CETP – Clean Energy Transition Partnership

A webinárium célja:

- A pályázati konstrukció rövid bemutatása (kezdő és tapasztalt pályázóknak)
- Módszertani tanácsok a pályázati tervezéshez;
- Figyelemfelkeltés a 2025-ös változásokra;
- A 2025-ös felhívások bemutatása;
- Előző évek magyar pályázati tapasztalatainak bemutatása.

VÁLTOZÁSOK 2025-től!

Változik a pályázati időszak !

Korábban lesznek közzétéve a felhívások (május végén)!

A pályázati időszak június 11-én nyílik.

CETP – Clean Energy Transition Partnership

Horizont Európa Keretprogram része
Társfinanszírozott partnerség

Támogatja és előmozdítja a tudományos szféra – közszféra - piaci szféra közötti együttműködést az innovációs célkitűzések megvalósítása érdekében – a **megújuló energiák területén.**

Támogatási időszak: 2021-2027

Éves magyar költségvetés: 1 165 000 EUR (ebből kb. 5-6 projekt támogatható)

Projektenként max. 300 000 EUR; partnerenként max. 150 000 EUR; konzorcium vezetőként max. 200 000 EUR pályázható.

A felhívások csak a CETP honlapján érhetők el - nem a Funding and Tenders portálon, Úgyszintén az aktuális információk Clean Energy Transition Partnership

Pályázási felület:
CETPartnership Submission Platform (mur.gov.it)
CETP

CETP felhívások sajátosságai a HE klasztertípusú felhívásokhoz képest

- A tagállami prioritások jobban előtérbe kerülnek a partnerség esetében;
- Kevésbé erős a verseny a CETP – nél mint a klasztertípusú HE pályázatoknál;
- Kisebb konzorciumok, kisebb költségvetéssel a CETP pályázatoknál a nemzeti költségvetési korlátokból adódóan

A CETP kiegészíti és nem duplikálja a HE fókuszterületeit (!)

Más megközelítésben, más TRL elvárások mentén összeállított felhívások

Érdemes mindkét típusú (Cluster 5 + CETP) felhívás csomagot megvizsgálni

TÁRSFINANSZÍROZOTT PARTNERSÉGI konstrukciók

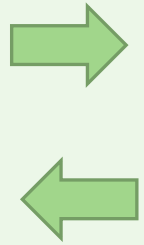
Célok:

- Nemzeti KF prioritások összehangolásával
- K+F erőfeszítések széttagolódásának és megkettőződésének elkerülése
- Nemzeti források egyesítése uniós társfinanszírozással (CETP 30% top up)
- Korábbi ERA_NET támogatási programok folytatása

Szakpolitika:

- Horizon Europe – the Framework Programme for Research and Innovation (2021 to 2027)
- **Strategic Research and Innovation Agenda**
- Annual Work Programmes
- Pályázati felhívások

Előnyök: fókuszáltabb felhívások, nemzetközi elbírálás, nemzeti források és prioritások



CETP – szakpolitikai háttér

Az Európai Energiatechnológiai Stratégiai-tervre (European Strategic Energy Technology Plan -**SET Plan**) valamint több korábbi programra (ERA-Nets, IWG-k, ETIP-k stb.) épül

Az európai Stratégiai Kutatási és Innovációs Agenda-ban/ Strategic Innovation and Research Agenda **(SRIA)** rögzített **7 szakpolitikai (Transition Initiatives -TRI) területen** határoz meg évente pályázati kiírásokat.

Célja szinergiákat teremteni a Nemzeti Energia- és Klíma Tervekkel, **30 ország** (20 uniós tagállam+ 10 társult ország) KFI prioritásainak összehangolásával

Fontos az érintett SRIA ismerete a pályázati felhívás szakpolitikai céljainak és az elvárt eredmények megértéséhez

Az innovációs ötlet/megoldás a felhívás **céljaihoz kell igazodjon, konkrét eredmények elvártak** a projekt végén

Szakpolitikai célok (TRI) és a felhívások

A tematikus pályázati felhívásokat a partnerországok által létrehozott **szakértő testületek (TRIk),** amelyek egy-egy területen felelnek a Stratégiai Kutatási és Innovációs Akcióterv/**Strategic Innovation and Research Agenda (SRIA)** megvalósításáért.

A pályázati kiírások kettős értelemben használják a Transition Initiative –nek megfelelő TRI rövidítést: egyrészt jelenti **a SRIA-ban nevesített szakpolitikai területet**, másrészt **a területért felelős testületet**.

A SRIA-ban megnevezett 7 TRI mentén határozzák meg a TRI testületek a éves kiírás pályázatait.

Szintén a TRI területek szerint vannak szervezve a **tematikus webináriumok pályázók számára.**

Figyelem!

A **TRIk NEM módosulnak**, csupán **a pályázati kiírások fókusza változik évente. (kiszámíthatóság)**

A 7 TRI

TRI 1: Integrated Net-zero-emissions Energy System (Giuseppe Palazzo, TRI1@cetpartnership.eu)

TRI 2: Enhanced zero emission Power Technologies (Rachele Nocera (MUR, IT) TRI2@cetpartnership.eu)

TRI 3: Enabling Climate Neutrality with Storage Technologies, Renewable Fuels and CCU/CCS (Aage Stangenland (NO) TRI3@cetpartnership.eu)

TRI 4: Efficient zero emission Heating and Cooling Solutions (Alicja Wiktoria Stokłosa TRI4@cetpartnership.eu)

TRI 5: Integrated Regional Energy Systems Angela Berger (FFG, Austria) TRI5@cetpartnership.eu)

TRI 6: Integrated Industrial Energy Systems, TRI 6 Office TRI6@cetpartnership.eu)

TRI 7: Integration in the Built Environment, TRI 7 Office TRI7@cetpartnership.eu)

A felhívásokkal kapcsolatos tartalmi kérdéseket intézhetik közvetlenül az illetékes TRI munkacsoporthoz is!

Milyen típusú K+F pályázatokat/projekteket támogat a CETP ?

(a) Technológiai alapkutatások

(b) Technológiai megoldás piacra vitele

(c) Hasznosítás hatékonyságát növelő megoldások

Viszont, a nemzetközi pályázati kiírás és a nemzeti feltételek alapján is változó, hogy egy adott témakörben milyen típusú kutatások kaphatnak támogatást! **Partnerországonként is változó**!

Magyarország mindhárom típust támogatja, mind a 9 TRL szinten.

A magyar (nemzeti) követelmények a nemzetközi felhívás mellékletében találhatók

Kik jogosultak támogatásra?

Célcsoportok: egyetemek, kutatóintézetek, piaci szereplők (KKV-k, nagyvállalatok), önkormányzatok, szakmai szervezetek, NGO-k, érdekképviseleti szervezetek (felhívásonként változó!)

A nemzetközi pályázati kiírás határozza meg, hogy milyen összetételű konzorciumoktól várnak pályázatokat az adott területen a kutatási célok leghatékonyabb megvalósításához.

Konzorcium építés: min. 3 különböző országból, min. 2 uniós tagállamból vagy társult országból kell tagokat tartalmazzon a konzorcium és 1 partner hozzájárulása nem lehet több mint 75%.

Figyelem!
Magyar követelmények

Partnerségek:
https://nkfih.gov.hu/palyazoknak/nkfi-alap/horizont-europa-europai-partnersegek-magyar-szervezetek-tamogatasa-2024-121-he-partnerseg/palyazati-felhivas

Támogatási intenzítás/pályázó entitás típus

Entity	Basic research	Industrial/Applied research	Experimental Development/ Innovation
Large Enterprise	100%	60%	40%
Medium Enterprise	100%	75%	50%
Small Enterprise	100%	80%	60%
Universities/Public Research Institutes	100%	100%	100%
Public Authorities	100%	65%	40%
Associations without Economic Activities, NGOs	100%	100%	100%

A magyar pályázati követelmények része, amely a CETP 2025 Call (nemzetközi pályázat melléklete)
Funding Organisations and Call Modules | CETPartnership

Modellváltó egyetemek:

- Továbbra is pályázhatnak
- Nemzetközi konzorciumok nem zárhatják ki őket
- Nemzeti szinten egyenlő bánásmód a többi pályázó entitással

Figyelem!
Magyar követelmények:

Partnerségek:
https://nkfih.gov.hu/palyazoknak/nkfi-alap/horizont-europa-europai-partnersegek-magyar-szervezetek-tamogatasa-2024-121-he-partnerseg/palyazati-felhivas

Kormányzati Önerő Alap
https://nkfih.gov.hu/palyazoknak/kormanyzati-onero-alap

Pályázati rendszer:

- Nemzetközi éves felhívások és értékelés
- 2 lépcsős rendszer: a 2. szakasz meghívásos
- Nemzeti kifizetés (partnerország támogatási ügynöksége - NKFIH) nemzeti követelmények alapján + EU-s top-up (nemzetközti felhívás szerint)
- Nemzeti elszámolás (költségvetés)

Pályázatbenyújtás + tartalmi értékelés: NEMZETKÖZI

Forrás: NEMZETI

Monitoring + elszámolás a projektmegvalósításról: NEMZETKÖZI

Nemzeti forráslehívás + elszámolás a nemzeti forrás felhasználásáról: NEMZETI

Pályázati rendszer: nemzetközi szint

Nemzetközi éves felhívás
1. szakasz –pre-proposal
(rövid leírása a projektnek)
Nemzeti és nemzetközi eligibility vizsgálat
nemzetközi értékelés,
lehetőség partnercserére,
amennyiben szükséges
(widening)
2.szakasz – full-proposal
(a projekt részletes bemutatása)
Újabb eligibility vizsgálat
(nemzeti és nemzetközi),
újabb nemzetközi értékelés,
nemzetközi
eredményhirdetés

Figyelem!

