response to EU directives on energy efficiency and the Renovation Wave strategy, RENOVA aims to support small and mediumsized public authorities in overcoming competence and organizational barriers to renovation by establishing a national network of local facilitation structures (local hubs) to accelerate public building renovation in Italy. The project will create and operate four pilot local hubs in Vicenza, Rome, Naples, and Brindisi, supported by a central hub. The central hub will provide comprehensive governance, mentoring, and quality assurance for the network, while developing and transferring standardized methodologies, digital tools for portfolio assessment, energy modelling, financial engineering, and procurement support to local hubs. Local hubs will deliver standardized, highquality supportive services to public authorities, covering technical, legal, and financial aspects, and promote industrialized renovation solutions and Energy Performance Contracts (EPCs). The established national network of local hubs will engage 50 municipalities during the project, targeting renovation of 14 public buildings (residential, educational) to nZEB/ZEB standards, with potential to reach 1,835 buildings within 5 years post-project. The project will trigger 14.4 mEur investments during implementation, scaling to 2,000 mEur within 5 years. By leveraging industrialization, facilitating public procurement, and favouring private investments, RENOVA will contribute to the substantial decarbonization and transition to renewable energy in Italy, with replicable lessons for other EU countries.

Attività ENEA:

ENEA è coinvolto in tutti i WPs del progetto e in particolare è leader del Work Package 2 “Stakeholder Engagement and Needs Assessment” e del WP7 “Dissemination, communication and networking”. • WP1 - Project Management and Coordination • WP2- Stakeholder Engagement and Needs Assessment • WP3 -Development of network and central hub • WP4- Establishment and Operation of Pilot local hubs • WP5 - Financial Engineering and Investor Engagement • WP6 - Sustainability, Replication, and Exploitation of Project Results • WP7 - Dissemination, communication and networking

Responsabile:	DE ROSSI PATRIZIA	**Unità:**	DUEE-SAIP-PRE
Anno Stipula:	2025		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	LIFE ProJect Grants
Data Inizio:	01-10-2025	**Data Fine:**	30-09-2028
Doc. approvazione:	31/2025/DUEE-SAIP	**Codice atto:**	PW4ABP
Contributo Totale:	€ 1.428.278	**Costo eleggibile:**	€ 1.503.451
Contributo ENEA:	**€ 308.756**	**Costo ENEA:**	**€ 325.006**

Interreg NEXT MED — Co-funded by the European Union

MEDWISE

Mediterranean Waste Innovations for Sustainable Environments

Coordinatore: UNIV. CATANIA (Italia) N. Partner:

Abstract:

The project is based on the Programme Specific Objective 2.4 (RSO2.6) Promoting the transition to a circular and resource efficient economy. Particularly, the project is aimed at implementing and testing solutions for sustainable waste management within the framework of a circular economy strategy. The project will optimize the management of organic waste and residues using two main strategies: enhancing cross-border testing of innovative technological solutions for resource efficiency and increasing transnational sharing of technological knowledge through a triple helix approach. Available solutions/innovations will then be mapped and analyzed, and tested and implemented through pilot projects in the regions of European and non-European partners (Italy, Spain, Turkey, Palestine, Lebanon, and Jordan). The results will then be disseminated through transnational awareness campaigns, and policy tools will be developed to promote the development of technologies. Specifically, a platform based on industrial symbiosis will be developed, and actions based on monitoring and involving all stakeholders in the value chain will be implemented through industrial symbiosis round tables and the identification of IS synergies.

Attività ENEA:

L'ENEA rivestirà il ruolo di Partner e sarà WP Leader per il WP3 - Mapping and development of solutions in a circular and resource-efficient economy. ENEA sarà inoltre responsabile di attività inerenti la simbiosi industriale e lo sviluppo della piattaforma. L'ENEA è inoltre coinvolta nei seguenti Work Packages: WP1 – Management and coordination; WP2 - Communication and dissemination; WP4 - Pilot demonstrations: implementing and monitoring of innovative solutions in twinned case-studies; WP5 - Capitalization of results; WP6 - Policy Dialogue and Outreach

Responsabile:	LUCIANO ANTONELLA	**Unità:**	SSPT-EC-SSC
Anno Stipula:	2025		
PQ:	Other programmes (2021-2027)	**Programma UE:**	Interreg NEXT-MED
		Tipo Progetto:	N/A - Non applicabile
Data Inizio:	16-07-2025	**Data Fine:**	15-07-2028
Doc. approvazione:	141/2025/SSPT/EC	**Codice atto:**	PS6AFH
Contributo Totale:	€ 2.491.900	**Costo eleggibile:**	€ 2.491.900
Contributo ENEA:	**€ 370.200**	**Costo ENEA:**	**€ 370.200**

EURAMET

MetHIR

Metrology for harmonisation of field isotope ratio measurements

Coordinatore: PTB PHYSIKALISCH TECHNISCHE BUNDESANSTALT (Germania) N. Partner:

Abstract:

Climate change is a major threat facing society. The atmospheric burden of greenhouse gases (GHGs), such as carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O), is continuously increasing due to anthropogenic emissions, thereby causing global warming. Therefore, a reduction of emissions is urgently needed. Measurements of isotopic ratios offer the possibility of discriminating anthropogenic from natural contributions of GHGs. However, harmonised and standardised field calibration and measurement methods are required to support measurements networks such as Integrated Carbon Observation System (ICOS) and National Oceanic and Atmospheric Administration (NOAA). The aim of the project is to develop a metrological infrastructure (reference materials, guidelines, methods) that is directly linked to monitoring networks such as ICOS to harmonised field isotope ratio measurements.

Attività ENEA:

L'ENEA, in qualità di partner n. 2, parteciperà al progetto con l'obiettivo di: 1. sviluppare metodi di misura con affidabilità metrologica, materiali di riferimento certificati e linee guida per l'armonizzazione di misure in campo dei rapporti isotopici dei gas serra, identificando possibilmente attuali carenze nel settore delle misure in campo di tali isotopi (WP1); 2. sviluppare, a livello metrologico, metodi di misura per collegare la composizione isotopica specifica del sito, nel CRM N2O, alle scale internazionali di rapporti isotopici con un'incertezza inferiore all'1.0 per mille (WP1); 3. sviluppare strumenti e metodi di misura con obiettivi altamente metrologici per misure di rapporti isotopici in campo dei GHGs, che includano metodi ottici e di spettrometria di massa, con accuratezze migliori di quelle attualmente raggiunte dalla World Meteorological Organization (WMO) (WP2); 4. implementare approcci di misure metrologiche armonizzate e linee guida per misure di rapporti isotopici di GHGs pressi siti ICOS, quale la stazione ICOS di Jungfraujoch e la ICOS Cities di Zurigo in Svizzera o il sito ICOS di Lampedusa in Italia (WP3); 5. facilitare l'adozione delle tecnologie e delle infrastrutture di misura sviluppate nel progetto da parte della filiera di misura (produttori di strumenti) e le organizzazioni rilevanti nel contesto delle normative (ad es. CEN ISO standards) e utenti finali (ICOS, IAEA, etc.) (WP4).

Responsabile:	CAPONE MAURO	**Unità:**	NUC-INMRI
Anno Stipula:	2025		
PQ:	Other programmes (2021-2027)	**Programma UE:**	EURAMET
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-08-2025	**Data Fine:**	27-07-2028
Doc. approvazione:	088 (2025) NUC	**Codice atto:**	PF5AAQ
Contributo Totale:	€ 23.576.258	**Costo eleggibile:**	€ 23.576.258
Contributo ENEA:	**€ 100.000**	**Costo ENEA:**	**€ 100.000**

MINKE

Metrology for Integrated Marine Management and Knowledge-Transfer Network

Coordinatore: CSIC - SPANISH NATIONAL RESEARCH COUNCIL (Spagna) N. Partner:

Abstract:

MINKE will integrate key European marine metrology research infrastructures, to coordinate their use and development and propose an innovative framework of “quality of oceanographic data” for the different European actors in charge of monitoring and managing the marine ecosystems. MINKE proposes a new vision in the design of marine monitoring networks considering two dimensions of data quality, accuracy and completeness, as the driving components of the quality in data acquisition. This new vision will be framed in a quintuple helix model of innovation, incorporating all the elements involved in the monitoring network design: ? the context (ocean health), identifying the Essential Ocean variables (EOVs) as the key parameters to monitor ? the civil society (NGO, Makers community, Social media and Citizen Science platforms) as the key actors to ensure data completeness ? the academia researching new methods to ensure the accuracy and the global quality of the final products, developing tools for integrating the information of top-qualified oceanographic instruments and low-cost instrumentation. ? the industry improving the performance of the observations with new instrumentation, data-transmission systems and cost-effective technologies ? the governments that provide the legal and socio-economic frameworks to develop the proposed network The present proposal, through the different Integration Activities (Networking, Transnational-Virtual Access and Joint Research), aims to lay the groundwork for creating the necessary synergies among the different involved actors in the quintuple helix model of innovation, creating a new community with complementary capabilities for Ocean & Coastal Observation, that will facilitate the transition towards a blue growth socio-economic system.

Attività ENEA:

ENEA è coinvolto nel WP2 (Promoting Operational Integration through Harmonization of Procedures) e si occuperà di: • misure in situ e caratterizzazione metrologica della strumentazione marina; • sviluppo delle migliori pratiche per gli strumenti e analisi dell'incertezza relativa agli EOV ENEA è coinvolto inoltre nel WP10 (Management, Communication and Ethics), come gli altri 21 partners partecipanti alla proposta, per lo svolgimento della seguente attività: • l'obiettivo generale del WP10 è fornire, promuovere e gestire tutti i compiti, gli strumenti, le strutture e le strategie necessarie per una gestione e governance quotidiana efficace, adeguata e trasparente del consorzio durante tutto l'arco di vita del progetto .

Responsabile:	RESEGHETTI FRANCO	**Unità:**	SSPT-PROTER-BES
Anno Stipula:	2021		
PQ:	HORIZON 2020	**Programma UE:**	European Research Infrastructures
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-04-2021	**Data Fine:**	31-03-2025
Doc. approvazione:	39/2021/SSPT-PROTER	**Codice atto:**	PS4ACR
Contributo Totale:	€ 4.994.955	**Costo eleggibile:**	€ 4.994.955
Contributo ENEA:	**€ 55.057**	**Costo ENEA:**	**€ 55.057**

Multiscale Ocean models and Information for climate Risk Assessment and Impact mitigation

Coordinatore: UNIV. NATIONAL TECHNICAL ATENE (NTUA) (Grecia) N. Partner:

Abstract:

MOIRAI, named after the three Greek goddesses of fate, stands as a pioneering project at the intersection of past, present, and future. MOIRAI endeavors to weave a comprehensive understanding of the ocean's dynamics and biogeochemical cycles through advanced models, integrating historical data, current observations, and future projections. Integrated into the frameworks of Destination Earth (DE) and the European Digital Twin of the Ocean (DTO), key components of the broader Digital and Green transitions, MOIRAI aims to significantly advance our comprehension and mitigation of climate-related challenges. MOIRAI is set to advance the next generation of regional to coastal ocean and biogeochemical climate models in European seas, bridging the gaps between operational and regional ocean climate models. Benchmarked with improved climate modelling and prediction capacities in the estuarial-coastal-open sea continuum, the developed models will contribute to the European Green Deal, addressing resilience to climate change (both mitigation and adaptation) in coastal areas. The quality of its coastal models forms the backbone of MOIRAI's commitment to delivering reliable outcomes for end- users. At its core, MOIRAI, in conjunction with the establishment of REASSHORE (Resilience and Adaptation Strategies Selection Hub for Ocean risks Assessment and End-users feedback), aims to create replicable scientific frameworks and pave the way for basin-scale services, fostering collaborative initiatives across European regional seas. Designed to be modular and interoperable, REASSHORE will seamlessly integrate with existing and future digital infrastructures for ocean climate and risk services.

Attività ENEA:

ENEA rivestirà il ruolo di partner del progetto e parteciperà ai seguenti work package: WP1 (Project Management): partecipazione attività di coordinamento scientifico e di monitoraggio del progetto; WP2 (Refined ocean physics and climate models for regional seas): sviluppo di modelli oceanici innovativi ad alta risoluzione e produzione di simulazioni climatiche sul bacino mediterraneo ad altissima risoluzione (circa 2 km); WP5 (Model assessment and optimization): valutazione dei risultati delle simulazioni e relative ottimizzazioni; WP7 (Demonstration, validation and feedback): valutazione delle performance dei nuovi modelli in casi di studio dedicati; WP8 (Communication, Dissemination and Policy recommendation): partecipazione attività di disseminazione dei risultati del progetto.

Responsabile:	IACONO ROBERTO	**Unità:**	SSPT-CLIMAR-MSC
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 6 - Food, Bioeconomy, Natural Resources, Agriculture and Environment
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-11-2024	**Data Fine:**	30-04-2028
Doc. approvazione:	38/2024/SSPT/CLIMAR	**Codice atto:**	PS2ADB
Contributo Totale:	€ 4.499.160	**Costo eleggibile:**	€ 4.499.160
Contributo ENEA:	**€ 298.070**	**Costo ENEA:**	**€ 298.070**

MoSaiC

real-time Monitoring and Sampling of CB menaces for improved dynamic mapping of threats, vulnerabilities and response capacities

Coordinatore: FONDAZIONE SAFE (Italia)

N. Partner:

Abstract:

MoSaiC is a research project focused on real-time monitoring of CBRN events paired with innovative sampling capabilities, to enhance dynamic mapping of threats, vulnerabilities and response capacities, inter alia addressing CBRN forensics priorities. The initiative will provide additional features to existing CBRN DIM platforms by working on the integration of a set of sensing capabilities which include: • Research on innovative and low-cost CB monitoring technologies installed on UAV and UGV systems (building inter alia on the H2020 projects ROCSAFE and 5G!Drones, and focusing on miniaturization of previously deployed technological solutions); • Research on innovative sampling technologies based primarily on the concept of “smart swabs”, enabling fast and non-destructive in situ analysis of a sample that can later be analyzed a second time in the lab by standard forensic; • Nearly real-time 3D mapping and processing of areas affected by CBRN contamination (indoor and outdoor), with a high-degree of autonomy. • Real-time visualization for Incident Commanders, including flowing of data from 3D mapping and CB monitoring sensors. • Real-time communication between C2 systems and drones, robots and sensors for CB monitoring and sampling missions. The project is formally supported by five EU Member States MoDs (Italy, Austria, Denmark, the Netherlands and Estonia) thanks to the cooperation of their industrial players as well as public/private academic and research institutions. Over its thirty-six months of implementation, MoSaiC will provide tangible research outcomes with the complete design of an integrated, disruptive CBRN DIM technology able to provide real-time monitoring of CB threats, enhanced real-time C2 solutions for EU military forces. It will set a cornerstone for an improved industrial sovereignty of the EU in CBRN DIM applications.

Attività ENEA:

L'ENEA partecipa alle attività afferenti ai WP1, WP2 e WP8: . WP1: partner per la gestione degli aspetti organizzativi e di gestione del progetto. . WP2: sviluppatore di tecnologie laser per l’identificazione ed il monitoraggio di minacce chimiche e biologiche in situazione di crisi derivanti da scenari di attacco da parte di soggetti intenzionati a destabilizzare l’ordine all’interno della Comunità Europea. . WP8: il laboratorio FSN-TECFIS-DIM dell'ENEA coordinerà le attività finalizzate a validare il sistema MOSAIC ed a sviluppare un programma di sfruttamento futuro dei risultati ottenuti dal progetto.

