

# Clean Energy Transition partnership

Continuing the journey of R&D in solar energy:  
Results of 2022 call and launch of 2023 call  
Francesco Basile & Rachele Nocera (MUR)

## CETP JC 2022: results

**112** pre proposals

**75** invited for the full proposal

**72** handed in their full proposals

**45** approved projects (still to be confirmed)

More than **80.000.000** Euros for the projects

Applicants from more than **20+** countries

# Turning TRI2 objectives in Call Module priorities

## 2022

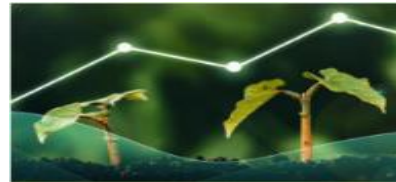
Two Call Modules on development of RE technologies for zero emission power production :

2.1) Objective: Cost reduction (high TRL)

2.2) Objective: Increased efficiency (Low TRL)

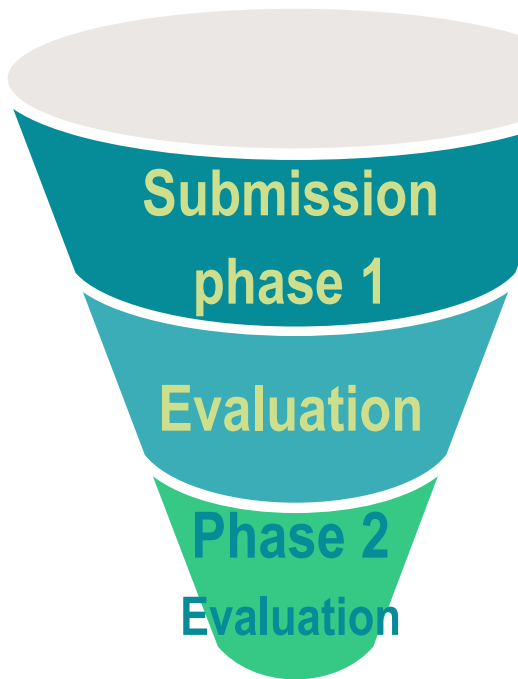


**CM 2.1:** Advancing RE technologies for power production through cost reduction



**CM 2.2:** Breakthrough R&D to increase RE power technologies efficiency

# TRI 2 Call Modules 2022: results



**Call Module: TRI2  
Advancing RE  
technologies for power  
production through  
cost reduction**

- 12 proposals submitted
- 9 proposals passing
- 75% success rate
- 9 Proposals sub 2<sup>nd</sup> stage
- **4 proposal approval**

PV	1
WIND	1
Offshore RES	2

**Call Module: TRI2  
Breakthrough R&D to  
increase RE power  
technologies efficiency**

- 22 proposals submitted
- 15 proposals passing
- 68% success rate
- 12 Proposals Sub. 2<sup>nd</sup> stage
- **10 Proposal approved**

PV	4
WIND	2
Offshore and ocean	2
CSP-ST	2

# Start of the selected project

Call Module	Project Id	Acronyme	Ranking	Score	Funding request
CM 2.1	Cetp-2022-00371	SEASNAKE+	1	14	2.213.103,00
CM 2.1	Cetp-2022-00018	HYBRID WIND	2	13	2.499.175,13
CM 2.1	Cetp-2022-00127	WECHULL+	2	13	2.550.297,00
CM 2.1	Cetp-2022-00394	WaMTec	4	12	1.304.200,34
					<b>8.566.775,47</b>

Call Module	Project Id	Acronyme	Ranking	Score	FUNDING REQUEST
CM 2.2	Cetp-2022-00377	WIND-DIGIPOWER	1	14	1.112.976,00
CM 2.2	Cetp-2022-00085	NextGen	1	14	2.313.672,00
CM 2.2	Cetp-2022-00360	NORD STORM	3	13	1.574.638,63
CM 2.2	Cetp-2022-00297	EPoBoC	3	13	1.350.505,00
CM 2.2	Cetp-2022-00102	Sunflower	5	12	1.163.323,90
CM 2.2	Cetp-2022-00345	MORE	5	12	1.463.400,00
CM 2.2	Cetp-2022-00336	SPOT-IT	5	12	1.787.898,91
CM 2.2	Cetp-2022-00036	ACT-FAST	5	12	601.216,91
CM 2.2	Cetp-2022-00131	DETECTIVE	9	11	778.747,00
CM 2.2	Cetp-2022-00382	SMARTMOORING	10	10	1.067.029,50
					<b>13.213.407,85</b>