- **A pályázatbenyújtás nemzetközi mindkét szakaszban**
- **Nemzeti szinten tudományos-szakmai értékelés nincs (az nemzetközi szinten történik)**
- Csak a nemzetközi eredményhirdetést követően kell benyújtani pályázatot a hazai kifizető ügynökségnél (NKFIH) a forráslehívásra

Pályázati rendszer: nemzeti szint

- Nemzeti feltételek szerint:

  a) a nemzetközi felhívás mellékletében
  b) A nemzeti kifizetés (partnerország támogatási ügynöksége - NKFIH) nemzeti követelményei

- Nemzeti elszámolás

Figyelem !

- Pályázás: a nemzeti forráslehívás a nemzeti követelmények szerint történik; ezért már a nemzetközi pályázat összeállításához és benyújtásához szükséges megfelelni a nemzeti feltételeknek;
- Kifizetés: a nemzeti forráslehívás a nemzeti követelmények szerint
- Elszámolás a nemzeti forrás felhasználásáról: nemzeti követelmények szerint

Nemzeti követelmények:

- https://nkfih.gov.hu/palyazoknak/nkfi-alap/horizont-europa-europai-partnersegek-magyar-szervezetek-tamogatasa-2024-121-he-partnerseg/palyazati-felhivas

Pályázati rendszer: finanszírozás mértéke, költségtételek

- Nemzetközi felhívás
- Nemzetközi felhívás nemzeti követelményrendszere
- NKFIH kifizetési szabályai

Nemzetközi követelmények: aktuális felhívás

Nemzeti követelmények:

- https://nkfih.gov.hu/palyazoknak/nkfi-alap/horizont-europa-europai-partnersegek-magyar-szervezetek-tamogatasa-2024-121-he-partnerseg/palyazati-felhivas
- https://nkfih.gov.hu/palyazoknak/kormanyzati-onero-alap

Hasznos linkek – társfinanszírozott partnerségekről

- Co-funded European Partnerships — ERA-LEARN
- Implementation of co-funded European Partnerships — ERA-LEARN
- Nemzeti Kutatási, Fejlesztési és Innovációs Hivatal | Futó Európai Partnerségek
- https://nkfih.gov.hu/horizontpentek10
- Nemzeti Kutatási, Fejlesztési és Innovációs Hivatal | Horizont Európa hírlevél

A CETP 2025-ös felhívásai

- CM2025-01:Multi-vector interactions between the integrated energy system and industrial frameworks -TRI1 & TRI6
- CM2025-02:Energy system flexibility: renewables production, storage and system integration -TRI1 & TRI2
- CM2025-03A: Advanced renewable energy (RE) technologies for power production (ROA) -TRI2
- CM2025-03B: Advanced renewable energy (RE) technologies for power production (IOA) -TRI2
- CM2025-04:Carbon capture, utilisation and storage (CCUS) - TRI3
- CM2025-05:Hydrogen and renewable fuels- TRI3
- CM2025-06:Heating and cooling technologies -TRI4
- CM2025-07:Integrated regional energy systems - TRI5
- CM2025-08:Integrated industrial energy systems -TRI6
- CM2025-09: Clean energy integration in the built environment – TRI7

Figyelem!

Nem minden partnerország támogat minden modult

Változások előző évekhez viszonyítva

- **Több részvételi lehetőség cégek számára**
- **Nőtt a piacraviteli fókusz**
- **Maradt az egyensúly az alacsony és magasabb TRL elvárású felhívások között**
- **Erősödik a komplementarítás/kapcsolódás a felhívások között (integrált megközelítés)**
- **Szinergiák más támogatási programokkal**
- **A horizontális követelmények növekvő térhódítása**
- **Erősödik Digitalizálás, AI használata mint eszköz az elvárt célok megvalósításában**
- **Sokkal részletesebbek, hosszabbak és világosabbak (a technológiai elvárások, eredmények síkján) a felhívások**
- **Világos, egyértelmű leírása, hogy milyen típusú entitások pályázhatnak (mi elvárt, eligible, és mi ajánlott)**

Figyelem!

Nem minden partnerország támogat minden TRL szintet

Nem minden partnerország támogat minden modult

Mindez fontos kritérium a konzorcium építésnél!

Konzorcium követelmények felhívásonként

- CM2025-01:Multi-vector interactions between the integrated energy system and industrial frameworks (**need owners** –mandatory)
- CM2025-02:Energy system flexibility: renewables production, storage and system integration (**SMEs and spin-off companies**-recommended)
- CM2025-03A: Advanced renewable energy (RE) technologies for power production (ROA)
- CM2025-03B: Advanced renewable energy (RE) technologies for power production (IOA) (**industry** as partner-mandatory)
- CM2025-04:Carbon capture, utilisation and storage (CCUS) **industrial partner (s)** or **industrial member** in advisory boards)
- CM2025-05:Hydrogen and renewable fuels (**industrial partner (s)** or **industrial member** in advisory boards)
- CM2025-06:Heating and cooling technologies (**must have at least one company as partners)**
- CM2025-07:Integrated regional energy systems (**networks and clusters, or existing initiatives** is encouraged)
- CM2025-08:Integrated industrial energy systems (**must have at least one industrial partner** -private for-profit company-, preferably an end user)
- CM2025-09: Clean energy integration in the built environment

Need owner:
A stakeholder who seeks a solution to a need/problem within its areas of operation and will benefit from the solution.

Számos felhívás cégek részvételével !

A nemzetközi együttműködés partnerei 2025-ben

27 ország vesz részt a 2025-ös felhívásokban

Ausztria, Izland, Lengyelország, Belgium, India, Portugália, Kanada, Írország, Románia, Cseh Köztársaság, Olaszország, Spanyolország, Dánia, Lettország, Svédország, Finnország, Litvánia, Svájc, Franciaország, Málta, Tunézia, Németország, Hollandia, Törökország, Magyarország, Norvégia, Amerikai Egyesült Államok.

Új partnerország: INDIA

Figyelem!

Nem minden partnerország támogat minden modult
Funding Organisations and Call Modules | CETPartnership
HU –összes modult támogatja

Nem minden partnerország támogat minden TRL szintet
HU- minden TRL szintet támogat

Fontos kritérium a konzorcium építésnél!

Határidők

Call Launch: 2025. május 28, 10:00-12:30 (CEST)-
a felvétel elérhető a CETP honlapján

1. szakasz kezdete: 2025. június 11.
1. szakasz zárása: 2025. október 9. 14:00 (CEST)

2. szakasz (kezdete): 2026. január 9.
2. szakasz (zárása): 2026. március 12.

Eredményhirdetés: 2026. június közepén

Megvalósítás: 2025 szeptember 1- 2026 december 15
Megvalósítás időtartama: (max.36 hónapos futamidő)

Ajánlatos a nemzetközi eredményhirdetést követően mielőbb beadni a pályázatot a magyar forráslehívásra, (több hónap az elbírálás)

Ez már nem az NKFIH Nemzetközi Főosztály hatásköre!
NKFIH Pályázati Főosztály ügyfélszolgálat

CM2025-01 Multi-vector interactions between the integrated energy system and industrial frameworks

Call Module requirement: For a proposal targeting a higher TRL or including validation, involvement of need owner(s) as Project Consortium Partner(s) is mandatory.

Project partners: none

Budget: In the range of EUR 2–3 million, including any self-financing.

TRL:

Project start: TRL 3 or higher

Project end: TRL increase of at least 2 from project start

In case of modelling and planning activities, the definition of TRL is hardly applicable. However, the Key Exploitable Results (KERs) of the projects shall consist of tools (e.g. models, software, APIs, etc.) developed in open access platforms and developed according to quality standards, characterised by results traceability and system maintainability. In case of validation and application activities (advanced laboratory activities): Project start: TRL 3 or higher Project end: TRL increase of at least 2 from project start

Contact: Both TRI 1 and TRI 6, who have jointly developed this Call Module

CM2025-01 Multi-vector interactions between the integrated energy system and industrial frameworks

Challenges

New solutions are required, looking at implications under different perspectives:

• Sub-optimal interfaces exist at present between industrial systems and the energy system fostering multi-vector integration

• Business models and market and regulation aspects are not completely developed to address the interactions between industrial systems and the integrated energy system adopting a multi-vector approach (considering parameters like balance CAPEX/OPEX, cost of electricity and its cycles, efficiency measures, cost of CO2, price signals, flexibility services to the network, etc.)