Responsabile:	FIORANI LUCA	**Unità:**	FSN-TECFIS-DIM
Anno Stipula:	2023		
PQ:	Other programmes (2021-2027)	**Programma UE:**	EDF - European Defence Fund (2021-2027)
		Tipo Progetto:	EDF Research Actions
Data Inizio:	01-01-2023	**Data Fine:**	31-12-2025
Doc. approvazione:	195/2022/FSN	**Codice atto:**	PF7ABU
Contributo Totale:	€ 4.401.672	**Costo eleggibile:**	€ 4.401.672
Contributo ENEA:	**€ 467.500**	**Costo ENEA:**	**€ 467.500**

MSA-Trough

Development of a parabolic Trough concentrator system for Molten Salt Application

Coordinatore: UNIV. EVORA (Portogallo) N. Partner:

Abstract:

Within the MSA-Trough project a fix-focus parabolic trough is developed by an international consortium of 7 partners. The novelty of the new collector is the complete independence (detachment) between the concentrator and the fixed absorber tube, so that the absorber tube string is not moved by the concentrator and can be designed in a continuous line up to a length of more than 0,8km. Due to the new design not only the collector connection piping becomes obsolete but also all flexible connections in the solar field are omitted, leading to a significant reduction in investment costs as well as in pressure drop and heat losses. Because of its horizontal “storm-position” wind loads are reduced by 75%, thus steel structure, pylons and foundations can be designed very light and cost-saving. In addition, biodegradable and very stable thin-glass sandwich mirrors will be developed, which increase the optical efficiency by 2% due to better reflectivity. A further important project highlight is the development of an automatic mirror washing device, which will recycle about 90% of washing water and increase the solar field performance by 4% because of daily washing. The new MSA-Trough design will be especially suitable for dispatchable power generation at very high temperature (555°C) using directly molten salt as heat transfer fluid and storage medium, thus reaching a very high cycle efficiency and an excellent volumetric storage capacity. A 350m-collector (aperture 6,7m) will be erected and tested with molten salt at the EMSP. Optical, mechanical and thermal tests will be carried out in order to verify the collector quality and efficiency. In order to eliminate heat losses during nights the “overnight drainage strategy” will be tested and optimized. Compared to current parabolic trough power plants the use of MSA-Trough collectors will increase the annual electrical output by 24,5% and reduce the solar field costs by 30%.

Attività ENEA:

ENEA è presente in tutti i WPs del progetto tranne il WP2 relativo alla realizzazione del prototipo. L’Agenzia, in particolare, avrà la responsabilità del WP5 “Optimization of collector operation and maintenance” e dei task 5.2 (Night operation optimization by additional receiver insulation), 5.3 (Part load operation optimization) e 5.6 (Evaluation and optimization of operation and maintenance). L’ENEA è responsabile dei seguenti Deliverable: D5.3 – Report on “night operation with additional insulation, D2.1 - MS driven energy system management and power/gas grid integration solutions, D5.1 on night operation with additional insulation,”, D5.4 – Part load operation report, D5.8 – Final operation-maintenance evaluation report e Milestone MS15- Outlet temperature controller successfully tested, MS17 - Final operation and maintenance concepts developed.

Responsabile:	RUSSO VALERIA	**Unità:**	TERIN-STSN
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D3 Energy supply
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-10-2023	**Data Fine:**	31-03-2027
Doc. approvazione:	201/2023/TERIN	**Codice atto:**	PK7AAJ
Contributo Totale:	€ 5.421.360	**Costo eleggibile:**	€ 6.535.765
Contributo ENEA:	**€ 468.125**	**Costo ENEA:**	**€ 468.125**

MULTICLIMACT

CLIMate adaptation ACTions to improve resilience, preparedness and responsiveness of the built environment against multiple hazards at multiple scales

Coordinatore: RINA CONSULTING (Italia) N. Partner:

Abstract:

As climatic conditions are constantly changing and the frequency of extreme events increases, there is an urgency of planning, designing and retrofitting the built environment in order adapt it to present and future risks. Too frequently the built environment is a driver of vulnerability, rather than being a shelter for citizens. For this reason, mitigation and adaptation need to be pursued actively, putting built environment and human resilience at the center of a climate and future-proofing action. The MULTICLIMACT project aims to develop a mainstreamed framework and a tool for supporting public stakeholders and citizens to assess the resilience of the built environment and its people at multiple scales (buildings, urban areas, territories) against locally relevant natural and climatic hazards and supply-chains, as well as to support them to enhance their preparedness and responsiveness across their life cycle. The mainstreamed approach will include a method specifically targeted for including several types of built environment assets, including human well-being, health, and quality of life as an essential scale of analysis and action. MULTICLIMACT will support resilience-enabling ACTions by implementing a toolkit of 18 reliable, easy-to-implement and cost-effective Design methods, Materials, and Digital Solutions, enabling users to easily estimate the impact of their implementation on the resilience of the targeted asset, integrating a multidisciplinary approach integrating socio-economic, life, engineering, and climate disciplines. The MULTICLIMACT approach is integrated with relevant international and European initiatives, building upon existing knowledge and instruments, and demonstrating the proposed approach in four case studies that represent various geographical location, natural and climatic hazards, social and economic systems and scales of analysis, ranging from single buildings (including cultural heritage) to the urban and territorial scales

Attività ENEA:

Le attività in cui ENEA è coinvolta è riconducibile a otto work package: WP1: supporting the built environment adaptation to climate change – Plan and Design WP3: Materials and Technologies for supporting the built environment preparedness and responsiveness to disrupting events – Plan and Design WP4: Digital solutions for supporting the protective role of the built environment for people safety and quality of living – Plan and Design WP9: Materials and Technologies for supporting the built environment preparedness and responsiveness to disrupting events – Develop WP10: Digital solutions for supporting the protective role of the built environment for people safety and quality of living – Develop WP11: MULTICLIMACT in-field demonstration – Test WP15: MULTICLIMACT in-field demonstration - Deploy WP17: Project coordination for Phase 3

Responsabile:	DI PIETRO ANTONIO	**Unità:**	TERIN-SEN-APIC
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D4 Energy use
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-10-2023	**Data Fine:**	31-03-2027
Doc. approvazione:	206/2023/TERIN	**Codice atto:**	PK5AAP
Contributo Totale:	€ 7.499.166	**Costo eleggibile:**	€ 7.499.166
Contributo ENEA:	**€ 495.250**	**Costo ENEA:**	**€ 495.250**

MultiSoil

Multifunctional Soil Biodiversity: Unlocking Potential for Healthy Cropping Systems

Coordinatore: LUKE - NATURAL RESOURCES INSTITUTE FINLAND (Finlandia) N. Partner:

Abstract:

MultiSoil's goal is to co-create, test, and demonstrate agricultural practices that improve soil and plant health factors and thus maintain soil functional biodiversity. This in turn helps control pests with less chemicals, in line with Horizon Europe's Mission "A Soil Deal for Europe" specific objectives to reduce soil pollution, enhance restoration, and improve soil structure to enhance soil biodiversity and crop production. Soil organic amendments, microbial inoculants, and diversified cropping systems are co-developed with local actors into innovations to complement Integrated Pest Management (IPM) practices. Their site-specific effectiveness is analysed, and sustainability is assessed in experimental field trials and demonstration sites covering 6 European pedoclimatic zones (7 countries). Innovations are tested and demonstrated with a range of commercially important crops (potato, sugar beet, maize, winter rye, olives, wheat). This will be supported by existing data, collected from other projects, existing field trials, and ongoing Living Labs, to monitor the long-term effects of the practices. MultiSoil is created with farmers and implements a multi-actor approach to ensure continuation of the good practices after the project timespan. Activities will include sharing knowledge, capacity building and training focusing on the tools and expertise developed by MultiSoil. The project will reach out to relevant R&I initiatives and projects, maximising knowledge exchange, and seeking synergies and collaboration. By the end of the project, local actors will have a Toolbox of tailored best practices, and guidelines on how to improve soil health and support soil biodiversity. Data on the social, economic and environmental impacts as well as the risks of the developed practices will support decision making.

Attività ENEA:

ENEA è leader del Task T2.3 Monitor the effects of soil- and plant-health promoting practices in demonstration sites del WP2: Demonstrate and tailor integrated soil and pest management practices; inoltre partecipa ai seguenti Work Packages: WP1 Develop and validate innovative IPM approaches to enhance soil health and optimise crop production WP3 Social, economic and environmental impacts, and innovative method development of IPM innovations for improving soil and plant health WP4 Strategic outreach and impact maximisation WP5 Project coordination & administration

Responsabile:	BEVIVINO ANNAMARIA	**Unità:**	SSPT-AGROS
Anno Stipula:	2025		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 6 - Food, Bioeconomy, Natural Resources, Agriculture and Environment
		Tipo Progetto:	HORIZON Innovation Actions
Data Inizio:	01-09-2025	**Data Fine:**	28-02-2030
Doc. approvazione:	88/2025/SSPT/AGROS	**Codice atto:**	PS1AER
Contributo Totale:	€ 8.000.000	**Costo eleggibile:**	€ 8.351.172
Contributo ENEA:	**€ 574.820**	**Costo ENEA:**	**€ 574.820**

NARCOSIS

NARCOSIS

Non-tArgeted foRensic multidisCiplinary platfOrm for inveStigatIon of drug-related fatalitieS

Coordinatore: ENEA (Italia)

N. Partner:

Abstract:

The rapidly changing nature of the New Psychoactive Substance (NPS) market and the overall large number of substances that need to be monitored have presented challenges for early warning activities in recent years. Since the number of illicit drug classes is growing exponentially over time, the current challenge is no longer to search substances during an investigation, but rather to provide a sort of preliminary identification of the substance as illicit, i.e., to tag it as such, especially when it is a new type of drug. Today several instruments equipped with up-to-date libraries allow for the rapid identification of drugs of abuse. However, this approach suffers from four main problems: 1) The instruments' libraries are not updated regularly; 2) The instruments do not easily overcome the matrix effect; 3) NPSs are trafficked and sold in smaller doses, making their detection and identification more difficult; 4) Routine methods of analysis during forensic analysis are no longer effective in screening drugs of abuse, the parent drugs but also their metabolites, due to the lack of structural information and commercial reference materials. NARCOSIS (Non-tArgeted foRensic multidisCiplinary platfOrm for inveStigatIon of drug-related fatalitieS) will provide a set of features for fast, robust, and reliable multidisciplinary approach to harmonise forensic investigations by means of an up-to-date and updateable diagnostic platform with the following key features: 1) A set of selected orthogonal instruments operable both on-site and in laboratories (Raman/SERS, IR, HSI, HRMS) will be adapted to be used with the NARCOSIS platform; 2) Build a comparable and shareable (cross-organisation) reference spectra (meta-spectra) database for faster detection and identification of drugs of abuse; 3) Create an AI-assisted spectra management and integration toolkit for analytical measurements to support the EU Early Warning System to rapidly detect, assess and respond to NPS.

Attività ENEA:

ENEA coordina il progetto con il compito di sviluppare tecnologie innovative per applicazioni forens. E' leader del WP1 Project Management, del WP5 Validation and Demonstration, Training and Evaluation e del WP8 Ethic requirements. Inoltre partecipa attivamente al WP2 Needs, specifications and practitioners support.

Responsabile:	CHIRICO ROBERTO	**Unità:**	NUC-TECFIS-DIM
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 3 - Civil security for society
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-11-2024	**Data Fine:**	31-10-2027
Doc. approvazione:	147/2024/NUC	**Codice atto:**	PF7ABZ
Contributo Totale:	€ 4.410.856	**Costo eleggibile:**	€ 4.635.295
Contributo ENEA:	**€ 704.730**	**Costo ENEA:**	**€ 704.730**

ScieNcE Together

Coordinatore: CNR - CONSIGLIO NAZIONALE DELLE RICERCHE (Italia) N. Partner:

Abstract:

Throughout its history, Rome has been a leading centre for culture and science, and still today the city and its environs are home to Italy's largest concentration of research centres, laboratories and universities; in fact one of the largest concentration in Europe. In 2019, the ScieNcETogether NETwork was established, primarily just by those roman research organizations that had a long-standing tradition of interaction and cooperation among them and with international scientific contests and wanted to lay the foundation for an active collaboration also in science dissemination. In these four years of joint work taught us that to make the Night a more engaging and inclusive experience and address a large number of citizens and young people, joining forces and collaboration is key and brings added value. Consequently we have developed a formula to celebrate the Night: a major event with researchers from all NET partners institutions and representative of the stakeholder groups in Rome (the NET village) but, at the same time, we are also aware that celebrating the ERN means feeling part of a larger European community. So, on the one hand we are inviting the partners' branch laboratories and research centres scattered all over Italy (20 cities from north to south Italy) to share NET's objectives and contribute to a national celebration, on the other hand we have searched for partners/project stakeholders outside Italy that could help us enhance the European and international dimension of the ERN. Having based our communication strategy on Marie Slodowska Curie as NET Night goodmother, it has been almost natural to look at Poland (Polish Academy of Sciences), France – (Marie Curie Museum) and Sweden (Tekniska museet | National Museum of Science and Technology), the three countries that sort of represent three different stages in the scientist's life.

Attività ENEA:

L'ENEA è Leader del WP3 Researchers at Schools activities 1 e del WP8 Researchers at Schools activities 2 con attività che favoriscono il contatto dei ricercatori con il sistema scuola, su tutto il ciclo di studi. Inoltre, l'ENEA partecipa ai seguenti WP: WP2 Awareness Campaign 1 e WP6 Awareness Campaign 2; WP2 Activities during the NIGHT 2024 e WP7 Activities during the NIGHT 2025; WP4 Impact Assessment 1 e WP9 Impact Assessment 2; WP5 Managment 1 e WP10 Management 2

Responsabile:	FALCONIERI FABIOLA LETIZIA	**Unità:**	REL-EVENTI
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	MSCA Marie Skl. Curie Actions
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	11-03-2024	**Data Fine:**	10-03-2026
Doc. approvazione:	Determinazione n. 106/2024/SSPT	**Codice atto:**	PS0ABH
Contributo Totale:	€ 774.988	**Costo eleggibile:**	€ 957.452
Contributo ENEA:	**€ 55.769**	**Costo ENEA:**	**€ 79.670**

NHyRA

pre-Normative Research on Hydrogen Releases Assessment

Coordinatore: SNAM SPA (Italia) N. Partner:

Abstract:

How much hydrogen (H2) is released from the value chain? To answer the question is very challenging since insufficient and, when available, no standardized data can be found in the literature. However, it is essential to cover this knowledge gap to perform any credible and scientifically validated research regarding the H2 value chain impact on the climate change. The literature is full of studies investigating and calculating the risk of H2 leakages in case of failures, accidents, and emergencies. But significant knowledge gaps exist about the amount of anthropogenic H2 (in the atmosphere) from the H2 value chain. The research community needs to address this by improving the capability to quantify small and large releases, delivering validated methodologies and techniques for measuring or calculating them. A universally accepted and open-access inventory is needed as soon as possible. Likewise, an open access and comprehensible tool that is easy to be used is also asked by the stakeholders to better quantify the leaks from the whole in H2 value chain while the momentum is fast gathering to upscale H2 energy applications. The NHyRA project is specifically designed to address these urgent needs. The project will deliver a "H2 releases" inventory to serve as a reference for the scientific and industrial community. New or adequately adapted experimental, theoretical, and simulation methodologies will be validated to perform laboratory or in-field measurements to achieve the ambitious goal. Experimental tests will also be performed on the most critical elements of the H2 value chains by the partners of the Consortium. A complete picture of the H2 releases' scenarios in the middle (2030) and long (2050) term will be developed to enable decision-makers to identify and prioritize effective mitigation actions. And finally, the project will formulate recommendations for Standards and Technical Specifications.