## Participating Funding Organisations

Belgium/Flanders

Denmark/IFD

Estonia

Finland

France/ANR

France/PdLoire

Germany

Germany/NRW

Germany/Saxony

Iceland

Ireland

Italy/MiMIT

Italy/MUR

The Netherlands/NWO

The Netherlands/RVO

Norway

Poland

Spain/AEI

Spain/CDTI

Sweden

Türkiye

# Project approved in TRI2

WaMTec	From Wafer to Module: Cost-Effective High-Efficiency Silicon Technologies	Fraunhofer Gesellschaft zur Förderung der angewandten Forschung	DE
NORD STORM	Novel paths towards next generation heterojunction solar cell and module	Forschungszentrum Julich GMBH	DE
EPoBoC	Easy to fabricate, both sides poly-Si passivating contact bottom cell for Perovskite/Silicon tandem devices	Fraunhofer Institute for Solar Energy Systems ISE	DE
SPOT-IT	Stable printed perovskite/organic tandem solar cells and modules for indoor & IoT	Univ di Roma Tor Vergata	IT
DETECTIVE	Development of a novel Tube - bundle-Cavity linear receiver for CSP applications	Politecnico di Torino	IT
Sunflower	Sustainable Near-net-shape Fabrication of Low Environmental impact Receiver materials	Fraunhofer Gesellschaft zur Förderung der Angewandten Forschung	DE
ACT-FAST	Sustainable Antimony Chalcogenide Thin-Film Tandem Solar Technology	Tallinn University of Technology	EE

8.560 Million Euro of financing

# Project approved in TRI7

## Call module 7.1 (High TRL)

REFORM 1.261.870	Power Generation from Perovskite Architectural Elements	Universitat de València	ES
TRANSMIT 985'585	Semi-transparent micro-stripped thin-film photovoltaics for energy-harvesting windows	International Iberian Nanotechnology Laboratory (INL)	ES

## Call module 7.2 (Low TRL)

NewHeat Integrated 1.271.547	Highly flexible and modular PCM based thermal energy storage system for efficient heating applications in the built environment	Fraunhofer ICT	DE
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3.519 Million Euro of financing

# JOINT CALL 2023



# Joint Call 2023 overview

- A total Call budget of over € 127 million from almost 50 national/regional Funding Organisations plus additional funding from the European Commission
- Funding Organisations can fund entities based in their country/region. Funding arrangements will be made directly between the project partners and their national/regional Funding Organisation.
- Different Funding Organisations have different national/regional requirements and fund different Call Modules, see Annex C.

# Call structure

## Transnational Part (2 Stages)

### Stage 1: Pre-proposal

Submission of a pre-proposal, including a concise project description as well as a description of the partners. If the pre-proposal is selected, the project consortium is invited to submit a full proposal.

### Stage 2: Full proposal

Submission of a full proposal, only if the pre-proposal is invited to participate in Stage 2.

## National/Regional Part

- All project partners will be evaluated according to national/regional eligibility criteria and requirements.
- **Important!** Some Funding Agencies require submission of a proposal on national/regional level. See the respective national/regional requirements for more information.



## Eligibility criteria/requirements

- Transnational eligibility criteria (see Chapter 4)
- Call Module requirements (see Chapter 8)
- National/regional requirements (separate submission may be needed, see Annex B)

Eligibility check will be performed by Call Management, TRIs and Funding Organisations in both proposal stages.