• Environmental aspects related to the interaction between industries and energy systems are not yet fully considered (considering parameters like enabling solutions for RES integration, reduction of energy consumption and emissions, circularity practices, efficient use of digital technologies etc.)

• Societal aspects linked with the evolution of energy-industry interactions are not completely tackled yet (considering parameters like modification of production cycles and impact on workforce, the societal implications of environmental impacts and of the new production cycles related with new energy industry synergies, etc.

CM2025-01 Multi-vector interactions between the integrated energy system and industrial frameworks

Propose solutions to foster flexible interaction between industrial plants and the clean energy system, leveraging a multi-vector approach (electricity, gas, hydrogen, heating/cooling, fuels etc.).

Examples of multi-vector interactions:

- Flexibility from industry for power system balancing (e.g. ancillary services, internal RES, vRES, CHP, internal vector integration, efficiency, load shedding, peak shaving, load shifting, production schedule shifting, Direct Current industrial networks, flexible industrial production processes etc.)
- Energy storage – all types (e.g. electric, heat, chemical, hydrogen, compressed air, pumped water storage, and feedstock energy in products) and all durations (short/medium/long storage
- Interaction with heat (e.g. waste heat, utilisation of heat tapping from thermal processes to enable industrial symbiosis unleashing energy efficiency of combined processes, and heat storage)
- Interaction with gas (e.g. biogas, biofuels, hydrogen and e-fuels) • Interaction with water (e.g. electrolysis with fresh or treated water)

CM2025-01 Multi-vector interactions between the integrated energy system and industrial frameworks

Target topics:

• assessing flexibility resources available from the industry, and flexibility needs from the energy system viewpoint, leveraging the interaction of industrial systems with the renewables-based clean energy system looking at a multi-vector approach

• modelling, planning and optimising the multi-vector interactions between industrial sectors and the energy system (e.g. investigations and simulations of the dynamics of these interactions; development, testing and validation of reliable interfaces; etc.), also including environmental and economic aspects (e.g. analyses of sustainability and environmental impacts of these interactions and market-related aspects)

Nice-to-have, in addition to what is required above, the Call Module is also interested in proposals assessing the societal implications of the new energy-industry synergies enabled by project outcomes, such as the modification of production cycles and impact on workforce.

Dimensions of innovation: A proposal is expected to cover the 1st and 2nd dimensions of innovation (see Subsection 2.3.2).

CM2025-01 Multi-vector interactions between the integrated energy system and industrial frameworks

Expected outcomes

Depending on the specific industrial context, projects should develop one or more of the following:

- **tools** (e.g. tools for integrated and multi-vector planning under high uncertainty conditions using stochastic and risk-management integrated planning)
- **methods** (e.g. methods using advanced computational technologies and AI to address holistically the energy system with multi-vector integration and implications related to environment and energy and flexibility markets)
- **solutions** (e.g. advanced multi-vector interface systems, working on existing infrastructures - control and measurement tools, or on test facilities – Hardware-in-the-Loop, considering standard architectures, interoperability and cybersecurity by design)

To promote more impactful projects, this Call Module **encourages applicants to develop user-friendly tools for future uses in other contexts** (tools characterised by proper levels of scalability and replicability) using open-access platforms

CM2025-01 Multi-vector interactions between the integrated energy system and industrial frameworks

Complementarity with other Call Modules

- This Call Module addresses the overall flexibility from the interface between industry and the energy system, **from the energy system point of view**. **The focus is on energy system studies** (adding environmental/social aspects).
- **Provision of flexibility from industry is covered by CM2025-08** by studying and developing solutions on production processes themselves, up to the interface with the entire energy system

CM2025-02 Energy system flexibility: renewables production, storage and system integration

Call Module requirement: none

Project partners:

Secondary and higher education establishments • Research organisations • Private for-profit companies, bringing in expertise, knowledge, and know-how for the implementation of innovative and breakthrough solutions, such as: o system operators o SMEs o spin-off companies

The participation of SMEs and spin-off companies is recommended.

The participation of Project Consortium Partners from member countries of the Green Powered Future Mission (even if not members of the CETPartnership) is not a compulsory prerequisite but a preferential attribute

Budget: in the range of EUR 1–2 million, including any self-financing.

TRL:

Project start: TRL 3 or higher

Project end: TRL increase of 1–2 from project start

Contact: Both TRI 1 and TRI 2, who have jointly developed this Call Module.

CM2025-02 Energy system flexibility: renewables production, storage and system integration

Challenges

In line with the final goal of MI GPFM and the CETP's SRIA48, this Call Module addresses **the challenge of integrating up to 100% variable renewable energies** (e.g. wind and solar) by 2030, while ensuring a **cost-efficient, secure and resilient energy system.**

<u>This can be detailed into these 5 R&I challenges:</u>

- increase large-scale renewable generation while preserving system stability and reliability
- foster flexibility services through the adoption of **energy storage technologies and systems**
- strengthen **system stability and flexible operations**
- enable flexibility markets adopting innovative flexibility sources and demand side applications
- leverage system **digitalisation, including AI and digital twin**

CM2025-02 Energy system flexibility: renewables production, storage and system integration

Scope

Proposals should address key aspects of the clean energy transition ranging from **large-scale integration of renewable energy sources into the power grids** to **broad technological and market aspects** as well as **approaches towards system integration**, **considering storage as a possible solution to deal with their intermittent nature.**

Proposals need to **duly consider digitalisation and standardisation**, being key enablers for the deployment of innovative system flexibility solutions.

Concentrate **efforts and financial resources to accelerate the deployment of key innovations** thus considering **replicability and scalability** and enabling the realisation of clean energy solutions in the near future.

The Call Module mainly focuses on research and development.

Nevertheless, **it is expected to possibly involve industry**, bringing in expertise, knowledge, and know-how for the implementation of innovative and breakthrough solutions.

Proposals should preferably be designed building on top of existing initiatives or assets and propose replicable and scalable solutions.

Proposals are expected to share knowledge and results with the GPFM and through the GPFM knowledgesharing Platform51.

CM2025-02 Energy system flexibility: renewables production, storage and system integration

Proposals must address one or more of the following Innovation Priorities:

1. Large-scale renewable energy generation for improving system reliability & stability (GPFM IP 1.3.2)
2. Variable renewable energy flexibility provision & contribution to generation capacity (GPFM IP 2.1.1)
3. Innovation in energy storage technologies (GPFM IP 1.5.3)
4. Utility scale storage systems for innovative flexibility services (GPFM IP 2.4.3)
5. System stability assessment considering high VRE penetration (GPFM IP 2.3.1)
6. Enhanced TSO-DSO coordination platform for flexibility markets optimisation (GPFM IP 2.3.2)
7. Flexibility markets for innovative ancillary services by VRE and storage (GPFM IP 2.7.1)
8. Unlocking commercial and residential buildings flexibility potential (GPFM IP 2.5.2)
9. Connected data platforms for enhanced forecasting and flexible operation (GPFM IP 3.3.2)
10. Standardisation of devices and control platforms (GPFM IP 3.1.2)
11. Identify priority dataset for system security (GPFM IP 3.2.2)
12. Grid supporting technologies from inverter-based resources (GPFM IP 1.6.2)
13. Tools and solution for DSO flexibility management (GPFM IP 2.3.4) 14. Demand response, EV services and grid impact assessment (GPFM IP 2.5.4)

The 14 selected Innovation Priorities listed above are clustered into the 5 main R&I challenges (see above in Challenges)

CM2025-02 Energy system flexibility: renewables production, storage and system integration

Expected outcomes:

- preservation of power system stability and reliability also in presence of large-scale renewable generation
- provision of flexibility services through energy storage technologies
- enhanced system stability and efficiency, also through digitalisation and AI applications
- development of flexibility markets through demand side applications and use of innovative flexibility sources

Another expected outcome of funded projects is that, by involving Project Consortium Partners outside of Europe, they will facilitate the dissemination of this approach globally. Consequently, this may prompt more countries to embrace clean energy technologies and practices.

CM2025-02 Energy system flexibility: renewables production, storage and system integration

Synergies:

Synergies with one or more projects supported under the following Horizon Europe topics are strongly recommended where relevant and applicable:

HORIZON-CL5-2023-D2-01-04, Battery management system (BMS) and battery system design for stationary energy storage systems (ESS) to improve interoperability and facilitate the integration of second life batteries

HORIZON-CL5-2023-D2-01-05, Hybrid electric energy storage solutions for grid support and charging infrastructure

HORIZON-CL5-2024-D2-01-02, Non-Li Sustainable Batteries with European Supply Chains for Stationary Storage

CM2025-03A/03B Advanced renewable energy (RE) technologies for power production

Call Module requirement: CM2025-03B (IOA): Projects Consortia shall comprise **at least one industry Project Consortium Partner** / private for-profit company

Project partners: Project Consortia may include RPOs (public and private Research Performing Organisations and their spin-offs), industrial partners (large companies and/or SMEs), technology providers, any relevant market or technology actor

Budget:

CM2025-A (ROA): in the range of (but not limited to) EUR 1–2.5 million, including any self-financing.