Attività ENEA:

In particolare, ENEA è chiamata a contribuire alle seguenti 7 tasks scientifiche: • Task 1.1: Definition of the H2 supply chains and unit processes (M1 – M6): [Lead partner: FBK; Participant partners: UNIBO, FBK, SNAM, ENEA, SURREY, DLR, ENGIE, BH, LINDE, EQN] • Task 1.3: Priority list of the most critical elements (M3 – M12) [Lead partner: UNIBO; Participant partners: SURREY, ENEA, DLR, INIG, ENGIE, BH, NPL, SNAM, LINDE, EQN] • Task 4.1: Modelling of the H2 releases from hydrogen value chain (M12 – M26) [Lead partner: ENGIE; Participant partners: FBK, SURREY, ENEA, INIG, DLR, UNIBO, BH, SNAM] • Task 4.3: Mitigation benefits at value chain level (M30 – M34) [Lead partner: ENGIE; Participant partners: FBK, ENEA, SURREY, UNIBO, BH] • Task 5.1: Hydrogen H2 economy Scenario identification (M12-M24) [Lead partner: FBK; Participant partners: ENEA, SURREY, INIG, UNIBO, DLR; GERG] • Task 5.2: H2 releases from H2 economy Scenarios (M24-M36) [Lead partner: FBK; Participant partners: ENEA, SURREY, ENGIE] • Task 5.3: Liaison with project on H2 fate in the atmosphere and climate forcing (M31-M36) [Lead partner: ENEA; Participant partners: FBK, SURREY, INIG, SNAM, UNIBO, DLR, ENGIE]

Responsabile:	AGOSTINI ALESSANDRO	**Unità:**	TERIN-PSU-ABI
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Clean Hydrogen JU
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-01-2024	**Data Fine:**	31-12-2026
Doc. approvazione:	309/2023/TERIN	**Codice atto:**	PK4ABA
Contributo Totale:	€ 2.086.684	**Costo eleggibile:**	€ 2.086.684
Contributo ENEA:	**€ 174.125**	**Costo ENEA:**	**€ 174.125**

NiCE

From Niche to Centre - City Centres as Places of Circular Lifestyles

Coordinatore: UBA - GERMAN ENVIRONMENTAL AGENCY (Germania) N. Partner:

Abstract:

European city centres are changing: In recent decades, they were resource-intensive centres of consumption. Currently, the online trade is growing, which increasingly shifts consumption from stationary trade to the digitalised sphere. In connection with the COVID19 pandemic, numerous shops had to close and supply chains were interrupted. In contrast, alternative and sustainable consumption models leading to more circularity and sufficiency increase. However, due to the current framework conditions these models usually only remain in their niche and are only seen by "interested parties" at most. Consumers therefore lack a central and easily accessible offer of alternative forms of consumption. NiCE brings these two challenges together: a transformation of central places in cities that make it easy for their inhabitants to implement sustainable lifestyles and at the same time to (re)animate centres in a more circular way. We want to show various practical approaches in different settings that consciously strengthen these new forms of consumption, make them visible in urban centres and bring all relevant actors together. One such setting is for example a "multifunctional resource centre", where several services and offers (such as different repair services) are accessible at one central spot. NiCE partners will prepare, document and evaluate these approaches in transnational teams to develop viable, transferable models and approaches: How to use empty spaces for circular offers? How to run and economically sustain central resource centres? How to combine transnational online trade with local circular services? Educational, inspirational, and exchange formats at transnational, national and regional level will transfer our results to municipalities, regions, providers of alternative consumption and business models, citizen associations and policymakers and invites for further joint activities to establish circular city centres throughout Central Europe

Attività ENEA:

Le attività ENEA prevedono l'esecuzione di un pilota sul tema della gestione circolare della risorsa idrica, attraverso un ULL sviluppato dall'ENEA all'interno della città di Bologna nonché la partecipazione alle attività del progetto, ai meeting interni e a quelli di diffusione dei risultati. L'ENEA parteciperà a tutti i work package: • WP 0 Project Management per la redazione di report di progetto e la partecipazione ai meeting con i partner; • WP 1 Assessing, showing and framing the challenges and potentials of circular lifestyles in city centres: contribuirà all'assessment dello status quo dell'economia circolare a livello locale e regionale e alle attività di raccolta delle buone pratiche di consumo circolare a livello urbano; • WP 2 Development of practical tools and approaches to promote circular lifestyles in city centres: si occuperà della realizzazione del pilot italiano nella città di Bologna con focus sulla risorsa idrica; • WP 3 Transfer and capitalisation of solutions promoting circular lifestyles in city centres: svolgerà un ruolo attivo nei workshop ed eventi interattivi sui temi del progetto e nella disseminazione e diffusione delle fasi e dei risultati di progetto.

Responsabile:	CORTESI SARA	**Unità:**	SSPT-SEC
Anno Stipula:	2023		
PQ:	Other programmes (2021-2027)	**Programma UE:**	Interreg Central Europe 2021-2027
		Tipo Progetto:	N/A - Non applicabile
Data Inizio:	01-05-2023	**Data Fine:**	30-04-2026
Doc. approvazione:	115/2023/SSPT	**Codice atto:**	PS0ABG
Contributo Totale:	€ 1.776.614	**Costo eleggibile:**	€ 2.220.767
Contributo ENEA:	**€ 153.735**	**Costo ENEA:**	**€ 192.169**

OBSERVE

natiOnal Building Stock obsERVatoriEs

Coordinatore: IEECP - INSTITUTE FOR EUROPEAN ENERGY AND CLIMATE POLICY STICHTING (Paesi Bassi) N. Partner:

Abstract:

To achieve the reduction of carbon emissions in the building sector, policymakers should be provided with reliable and updated data to facilitate monitoring and periodic assessment of the effectiveness of building-related policies and strategies. The lack of reliable and highquality data of the building sector, the disparities regarding the type and quality of data among Member States and the lack of standard approaches and templates for data collection, management and reporting create an urgent need for more efficient and well-established data procedures through the EU. The recast of the EPBD introduces key provisions for the promotion of a more reliable and transparent data framework in the EU. OBSERVE aims to guide national authorities develop national Building Stock Observatories by developing and standardising protocols for the systematic collection and aggregation of building-related data, optimising data collection methods and streamlining the coordination of all relevant bodies. OBSERVE will also enhance synergies and interaction between several relevant EU and national initiatives and projects. Special attention will be given to establish cooperation with the overarching EU Building Stock Observatory. OBSERVE will directly support six Member States (Croatia, Cyprus, France, Greece, Italy and Spain) and further spread good practices and governance models to other EU countries. OBSERVE's collaborative effort is expected to enhance the transparency and utility of building data, thereby assisting national authorities to better implement energy and climate policies towards 2030 and support more informed policy and decision-making in the realm of building energy efficiency and regulation compliance

Attività ENEA:

L'ENEA è leader del WP3 "Data-driven process for OBSERVE's national BSOs"; è inoltre coinvolta in misura moderata sui seguenti Work Packages: WP1 "Project management and coordination", WP4 "Ensuring stakeholder engagement at national and EU level, WP5 "Synthesis and policy recommendations" e in modo massivo sul WP2 "Requirements' analysis and specification of OBSERVE's national building stock observatories".

Responsabile:	PAGLIARO FRANCESCA	**Unità:**	DUEE-SAIP-PEF
Anno Stipula:	2024		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	LIFE ProJect Grants
Data Inizio:	01-11-2024	**Data Fine:**	31-10-2027
Doc. approvazione:	Determinazione n. 38/2024/DUEE-SAIP	**Codice atto:**	PW4ABH
Contributo Totale:	€ 1.978.640	**Costo eleggibile:**	€ 2.094.756
Contributo ENEA:	**€ 199.285**	**Costo ENEA:**	**€ 209.774**

OperaHPC

OPEn HPC theRmomechanical tools for the development of eAtf fuels

Coordinatore: CEA - COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES (Francia) N. Partner:

Abstract:

Increasing further the safety of light water nuclear reactors in the new operating conditions induced by their integration in a more varied energy mix brings many new challenges for fuel development. This calls for effective and validated tools enabling one to capture the complexity of the behaviour of fuel elements under various operation conditions from nominal to design basis accident ones.. The objective of the OperaHPC proposal is to develop open tools using High Performance Computing (HPC) enabling a full 3D high-fidelity thermo-mechanical simulation of the fuel element including the material microstructure. This will contribute to the design of so-called fuel element digital twins. This development includes an ambitious basic research program devoted to the investigation of non-linear mechanical behaviour of irradiated fuel using multiscale experiments and simulations from the atomic scale up to the material law. This will yield the detailed description of the in-pile behaviour of the fuel element and the materials data necessary for the simulation. The tools developed will be assessed against state-of-the-art 1D/3D fuel performance codes for verification, definition of boundary conditions and coupling with neutronic, thermochemical and thermohydraulic codes. Validation and uncertainty analyses will also be performed through the comparison of the results of the 3D simulations with the experimental data available from irradiation programs. The knowledge from these advanced simulations will be transferred to industrial fuel performance codes thanks to the application of new methods based on reduced order and meta models, including Artificial Intelligence. The HPC tools will finally be applied to the detailed evaluation of innovative fuel element concepts, including (enhanced) accident tolerant fuels, under transient conditions in several light water reactor designs.

Attività ENEA:

ENEA è coinvolta dei seguenti Work Package: • WP4 - Development of 3D HPC simulation tools for the thermomechanical behavior of fuel elements under irradiation • WP5 - Verification and validation, uncertainties and sensitivity analyses • WP6 - Development of improved models for industrial fuel performance codes • WP7 – Simulation of fuel element behavior in operating and accidental transient conditions • WP8 – Education and training, exploitation, dissemination and communication

Responsabile:	CERVONE ANTONIO	**Unità:**	FSN-SICNUC-SIN
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-11-2022	**Data Fine:**	30-04-2027
Doc. approvazione:	104/2022/FSN	**Codice atto:**	PF6ABA
Contributo Totale:	€ 2.846.944	**Costo eleggibile:**	€ 4.515.552
Contributo ENEA:	**€ 170.300**	**Costo ENEA:**	**€ 262.000**

N. Contratto: NDICI THREATS FPI/2023/448-803

P104

Strengthening crime scene forensics and prosecution capabilities in investigating CBRN incidents in the Middle East Region

Coordinatore: ENEA (Italia)

N. Partner:

Abstract:

This tender is to address specific global and trans-regional threats to peace, international security and stability, through enhancing governance and cooperation on CBRN risk prevention, detection and mitigation. Actions are targeted to improve the detection of and mitigation against risks related to CBRN materials or agents and risks related to installations or sites through the EU CBRN Centres of Excellence Initiative and associated actions. In particular, the overall objective of the project of which this contract will be a part is strengthening CBRN forensics capacities in the Middle East region (Lebanon, Jordan and Iraq) which includes: • Strengthening existing traditional forensic capabilities in investigating and prosecuting CBRN incidents among all relevant stake holders. • Development of a training programme on forensic investigations and prosecution in CBRN-related cases. • Improve forensic awareness for first responders. • Fostering the interoperability of institutions and first responders involved in CBRN incidents • Establishing networks of CBRN and forensics-related institutions and experts dealing with CBRN-related investigations at national and regional level.

Attività ENEA:

ENEA è il contraente capofila che dovrà coordinare un Consorzio per perseguire l'accrescimento delle competenze degli operatori locali nel settore CBRN in Giordania, Libano e Iraq. In particolare l'ENEA svolgerà attività di supporto tecnico-scientifico per "Strengthening crime scene forensic and prosecution capabilities in investigating CBRN incidents in the Middle East Region"

Responsabile:	DE DOMINICIS LUIGI	**Unità:**	NUC-TECFIS
Anno Stipula:	2024		
PQ:	Other programmes (2021-2027)	**Programma UE:**	NDICI - GLOBAL EUROPE
		Tipo Progetto:	Service contract
Data Inizio:	26-11-2024	**Data Fine:**	25-11-2027
Doc. approvazione:	211-2024-NUC	**Codice atto:**	CF7AAN
Contributo Totale:	€ 1.968.000	**Costo eleggibile:**	€ 1.968.000
Contributo ENEA:	**€ 490.000**	**Costo ENEA:**	**€ 490.000**

PANORAIMA

Pan-European Network for Responsible Artificial Intelligence Multisector Masters' Programme

Coordinatore: UNIV. OF APPLIED SCIENCES UTRECHT (HU) (Paesi Bassi) N. Partner:

Abstract:

Artificial intelligence is drastically changing our society. However, there remains a shortage of individuals with the required digital skills to effectively and responsibly apply AI. The PANORAMA consortium, a network consisting of 16 like-minded universities, research and industry partners, presents in this proposal a flexible educational architecture that enables to build different forms of responsible AI education and make it accessible to everyone in Europe, male or female, with or without ICT knowledge, from a low digital skills Member State or not. PANORAIMA entails the development and delivery of a Master program in human-centred AI, consisting of four (and later more) specialized tracks that provide deep knowledge on the responsible development and application of AI technology to (non-ICT) students coming from traditional industries: 1. Healthcare & Life Sciences 2. Media & Culture 3. Law & Compliance 4. Management & Finance The developed tracks relate to the specific challenges faced when applying or working with AI in that sector and involve a lot of practice-oriented components. Next to the delivery of the specialised tracks, self-standing modules will be created to support the reskilling and upskilling of the existing work force. Both the master programme as the self-standing modules will be co-designed by the higher education institutions, industry and research partners. To maintain the program contents over an extended period, PANORAIMA builds a network of universities and industries to be able to train more professionals in advanced digital skills and prepare them for the EU vision on trustworthiness of technological development and sustainability. The materials developed in this project, as well as the programs delivered, will help create a cross-European master standard for the education of responsible AI- and data-related skills.

Attività ENEA:

ENEA partecipa ccon la qualifica di centro di eccellenza e non di partner universitario e parteciperà solo alle attività di alcuni task interni ai WPs relativi allo sviluppo di attività di ricerca, didattica e tutoraggio relative alle tematiche dell'energia. In particolare: WP1 Coordination, WP2 Analysis, WP3 Design, WP4 Development, WP5 Delivery, WP6 Stand-alone & online modules, WP7 Communication & Scaling.

Responsabile:	PIANTADOSI GABRIELE	**Unità:**	TERIN-SSI-EDS
Anno Stipula:	2025		
PQ:	Other programmes (2021-2027)	**Programma UE:**	DIGITAL
		Tipo Progetto:	DIGITAL Lump Sum Grants
Data Inizio:	01-01-2025	**Data Fine:**	31-01-2029
Doc. approvazione:	242/2024/TERIN	**Codice atto:**	PK7AAN
Contributo Totale:	€ 3.734.037	**Costo eleggibile:**	€ 3.734.037
Contributo ENEA:	**€ 128.800**	**Costo ENEA:**	**€ 128.800**

PIANOFORTE

Partnership for european research in radiation Protection and detection of ionising radiation: towards a safer use and improved protection of the environment and human health

Coordinatore: IRSN - INSTITUT DE RADIOPROTECTION ET DE SURETE NUCLEAIRE (Francia)

N. Partner:

Abstract:

The ambition of the PIANOFORTE Partnership is to improve radiological protection of members of the public, patients, workers and environment in all exposure scenarios and provide solutions and recommendations for optimised protection in accordance with the Basic Safety Standards. Research projects focusing on identified research and innovation priorities will be selected through a serie of three competitive open calls. The input to define the research priorities will be based on the priorities defined in the Joint Road Map (JRM) developed during the H2020 CONCERT EJP but also on the results of ongoing H2020 projects and on the expectations expressed by other actions carried out in other European programmes, in particular the SAMIRA action plan. High priority will be dedicated to medical applications considering that 1) medical exposures are, by far, the largest artificial source of exposure of the European population and 2) the fight against cancer is a top priority of the present European Commission. In order to ensure an appropriate continuity in the research goals and methodologies, in line with the contents of the CONCERT JRM, two other priorities have been identified to further understand and reduce uncertainties associated with health risk estimates for exposure at low doses in order to consolidate regulations and improve practices and to further enhance a science-based European methodology for emergency management and long-term recovery. Once the research priorities defined, the open call system will promote excellence in science and widening participation through a process open to the whole radiation protection community. Beyond the research actions, the selected projects will be able to benefit from the system of sharing and mutualisation of infrastructures that will be implemented at the European level. This will be accompanied by education and training schemes for health workforce and young scientists to increase Europe's research capacity in the field.