# Transnational eligibility criteria

- 1 Submission on [CETPartnership Submission Platform](#) before **deadlines** using **templates**
- 2 **≥3 independent entities** applying for funding from **≥3 countries participating in the Call** (≥2 EU Member States or Horizon Europe Associated Countries)
- 3 **Maximum 60%** of the total project efforts (PMs) for one Project Consortium Partner
- 4 **Maximum 75%** of the total project efforts (PMs) from one country/region
- 5 Not from the CETPartnership members/Funding Organisations
- 6 Project start before **15 December 2024**
- 7 Project duration **36 months** maximum
- 8 Work package called **Reporting and Knowledge Community** included

# Project consortia

- A project consortium may consist of following legal entities:
  - A Coordinator: cannot be changed before the funding decision
  - Beneficiary Partners: participating with funding from the Call
  - Self-financed Partner(s): participating from any country without applying for funding in the Call
- Associated Project Partner(s) may participate without declaring their costs, nor applying for funding in the Call
- Specific Call Module and/or national/regional requirements may apply
- Minor changes in the project consortium may be accepted between the pre-proposal and the full proposal (see Subsection 6.2.1)


# Participating Funding Organisations

 Austria	Austrian Research Promotion Agency (FFG)
 Belgium	Fonds Innoveren en Ondernemen (FIO)
 Belgium	Service Public de Wallonie (SPW)
 Canada	Emissions Reduction Alberta (ERA)
 Cyprus	Research and Innovation Foundation (RIF)
 Czech Republic	Technology Agency of the Czech Republic (TA CR)
 Denmark	Energy Technology Development and Demonstration Programme (EUDP)
 Denmark	Innovation Fund Denmark (IFD)
 Estonia	Estonian Research Council (ETAg)
 Estonia	Ministry of Economic Affairs and Communications (MKM)

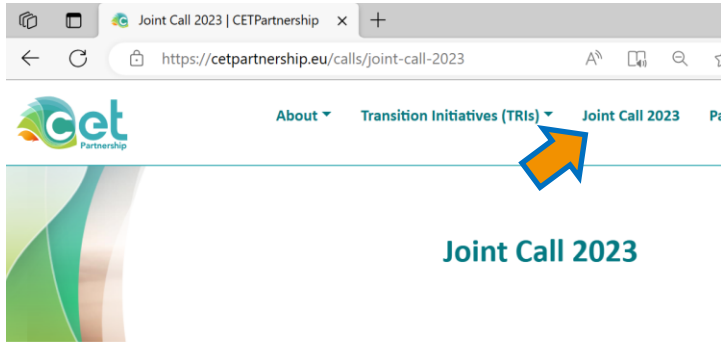
 Finland	Innovaatorahoituskeskus Business Finland (BF)
 France	Agence de la Transition Écologique (ADEME)
 France	Agence Nationale de la Recherche (ANR)
 France	Pays de la Loire Region Council ( RPL)
 Germany	Forschungszentrum Jülich – Projektträger Jülich on behalf of BMWK (PTJ (BMWK))
 Germany	Forschungszentrum Jülich – Projektträger Jülich on behalf of MWIKE (PTJ (MWIKE))
 Germany	Saxon State Ministry for Science, Culture and Tourism (SMWK)
 Greece	General Secretariat for Research and Innovation (GSRI)
 Hungary	National Research, Development and Innovation Office (NKFIH)
 Iceland	The Icelandic Centre for Research (RANNIS)

 India	Ministry of Science & Technology, Government of India (DST)
 Ireland	Geological Survey Ireland (GSI)
 Ireland	Sustainable Energy Authority of Ireland (SEAI)
 Israel	Ministry of Energy (MoE)
 Italy	Ministero dell'Università e della Ricerca (MUR)
 Italy	Ministry of Economic Development (MIMIT)
 Latvia	Latvian Council of Science (LZP)
 Lithuania	Ministry of Energy of the Republic of Lithuania (ENMIN LITHUANIA)
 Malta	Malta Council for Science and Technology (MCST)
 Netherlands	Dutch Research Council (NWO)
 Netherlands	Netherlands Enterprise Agency (RVO)
 Norway	The Research Council of Norway (RCN)