CM2025-B (IOA): in the range of (but not limited to) EUR 2.5–5 million, including any self-financing.

TRL:

CM2025-03A (ROA): TRL 3–5 (Project start: TRL 3 or higher; Project end: TRL 4 or higher)

CM2025-03B (IOA): TRL 5–7 (Project start: TRL 5 or higher; Project end: TRL 6 or higher)

Contact: TRI2

CM2025-03A/03B Advanced renewable energy (RE) technologies for power production

Challenges:

- Advancing technologies and improving performance: Improving the efficiency and performance of renewable technologies through innovative/improved components, materials and technologies.
- Next generation RES: exploring innovative approaches to increase efficiency, sustainability and circularity of RE technologies, reducing environmental impacts of large installations.
- Improving operational efficiency: developing advanced monitoring and predictive analytics for renewable energy assets to prevent system failures and maximise energy generation.
- Integration and hybridisation of different RES and/or storage technologies on the same site/point of connection to the grid; Production of power along with other energy carriers.
- Digitalisation and digital twins: Design and develop digital twins for renewable energy technologies; leverage the potential of digital technologies to improve efficiency and reduce operational cost.

CM2025-03A/03B Advanced renewable energy (RE) technologies for power production

Project proposals shall address one or more topic(s) under the respective technology areas listed below.

Concentrated solar power (CSP) / Solar thermal energy (STE): Line-focus solar power plants technology; Central Receiver power plants technology; Next generation of thermal energy storage (TES) technologies for CSP: Heat transfer media for innovative high-temperature thermal storage systems; Environmentally friendly PFAS-free heat transfer fluids (HTF); Digitalisation of CSP plants for a more efficient flexibility, monitoring, operation maintenance and control, including interfaces for remote control. • Coating materials • Integration of advanced meteorological data and forecasts.

Cross-cutting offshore renewables technologies (ocean/marine renewables, floating wind/PV, etc.): • critical technologies for arrays; materials for moorings, foundations and components; mooring and foundations; connections and cabling systems, operation and maintenance (O&M); enhanced marine and meteorological modelling for offshore renewables; sustainable and efficient generation technologies; co-location of offshore wind and wave energy.

Geothermal energy for power applications: sesource assessment; sustainable and efficient production technologies; new tools and approaches for the industrialisation and standardisation of a "common geothermal project" (for power applications) which fits the social and environmental frame and supports the optimal decision-making process for techno-economic perfomance evaluation of the project.

Ocean energy: next generation of technologies & subsystems; integration of enabling technologies in ocean energy systems; ocean energy analysis and modelling tools; direct generation wave energy converter design and development; dry testing of power take-off for wave energy devices to debug, improve, stabilise, fine-tune and optimise wave energy devices before offshore operations; tidal stream power take-off.

Solar photovoltaics: performance enhancement of PV modules; sustainability and circularity; installation and operations; mounting structures adapted to large PV modules reducing the amount and nature of materials; energy yield improvement; digitalisation for O&M; innovative applications (agrivoltaic and landscape integration; floating PV).

Wind energy (onshore and offshore): next generation of wind energy systems; digital solutions and digital twins for turbine and optimized wind energy applications; O&M; lifetime extension; sustainable wind farms; site allocation and public acceptance; advanced forecasting methods.

Hybridisation and integration: site, system and technological integration of co-located RES (onshore and offshore: co-location of ocean and wind energy; co-location of wind and PV; etc.). Hybrid systems combining electricity generation with heat or other energy carriers (H2, Fuels, etc.) improving cost-effectiveness and overall energy efficiency.

Storage solution for renewable power: Innovative solutions and technologies for medium- and longterm storage of renewable power demonstrating benefit and or integration with the renewable power production technologies

WARNING: Applicants are advised to check preliminarily with their respective Funding Organisations if the technology area of interest is supported.

CM2025-03A/03B Advanced renewable energy (RE) technologies for power production

Project proposals are expected to contribute to one or more of the following outcomes:

- Solutions that enhance the energy conversion efficiency of renewable energy (RE) and overall system efficiency, contributing to zero emission power production
- Improved technological performance of RE technologies (aligned with SET Plan Implementation Plans), enabling extended operation in harsh or varying weather conditions and increasing the lifespan of components and installations
- Reduction in investment costs and LCOE for RE installations and operations, compared to the regional state of the art
- Feasibility and efficiency of hybrid and integrated solutions to enhance dispatchable energy and system flexibility, while considering potential economic revenue to support market penetration
- Cost-effective medium- to long-term storage solutions for the power sector
- Sustainable RE technologies that minimize environmental impacts, including land and maritime surface use, as well as effects on landscapes and biodiversity
- Significant reduction in the use of Critical Raw Materials
- Development of guidelines and tools to effectively address circularity in RE technologies
- Digital tools to optimize design, deployment, operation and maintenance of RE technologies

CM2025-04 Carbon capture, utilisation and storage (CCUS)

Call Module requirement:

Proposals must fit thematically with the definition of CCUS or CDR given in this Call Module.

Proposals must include industrial involvement in the project. The project must have industrial Project Consortium Partner(s) or industrial members in an advisory board.

Proposals targeting lower TRL than indicated below are ineligible.

Project partners:

Higher education establishments

Research organisations

Private for-profit companies

Public bodies

Other entities (e.g. non-profit organisations)

See also Call Module requirement 2 above.

Budget: Funding requested from the Call in the range of (but not limited to) EUR 1–3 million, in addition to any self-financing.

TRL: Project end TRL 5 or higher

Contact: TRI3

CM2025-04 Carbon capture, utilisation and storage (CCUS)

The Call Module supports research and innovation projects to develop and implement CCUS technologies, primarily in the industrial and energy sectors.

Challenges

- The challenge is to accelerate and mature CCUS technologies, bring down cost, and implement CCUS at industrial scale
- It is also a challenge to develop circular economy strategies to reduce CO2 footprint throughout the CCUS life cycle. To accelerate the time to market for the CCUS technologies, research and innovation actions require cost shared participation from the industrial sector, especially from energy intensive and heavy industries, which will benefit strongly from implementing CCUS technologies.

CM2025-04 Carbon capture, utilisation and storage (CCUS)

Scope

- Proposals must address CCUS or CDR, see Call Module requirement 1.
- In this Call Module, the term CCUS refers to all areas of the CCU (carbon capture and utilisation) and CCS (carbon capture and storage) chains.
- It encompasses a wide spectrum of technologies to capture CO2 from large point sources, transport captured CO2 through multi-modal approaches, and either store CO2 in porous geological formations that are typically located several kilometres under the earth's surface, onshore or offshore (CCS), or use the CO2 to produce valuable products like fuels or energy, chemicals, and other materials (CCU).
- In this Call Module, CCU does not include the use of CO2 as a non-reactive working fluid, unless it is combined with other renewable systems (such as geothermal) to constitute a CCUS system.
- Carbon dioxide removal (CDR) is defined by Mission Innovation as human activities that deliberately capture CO2 from the atmosphere and securely store the captured CO2 in a manner intended to be permanent 53.
- For a CDR project to be net negative, on a life cycle basis more CO2 equivalent (CO2-eq) must be removed than is emitted.

CM2025-04 Carbon capture, utilisation and storage (CCUS)

Target topics (Project proposals must address at least one of the following technological topics):
CO2 capture from the energy sector and energy intensive or heavy industry sectors such as cement, iron & steel, aluminium, other metals, waste to energy systems, and petrochemicals.
• CO2 capture technologies for reducing the carbon intensity of current mobile sources including the marine transport, rail transport, and heavy-duty trucking transportation sectors.
• Emissions monitoring and management technologies for CO2 capture systems. Advancing lower cost CO2 capture technologies that can effectively remove 95–100% of CO2 from flue gases, with dilute CO2 concentrations.
• CO2 transport and storage infrastructure (pipelines, ships and other non-pipeline transport, intermodal options, monitoring and metering within CO2 networks, temporary storage, well integrity and well technology).
• Developing commercial CO2 storage sites, including elements that are needed for screening and characterisation, safe management, and low-cost effective monitoring.
• Enabling CCU technologies, including the CO2 capture, conversion, and utilisation value chain.
• Improvement of the cost-efficiency and energy-efficiency along CCUS value chains (scale-up, storage at basin-scale including hubs, by digital tools, or by effective collaboration among the stakeholders, etc.).
• Development of lower cost solutions for efficient CO2 capture from hydrogen produced using natural gas.
• Bring CDR technologies closer to the market. This includes direct air capture (DAC), enhanced mineralisation and biomass with carbon removal and storage (BiCRS). Technologies included under CDR are similar to what has been defined by the Mission Innovation Carbon Dioxide Removal Mission57
• Develop reactive capture (RC) where CO2 capture and CO2 conversion is integrated in one single process module.
• Design and manufacturing of new materials that can make CCU/CCS more affordable

CM2025-04 Carbon capture, utilisation and storage (CCUS)

- Project proposals must illustrate the potential for upscaling to industrial size, either in a demonstration phase or an early-commercial phase.
- Proposals focusing on developing new pilot and demonstration facilities are of special interest.
- Project proposals must also illustrate how their projects will help accelerate the time to market of affordable, cost-effective, low environmental impact and resource efficient CCU/CCS technologies. Access to top class research infrastructure is key for reaching the objectives of this Call Module.
- Project proposals should, if relevant, seek to maximise synergies with existing infrastructures, such as, for example the European Research Infrastructure for CO2 capture, utilisation, transport and storage (ECCSEL) 58, members of the International Test Center Network (ITCN) 59, the Alberta Carbon Conversion Technology Centre (ACCTC) 60, or similar world class infrastructures.