Attività ENEA:

L'ENEA rivestirà il ruolo di Partner nel progetto nella Task 2.2 (Update of the Joint Road Map) e sarà Sub-Task leader (Identification of changes affecting the Joint Roadmap including the update of platform SRAs). In particolare l'ENEA coordinerà l'analisi dei cambiamenti nel campo delle applicazioni mediche delle radiazioni ionizzanti dovute ai progressi tecnologici, e/o ai cambiamenti ambientali e climatici. Il time-frame di questa analisi permetterà di includere i progressi scientifici e tecnologici nelle tematiche dei bandi di ricerca finanziati da PIANOFORTE. Questo imput sarà sintetizzato nella milestone 2.2.2 al mese 32 del progetto. ENEA ha accettato l'niversità di Pavia come "Affiliated Entity" in PIANOFORTE.

Responsabile:	PAZZAGLIA SIMONETTA	**Unità:**	SSPT-TECS-TEB
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	EJP COFUND - Coordinamento di progetti nazionali di Ricerca ed Innovazione
Data Inizio:	01-06-2022	**Data Fine:**	31-05-2027
Doc. approvazione:	119/2022/SSPT	**Codice atto:**	PS5ABE
Contributo Totale:	€ 29.414.411	**Costo eleggibile:**	€ 45.252.945
Contributo ENEA:	**€ 30.371**	**Costo ENEA:**	**€ 46.725**

POLYRISK

POLYRISK

Understanding human exposure and health hazard of micro- and nanoplastic contaminants in our environment

Coordinatore: UNIV. UTRECHT (Paesi Bassi) N. Partner:

Abstract:

The POLYRISK project aims unraveling the risks of microplastic and nanoplastic particles (MNP) that are ubiquitous in our environment and are likely to be entering the human body via inhalation and ingestion. The most bioavailable low-micron and nano-sized MNP, pose the biggest analytical challenges or today's analytical chemists. Existing knowledge about the adverse pro-inflammatory effects of airborne particulate matter and nanoparticles, combined with pro-inflammatory evidence of MNP exposure observed in animal models and in vitro pilot tests with human immune cells, suggests that MNP may cause immunotoxicity in humans. Occupational exposure of workers to fibrous MNP can indeed lead to granulomatous lesions, causing respiratory irritation, functional abnormalities and flock worker's lung. Currently, human health risk assessment protocols specific to MNP are not available and key data is missing. This hampers science-based decision making. On this backdrop, POLYRISK's human risk assessment strategy will combine highly advanced sampling, sample pretreatment and analytical methods to detect MNP in complex matrices, up-to-date fit-for-purpose hazard assessment technologies and multiple real-life human exposure scenarios. We will focus on key toxic events linked to several chronic inflammatory diseases. The consortium uniquely brings together interdisciplinary experience and know-how on quality-controlled chemical analyses of MNP and additives, intestinal and respiratory toxicity models, human exposure epidemiology, immunotoxicology and real-life high-exposure studies. POLYRISK's novel human risk assessment strategy is based on mechanistic reasoning and pragmatically accommodates the complexity of the MNP toxicant class. Building with ground-breaking science, stakeholder engagement and strong communication, POLYRISK aims to rapidly reduce current MNP risk uncertainties and support EU efforts to ensure public health is adequately protected from the potential risks of MNP pollution. POLYRISK is a part of the European cluster on Health Impacts of Micro- and Nanoplastics.

Attività ENEA:

L'ENEA è coinvolto nella preparazione di materiali e nella messa a punto di metodi per la valutazione dell'esposizione (WP1), nella caratterizzazione di materiali plastici in scenari di vita reale (WP3), nella definizione del rischio da microplastiche (WP4) e nella redazione di Standard operational procedures per la valutazione delle microplastiche (WP5). In particolare, ENEA si occuperà principalmente di produrre e qualificare un set di materiali plastici micrometrici arricchiti con contaminanti ambientali selezionati (e.g. IPA, PCB, ecc.) e di caratterizzarli anche per gli effetti ecotossici

Responsabile:	MANZO SONIA	**Unità:**	SSPT-PROTER
Anno Stipula:	2021		
PQ:	HORIZON 2020	**Programma UE:**	Health
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-04-2021	**Data Fine:**	31-03-2025
Doc. approvazione:	10/2021/SSPT-PROTER	**Codice atto:**	PS4ACQ
Contributo Totale:	€ 5.991.078	**Costo eleggibile:**	€ 5.991.078
Contributo ENEA:	**€ 185.250**	**Costo ENEA:**	**€ 185.250**

PRO-GRACE

PROMOTING A PLANT GENETIC RESOURCE COMMUNITY FOR EUROPE

PRO-GRACE

Promoting a Plant Genetic Resource Community for Europe

Coordinatore: ENEA (Italia) N. Partner:

Abstract:

Plants are the basis of all food, feed and renewable bioenergy production and are essential for the transition from a fossil-based to a bio-based economy. Plant Genetic Resources (PGR) play a key role in ensuring this transition, as well as food security and climate mitigation. More than 2 million plant accessions are preserved “ex situ” in 410 institutes in Europe and associated countries and listed in the EURISCO database; even more diversity is found “in situ” in European farmlands and wild habitats, where it contributes significantly to agricultural resilience and climate mitigation. Detailed information on “ex situ” accessions is, at best, fragmentary, while for “in situ” accessions it is almost non-existent. A considerable part of these resources could be lost over the coming decade due to limitations in the “ex-situ” infrastructure and management, climate change, habitat loss, and invasive/alien species. The roadmap 2016 of the European Strategy Forum on Research Infrastructures (ESFRI) identifies a clear gap in the sector “Plant facilities – unlocking green power”, i.e. the lack of a European Research Infrastructure (RI) specifically dedicated to PGRs. PRO-GRACE will undertake the first step to fill this this gap, by developing the concept of a novel (RI) dedicated to the conservation and study of PGRs. The concept will describe the proposed distributed structure, governance, economic plan and scientific services of the proposed RI, and will be the basis for a full proposal at the next ESFRI call. If implemented, this new RI will aim to catalog, describe, preserve and enhance European plant agrobiodiversity, and translate the results into conservation practices and agricultural innovation, and will collaborate with global organizations dedicated to Plant Genetic Resources and with other established ESFRI RIs working on complementary fields. (eg ELIXIR, EMPHASYS, DISSCO, LIFEWATCH, MIRRI).

Attività ENEA:

L'ENEA coordina il progetto, partecipando a tutti i WP, ma svolgendo le principali attività nei seguenti workpackage: . WP1 (Inventory and information system), nel quale curerà la base di dati fenotipici, genomici e metabolomici sviluppata nel progetto G2P-SOL (coord ENEA) appena concluso, e la interfaccerà al database Europeo sulle risorse genetiche EURISCO; . WP3 (Technologies and scientific services) nel quale parteciperà alle fasi di “concept development” e “proof of concept” dei servizi offerti dalla futura infrastruttura di ricerca, proponendosi come uno dei nodi fornitori di tali servizi. . WP6 (Dissemination, communication and training) in cui parteciperà alle varie fasi di disseminazione, comunicazione e “training” del progetto, organizzando fra l’altro il “workshop” finale.

Responsabile:	APREA GIUSEPPE	**Unità:**	SSPT-BIOAG
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Research Infrastructures (2021-2027)
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-01-2023	**Data Fine:**	31-10-2025
Doc. approvazione:	495/2022/PRES	**Codice atto:**	PS1ADC
Contributo Totale:	€ 2.847.250	**Costo eleggibile:**	€ 2.847.250
Contributo ENEA:	**€ 290.000**	**Costo ENEA:**	**€ 290.000**

PROMEDLIFE

Novel food products for the PROmotion of MEDiterranean LIFEstyle and healthy diet

Coordinatore: FEM - FONDAZIONE EDMUND MACH (Italia) N. Partner:

Abstract:

PROMEDLIFE aims to increase adherence to the MD through a multi-actor approach by encouraging the adoption of a healthy eating lifestyle while decreasing the environmental and economic impact of food production and processing. It also aims to attain optimal food communication and education through training programs that target primary and (upper) secondary students as well as their families, from children to older adults.

Attività ENEA:

L'ENEA, partner del progetto, parteciperà allo studio degli stili di vita adottati nei Paesi coinvolti grazie ad approcci innovativi e avanzati per la caratterizzazione, la rintracciabilità e la verifica dell'autenticità dei prodotti agro-alimentari, unendo le sue competenze scientifiche ad un'analisi delle percezioni dei consumatori.

Responsabile:	DIRETTO GIANFRANCO	**Unità:**	SSPT-BIOAG-BIOTEC
Anno Stipula:	2022		
PQ:	HORIZON 2020	**Programma UE:**	PRIMA (2018-2028)
		Tipo Progetto:	N/A - Non applicabile
Data Inizio:	01-04-2022	**Data Fine:**	31-03-2026
Doc. approvazione:	01/2022/SSPT-BIOAG	**Codice atto:**	PS1ACG
Contributo Totale:	€ 2.363.973	**Costo eleggibile:**	€ 2.590.863
Contributo ENEA:	**€ 253.313**	**Costo ENEA:**	**€ 253.313**

PROTOSTACK

PROTOSTACK

Tubular proton conducting ceramic stacks for pressurized hydrogen production

Coordinatore: SINTEF (Norvegia)

N. Partner:

Abstract:

PROTOSTACK will create a radically new, compact and modular PCCEL stack design with integrated hot-box for operation and delivery of hydrogen up to 30 bar. The stack will be demonstrated at 5 kW and provide a pathway for further scale-up to systems of hundreds of kW. These achievements will be an important proof of technological feasibility that will attest to the advancement of PCCEL technology from TRL 2 to TRL 4. To achieve its ambitious goals, the project consortium gathers research and industry partners that are world-leading within proton ceramic technologies, with recognized expertise relevant to the research and development of electrolysers, membrane-reactors, materials, electrochemistry, and process engineering. The overall consortium will engage in wide communication and dissemination activities to ensure maximum impact of the project's outcomes and the industry partners have high ambition for business exploitation and commercialisation of the PROTOSTCK technology.

Attività ENEA:

ENEA SVOLGE il ruolo di Affiliated Entity di ATENA ed è coinvolta, come supporto ad ATENA, nelle seguenti task del WP6: • WP6-Task 6.1: Evaluation framework and data collection strategy; • WP6-Task 6.2: Techno-economic assessment; • WP6-Task 6.3: Environmental sustainability evaluation; • WP6-Task 6.4: Opportunity assessment and business case development; • WP7-Dissemination, Communication and Exploitation.

Responsabile:	CIGOLOTTI VIVIANA	**Unità:**	TERIN-PSU-ABI
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Clean Hydrogen JU
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-01-2023	**Data Fine:**	31-12-2025
Doc. approvazione:	32/2023/TERIN	**Codice atto:**	PK4AAV
Contributo Totale:	€ 2.497.014	**Costo eleggibile:**	€ 2.497.014
Contributo ENEA:	**€ 25.000**	**Costo ENEA:**	**€ 25.000**

RADNEXT

RADiation facility Network for the EXploration of effects for indusTry and research

Coordinatore: CERN - EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH (Svizzera)

N. Partner:

Abstract:

New applications in the industrial sectors of space, automotive, IoT, nuclear dismantling and civil applications, medical and accelerators among others require innovative radiation testing methodologies. As well, for coping with the industrial demand and market timelines, streamlined and coordinated testing becomes highly necessary. Although punctual exceptions exist, Europe does not count with a coordinated network of cost-effective testing facilities helping these purposes. Such a network could enormously help fast innovators such as SMEs who in many cases find difficult to access the required facilities and related test expertise. As well, it will offer a competitive advantage to large Corporations. Novel testing methodologies will also pave the way for generating new standards since the existing ones are mainly restricted to classical space applications and radiation-hardened components. Pan-European and National Research Infrastructures can play a key role for boosting European Industry by taking the first steps in the creation of a sustainable, coordinated and streamlined irradiation testing facilities network. It will also respond to the need of establishing a radiation hardness evaluation based on risk assessment and mitigation rather than on complete risk avoidance. This project aims at increasing and optimizing the access of system developers to irradiation facilities in which representative conditions of their final application are reproduced, and that can serve as a satisfactory validation for the end-users. Such optimization will be based on a network of irradiation facilities with a common entry-point, in which users can define, prepare, carry out and analyze their irradiation campaigns. A key point of such improvement would be that of advancing in the harmonization and standardization of the system level testing methodology, so not to multiply efforts around the same common objective.

Attività ENEA:

ENEA sarà coinvolta in misura diversa nei vari work packages del progetto RADNEXT. In generale coordinera' tutte le attivita' connesse alla gestione del Transnational Access attraverso il progetto, i cui costi costituiscono piu' della meta' del budget complessivo del progetto; svolgera' inoltre attivita' di irraggiamento con il Frascati Neutron Generator.

Responsabile:	FIORE SALVATORE	**Unità:**	FSN-FUSTEC-TEN
Anno Stipula:	2021		
PQ:	HORIZON 2020	**Programma UE:**	European Research Infrastructures
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-06-2021	**Data Fine:**	31-05-2025
Doc. approvazione:	052/2021FSN	**Codice atto:**	PF3AAG
Contributo Totale:	€ 5.000.000	**Costo eleggibile:**	€ 5.000.000
Contributo ENEA:	**€ 400.938**	**Costo ENEA:**	**€ 400.938**

REHOUSE ACCELERATING THE EUROPEAN RENOVATION RATE

REHOUSE

Renovation packagEs for HOlistic improvement of EU's bUildingS Efficiency, maximizing RES generation and cost-effectiveness

Coordinatore: FUNDACION CARTIF (Spagna) N. Partner:

Abstract:

The main objective of REHOUSE is to develop and demonstrate 8 renovation packages of promising technology innovations until TRL7. The renovation packages are fully designed for a wide range of building renovation actions, including deep renovations, that overcome the main barriers that slow down the current EU renovation ratios, following circularity principles, including multifunctionality through active/passive elements integration, prefabrication and off-site construction of components and respect of buildings aesthetics, architectural and historic value. REHOUSE also implements an inclusive people-centric social engagement strategy to endow the renovation wave with a resident and owner perspective towards affordability, satisfaction and attractiveness of sustainable renovation. The renovation packages will be deployed across 4 locations serving as demonstrators located in Greece, Italy, France and Hungary. These buildings renovations include detailed design, pilot set-up, demonstration and evaluation to validate in operational conditions (social) the prototypes of the 8 renovation packages. REHOUSE proposes solutions that cover together a set of 5 renovation principles offering technically and economically affordable renovation solutions with enough flexibility to tackle almost 100 % of the building renovation challenges at EU level. The aim is to boost market uptake, scalability and replicability of REHOUSE renovation packages, linking its value proposition with critical economic, technical, social, regulatory and data security/protection aspects and barriers and propose practical recommendations on how to overcome them.

Attività ENEA:

Il progetto si inserisce nelle attività di ENEA a supporto alla pubblica amministrazione per la riqualificazione energetica degli edifici, considerando un approccio che parte dalle diagnosi energetiche e arriva al coinvolgimento degli utenti. In particolare nel progetto verranno affrontati i temi di riqualificazione energetica che includeranno l'integrazione tra aspetti energetici e strutturali; l'approccio EU di "Energy Effciency First" in un percorso di riqualificazione che include gli aspetti sociali; lotta alla povertà energetica lavorando su modelli di integrazione che siano economici e facilmente replicabili; coinvolgimento degli utenti secondo il "Behavioural change". ENEA è coinvolta maggiormente nei WP1 (SOCIAL INNOVATION FOR PEOPLE-CENTRIC RENOVATION PROCESSES) e WP2 (WP4: DEMONSTRATION OF THE 8 RENOVATION PACKAGES: ENEA è responsabile del DEMO Italiano). Parteciperà inoltre a tutti gli altri work package.