 Poland	National Centre for Research and Development (NCBR)
 Portugal	Fundação para a Ciência e a Tecnologia (FCT)
 Romania	Executive Agency for Higher Education, Research, Development and Innovation Funding (UEFISCDI)
 Spain	Agencia Estatal de Investigación (AEI)
 Spain	Centre for the Development of Technology and Innovation (CDTI)
 Spain	Departamento de Desarrollo Económico, Sostenibilidad y Medio Ambiente. Eusko Jauriaritza-Gobierno Vasco (EUSKADI)
 Spain	Ente Vasco de la Energía (EVE)
 Spain	Fundación para el Fomento en Asturias de la Investigación Científica Aplicada y la Tecnología / Agencia de Ciencia, Competitividad Empresarial e Innovación Asturiana (FICYT / SEKUENS)

 Spain	Regional Development Agency of Cantabria (SODERCAN)
 Sweden	Swedish Energy Agency (SWEA )
 Switzerland	Swiss Federal Office of Energy (SFOE)
 Switzerland	Swiss National Science Foundation (SNSF)
 Tunisia	Ministry of Higher Education and Scientific Research (MHESR )
 Türkiye	The Scientific and Technological Research Council of Türkiye (TUBITAK)
 United Kingdom	Scottish Enterprise (SE)
 United States	Department of Energy (DOE )