Cross-cutting dimensions

In addition to technological solutions, project proposals should also address cross cutting topics that might impact industrial deployment of the proposed CCUS tech nology. Cross cutting topics include regulations and market design, circularity and environmental sustainability, social needs, education, digitalisation, robust transition pathways, Innovation ecosystems, and fair, just and democratic transition. Proposals addressing only environmental, social or economic implications of existing and commercial ready technologies are outside the scope of the Call Module.

CM2025-04 Carbon capture, utilisation and storage (CCUS)

Applicants are encouraged to also include one or several of the cross-cutting topics listed below:

• Faster scale-up of CCS, CCU or CDR technologies at lower risk (by design, demonstration, development of legal framework, measures to strengthen the innovation system, knowledge sharing from full-scale operations, integration into the energy system, etc.).

• Development of CCS, CCU or CDR market and business case.

• Assessments of risks to the environment and human health throughout the CCS, CCU or CDR life cycle and development of mitigation approaches and strategies.

• Development of circular economy strategies to reduce CO2 footprint throughout the CCS, CCU or CDR life cycle.

• Development of best practices and strategies for educating the public about the benefits and risks of CCS, CCU or CDR. • Development of strategies for engagement between CCS, CCU or CDR project developers and communities that lead to projects with mutual benefits and social acceptance.

• Development of a robust life-cycle assessment (LCA) and techno-economic analysis (TEA) for full CCS, CCU or CDR value chains and life cycles. Alternatively, development of a more complex sustainability assessment addressing social sciences and humanities (SSH) disciplines (e.g., sociology, social psychology and economics).

• Development of technologies and approaches for monitoring and managing basin-wide effects and impacts from multiple CCS projects within a basin

CM2025-04 Carbon capture, utilisation and storage (CCUS)

Complementarity with other Call Modules

This Call Module complements CM2025-08,

Integrated industrial energy system, where the aim is development and demonstration of technical solutions for integrated industrial energy systems that enables efficient carbon-neutral industrial production.

CCU is one of several technologies addressed.

Applicants addressing CCU technologies at high TRL for the industrial sector are recommended to apply to CM2025-08.

Expected outcomes of funded projects Funded projects must advance the state-of-the art for CCS, CCU or CDR technologies and contribute new knowledge and competence that bring CCS, CCU or CDR closer to commercialisation by bridging the gap between technology development and its implementation by the industry.

Funded projects are expected to lead to at least one of the following:

• CO2 capture on an industrial scale by early 2030ies. CO2 storage on megaton scale by early 2030ies and gigaton scale by 2050ies.

• Pave the way for deployment of large-scale infrastructure for CO2 capture from multiple sources, crossborder CO2 transport, and CO2 storage of tens of million tons of CO2 annually by mid 2030ies.

• Be a bridge to implementation of CO2 utilisation projects on an industrial scale by early 2030ies that will have a sustainable and significant effect on reducing CO2 emissions. •

Pave the way for CDR technologies to be implemented on industrial scale by mid 2030ies.

CM2025-05 Hydrogen and renewable fuels

Call Module requirement:

Proposals must fit thematically with the definitions given in this Call Module.

Proposals must ensure industrial involvement in the project.

The project must have industrial Project Consortium Partner(s) or industrial members in an advisory board.

Proposals targeting lower TRL than indicated below are ineligible.

Project partners:

Higher education establishments

Research organisations

Private for-profit companies

Public bodies

Other entities (e.g. non-profit organisations) See also Call Module requirement 2 above.

Budget: Funding requested from the Call in the range of (but not limited to) EUR 1–3 million, in addition to any self-financing

TRL: Project end: TRL 5 or higher

Contact: TRI3

CM2025-05 Hydrogen and renewable fuels

It is the ambition of the Call Module to accelerate the time to market for hydrogen and renewable and advanced fuel technologies, requiring industrial involvement both in research and innovation activities.

Challenges

Decarbonisation of society through fossil fuels' substitution by renewable fuels will have a significant impact on all economic sectors.

Fuels are used across all sectors, i.e. in transportation, industry, heat/power generation, domestic, and services. Although technologies already exist in providing fuels from renewable sources, including hydrogen, the challenge is to upscale production with various kinds of feedstock in a sustainable way and **at a cost that is competitive to fossil fuel derivatives.** In addition, there is a need for transformative changes to deliver new sustainable and safe solutions to contribute to EU and worldwide policies towards carbon neutrality in 2050.

This calls for technological development in the whole value chain. However, providing hydrogen and renewable fuels, to substitute fossil fuels in a competitive, safe and sustainable way poses challenges not only at the level of feedstock and technology, but also regarding infrastructure, industrial involvement and capacitation, market development, regulation and certification, and societal acceptance for a faster penetration.

The interoperability of all different segments also needs to be investigated to ensure that technology and infrastructure are efficiently integrated.

Europe faces various **challenges considering the deployment** of renewable hydrogen technologies, including **regulatory frameworks, infrastructures and networks, new market models, and certification of origin,** in addition to further research and innovation to deliver breakthrough technologies and new solutions to ensure a safe and sustainable hydrogen-based economy with societal acceptance.

CM2025-05 Hydrogen and renewable fuels

Scope

This Call Module finances projects on hydrogen66 and renewable fuels 67, including fuels of non-biological origin68, supporting countries in achieving the decarbonisation goals and in line with SET Plan priorities and new directions to accelerate the clean energy transition69.

The use of zero emission energy technologies for conversion processes, such as solar energy to produce cost-effective thermo-, photo-, and electrochemical fuels (so-called solar fuels), as well as the supply of advanced biofuels from sustainable biomass, are important for a net-zero energy system.

This Call Module is technology focused but addressing cross-cutting dimensions to ensure sustainability and a better penetration to advance transition, where social acceptance becomes relevant. It also strives to be complementary to calls for proposals issued under the Horizon Europe Work Programme, or other available instruments, including national research programmes. A balanced portfolio approach for renewable fuels and hydrogen will be followed for selection and fund-ing to ensure that both areas are equally covered, provided that proposals attain all thresholds and sub-ject to available budget.

CM2025-05 Hydrogen and renewable fuels

Hydrogen: The production of hydrogen plays a key role in any industrial society, since hydrogen can be used for many essential chemical processes, as fuel to power electric motors via fuel cells, as input to produce electrofuels (e-fuels), biofuels, and other hydrogen carriers like ammonia, or to power gas turbines. The use of renewable ammonia is expected to increase for both fertiliser and e-fuels. The advantage of renewable ammonia is that its production does not require a CO_2 source, it is easy to transport, and it is an established commodity. Thus, ammonia can be produced at remote locations with access to cheap renewable electricity. Hydrogen can be produced from biomass or low-carbon power. Hydrogen produced by water electrolysis has the advantage of producing extremely pure hydrogen (>99.9%), but it can also be produced by gasification of biomass through further hydrogen separation or purification, or other processes. Integration of hydrogen production and carbon capture and storage (CCS) offers significant opportunities for cost reduction. Commercial technologies for this type of hydrogen production are available but not implemented in large scale. Biomass can be used to produce hydrogen, biofuels and CO2. Production of hydrogen from biomass through anaerobic digestion, fermentation, gasification, or pyrolysis (all with BiCRS) are at earlier stages of commercialisation. Hydrogen production with BiCRS is attractive as it would deliver negative emissions, although it would compete with other sources of demand for biomass.

Renewable fuels: Renewable fuels production, particularly when coupled with power-to-X (e.g. biogas or biosyngas upgrading and solar fuels) and CCUS, offers major opportunities for greenhouse gas mitigation and negative emissions. The provision of such renewable fuels is crucial for applications that are difficult to electrify in industry, as well as for the residential and especially the transport sectors, namely in aviation, shipping and heavy-duty road transport, where low-cost production of alternative clean fuels would promote their uptake with environmental benefits.