Responsabile:	MISCEO MONICA	**Unità:**	DUEE-SIST-SUD
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D4 Energy use
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-10-2022	**Data Fine:**	30-09-2026
Doc. approvazione:	31/2022/DUEE-SIST	**Codice atto:**	PW4AAP
Contributo Totale:	€ 10.016.536	**Costo eleggibile:**	€ 12.561.347
Contributo ENEA:	**€ 313.438**	**Costo ENEA:**	**€ 313.438**

a hub for materials research

ReMade-at-ARI

RECYCLABLE MATERIALS DEVELOPMENT at ANALYTICAL RESEARCH INFRASTRUCTURES

Coordinatore: HZDR - HELMHOLTZ-ZENTRUM DRESDEN-ROSSENDORF EV (Germania)

N. Partner:

Abstract:

A radical shift to the Circular Economy is urgently needed to cope with the challenge of finite resources decreasing at a frightening pace while the quantity of waste increases alarmingly. The European Commission`s (EC) Circular Economy Action Plan (CEAP) adopted in March 2020 has identified seven key product value chains that must rapidly become circular, given their environmental impacts and circularity potentials. This requires substantial research on materials with a very high recycling capability while exhibiting competitive functionalities. In ReMade@ARI, the most significant European analytical research infrastructures join forces to pioneer a support hub for materials research facilitating a step change to the Circular Economy. ReMade@ARI offers coordinated access to more than 50 European analytical research infrastructures, comprising the majority of the facilities that constitute the Analytical Research Infrastructures in Europe (ARIE) network. ReMade@ARI offers comprehensive services suiting any research focusing on the development of new materials for the Circular Economy in the key areas highlighted in the CEAP and plays an important role in the preparation of the common technology roadmap for circular industries. Senior scientist, facility experts and highly trained young researchers contribute scientific knowledge and extensive support to realise a user service of unprecedented quality, making each promising idea a success. Particular attention is attributed to the implementation of attractive formats to support researchers and developers from industry. The comprehensive service catalogue is complemented by an extensive training programme. Communication and dissemination activities are underpinned by a continuous impact assessment, which also enables evidence-based decision-making in the context of the proposal selection. Routes to sustainability of the platform will be explored towards the end of the project.

Attività ENEA:

L'ENEA partecipa al progetto come affiliato del partner Laserlab Europe AISBL. In particolare l'ENEA mette a disposizione una parte del tempo macchina degli impianti di ABC e CETRA.

Responsabile:	CONSOLI FABRIZIO	**Unità:**	FSN-PLAS-PAX
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Research Infrastructures (2021-2027)
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-09-2022	**Data Fine:**	31-08-2026
Doc. approvazione:	01/2023/FSN	**Codice atto:**	PF2AAM
Contributo Totale:	€ 13.679.983	**Costo eleggibile:**	€ 13.728.333
Contributo ENEA:	**€ 46.872**	**Costo ENEA:**	**€ 46.872**

REPRODIVAC

Next-generation vaccines and diagnostics to prevent livestock reproductive diseases of worldwide impact

Coordinatore: ENEA (Italia)

N. Partner:

Abstract:

Endemic and zoonotic infectious reproductive diseases of livestock cause major economic losses globally and threaten both food security and public health. REPRODIVAC will develop new and improved vaccines and diagnostic tools required to better control four priority abortifacient diseases: porcine reproductive and respiratory syndrome (PRRS), Q fever, ovine enzootic abortion (OEA), and porcine brucellosis. The consortium spans academia and industry with complementary expertise including structural biology, microbiology, immunology, plant and veterinary sciences. This enables us to address reproductive disorders with an interdisciplinary approach: (1) applying reverse and structural vaccinology to select and design vaccine and diagnostic candidate antigens; (2) exploiting relevant protein expression systems for the production of these antigens; (3) producing rationally attenuated and viral vectored vaccines; and (4) developing a suite of molecular and immunological diagnostic tests, including point-of-care tests (PoC) to discriminate vaccinated from infected animals (DIVA). We will develop a broadly protective PRRSV vaccine, and a serological ELISA that will reliably correlate with PRRSV neutralising antibody titres. We will identify protective subunit vaccine candidates for Q fever and validate a companion serological DIVA test. We will further refine an OEA vaccine for commercialisation and pursue a complementary approach towards a DIVA-compatible next-generation subunit vaccine and serological and molecular DIVA/PoC tests. We will develop live attenuated Brucella suis vaccines and brucellosis diagnostic tests with improved specificity. These new vaccines and diagnostics will be further developed by our industrial partners and made accessible to users. Thereby by using the latest technologies in vaccine and diagnostic development REPRODIVAC will improve animal health and welfare, productivity and sustainability of the livestock sector, as well as human health.

Attività ENEA:

ENEA coordina il progetto e partecipa alle attività dei seguenti work package (WP): WP5 - Stakeholder engagement, dissemination, exploitation, and communication WP6 – Project & IP management WP7 – Ethics requirements Partecipa inoltre alle attività dei seguenti work package (WP): WP1 - Target antigen identification and structure-based vaccine design WP2 - Antigen and antibody production and delivery platforms WP3 - Evaluation of vaccine antigen formulations in vivo WP4- Specific diagnostic tests and DIVA strategies

Responsabile:	BASCHIERI SELENE	**Unità:**	SSPT-BIOAG-BIOTEC
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 6 - Food, Bioeconomy, Natural Resources, Agriculture and Environment
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-09-2022	**Data Fine:**	31-08-2025
Doc. approvazione:	82/2022 e 103/2022/SSPT-BIOAG	**Codice atto:**	PS1ACO
Contributo Totale:	€ 3.125.324	**Costo eleggibile:**	€ 3.136.284
Contributo ENEA:	**€ 874.526**	**Costo ENEA:**	**€ 874.526**

RescEU-CBRN-DSIM-IT

Development and maintenance of rescEU CBRN mobile laboratories and rescEU CBRN detection, sampling, identification and monitoring capabilities

Coordinatore: ENEA (Italia) N. Partner:

Abstract:

The rescEU-CBRN-DSIM-IT proposal brings together First Responders, National CBRN Authorities, Research Organizations and leading Private Organizations to develop a plurality of CBRN mobile laboratories equipped with the most advanced detection, sampling, identification and monitoring (DSIM) capabilities, placing the EU at the forefront of global efforts to protect citizens, infrastructure and the environment from CBRN incidents and accidents. As CBRN threats grow in scale and sophistication, the rapid mobilization of human and technological resources directly on the crisis area is key to provide data on the nature of the CBRN agents, real-time diffusion and level of hazard. All these pieces of information are instrumental to plan commensurate mitigation and recovery actions. The rescEU-CBRN-DSIM-IT proposal is based on the leading capabilities of various national actors and foresees the development of a modular capacity strategically located in Lombardia, Lazio and Veneto regions, and with the operational management of the Italian Fire Brigades which allows effective mobilization of the capacity on the entire EU territory. Furthermore, the proposed CBRN DSIM capacity is designed to be an added value in the roster of the rescEU and European Civil Protection Pool (ECPP) capacities, with all the solutions interoperable and compliant with the applicable international standards. A unique approach to training and testing will complete the capacity with the most advanced Virtual and Augmented Reality training and simulation packages, through development of a dedicated mixed reality CBRN training facility open to all EU MS authorities. The DSIM components will be made available in modular format over thirty-six months , and the full capacity will be operationally tested with an “on-the-job” training at the Winter Olympic Games of Milan-Cortina of 2026, with complementary visibility and outreach activities to underline the value added of the new rescEU capacity.

Attività ENEA:

L'ENEA coordina il progetto e partecipa a sei dei sette Work package del progetto, svolgendo attività incentrate sullo sviluppo e gestione di una serie di laboratori mobili per la prevenzione e risposta ad eventi CBRN (minacce Chimiche, Batteriologiche, Radiologiche e Nucleari) sia dovuti a cause naturali che ad azioni deliberate.

Responsabile:	DE DOMINICIS LUIGI	**Unità:**	FSN-TECFIS
Anno Stipula:	2023		
PQ:	Other programmes (2021-2027)	**Programma UE:**	UCPM - Union Civil Protection Mechanism
		Tipo Progetto:	UCPM Project Grants
Data Inizio:	30-10-2023	**Data Fine:**	29-09-2026
Doc. approvazione:	201/2023/FSN	**Codice atto:**	PF7ABW
Contributo Totale:	€ 26.701.048	**Costo eleggibile:**	€ 26.701.048
Contributo ENEA:	**€ 995.804**	**Costo ENEA:**	**€ 995.804**

RISEnergy - Research Infrastructure Services for Renewable Energy

Coordinatore: KIT - KARLSRUHER INSTITUTE OF TECHNOLOGY (Germania) N. Partner:

Abstract:

The European Green Deal aims to transform the EU into a modern, resource-efficient and competitive economy with zero net greenhouse gas emissions by 2050. To achieve more efficient, competitive and cost-effective energy systems and devices, RISEnergy fosters a European ecosystem of industry, research organizations and funding agencies aimed at developing novel energy technologies and concepts. RISEnergy brings together a consortium of 69 beneficiaries from 23 countries: ERIC institutions, technology institutes, universities and industrial partners, to jointly improve the economic performance of technologies. Members of the European Energy Research Alliance are establishing the core European ecosystem. The main objectives of RISEnergy are: 1.) enable research and innovation to increase energy efficiency and reduce the cost of energy technologies to foster wider use of renewables into energy systems through proactive innovation management having single entry point with tailor-made access roads for academics, industry, and SMEs, and advising RI providers, all acces Users, and policy makers on LCA, ICT development and networking issues; 2.) provide efficient transnational access (TNA) to facilities to support renewable energy technologies and systems: Provide more than 2,500 days of access to major European and international world-leading analytical facilities; 3.) reach out to all stakeholders performing research along the value chain, from materials and technology development to applications in the eight most relevant fields of PV, CSP/STE , hydrogen, biofuels, offshore wind, ocean energy, integrated grids, and energy storage, research infrastructure providers and policy makers; 4.) provide comprehensive services of unprecedented quality: new cross-RI services, a single entry point, tailor-made access roads for academia industry, and SMEs with a particular focus on scientists from research fields in which the use of research infrastructures is not yet established.

Attività ENEA:

L'ENEA coordinerà lo svolgimento di accessi transnazionali riguardanti la gasificazione delle biomasse e l'upgrading del syngas, rendendo disponibili le facility del dipartimento TERIN attive presso il CR Trisaia, includendo impianti di gasificazione e laboratori, per un totale di 25 giorni a ricercatori o team di ricercatori europei o extraeuropei che nei loro Paesi non hanno accesso allo stesso tipo di infrastrutture. In particolare l'ENEA parteciperà alle attività dei seguenti Work Packages: WP1 Building an energy RI ecosystem; WP2 Transnational and Virtual Access to world-class Research Infrastructures; WP4 Proactive Innovation Management

Responsabile:	ZIMBARDI FRANCESCO	**Unità:**	TERIN-STS
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Research Infrastructures (2021-2027)
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-03-2024	**Data Fine:**	31-08-2028
Doc. approvazione:	297/2023/TERIN, 13/2024/TERIN	**Codice atto:**	PK7AAK
Contributo Totale:	€ 14.499.998	**Costo eleggibile:**	€ 14.499.998
Contributo ENEA:	**€ 426.085**	**Costo ENEA:**	**€ 426.085**

SALTOpower

European facility on Molten SALT technologies TO power and energy system applications

Coordinatore: UNIV. EVORA (Portogallo)

N. Partner:

Abstract:

The use of Thermal Energy Storage (TES) in combination with the thermal conversion of solar irradiation – Concentrated Solar Power (CSP) – has long been regarded as an important technological solution for the production of dispatchable electricity. Whereas thermal oil based systems have set the standard in the first generation of commercial CSP Plants, the use of Molten Salts as heat transfer and storage media has been gathering research efforts and is regarded, by the industry, as the foregoing standard for new commercial plants. Molten Salt (MS) research has been deployed along the past decade in Germany and Italy, alongside with the erection of dedicated Research Infrastructure (RI) enabling the study and experimental test of e.g. materials, components or O&M procedures suiting this innovative technological approach. With the recent commissioning of a full-fledged Molten Salt Solar system emulating a commercial MS-CSP Plant in Évora, Portugal has joined this research effort with a new outstanding RI in this field. Gathering the unique experience of two non-Widening partners in the development and operation of the most important MS-RI at European level with the incumbent new RI capacity available in a Widening country, the present proposal aims at enhancing the scientific excellence and innovation capacity of the Consortium in the foregoing exploitation of this outstanding RI. SALTOpower has a strong focus on an enhanced capacity building of researchers going beyond purely scientific capacities, strengthening the research management and administration skills of the Widening RI. By means of enhanced cooperation duly framed on a common research strategy aiming at further developing MS technologies, SALTOpower aims at creating the reference European facility for the development and testing of Molten Salt based technologies for energy storage and dispatchable power production solutions, for the integration of different renewable energy sources, power and gas grids.

Attività ENEA:

ENEA è presente in tutti i WPs del progetto ed in particolare avrà la responsabilità del WP2 “Excellence R&D” e del WP4 “Aligned strategy” e dei task 1.3 (Widening Profile); task 2.1 (MS driven Thermo- Electrochemical H2/syngas production); task 3.3 (Mentoring); task 4.2 (Scientific alignement) e task 5.1 (quadrupla elica). ENEA è responsabile dei seguenti Deliverable: D1.5 - Widening Profile Report, D2.1 - MS driven energy system management and power/gas grid integration solutions, D5.1 – Relevant Impacts Report e Milestone MS3 - Widening upgrade MS6- Beyond SoA Know-how, MS15 SALTOpower identity established

Responsabile:	D'AURIA MARCO	**Unità:**	TERIN-STSN-SCIS
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	WIDERA - Widening participation and spreading excellence
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-11-2022	**Data Fine:**	31-10-2025
Doc. approvazione:	128/2022/TERIN	**Codice atto:**	PK7AAD
Contributo Totale:	€ 1.499.011	**Costo eleggibile:**	€ 1.499.011
Contributo ENEA:	**€ 447.000**	**Costo ENEA:**	**€ 447.000**

SASPAM-SA

Safety Analysis of SMR with PAssive Mitigation strategies - Severe Accident

Coordinatore: ENEA (Italia) N. Partner:

Abstract:

Small Modular Reactors (SMR) are one of the key options for the near-term deployment of new nuclear reactors. Currently in Europe there is a growing interest towards the deployment of SMRs, and several activities are underway in many countries preparing for possible licensing needs. In particular, Integral Pressurized Water Reactor (iPWR) are ready to be licensed as new builds because they start from the well-proven and established large Light Water Reactor (LWR) technology, incorporate their operational plant experience/feedback, and include moderate evolutionary design modifications to increase the inherent safety of the plant. However, despite the reinforcement of the first three levels of the Defence-in-Depth (DiD), e.g., with the adoption of passive safety systems, a sound demonstration of Ipwr ability to address Severe Accidents (SA) should be carried out (DiD levels 4-5). The main objectives of the project will be to transfer and adapt such knowledge and know-how to iPWR, in view of the European SA and Emergency Planning Zone (EPZ) analyses. The main elements considered are: (i) the identification of plausible SA scenarios for iPWRs with the related conditions in the vessel and in the containment, (ii) the study of the applicability of the existing experimental databases to iPWR and identify new experimental needs, (iii) the assessment of the capability of internationally recognized European and Non-European computational tools (largely used in Europe) to describe the behaviour of the most promising iPWR designs during SA scenarios, and (iv) the prediction of the resulting radiological impact on- and off-site, taking into account special SA mitigation/management strategies. The expected outcomes of the project will help speeding up the licensing of iPWRs in Europe, as well as the siting processes of these reactors in light of their possible use near densely populated areas.

Attività ENEA:

L'ENEA coordina il progetto e partecipa ai seguenti Work Package (WP): WP1: coordinamento del progetto. WP2: sviluppo di input-deck ed analisi di scenari di incidente severo. WP3: analisi del database sperimentale. WP4: analisi della capacità dei codici di simulare e valutare il contenimento del corium nel vessel. WP5: analisi delle capacità dei codici di simulare il contenimento degli iPWR e caratteriz-zare l'efficacia delle misure di mitigazione. WP6: caratterizzazione dell'Emergency Planning Zone per iPWR. WP7: "communication", "dissemination" ed "exploitation".