CM2025-05 Hydrogen and renewable fuels

Proposals must address at least one of the following technological topics:

- New and improved processes for hydrogen and renewable fuels production
- Reliable and low-cost production technologies of new and advanced fuels
- Development of new processes for fuels production
- Secure and safe storage of hydrogen, including using solid and liquid carriers
- New and adapted infrastructures for hydrogen and new fuels distribution
- New and adapted end-use technologies in residential, industrial and mobility sectors

Proposals must clearly state how projects contribute to the challenges posed and clearly describe the **disruptive nature or the innovative aspect of technological concept.**

CM2025-05 Hydrogen and renewable fuels

Cross-cutting dimensions

Projects are also required to consider one or more of cross-cutting dimensions, such as:

- Consumer attitudes, risk perception and the levers which could influence consumer behaviour
- Life cycle, techno-economic and environmental impact analyses, including mass, water, land and energy consumptions aspects
- Barriers, opportunities, and solutions to scaling up
- System analysis and integration of processes in the energy system, continuity/intermittence
- Infrastructure and distribution aspects, including pipeline reuse and cost competitive materials for pipelines
- Digitalisation as part of the project

CM2025-05 Hydrogen and renewable fuels

The Call Module is expected to contribute to the following:

- Enabling energy storage through hydrogen carriers by offering new solutions for hydrogen production through electrolysis and advancing a new generation of electrolysers at lower cost and with higher yields in hydrogen production.
- Delivering new concepts for renewable fuels and hydrogen production at competitive costs compared to fossil fuels' derived hydrogen (e.g., non-pure water electrolyzers, water splitting through concentrated solar power (CSP), hydrogen production from natural resources, and solar fuels via artificial photosynthesis).
- Implementing pilot installations to prove new concepts related to the value chain of renewable fuels, including hydrogen, to accelerate deployments and build technology confidence for societal acceptance.
- Providing safe environmentally and economically feasible solutions for fuels storage and transport, including in the case of hydrogen using solid and liquid carriers.
- Producing technological alternatives for end-use of 100% renewable and advanced fuels, especially in sectors difficult to decarbonise, such as industry and transport, whereas transport includes aviation, shipping, and heavy-duty machinery related to various activities, should be considered.
- Accelerating the time to market of affordable, cost-effective, low environmental impact, and resourceefficient sustainable technologies to produce, store, transport, and distribute hydrogen and renewable and advanced fuels along the whole value chain.

CM2025-06 Heating and cooling technologies

Call Module requirement:

The project must have at least one company as a Project Consortium Partner.

All projects must have a valid proof of concept before applying.

Project partners:

- Companies (small, middle-sized, and large)
- Research organisations
- Secondary and higher education establishments
- Non-profit organisations

Budget: Approximately EUR 1–4 million, in addition to any self-financing

TRL:

Project start: TRL3 or higher

Project end: TRL4 or highe

Contact: TRL4

CM2025-06 Heating and cooling technologies

Challenges

The energy crisis caused by the war in Ukraine has clearly shown that Europe needs to repower and rethink its heating and cooling policy (ref. REPowerEU76), and the revised Renewable Energy Directive 77 (RED III) increases focus on the heating transition. According to Eurostat 78, 26,2% of heating and cooling in 2023 was supplied by renewable energy sources across Europe, while 45.3% of our electricity was supplied by renewable energy sources in that same year. The heating transition is lagging behind. There is a clear challenge to develop better, cheaper, easier applicable and climate-neutral heating and cooling technologies which are needed to provide thermal comfort and heat for industry and agriculture while fully phasing out fossil fuelfired dependence.

CM2025-06 Heating and cooling technologies

Scope

- Projects should aim for more robust, affordable, efficient, easier to install, retrofit, and integrate heating and cooling technologies.
- Projects that address just one component or one part of the value chain are fully in scope.
- This Call Module brings together the Call Modules "Heating and cooling technologies" and "Geothermal energy technologies" from previous CETPartnership Calls (2023 and 2024) in one Call Module and covers the entire scope of those previous Call Modules.
- The Call Module supports 1. pilot and demo projects and 2. applied research and development projects that will develop technologies, methods, knowledge or innovations for heating and cooling:
- 1. Pilot and demo projects (achieving TRL 7 or 8 after project completion) must be realised in real-life operational environments and address at least one of the following compared to state-of-the-art today: o cost reduction o increase in competitive market opportunities o increase in environmental protection
- 2. Applied research and development projects (achieving TRL 4, 5 or 6 after project completion) must have a valid proof-of-concept before starting, typically develop the innovation in detail in a laboratory or similar setting, and address at least one of the following compared to state-of-the-art today: o significant cost reduction o significant increase in competitive market opportunities o significant increase in environmental protection o better tools and methodologies Proposals are expected to explain their contribution to the aim of the Call Module and quantify this contribution to the extent that this is possible. 'Significant' can be interpreted as 'well over 10% improvement'. Considering the urgency of the challenge, **market-driven innovation activities are a must. The project must therefore have at least one company as a Project Consortium Partner.**

CM2025-06 Heating and cooling technologies

Target topics (projects should address one or more of the following topics to develop a secure, sustainable, competitive and affordable climate-neutral heating and cooling supply):

Sub-surface climate-neutral heat and cold sources: Innovative approaches for geothermal heating and cooling from the shallow and deeper subsurface, including exploration, resource development techniques and operation.

Above-ground heat and cold sources, Innovative approaches for local and regional excess resources, e.g. excess heat from industry, solar thermal technologies, renewable cooling technologies, concentrated solar for (industrial) thermal energy purposes, ambient heat and cold from the air, surface water, sewers etc., biomass and organic waste.

Thermal storage, new storage technologies and storage-related innovations aiming at, including but not limited to **large-scale seasonal subsurface thermal storage, small-scale hour-to-day thermal storage in industry and the built environment, smart systems balancing supply and demand, excess power to thermal energy, and thermal storage systems for residential and industrial applications.**

Heating and cooling networks, conversion, and integration, including but not limited to innovations for more cost-efficient heating and/or cooling networks and their operation, next generation district heating systems, retrofit of heating and/or cooling networks, conversion technologies such as heat pumping technologies, in the built environment and industry.

End-use systems: innovative distribution systems within the end user system (typically a building, a home or an industrial complex) are relevant to the heating and/or cooling system because the temperature level matters.

This Call Module is expected to encompass projects both relating to the built environment, agriculture or industrial end users. For the built environment, the projects may focus on **district heating and/or cooling systems and other collective systems, but also on individual solutions.**

CM2025-06 Heating and cooling technologies

Complementarity with other Call Modules

In case of uncertainty about where to best propose your project, consult with relevant Funding Organisations or TRIs:

- Concentrated solar power is covered in CM2025-03A/03B, while concentrated solar for thermal applications in the industry is covered in this Call Module.
- Geothermal energy technologies for power production are covered in CM2025-03A/03B.
- Projects focusing on integrating heating and cooling in regional or industrial energy systems or the built environment are referred to CM2025-07, CM2025-08 and CM2025-09, respectively.

CM2025-06 Heating and cooling technologies

Expected outcomes of funded projects

- Projects funded in this Call Module should improve business cases and/or increase the competitive market opportunities and environmental protection, compared to state-of-the-art today, through research and innovation.
- The projects' results must emphasise market-driven innovation activities, and the **involvement of a company is a requirement. Involvement of end users and need owners in Project Consortia is encouraged, where relevant.**
- Project outcomes are expected to help **accelerate the time to market** of secure, sustainable, competitive, affordable and climate-neutral heating and/or cooling technologies. Projects **can also focus on bringing up coming technologies to a level of validation** in a relevant environment or integrating their activities into already viable and ongoing demonstration or piloting projects.
- All projects are expected to **anticipate and substantiate how their results will accelerate the time to market**, and include **strategies to maximise impact, including a fit-for-purpose consortium.**

CM2025-07 Integrated regional energy systems

Call Module requirement: Proposals must take an integrated approach. Technological development of only single components is ineligible.

Project partners: • Private for-profit companies • Public bodies (municipalities, local and regional governments) • Innovation clusters • Infrastructure providers and operators • Interregional and transnational innovation ecosystems such as o Cluster networks o Start-ups networks • Higher or Secondary Education Organisation • Research organisations Participation of public and private organisations, networks and clusters, or existing initiatives is encouraged.

Budget: Funding requested from the Call in the range of (but not limited to) EUR 1.5–5 million, in addition to any self-financing.

TRL: Project end: TRL 6 or higher

Contact: TRI5

CM2025-07 Integrated regional energy systems

Challenges

Regional energy systems have a significant role to play in the clean energy transition. Different geographical regions have different challenges and opportunities, depending on for example geographic location, resource availability, infrastructure, socioeconomic conditions, political landscape, and type of industries.

By addressing the regional level of the energy system, such challenges can be addressed, and local resources and other opportunities can be leveraged. The regional scope depends on its context, such as the energy sectors under consideration (the need owners involved, regional resources, demand, and energy exchange) and the region's specific characteristics (urban, rural, agricultural, industrial, islands, etc.).

The energy transition is associated with both technical and complex societal challenges. It requires knowledge about, and insights into, transition, innovation and implementation processes, the acceptance of new systems and services, and the behaviour of stakeholders.

Regional governance structures and infrastructures can often address local challenges and opportunities more effectively than national and global ones. Regional energy transition processes can be accelerated by nurturing **active involvement of communities, companies, and responsible bodies for energy planning.**

CM2025-07 Integrated regional energy systems

Scope

Projects should aim to provide scalable, validated solutions to regional energy challenges on a system level. Development of singular technological components without system integration is not within the scope of the Call Module.

Project proposals should involve stakeholders of and reflect the needs of at least one specific region. This can be done, for example, by referring to existing local/regional climate, energy and implementation plans or roadmaps and describing their contribution to them.

The Project Consortium should cover or involve local target groups and – where relevant – involve distribution system operators and local or regional public authorities. The proposal must specify which actors will implement the proposed solution. If relevant actors are not part of the Project Consortium, explain how they will be involved in the project. Furthermore, the project proposals should enable the Project Consortium Partners and/or relevant actors and stakeholders to **organise, implement and scale up solutions and results successfully and independently after the end of the project.** To ensure the scalability and contribution to real change, project proposals benefit from building on the results of, and linking to, ongoing or recently completed research and demonstration projects, for example through use of test infrastructure, use of knowledge, cooperation of key demos, transfer of results, etc. Building on existing solutions, project proposals can show how these solutions can be transferred to similar regions in other countries – or show the gap in the framework conditions why the solution cannot be replicated.

Proposals will be assessed mainly on the basis of their specific challenges and proposed solutions, which cover one or more of the following key issues:

- the proposal offers a solution for a specific regional challenge relevant to the energy transition
- the proposed solution involves and enables the orchestration of the specific need owners in the targeted region
- the proposed solution can be translated to other regions (replication in other regions) to increase its positive impact on the energy transition
- the Project Consortium has the capacity to achieve a sustainable outcome in terms of the interplay between technical developments and non-technical

CM2025-07 Integrated regional energy systems

Target topics

Project proposals addressing regional energy transition challenges should include one or more of the following key areas.

• Integration of regional infrastructures: Emphasise the roles of municipalities, local communities, industries, and stakeholders in shaping infrastructures and consumer dynamics.

• Utilisation of local energy resources: Maximise synergies and flexibility in locally available renewable energy sources for heating, cooling, electricity, and transport.

• Cross-sectoral integration: Promote collaboration across sectors, including transport, industry, and trade.

• Research-driven innovation: Align research with initiatives like living labs for prototype development and testing.

The following energy transition challenges are examples of what projects can address. Please note that this list is non-exhaustive.

• Increasing the regional share of renewables among all energy sectors

• Increasing flexibility and resilience within the regional energy system

• Optimising and integrating supplier and consumer infrastructure

• Fostering cross-sector synergies

• Improving the added value in the region by utilising local resources

• Enabling citizens, need owners, and other stakeholders to take part in related regional value chains. Target groups include the following entities.

• Local and regional authorities, stakeholder groups or networks, aggregators, etc.

• Regional system operators and distribution system operators (DSOs)

CM2025-07 Integrated regional energy systems

- Private and public need owners, institutions and citizens, especially involving diversified stakeholders intending to implement innovative and cross-sectoral integrated solutions
- Solution providers: technology product and system developers, service providers, etc.
- R&D institutes, local and regional innovation clusters, programmes and ecosystems, technology transfer agencies, triple helix organisations, etc.
- This Call Module encourages Project Consortia to involve partners from countries and regions that have not yet been able to mobilise their stakeholders. This can for example be done by inviting follow-up proposals from ongoing CETPartnership projects and include partners from new regions.
- Dimensions of innovation Project proposals shall use the Integrative Innovation Model as a framework for the description of their expected impact.
- Project proposals funded in this Call Module should not only cover the dimension of Technology & Infrastructure.
- For integrated solutions, we expect that in the best case all layers (Technology & Infrastructure, Integration & Organisation and Transformation) are covered within the project.
- Proposals are expected to describe their impact in the dimensions addressed, which can also be complemented by a reference to European transition plans, such as the SET Plan and in particular the Implementation Working Group on energy systems (IWG 4).

CM2025-07 Integrated regional energy systems

Complementarity with other Call Modules

The main difference between CM2025-01, CM2025-07 and CM2025-08 is the perspective how they relate to the energy system and the role of the industrial sites as actors in the energy systems

This Call Module CM2025-07 focuses on the interrelation and energy exchange between actors- like industrial sites- in the regional energy system.

CM2025-01 focuses on energy system studies, considering contributions that different industrial sites can make to the overall energy system in terms of flexibility and other aspects

CM2025-08 focuses on a single industrial site and its internal energy system, considering the interrelation with the overarching energy systems.

CM2025-02 essentially considers outstanding technical innovations.

CM2025-07 Integrated regional energy systems

Projects that are funded are expected to provide solutions to one or more of the challenges:

- Regionally scalable and replicable system solutions that are validated and demonstrated system prototypes (TRL7 or higher) which enable sustainable transition, effective consolidation and growth of integrated regional energy systems
- Contributions to existing roadmaps and implementation plans, reference architecture models and common standards as they exist and contribute to further development of these.
- Increased participation of regional need owning private and public companies, institutions and people, intending to implement innovative solutions in order to take an active role in the future energy supply and energy system (producing energy, providing flexibility, etc.).

CM2025-08 Integrated industrial energy systems

Call Module requirement: A Project Consortium must have industrial involvement by **at least one industrial Project Consortium Partner** (private for-profit company), preferably an end user.

Project partners:

- Secondary and higher education establishments (social science, humanities, technology, economic and science disciplines)
- Research organisations
- Private for-profit companies (such as industrial companies, suppliers of technology and services)
- Public bodies (may include municipal companies) See also Call Module requirement above

Budget: Funding requested from the Call in the range of (but not limited to) EUR 1.5–5 million, in addition to any self-financing.

TRL: Project end: TRL 6 or higher

Contact:TRI6

CM2025-08 Integrated industrial energy systems

The expected impact of the Call Module includes:

- Integrating European industry into a climate-neutral economy.
- Enhancing the competitiveness of European industry.
- Strengthening the resilience and security of energy systems.
- Supporting the development and pre-commercialisation of **disruptive future technologies**. Promoting the wider use of renewable energy sources and emission control technologies to reduce industrial emissions.
- Facilitating the integration of renewable energy into industrial systems to support **increased electrification.**
- Improving resource and energy efficiency in industrial energy systems through innovative process and system integrations.
- Significantly reducing harmful environmental impact and lowering or eliminating greenhouse gas emissions.
- Boosting circularity, for example through carbon capture and utilisation (CCU) or the reuse of industrial excess heat.

CM2025-08 Integrated industrial energy systems

This Call Module welcomes proposals that address one or more of the following challenges:

- Challenge 1: Reducing emissions from the industrial energy system Support technological leaps and industry's ambitions to change to more sustainable production by integrated industrial energy systems.
- Challenge 2: Enabling renewable energy integration and resource efficient industrial energy system. Contribute to increasing knowledge and develop new and renewable innovative processes and system integrations that will improve sector coupling in an energy and resource efficient way between industrial energy systems and the energy system in general
- Challenge 3: Climate-neutral industry . Increase use of renewables, green hydrogen (and its derivatives) and removing carbon emissions from the carbon cycle in industrial energy systems for use in industrial processes or long-lasting products (CCU).

CM2025-08 Integrated industrial energy systems

Challenge 1: Reducing emissions from the industrial energy system. The scope of this challenge is addressed to projects that will contribute to reducing the industry's process related emissions, in particular emissions to air. The objective is to support technological leaps and industry's ambitions to change to more sustainable production by integrating clean energy to industrial energy systems. Process-related emissions refer to emissions directly from industrial processes according to environmental reporting as well as to emissions that occur during the combustion of residual products from fossil raw materials in production processes, such as flaring of industrial residual gases. Emissions with an indirect connection to industrial processes are, for example, combustion emissions from on-site power and heat production. Projects that focus on reduction of indirect emissions from industry can only be supported in cases where a reduction in direct emissions from processes is also included in the project or when they involve a technological leap for the industry. Therefore, projects that only involve conventional fuel changes will not be funded. Following are examples of topics that proposals could cover to meet the above challenge: • Industrial electrification • Coupling electricity and heat by integrating renewable technologies • Process-related emissions reduction (e.g. SOx and NOx)

Challenge 2: Enabling renewable energy integration and resource efficient industrial energy system The scope of this challenge is addressed to projects that will contribute to develop new and renewable innovative processes and system integrations that will improve sector coupling in an energy and resource efficient way between industrial energy systems and the energy system in general. System-level integrations across sectoral boundaries will provide support for a more flexible and robust European energy system based on a high degree of variable renewable energy sources. The projects in this area can include the role of industry in a larger perspective, i.e., integration between processes within an industrial site, between different industries or integration between an industrial site and the surrounding local or regional energy system, to create an energy- and resource-efficient system from a holistic perspective.