Responsabile:	MASCARI FULVIO	**Unità:**	FSN-SICNUC-SIN
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-10-2022	**Data Fine:**	30-09-2026
Doc. approvazione:	059/2022/FSN	**Codice atto:**	PF6AAT
Contributo Totale:	€ 2.991.694	**Costo eleggibile:**	€ 4.276.039
Contributo ENEA:	**€ 342.656**	**Costo ENEA:**	**€ 456.875**

SCRREEN3

Solutions for CRitical Raw materials - a European Expert Network 3

Coordinatore: BRGM - BUREAU DE RECHERCHES GEOLOGIQUES ET MINIERES (Francia)

N. Partner:

Abstract:

Based on the experience and background of SCRREEN1 and SCRREEN2, the prolongation of the project SCRREEN3 will continue to develop and animate an Expert Network which will contribute to expert advice in support of decision-making at the EU level covering all the raw materials and their value chains screened in the CRMs assessment.

Attività ENEA:

Le attività ENEA prevedono l'esecuzione di sviluppo della rete (network development) e relativa animazione, in continuità con il ruolo che già svolge in SCRREEN2. Inoltre, sarà Leader del WP11 "Other non Ferrous metals" e sarà responsabile per lo sviluppo dei factsheet di 8 elementi.

Responsabile:	PREKA ROVENA	**Unità:**	SSPT-USER
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 4 - Digital, Industry and Space
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-01-2024	**Data Fine:**	31-12-2026
Doc. approvazione:	327/2023/SSPT/USER	**Codice atto:**	PS6AEK
Contributo Totale:	€ 2.998.759	**Costo eleggibile:**	€ 2.998.759
Contributo ENEA:	**€ 96.750**	**Costo ENEA:**	**€ 96.750**

SEAKNOT

SEVERE ACCIDENT RESEARCH AND KNOWLEDGE MANAGEMENT FOR LWRS

Coordinatore: CIEMAT - CENTRO DE INVESTIGACIONES ENERGETICAS, MEDIOAMBIENTALES Y TECNOLOGICAS (Spagna)

N. Partner:

Abstract:

Severe Accidents (SA) are known to dominate the risk associated with the commercial production of nuclear energy and a vast amount of esearch has been done for decades in order to practically eliminate SAs with the potential for large early releases. At present time, when some of the knowledge acquired is at risk of being lost (as many specialists have already retired or are retiring) and new approaches for the SA assessment are being explored, it seems appropriate timing to deeply review and document the sound existing background and project it into the future, including an update on experimental research on SA mitigation tools. By putting in place the best resources possible to conduct any needed additional research and by articulating the most efficient ways possible to bring the young generation on board to face near- and mid-term research challenges, the best use of the current SA background with guarantees to target those issues bearing most uncertainties nowadays might be ensured. Therefore, it is of utmost relevance to conduct a firm assessment of the current State-of-the-Art and to pass this onto the generation who are inheriting such legacy. Management, exploitation, and assessment of this knowledge, are the main objectives of the SEAKNOT project. In addition, new emerging research needs, as those concerning Small Modular Light Water Reactors (SMLWR) and Accident Tolerant Fuels (ATF), will be considered. Meeting SEAKNOT objectives requires entails carrying out a deep, critical assessment of the current state of the art of the experimental infrastructure and analytical tools that would be necessary to efficiently tackle the challenges posed. The main expected outcomes will be: a sound and critical analysis of the current knowledge on SA; an update of the experimental research needs remaining; a strengthening of background and skills of young generations in the field.

Attività ENEA:

ENEA è coinvolta nei seguenti work package: WP1 dedicato allo sviluppo di una Phenomena Identification Ranking Table (PIRT) per incidenti severi. WP2 dedicato alla costruzione di un database di validazione basato sui database esistenti per incidenti severi. WP4 dedicato alla diffusione della conoscenza.

Responsabile:	MASCARI FULVIO	**Unità:**	FSN-SICNUC-SIN
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-10-2022	**Data Fine:**	30-09-2026
Doc. approvazione:	071/2022/FSN	**Codice atto:**	PF6AAS
Contributo Totale:	€ 2.158.321	**Costo eleggibile:**	€ 2.726.994
Contributo ENEA:	**€ 79.547**	**Costo ENEA:**	**€ 106.063**

SEAWave

Scientific-Based Exposure and Risk Assessment of Radiofrequency and mm-Wave Systems from children to elderly (5G and Beyond)

Coordinatore: UNIV. ARISTOTLE OF THESSALONIKI (AUTH) (Grecia) N. Partner:

Abstract:

The pervasiveness and social-economic dependence on wireless technology has steadily increased over the last three decades. Currently, the 5th generation (5G) New Radio (NR) cellular system is being deployed to unlock the potential of new applications that require the connection of many more devices (Internet of Things), higher data rates and low latency (autonomous driving, 'Factory of the Future'). 5G operates in two frequency bands, 5G NR FR1 and 5G NR FR2. Many exposure parameters of 5G are similar to those of 2G-4G. However, there are also many differences that lead to major knowledge gaps, all of which will be addressed by the SEAWave project. SEAWave will (i) quantify the differences in exposure patterns between 2G-4G and 5G for the entire population including children; (ii) provide new tools and instruments for reliable exposure evaluation of base stations, local networks in factories, and end-user devices; (iii) provide the means to minimise exposure; (iv) generate important new scientific data for assessing the health risk from exposure to the new frequency bands (FR2), especially with regard to the potential (co-)carcinogenicity of skin exposure and other hazardous effects; and (v) provide knowledge for effective health risk communication and dissemination to various stakeholders. To achieve these ambitious objectives, the interdisciplinary consortium consists of highly experienced partners with leading expertise in the field who ideally complement each other to achieve maximum impact. European citizens, workers, national public health authorities, European Commission services, regulators, and standardisation bodies will all benefit from the SEAWave results as they will support science-based decisions and policies for the safe deployment and use of 5G and future wireless networks. Project SEAWave is part of the European cluster on EMFs and health.

Attività ENEA:

L'ENEA riveste il ruolo di leader del WP6 e partecipa anche alle attività dei WP 5,7,8,9 e 11. In particolare sono previste le seguenti fasi: • Utilizzo di due diversi modelli murini per valutare l'impatto dell'esposizione cronica (dall'età neonatale a quella adulta) alla frequenza mm del 5G sulla cancerogenesi cutanea, in particolare valutando le incidenze di basalioma e carcinoma a cellule squamose. • Valutazione dei meccanismi molecolari strettamente correlati al rischio di insorgenza di tumori cutanei. • Valutazione dell'impatto dell'esposizione su altri distretti tessutali potenzialmente a rischio come l'ippocampo, l'occhio e il sistema riproduttivo maschile.

Responsabile:	MANCUSO MARIA TERESA	**Unità:**	SSPT-TECS-TEB
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 1 - Health
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-06-2022	**Data Fine:**	31-05-2025
Doc. approvazione:	218/2022/PRES	**Codice atto:**	PS5ABD
Contributo Totale:	€ 7.317.777	**Costo eleggibile:**	€ 7.317.782
Contributo ENEA:	**€ 1.913.358**	**Costo ENEA:**	**€ 1.913.358**

SECURE

Strengthening the European Chain of sUpply for next generation medical RadionuclidEs

Coordinatore: NCBJ - NATIONAL CENTER FOR NUCLEAR RESEARCH (Polonia) N. Partner:

Abstract:

SECURE project aims to make a major contribution to the sustainability of medical isotope production and its safe application in Europe. It is focusing on promising developments in the design of irradiation targets, production routes for existing and new isotopes in nuclear therapy and diagnostics. Isotopes critical in the success of nuclear medicine are selected and research activities are identified to address some of the major challenges in securing its future availability, with the objectives: 1. to remove critical barriers along the production of its selected alpha and beta emitting isotopes that restrict a sustainable production; 2. to develop a framework of guidance and recommendations that enables exploring the full clinical potential of alpha and beta particle therapy and its safe application; 3. to provide important lessons learned that act as a demonstration case for addressing issues in upscaling and sustained isotope production. At present, Ra-223 is the only radiopharmaceutical which has been granted marketing authorization to treat adults with prostate cancer. This has paved the way for a wider use of other alpha emitters such as Ac-225 or Bi-213. The expected demand of nuclear medicine for novel alpha emitters and beta- emitters requires re-evaluation of their production methods and inventories of target materials and parent radionuclides. The ambition of SECURE consortium is to identify and efficiently use the current resources for new radionuclides, in particular for alpha emitters and the relevant beta emitting theranostic radionuclides. The development of alternative technologies for production of such therapeutic radionuclides for improved patient treatment requires multidisciplinary scientific and technological knowledge including physics, chemistry, material science, machining of target materials, chemistry, biology and radiobiology, radiopharmacy and nuclear medicine. All this chain of expertise is present in SECURE consortium.

Attività ENEA:

L'ENEA, oltre a partecipare al WP5, dedicato all'impatto del progetto, partecipa attivamente a 3 dei 4 WPs tecnico-scientifici: WP1: Sviluppo di bersagli di irraggiamento (Target development) WP2: Vie di produzione (Production routes) WP4: Raccomandazioni per sperimentazioni cliniche e radioprotezione

Responsabile:	CAPOGNI MARCO	**Unità:**	FSN-INMRI
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-10-2022	**Data Fine:**	30-09-2025
Doc. approvazione:	070/2022/FSN	**Codice atto:**	PF1AAL
Contributo Totale:	€ 3.630.426	**Costo eleggibile:**	€ 3.657.175
Contributo ENEA:	**€ 370.719**	**Costo ENEA:**	**€ 370.719**

SEETIPOCEAN

SEETIP Ocean

Support to SET Plan Implementation Working Group and European Technology and Innovation Platform for Ocean Energy

Coordinatore: ASSOCIATION EUROPEENNE DE L (Belgio) N. Partner:

Abstract:

SEETIP Ocean's mission is to enhance cooperation and collaboration amongst stakeholders both inside and outside of the European ocean energy sector. This mission is broken down into 6 objectives: 1. Maximise European scientific excellence in ocean energy 2. Make sustainability and the Just Transition an integral part of ocean energy's development 3. Build a deeper understanding of how ocean energy can optimally fit into the wider energy, industrial & infrastructure systems and planning systems, and help realise this integration 4. Empower the SET Plan Ocean Energy Implementation Working Group and other public authorities by monitoring, analysing and reporting annual commentary on the sector's progress 5. Reinforce and expand the ocean energy network through strong outreach actions 6. Continue the work of ETIP Ocean and SET Plan Ocean Energy IWG after the project ends Ocean energy can power European society and economic life with electricity that is renewable, dependable and in harmony with local communities and environments. To reach this potential, sectoral stakeholders must collaborate, share knowledge and avoid duplication of efforts. SEETIP Ocean will do this by supporting the activities of both the European Technology & Innovation Platform for ocean energy (ETIP Ocean) and the SET Plan Ocean Energy Implementation Working Group. The project's objectives will be achieved through coordination actions bringing individuals and organisations together to exchange knowledge, create new knowledge and build more and deeper connections. Widespread knowledge-sharing will be facilitated via webinars and workshops. Based on these exchanges, SEETIP Ocean will publish accessible studies and reports that will be widely disseminated across and beyond the ocean energy sector. The SET Plan Ocean Energy IWG's work will be supported with annual updated information on sector's progress and policy and funding support. Up-to-date and accurate data will inform the IWG's decision-making.

Attività ENEA:

Le attività svolte da ENEA riguardano l'adozione di metriche appropriate ed efficaci per monitorare e valutare i progressi tecnologici e applicativi nel campo dell'energia dal mare. ENEA contribuirà inoltre alla diffusione di competenze tra gli stakeholder del settore e parteciperà alle attività di trasferimento tecnologico del progetto, per stimolare lo sviluppo in ambiti specifici riconosciuti come prioritari.

Responsabile:	STRUGLIA MARIA VITTORIA	**Unità:**	SSPT-MET-CLIM
Anno Stipula:	2022		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D3 Energy supply
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-08-2022	**Data Fine:**	31-07-2025
Doc. approvazione:	155/2022/SSPT-MET	**Codice atto:**	PS2ACK
Contributo Totale:	€ 788.254	**Costo eleggibile:**	€ 788.254
Contributo ENEA:	**€ 67.410**	**Costo ENEA:**	**€ 67.410**

SHARE.MedWATER

Strategic Harmonization and Resource Enhancement in the MEDiterranean: Advancing Water Management and Innovation through Non-Conventional Resources

Coordinatore: ANETEL - LARNACA AND FAMAGUSTA DISTRICTS DEVELOPMENT AGENCY (Cipro)

N. Partner:

Abstract:

Strategic Harmonization and Resource Enhancement in the MEDiterranean: Advancing Water Management and Innovation through Non-Conventional Resources – SHARE.MedWATER project co-funded by Interreg Euro-MED Programme aims to tackle water scarcity by fostering the reuse of unconventional water sources through innovative treatment technologies, circular water strategies, and participatory governance models, promoting community-based approaches, knowledge sharing, and policy integration and supporting sustainable and resilient water management in the Euro-MED region

Attività ENEA:

ENEA è partner del progetto, è Leader del WP3 Strategie di adattamento ai cambiamenti climatici per la salvaguardia della risorsa idrica. ENEA, infine, è coinvolta nei lavori del tavolo tecnico per l'elaborazione della nuova normativa nazionale sul riuso delle acque. Inoltre, l'ENEA porterà avanti un'ampia indagine bibliografica focalizzata sulle tecnologie per il recupero e il riutilizzo delle acque piovane e delle acque grigie nelle aree urbanizzate. L'obiettivo principale di questa ricerca è identificare, analizzare e sintetizzare i più recenti progressi, metodologie e applicazioni in questo ambito.

Responsabile:	DI FABIO SILVIA	**Unità:**	SSPT-EC-AR
Anno Stipula:	2025		
PQ:	Other programmes (2021-2027)	**Programma UE:**	Interreg Euro MED
		Tipo Progetto:	N/A - Non applicabile
Data Inizio:	01-09-2025	**Data Fine:**	31-05-2029
Doc. approvazione:	168 /2025/SSPT/EC	**Codice atto:**	PS6AFK
Contributo Totale:	€ 3.198.188	**Costo eleggibile:**	€ 3.997.735
Contributo ENEA:	**€ 201.500**	**Costo ENEA:**	**€ 201.500**

SMILE CITY

Sustainable materials for innovative, low emissions applications in the circular city

Coordinatore:

N. Partner:

Abstract:

SMILE CITY provides realistic circular systemic solutions to support the evolution towards a carbon-neutral, environmentally sustainable, toxic-free, circular economy by 2050. The contribution to C02 reduction works on two levels: - an intensive use of recycled materials in replacement of virgin ones, without decreasing the performance of final products; - the use of such products and applications to increase sustainable mobility. The project aims to integrate innovative systemic solutions in up to 100 km of cycling paths and implement 20 e-bike charging stations, developed using different types of recycled urban waste: construction materials, EoL tyres and EoL batteries from Electric Vehicles. The foreseen innovations include the creation of e-bike charging stations made of recycled concrete precast elements and PV panels equally produced with recycled materials, the installation of recycled rubber moulded products for urban furniture such as rubber bollard, lane dividers, and rubberized asphalt, which contributes both to increase sustainability and safety. SMILE CITY will thus assemble the technological state of the art of the different value chains involved to implement circular systemic solutions in 7 different EU and non-EU countries, backing the transition towards a regenerative, inclusive and circular economy at local and regional scale across Europe and therefore boosting interregional and cross-border cooperation. In addition, the project will also increase resource efficiency, reinforcing Europe's strategic autonomy and reduce the negative environmental footprint related to current recycling techniques of the considered urban waste value chains. By supporting awareness raising and information spreading, SMILE CITY will engage both citizens and industrial leaders in the green transition towards climate-neutral solutions for Circular Cities, bolstering the market uptake of circular solutions through regional and local actions. Two partners are CCRI members.