The area thus comprises industrial and cross-sectoral symbiosis, including: Partnership: cetpartnership.eu industrial and system-integrated structures, i.e., projects that study physical exchanges of energy, material or residual streams in the form of, for example, excess heating or cooling, operational and municipal wastes, and residual materials and flows. This area can thus help create circular economy solutions for industry and local communities and regions. Following are examples of topics that proposals could cover to meet the above challenge: • Solutions for advanced energy sector coupling in industries for instance for heat using or electricity • Recovery of excess heat and upgrade (e.g. with heat pump) for reuse within or outside the industrial site • Energy and resource efficient process technologies

Challenge 3: Climate-neutral industry The scope of this challenge is by use of renewables, green hydrogen and removing carbon emissions from the carbon cycle in industrial energy systems for use in industrial processes or long-lasting products (CCU). Addressed to projects that will contribute to removing industrial greenhouse gases from the carbon cycle through emission separation combined with long lifetime utilisation or long-term storage of carbon. Special emphasis is placed on greenhouse gases of biogenic origin and on CO2 removed from the atmosphere to advance development of carbon sinks. The challenge is also addressed to projects that enable industries to implement bio-CCU to produce chemicals from their biological CO2 emissions, or such energy carriers that would serve as energy storages and support balancing of the renewable-based future energy system. CCU production pathways might involve bioprocesses, e.g. with algae, or synthesis processes with clean hydrogen. Implementation of CCU, might open new business opportunities beyond today's industrial production. Following are examples of topics that proposals could cover to meet the above challenge: • Industrial Bio-CCU • Value chain development for CCU • Clean hydrogen for energy-intensive industrial applications.

CM2025-08 Integrated industrial energy systems

Cross-cutting dimensions:

In addition to the target topics, project proposals can (no requirement) address cross-cutting dimensions that might impact the deployment of industrial integrated energy systems.

Dimensions of innovation Projects shall drive innovation, lead to findings and create evidence-based knowledge in the three dimensions of innovation as outlined in the Dimensions of innovation, see Subsection

CM2025-08 Integrated industrial energy systems

Complementarity with other Call Modules:

- The overall flexibility from the interface of industry and energy sector coupling, for the entire energy system, with focus on energy system studies (adding environmental /social aspects) is covered by CM2025-01.
- Provision of flexibility from industry is covered in this Call Module by studying and developing solutions on production processes themselves, up to the interface for the entire energy system.
- Call Modules directed towards single technology development are focused on CM2025-04, CM2025-05, and CM2025-06. CCU technology is covered by CM2025-04, while it is covered by this Call Module if linked to industrial processes, industry symbiosis and energy system integration. Hydrogen technology in industry is covered by CM2025-05, while this Call Module is highlighting hydrogen in industry application and industrial symbiosis. Concentrated solar for thermal applications in the industry is covered by CM2025-06, while it is covered by this Call Module if linked to industry application and energy system integration. Industrial applications of new heating and cooling technologies are covered by CM2025-06, while it is covered by this Call Module if linked to industry application with energy system coupling included.

In case of uncertainty about where to best propose your project, consult with relevant Funding Organisations or TRIs.

CM2025-08 Integrated industrial energy systems

Projects are expected to contribute to one or more of the following outcomes:

- Technical solutions for integrated industrial energy systems are developed and demonstrated.
- To move closer to commercial readiness, and actively exploitation of results
- Support the operation of a fully integrated energy system and increase system flexibility and efficiency.
- Project Consortium Partners are ready to apply for follow-up funding for demonstration or flagships projects both from private sources and other funding programs like EU's Innovation Fund.
- Establish long-term international collaboration between countries/organisation bringing stakeholders together.

CM2025-09 Clean energy integration in the built environment

Call Module requirement: Proposals must take an integrated approach and must focus on the overall (energy) system of a building / the built environment. Technological development of only single components is ineligible.

Project partners:

- Research organisations
- Secondary and higher education establishments
- Start-ups networks
- Private for-profit companies (small and medium-sized enterprises (SMEs))
- Public bodies (municipalities, local and regional governments)
- Innovation clusters
- Ecosystems and programmes
- Infrastructure providers and operators
- Interregional and transnational innovation ecosystems such as • Cluster networks

Budget: Funding requested from the Call in the range of (but not limited to) EUR 1–5 million, in addition to any self-financing.

TRL: Project start: TRL 3 or higher Project end: TRL 5 or higher

Contact:TRI7

CM2025-09 Clean energy integration in the built environment

Challenges

The built environment is currently responsible for more than 40% of global energy and process-related CO2 emissions. To support an overall net-zero transition of buildings, it is important to consider the full life cycle of buildings to achieve net-zero for the entire built environment While one third of the emissions is material driven, the other two thirds are related to buildings operations according to data from IEA and Statista. **The overall goal of this Call Module is to reduce energy need and to increase efficiency, flexibility and renewable energy production within the built environment.**

The Call Module welcomes proposals addressing one or more of the following three challenges:

Challenge 1. Transform the building to an active part within the energy system by integrating energy production, energy storage and energy management technologies.

Challenge 2. Digitalisation of the whole life cycle of a building (planning, construction, fit-out, commissioning, operation, decommissioning and disposal).

Challenge 3. New concepts and technologies for the renovation of the existing built environment to enhance energy efficiency and lower the energy demand.

CM2025-09 Clean energy integration in the built environment

The scope of the Call Module is to **transform the built environment from a passive towards an active role in the future energy landscape.**

Proposals should identify any foreseen applications of developments in different building contexts:

- Existing and new buildings
- Residential (urban, rural, isolated) and non-residential buildings (large public and private buildings, commercial malls, service and mobility infrastructures, logistics platforms such as ports, airports, railway terminals, roads, large parking areas, warehouses)
- Old, historical and special buildings (cultural and built heritage)
- Different climate and geographical areas

This Call Module addresses innovative aspects and/or new approaches of the integration of different technologies, while the development of single technologies is addressed in other Call Modules.

Proposals should include a perspective for technology transfer including plans for verification and validation, data management and exploitation.

CM2025-09 Clean energy integration in the built environment

The targeted topics within the three challenges of the Call Module include, but not exclusively, the following.

Challenge 1 • Production of renewable energy within the building • Seamless integration of these technologies in the urban environment • Integration of electricity, heat and cold storage • Improving energy flexibility and resilience of energy systems • Integration of e- mobility concepts • Building-to-Building energy and active buildings concepts • New air-conditioning and ventilation concepts in local grids and neighbourhoods • New active building elements like facades, windows, switchable thermal insulation and their system integration • Other innovative ideas, which contribute to our first aim, namely the integration of renewables, storage solutions etc.

Challenge 2 • Digitalisation of in-building energy management • Increase self-consumption and energy efficiency during operation • Active energy production and storage management within buildings • Digitalisation of networks for heating and cooling • Building Information Modelling (BIM) from the cradle to the grave including life cycle analysis • New circular-oriented services at different levels of the Construction and Demolition Waste (CDW) supply/value chain • Other innovative ideas, which contribute to our second aim, the digitalisation of the planning process

Challenge 3 • Concepts for a more efficient heat distribution and to lower the heat demand • Intelligent management of electrical loads in public spaces across the existing built environment • Prefabricated elements to boost renovation processes and push serial renovation • New tools for efficient renovation pathways • Novel holistic + economically viable concepts incl. demonstration, LCA, etc. • Concepts for heritage buildings • LCA incl. grey energy • "User" acceptance and economic viability • Improving resilience of the renovated buildings • Other innovative ideas, which contribute to the increase of the renovation rate Expected outcomes of funded projects Funded projects are expected to provide solutions to at least one of the challenges in the Call Module through new knowledge, skills, and integration approaches. Moreover, the projects are expected to contribute to one or more of the following outcomes: • A set of technical solutions for building integrated energy systems are developed and demonstrated. • Projects are expected to move closer to commercial readiness. • Projects should support the operation of a fully integrated energy system and increase system flexibility and efficiency. • Support a wider use of renewable energy sources and digital tools like innovative energy management systems to increase efficiency and flexibility or tools to support planning, facility management during its lifetime and disposal / recycling of buildings.

A 2025-ös felhívásokra vonatkozó CETP webináriumok és matchmaking

- Information Event for Joint Call 2025: Call Modules 4 ,5 & 8 | CETPartnership – 2025. június 13 (11:00-12:00) - **CCUS (Call Module 4)**; **Hydrogen and renewable (Call Module 5)**; **Industry (Call Module 8)**
- Integrated Industrial Energy Systems Pitching & Matchmaking event: 2025. június 16 (9:00)

Integrated Industrial Energy Systems Pitching & Matchmaking event | Clean Energy Transition Partnership

- Information webinar on **Call Module 7 Integrated Regional Energy Systems**: 2025. június 17 (14:00) - Information webinar on Call Module 7 Integrated Regional Energy Systems | Clean Energy Transition Partnership
- TRI3 and TRI6 Call Launch webinar: 2025.június 13.
- TRI 6 Matchmaking event: 2025. június 18.

Partnerkeresés

- CETP Home | Clean Energy Transition Partnership – matchmaking platform
- Enterprise Europe Network: Enterprise Europe Network | Enterprise Europe Network

Eddigi magyar eredmények/sikerek

- 2022: 1 magyar nyertes pályázó; 2 magyar pályázó
- 2023: 5 magyar nyertes pályázó; 8 magyar pályázó
- 2024: 1 szakasz: az értékelés folyamatban (18 magyar pályázó; 2. szakaszban 13 magyar pályázó-5 projektben érintett) – támogatásra javasolt 5 projekt magyar érintettséggel, amelyben 7 magyar pályázó esélyes

2024 óta már nem vagyunk alul-reprezentált partnerország

Sikeres pályázást kívánok! (idén is)