Attività ENEA:

L'ENEA è partner del progetto. E' Leader del WP5 "Testing, Validation, Quality Assessment and Monitoring" e si occuperà-di monitorare i risultati progettuali- Inoltre partecipa alle attività dei seguenti Work Package: WP1 - "Project Management and Coordination"; WP3 "Circular Systemic Solutions"; WP8 "Communication and Dissemination"

Responsabile:	SPOSATO CORRADINO	**Unità:**	TERIN-PAEN
Anno Stipula:	2025		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 6 - Food, Bioeconomy, Natural Resources, Agriculture and Environment
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-01-2025	**Data Fine:**	31-12-2028
Doc. approvazione:	303/2024/TERIN	**Codice atto:**	PKAAAD
Contributo Totale:	€ 9.356.239	**Costo eleggibile:**	€ 10.506.797
Contributo ENEA:	**€ 277.250**	**Costo ENEA:**	**€ 277.250**

SOLARIZE

Bringing EU-SOLARIS ERIC to its Zenith

Coordinatore: EU-SOLARIS ERIC - EUROPEAN SOLAR RESEARCH INFRASTRUCTURE FOR CONCENTRATED SOLAR POWER (Spagna)

N. Partner:

Abstract:

The SOLARIZE project intends to enhance the long-term sustainability of the EU-SOLARIS ERIC by successfully achieving its general objectives: enlargement of the membership; further involvement of R&D institutes and national funding institutions at the National Nodes; educating new researchers to make appropriate use of the RIs; reinforcement of international cooperation and of science diplomac; improvement of the managerial skills of its staff; strengthen the interaction between industrial stakeholders and CST researchers; increase of the general awareness of other possible applications of CST RIs, e.g. industrial process heat; development of new standards and testing protocols; creation of the first e-infrastructure providing Remote/Virtual access to the R&D centres; study of best ways to combine CST with other energy sources and last but not least, targeting the greening of technologies and methodologies used by the CST RIs.

Attività ENEA:

ENEA contribuirà alle attività dei seguenti WP: WP1, WP2, WP3, e WP5. ENEA sarà responsabile del Deliverable: D3.5.1 – “Strategic Research and Innovation Agenda of European CST; e del task 3.5 dedicato alla Progettazione di una strategia congiunta di ricerca a lungo termine a livello europeo. Le attività di questo task saranno finalizzate alla esplicitazione di un quadro generale di attività strategiche di ricerca, sviluppo e innovazione che occorre attuare affinché il settore del CST possa contribuire in maniera fattiva alla realizzazione di un’economia a zero emissioni nette di gas serra entro il 2050

Responsabile:	GAGGIOLI WALTER	**Unità:**	TERIN-SSI
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Research Infrastructures (2021-2027)
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-07-2024	**Data Fine:**	31-12-2027
Doc. approvazione:	113/2024/TERIN	**Codice atto:**	PK7AAM
Contributo Totale:	€ 3.557.638	**Costo eleggibile:**	€ 4.468.405
Contributo ENEA:	**€ 102.500**	**Costo ENEA:**	**€ 128.125**

TWINNING COORDINATION FOR ENHANCED SCIENTIFIC CAPACITY IN WATER QUALITY, FOOD SAFETY, TRACEABILITY, AND AUTHENTICITY BY USING INNOVATIVE APPROACHES

Coordinatore: UNIV. ARISTOTLE OF THESSALONIKI (AUTH) (Grecia) N. Partner:

Abstract:

SPECTRA aims to improve AUTH R&I capacities to strengthen its scientific reputation, attractiveness, visibility, and networking channels. SPECTRA will stimulate scientific excellence and innovation in key research areas of Water Quality and Food Safety, Quality & Traceability (WQ&FSAT) for addressing the challenges that emanate from ongoing and accelerating climate changes in Greece. SPECTRA approach will be achieved by a unique combination of research activities, “hands-on” training, academic and non-academic mobilities /courses and workshops on scientific and complementary transferable skills facilitated by the academic-non- academic composition of the consortium. It will reinforce R&I and knowledge transfer capacity of AUTH’s research staff, including its permanent scientists and Early-Stage Researchers (ESR), fostering collaboration between academia, industry, and stakeholders in Greece within a sustainable research framework, promoting international networking, mobility, and integration into the European Research Area (ERA). At scientific level, it is expected to enlarge the community of competitive prestigious researchers at AUTH in WQ&FSAT, stronger and better-connected to a core of international and relevant R&I systems, supported by skilled R&I managers with their international networks. At social level, it is expected an improvement in WQ&FSAT by providing new breakthrough scientific knowledge on quality of water resources, advancing food safety supervision performance, increasing consumer and market confidence in Greek food product safety, facilitating monitoring, inspections, decision-making by competent authorities, and supply chain actors and policymakers and enhancing networking, and engaging with food safety high-level experts. At an economic level, the project will contribute to the development of an innovative WQ&FSAT industry and the profitability of regional companies through new product development, approaches and tools, innovation support, and job creation.

Attività ENEA:

ENEA è Leader del WP5 (Sustainability actions to step-up and continuously grow the excellence).

Responsabile:	DIRETTO GIANFRANCO	**Unità:**	SSPT-BIOAG
Anno Stipula:	2024		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	WIDERA - Widening participation and spreading excellence
		Tipo Progetto:	CSA - Coordination and support action
Data Inizio:	01-10-2024	**Data Fine:**	30-09-2027
Doc. approvazione:	97/2024/SSPT-BIOAG	**Codice atto:**	PS1ADY
Contributo Totale:	€ 1.492.415	**Costo eleggibile:**	€ 1.492.415
Contributo ENEA:	**€ 230.384**	**Costo ENEA:**	**€ 230.384**

StoRIES

Storage Research Infrastructure Eco-System

Coordinatore: KIT - KARLSRUHER INSTITUTE OF TECHNOLOGY (Germania) N. Partner:

Abstract:

According to the European Green Deal goals, new energy storage technologies will supply more flexibility and balance in the grid, providing a back-up to intermittent renewable energy and contribute to seasonal energy storage challenges. Above all, the main challenge for energy storage development is economic. In order to achieve more performing, competitive and cost effective energy storage devices, the project fosters a European ecosystem of industry and research organisations on energy storage technologies aimed at developing novel concepts and technologies. StoRIES brings together a consortium of 32 beneficiaries from 17 countries: ESFRI facilities, technology institutes, universities and industrial partners to jointly improve the economic performance of storage technologies. Members of the European Energy Research Alliance and from the industry lead European Association for Storage of Energy are establishing the core of this world-class European ecosystem. The main objectives of StoRIES are linked to the energy storage development by providing access to world-class research infrastructures and services, with a focus on improving materials for devices and optimizing hybrid energy systems with a view to make energy technologies more competitive and reducing costs. In addition, StoRIES focuses on the analysis of socio-technical and environmental aspects of new developments and systems and provides training and education on these issues. By promoting complementary expertise, interdisciplinary cooperation and a broader exchange of knowledge and technologies throughout the academic world and with industry, StoRIES will significantly improve the technological basis for energy storage applications. Furthermore, StoRIES will establish an ecosystem with international peer partners from Research and Industry to foster open science and promote new energy technology standards.

Attività ENEA:

ENEA svolge attività relative a: . gestione dei dati (WP1 - task leader per FAIR Data); . fornire accesso a infrastrutture di livello mondiale (WP2 – 3 Infrastrutture di ricerca); . Sviluppo di strumenti per tecnologie ibride (WP3 – dai materiali ai sistemi); . Definizione della roadmap (WP3); . Attività sulla valutazione della sostenibilità (WP4).

Responsabile:	PAOLETTI CLAUDIA	**Unità:**	TERIN-PSU-ABI
Anno Stipula:	2021		
PQ:	HORIZON 2020	**Programma UE:**	European Research Infrastructures
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-11-2021	**Data Fine:**	31-10-2025
Doc. approvazione:	217/2021/TERIN	**Codice atto:**	PK4AAM
Contributo Totale:	€ 6.999.980	**Costo eleggibile:**	€ 7.001.439
Contributo ENEA:	**€ 413.031**	**Costo ENEA:**	**€ 413.031**

EUROPEAN DEFENCE AGENCY

STYX

STAND-OFF DETECTION OF HYBRID THREATS CONTAINING EXPLOSIVES

Coordinatore: FOI SWEDISH DEFENCE RESEARCH AGENCY (Svezia) N. Partner:

Abstract:

The project STYX aims at developing and test systems for detecting and identifying explosive threats, such as mprovised Explosive Devices (IEDs), fast and from a stand-off distance. Recently, an increased awareness of threats from “grey zone” hybrid warfare has emerged, these threats include the use of IEDs by military or para-military/adversary networks, which can both reside and operate cross border. Such IED threats are a significant challenge for Member States Armed Forces and will be a cause of hazard for civilians. They also have the potential to severely disrupt both military and civilian logistic support, damage critical infrastructures (e.g. military bases, government buildings, air bases/airports, harbours, power plants, chemical industry, oil/fuel depots, …) and affect strategic lines of communication (e.g. bridges, roads, railways, ferries, …). In this way, these “grey zone” hybrid threats will be more complex than route clearance threats that Armed Forces have encountered in previous military operations (e.g. Afghanistan or Iraq). Key capabilities, to ensure an enhanced Force Protection, require fast, accurate and safe techniques to detect, identify and defeat/neutralize explosive threat devices. Therefore, the aim of the project is to identify new sensors for fast stand-off detection of existing and new types of explosives embedded in IEDs and other explosive threats. Such sensors should be able not only to detect the explosive but also to identify it, in order to minimize false positive alarms. Stand-off sensors for both trace and bulk explosives will be considered. The STYX project will be a starting point for research and development of novel stand-off detection sensors for explosives applied to hybrid warfare scenarios, aiming to reach TRL 5-6. It will strengthen the European knowledge base for future advanced stand-off detection equipment, materials and their applications. At the end of the project, both technological system development as well as the work done in testing and evaluation, will contribute to the long term goal of increasing the overall capability to tackle explosives used in hybrid warfare.

Attività ENEA:

L'ENEA partecipa in quasi tutte le attività del progetto con particolare contributo nello sviluppo di un sensore per la rivelazione in tracce di sostanze energetiche (esplosivi e loro precursori) che possa operare in tempo reale e a distanza nel WP300. Questo nuovo sensore implementerà una soluzione tecnica innovativa nel rimuovere la fluorescenza emessa dal substrato utilizzando un laser ad impulsi ultra corti con relativa catena elettronica veloce. Sempre nello stesso WP300, il laboratorio DIM collabora con il Fraunhofer ICT ai test sulla tecnica SERS. Una dimostrazione finale è prevista dopo il terzo anno a cui a seguire ci sarà una valutazione dei dati acquisiti.

Responsabile:	SANTORO SIMONE	**Unità:**	FSN-TECFIS-DIM
Anno Stipula:	2021		
PQ:	Other programmes	**Programma UE:**	European Defence Agency CAPTECH
		Tipo Progetto:	N/A - Non applicabile
Data Inizio:	15-12-2021	**Data Fine:**	14-12-2025
Doc. approvazione:	491/2021/PRES	**Codice atto:**	PF7ABT
Contributo Totale:	€ 700.000	**Costo eleggibile:**	€ 1.400.000
Contributo ENEA:	**€ 350.000**	**Costo ENEA:**	**€ 700.000**

Sulphurreal

SULPHURREAL

An innovative thermochemical cycle based on solid sulphur for integrated long-term storage of solar thermal energy

Coordinatore: DLR - GERMAN AEROSPACE CENTER E.V. (Germania) N. Partner:

Abstract:

SULPHURREAL aims at demonstrating and validating a breakthrough approach for next generation, carbon-free, direct conversion of solar energy into chemicals storable for a virtually unlimited time, based on elemental sulphur produced and consumed on-demand via a solar-aided thermochemical cycle. The project is targeted on the one hand to develop disruptive catalytic technologies for the two catalytic steps of this solid sulphur thermochemical cycle, namely the high- (800-850 C) and medium- (600-650 C) temperature catalytic SO3 splitting to SO2 and oxygen and the subsequent disproportionation of SO2 to solid sulphur and sulphuric acid. The research line involves identifying, developing and testing novel catalysts and reactor designs under operating conditions so that these two, less developed steps of the cycle cf. sulphur combustion, can be integrated and performed in sequence with maximum compatibility in a first-of-its kind integrated approach. Innovations to be introduced concern not only novel catalyst compositions but also novel reactor designs and methods of applying and distributing the catalysts within the reactors, to achieve maximum utilisation of the active catalytic materials and optimal combination of improved performance, conversion efficiency and process cost reduction. On the other hand, SULPHURREAL will further develop and upscale a first-of-its-kind sulphur burner operating at power density > 5 MW/ m³ at ambient pressure and having demonstrated potential for prolonged operation at power densities of > 75 MW/cbm for typical operating pressure of 15 bar by simulations. The proposed combination integrates renewable energy sources (solar energy) with valorisation of non-CRM substances currently produced as industrial by-products from oil and gas (solid sulphur) and steel industries (Fe-containing slags) and industrial-scale chemicals production (sulphuric acid industry) in absolute accordance with a circular economy environment and industrial symbiosis.

Attività ENEA:

ENEA è leader dei WP3 “Sulphur dioxide disproportionation catalysts” e WP6 ”Sulphur dioxide disproportionation reactor”. E' inoltre presente nei seguenti WP: 1 'Project coordination and management; 2 'Sulphur trioxide splitting catalysts'; 4 Advanced materials shaping; 8 System integration, Techno-Economic Analysis and Life Cycle Assessment; 9 Knowledge and innovation management, dissemination and communication.

Responsabile:	SAU GIOVANNI SALVATORE	**Unità:**	TERIN-STSN-SCIS
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	EIC - European Innovation Council
		Tipo Progetto:	EIC Grants
Data Inizio:	01-10-2023	**Data Fine:**	30-09-2026
Doc. approvazione:	146/2023/TERIN	**Codice atto:**	PK7AAI
Contributo Totale:	€ 3.982.133	**Costo eleggibile:**	€ 3.982.134
Contributo ENEA:	**€ 527.625**	**Costo ENEA:**	**€ 527.625**

Symbiosyst

SYMBIOSYST

Create a Symbiosis where PV and agriculture can have a mutually beneficial relationship

Coordinatore: EURAC - ACCADEMIA EUROPEA DI BOLZANO (Italia) N. Partner:

Abstract:

The decarbonisation of the energy sector is one of the top priorities at various political levels including at the European level. Photovoltaics (PV) is widely seen as one of the key technologies to drive the energy transition. The difficulties arise when the targets for PV (usually set at national level) needs to be put into practice at regional / local level. Although the PV rooftop potential is extremely large and could potentially contribute to the ambitious targets, the rate of installation of PV rooftop systems will not be fast enough to support a rapid transition. On the other hand, large utility-scale PV installations in open fields are not an option in many regions. It is in this context that the concept of Agrivoltaics is emerging. What several decades of efforts developing Building Integrated PV (BIPV) products and systems for rooftops and facades have taught us is that there are multiple levels of integration and various stakeholders across the value chain which can all generate significant barriers to widespread adoption. Agrivoltaics is in fact in the unique position to learn from the past mistakes made with BIPV which delayed the development of cost-effective BIPV solutions and market acceptance. In SYMBIOSYST we will not develop solutions that are highly customized as this would drive the costs up. We will rather innovate by adapting standardized cost-effective solutions in terms of PV modules, mounting structures and Operation and Maintenance (O&M) practices to the specific needs of various crops in different climates and landscapes. We will also find aesthetically pleasing solutions that can be mass manufactured and integrated with the agricultural land in a harmonious way while maintaining the primary goal of farming. The interdisciplinary consortium in SYMBIOSYST is composed of partners across the value chain with decades of experience in agriculture, precision farming, PV modules and systems, social science and integrated PV applications.

Attività ENEA:

Le attività che l'ENEA svolge all'interno del progetto SYMBIOSYST saranno inquadrate nel work package 'Agrophotovoltaics modelling value chain': Strumento di integrazione del paesaggio basato su GIS: l'ENEA guiderà lo sviluppo di un tool transdisciplinare basato su uno strumento GIS che integra una metodologia descrittiva spazialmente centrica, con l'obiettivo di facilitare e valorizzare l'integrazione dell'agrivoltaico nel modello paesaggistico.

Responsabile:	SCOGNAMIGLIO ALESSANDRA	**Unità:**	TERIN-FSD-DIN
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Cluster 5 - D3 Energy supply
		Tipo Progetto:	IA - Innovation Action
Data Inizio:	01-01-2023	**Data Fine:**	31-12-2026
Doc. approvazione:	226/2022/TERIN	**Codice atto:**	PK2AAE
Contributo Totale:	€ 4.827.668	**Costo eleggibile:**	€ 5.775.143
Contributo ENEA:	**€ 242.750**	**Costo ENEA:**	**€ 242.750**

TANDEM

Small Modular ReacTor for a European sAfe aNd Decarbonized Energy Mix

Coordinatore: CEA - COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES (Francia)

N. Partner:

Abstract:

Small Modular Reactors (SMRs) can be hybridized with other energy sources, storage systems and energy conversion applications to provide electricity, heat and hydrogen. SMR technology thus has the potential to strongly contribute to the energy decarbonisation in order to achieve climate-neutrality in Europe by 2050. However, the integration of nuclear reactors, particularly SMRs, in hybrid energy systems is a new R&D topic to be investigated. In this context, the TANDEM project aims to provide assessments and tools to facilitate the safe, secure and efficient integration of SMRs into smart low-carbon hybrid energy systems. It proposes to specifically address the safety issues of SMRs related to their integration into hybrid energy systems, involving specific interactions between SMRs and the rest of the hybrid systems; new initiating events will have to be considered in the safety approach. An open-source "TANDEM" model library of hybrid system components will be developed in Modelica language to build a hybrid system simulator which, by coupling, will extend the capabilities of existing tools implemented in the project. TANDEM intends to focus on two main study cases corresponding to hybrid system configurations covering the main trends of the European energy policy and market evolution: a district heating network and power supply in an urban area, and an energy hub serving energy conversion systems, including hydrogen production, in a regional perspective. TANDEM will provide assessments on SMR safety, hybrid system operationality and techno-economics. Societal considerations will also be encased by analyzing the European citizen engagement regarding SMR technology safety. The work will result in technical, economic and societal recommendations and policy briefs on the safety of SMRs and their integration into hybrid energy systems for industry, R&D teams, TSOs, regulators, NGOs and policy makers. The TANDEM consortium will involve 17 partners from 8 countries.

Attività ENEA:

ENEA sarà coinvolta nei seguenti work package: • WP2: Modelling for the simulation of the hybrid system behaviour, dedicato allo sviluppo dei modelli necessari alla simulazione del comportamento del sistema ibrido di test a effetti separati (SET) e combinati (CET). Task 2.1: si contribuirà a definire la strategia da adottare per la modellazione e per condurre le simulazioni. Task 2.4: ENEA svilupperà il modello CATHARE dell'intero sistema che dovrà essere impiegato per le analisi da condurre nel WP4. • WP4 dedicato ad analisi di transitorio ed incidentali da condurre per dimostrare l'affidabilità e la sicurezza dell'intero sistema.

Responsabile:	LOMBARDO CALOGERA	**Unità:**	FSN-SICNUC-SIN
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-09-2022	**Data Fine:**	31-08-2025
Doc. approvazione:	073/2022/FSN	**Codice atto:**	PF6AAZ
Contributo Totale:	€ 3.372.401	**Costo eleggibile:**	€ 3.781.490
Contributo ENEA:	**€ 140.375**	**Costo ENEA:**	**€ 159.125**

THOTH2

NOVEL METHODS OF TESTING FOR MEASUREMENT OF NATURAL GAS AND HYDROGEN MIXTURES

Coordinatore: SNAM SPA (Italia) N. Partner:

Abstract:

How maximize hydrogen (H2) blending potential in natural gas (NG) networks, supporting European energy system decarbonisation? The answer lies in the need of a systemic, multi-disciplinary approach to make NG infrastructure resilient to the challenges of tomorrow. Industrial and research players' competences are required. In this framework, THOTH2 consortium focuses on energy measurement value chain and instruments' ability to accurately measure physical parameters of H2NG mixtures with increasing H2 percentages, up to 100%. Including gas TSOs, DSOs, metrological and research institutes and academia, THOTH2 consortium has all competences and skills to reach the goals of i) define standards to evaluate the metrological performances of measuring devices at different H2 blending rates (up to 100%), ii) verify safety and durability of the same devices, and iii) suggest future needs to overcome the observed barriers and limitations. SNAM competences in managing NG assets are essential for the coordination and synergic integration of the 14 partners, recognized as experts in NG and H2 industry (GRTGAZ, GAZ-SYSTEM, Enagás, INRETE), metrology (CESAME, INRIM, METAS), H2 blending technologies and measuring devices design, engineering, and R&D activities (UNIBO, INIG, FBK, ENEA, CSIRO). The communication and dissemination strategy by GERG will give visibility to project's results, including contributions to Mission Innovation 2.0 and EURAMET projects. THOTH2 vision will lead to an acceleration towards H2 economy, contributing to REPowerEU and NextGeneration EU objectives. The project impact potential includes the establishment of a R&D Hub center, including THOTH2 partners and Advisory Board members, to translate into valuable results achieved by the project, aiming to i) the development/update of international standards, ii) foster innovation in the field of H2NG blending measuring devices, and iii) supporting H2 value chain development leveraging on the EU gas infrastructure.

Attività ENEA:

L'ENEA partecipa ai seguenti workpackage: WP1: predisposizione del Report Deliverable 1.3 "Normative gaps towards H2NG gas grid" WP4: supporto nella definizione di nuovi standard e nella identificazione delle innovazioni tecnologiche necessarie alla conversione delle reti gas a miscela idrogeno/gas naturale WP5: supporto alla disseminazione dei risultati WP6: supporto alla organizzazione generale del Progetto

Responsabile:	GISLON PAOLA	**Unità:**	TERIN-PSU-ABI
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	Clean Hydrogen JU
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-02-2023	**Data Fine:**	01-07-2025
Doc. approvazione:	17/2023/TERIN	**Codice atto:**	PK4AAT
Contributo Totale:	€ 1.997.361	**Costo eleggibile:**	€ 1.997.361
Contributo ENEA:	**€ 43.125**	**Costo ENEA:**	**€ 43.125**

European Innovation Council

THREAD

THermite REactions Assisting satellite Demise

Coordinatore: POLITECNICO DI MILANO (POLIMI) (Italia) N. Partner:

Abstract:

This project develops a new method to manage the decommissioning of satellites through the use of on-board heat generation systems based on non-explosive thermite charges, called thermite-for-demise (T4D). Thermites are mixtures of metal and metal oxide which can undergo spontaneous exothermic reactions even in vacuum, according to composition and production. Pioneering projects have demonstrated that T4D may be used to damage space components and support their demise during atmospheric reentry. However, its real world application needs the filling of knowledge gaps and practical problems: (A) the powdered form is not the best way to obtain localized reliable heat release; (B) the expected life cycle in a space mission has never been considered; (C) a strategy for T4D use is not available. The project targets the maturation of T4D technology in three major steps. (1) New thermite-based composite materials granting thermite a structural consistency will be developed and their behavior characterized. Environmental stress tests will secure their use across satellite lifecycle. (2) With these building blocks, heat-generating shapes and devices will be developed, supported by the experience of a large spacecraft integrator. The heat transfer behavior of thermite-based objects will be modeled and validated under representative reentry conditions, in hypersonic wind tunnel. Results will support the update of system-level reentry simulation tools and the definition of application strategy, further validated on demise test in wind tunnel with hardware of representative or simplified geometry from the selected use-cases, supplied by a space company. (3) All previous outcomes will support a cost-benefit analysis for T4D industrial implementation and its long term evolution. The results of the project will demonstrate with new experiments and modeling approaches that T4D has the potential to become an engineering standard for the space community.

Attività ENEA:

L'ENEA è partner del progetto e parteciperà attivamente ai seguenti 3 Work Packages: WP1: Management WP4 – Environmental stress tests WP7 - Communication, dissemination, and exploitation

Responsabile:	CEMMI ALESSIA	**Unità:**	NUC-IRAD-GAM
Anno Stipula:	2025		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	EIC - European Innovation Council
		Tipo Progetto:	EIC Grants
Data Inizio:	01-05-2025	**Data Fine:**	31-10-2028
Doc. approvazione:	4 (2025) NUC	**Codice atto:**	PF1AAO
Contributo Totale:	€ 2.919.176	**Costo eleggibile:**	€ 2.919.176
Contributo ENEA:	**€ 250.000**	**Costo ENEA:**	**€ 250.000**

TITANS

Tritium Impact and Transfer in Advanced Nuclear reactorS

Coordinatore: CEA - COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES (Francia)

N. Partner:

Abstract:

The TITANS (Tritium Impact and Transfer in Advanced Nuclear reactorS) multidisciplinary project is built to contribute to Research and Innovation to “improve knowledge on tritium management in fission/fusion facilities” and provide ”robust science to EU safety regulators, radiation protection authorities and decision makers”. TITANS will answer the main challenges of the call: i) Tritium permeation description and associated modeling, ii) tritium measurement, iii) mitigation of tritium release, iv) gain expertise on dismantling activities, v) improve knowledge in radiotoxicity and radiobiology, both combined to dosimetry specific to each biological model studied. The TITANS work program is established from the results obtained in the former EU TRANSAT project and thanks to scientific discussion within TRANSAT SAC, TITANS members and external experts from EU/broader countries. TITANS will improve modelling tools to assess tritium inventory/migration in nuclear fission/fusion reactors in order to identify where the new barrier concept developed within TITANS are needed to limit the spread of tritium. The tritium release during dismantling of tritium-contaminated setup will be evaluated with the help of innovative tritium inventory measurement techniques developed within TITANS. Finally, to ensure tritium circular economy, a mobile device for tritiated water processing will be developed. At last, human and environmental toxicity impacts after an accidental release of tritiated particles will be assessed through studies on i) the behaviour of aerosols in the environment, ii) biological effects on a mussels population, iii) biokinetics by the skin route and iiii) genotoxic effects on human lung macrophages. In order to estimate a dose-response relationship, a dosimetric study specific to each organism or cell type will be carried out. This 3 years project with a 3 M€ allocated budget gathers 21 partners from European countries and UK all involved in tritium activities.

Attività ENEA:

Il progetto vede il coinvolgimento dell’ENEA nei seguenti Work Packages: - WP1, Proposals for enhancement of barriers against tritium permeation and tritiated waste management, - WP2, Tritium inventory management and modeling - WP4, Dissemination, Communication & Stakeholders Engagement

Responsabile:	TOSTI SILVANO	**Unità:**	FSN-FUSTEC-TEN
Anno Stipula:	2022		
PQ:	Euratom2027	**Programma UE:**	Euratom fissione
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-09-2022	**Data Fine:**	31-08-2025
Doc. approvazione:	095/2022/FSN	**Codice atto:**	PF3AAH
Contributo Totale:	€ 2.843.297	**Costo eleggibile:**	€ 3.854.193
Contributo ENEA:	**€ 197.225**	**Costo ENEA:**	**€ 281.750**

Traceability in medical X-ray imaging dosimetry

Coordinatore: STUK RADIATION AND NUCLEAR SAFETY AUTHORITY (Finlandia) N. Partner:

Abstract:

X-ray imaging, covering diagnostic and interventional examinations, is an important part of modern medicine but on the other hand it forms the largest component of exposure to artificial ionizing radiation in Europe. Therefore, accurate and consistent quantification of patient radiation exposure with calibrated dosimetry equipment is essential to comply with Council Directive (2013/59/Euratom) and to ensure safety to patients. Currently, the calibration procedures used by calibration laboratories are based on relevant standards (IEC 61267, IEC 61674, IEC 61676) and international protocols (IAEA TRS-457) however they do not fully consider the recent technical developments within medical X-ray imaging. This project will perform a critical assessment of conditions applied in calibrations compared to those used in clinical practice and will study the performance of different clinical dosimeters and for calibrations. Based on the results, updated and traceable measurement and calibration procedures will be proposed to IEC and IAEA for inclusion into forementioned standards and protocols.

Attività ENEA:

L'ENEA partecipa a tutti i work package tecnici del progetto e coordina il Work package 2 "Classification of dosimeters based on their performance".

Responsabile:	PINTO MASSIMO	**Unità:**	FSN-INMRI
Anno Stipula:	2023		
PQ:	HORIZON EUROPE (2021-2027)	**Programma UE:**	EPM - European Partnership on Metrology
		Tipo Progetto:	RIA - Research and Innovation Action
Data Inizio:	01-06-2023	**Data Fine:**	31-05-2026
Doc. approvazione:	116/2023/FSN	**Codice atto:**	PF5AAM
Contributo Totale:	€ 1.098.530	**Costo eleggibile:**	€ 1.098.530
Contributo ENEA:	**€ 85.000**	**Costo ENEA:**	**€ 85.000**

tunES

Tuning EPC and SRI instruments to deliver full potential

Coordinatore: EMPIRICA (Germania) N. Partner:

Abstract:

tunES brings together 7 national Energy Agencies, representing 132 million citizens, who will tackle the common challenge of making building energy efficiency and smartness instruments work. Member States (MS) receive technical assistance, support and consulting from 4 research organisations, forming the Technical Support Team (TST). tunES will impact positively on the shortcomings of implementing EPC, SRI, and linked instruments, by structuring work into five building blocks to better collect, share, implement and replicate good practice: Understanding EPC, Upgrading EPC, Databases & Tools, SRI Development & Deployment, and, as horizontal block, Integration of Instruments to maximise harmonisation, coherence and synergies. Each building block is represented by MS Leaders having implemented good practice. MS Followers design policy options, packages and pathways that will facilitate uptake of good practice. tunES deploys a Technical Support and Assistance Framework based on the EU Better Regulation Guidelines (BRG). For each stage of the policy design process (inception, data collection, analysis, policy options design, prioritisation, impact assessment, iteration, roll-out planning and throughout stakeholder engagement). Simultaneously and across the building blocks, the TST prepares for the Energy Agencies the necessary methods and tools to safeguard consistency within and across MS. From the beginning, results on good practice as well as how to apply BRG methods are publicly shared in a guidance. Other MS are invited to apply all or selective methods in-sync with the project. The core outcome are seven national policy measure packages including extensively vetted policy options, with clear impact, stakeholder reaction, and concise actions for realising full national implementations. On the EU-level, a comprehensive guidance strategy allows other stakeholders not only to access use cases but have all tools readily at hand for effective replication.

Attività ENEA:

ENEA è leader del work package n. 1 "Facilitation of cross-border Exchange and external Follower Network" ed è coinvolta in tutti gli altri work package: . WP2 Data Collection and National Stakeholder Engagement . WP3 Policy Development & Ex-ante testing . WP4 Data analysis & Impact Assessment . WP5 Sustainability, Replication and Exploitation of Project Results + Dissemination . WP6 Project Management & Coordination

Responsabile:	DI PIETRA BIAGIO	**Unità:**	DUEE-SPS-SEI
Anno Stipula:	2023		
PQ:	Other programmes (2021-2027)	**Programma UE:**	LIFE27 (2021-2027)
		Tipo Progetto:	LIFE ProJect Grants
Data Inizio:	01-09-2023	**Data Fine:**	31-08-2025
Doc. approvazione:	20/2023/DUEE-SPS	**Codice atto:**	PW3ABF
Contributo Totale:	€ 1.999.707	**Costo eleggibile:**	€ 2.104.954
Contributo ENEA:	**€ 208.942**	**Costo ENEA:**	**€ 219.939**