# Find national contact points on the CETPartnership website

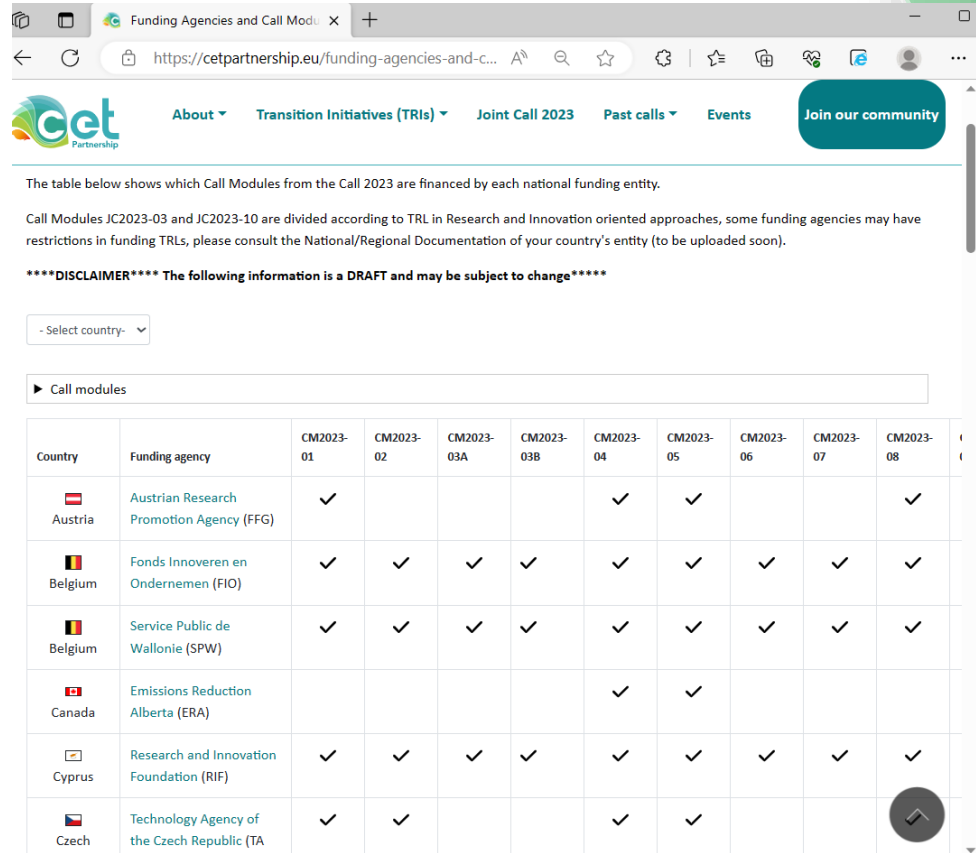


- SUBMIT YOUR PROPOSAL
- MATCHMAKING PLATFORM
- JOINT CALL 2023 DOCUMENTS
- FUNDING AGENCIES AND CALL MODULES

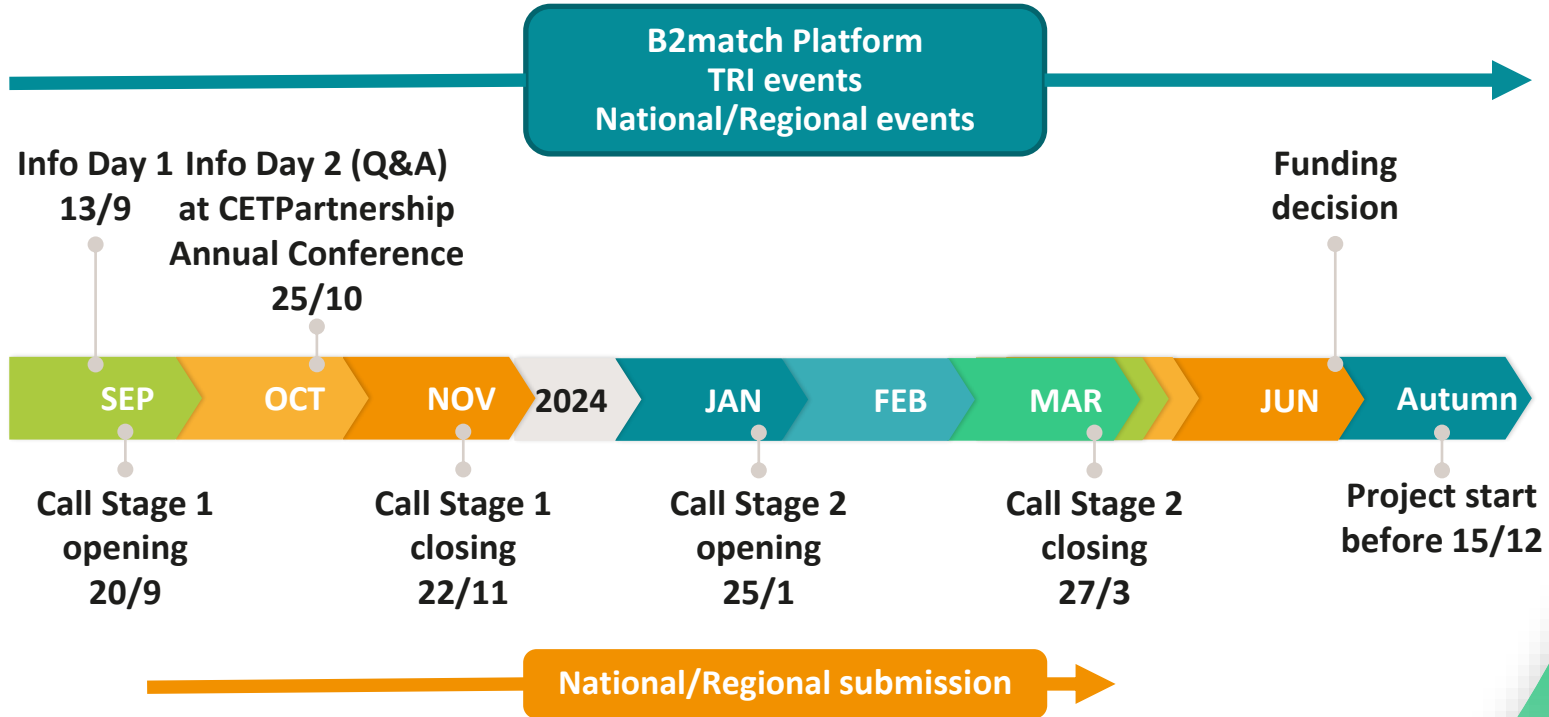
The **CETPartnership Joint Call 2023** is the second CETPartnership. To cover different topics and RDI **Modules**, aimed at different energy technologies; and innovation oriented approaches on different T complementing and completing each other.

### General information about the call

The **CETPartnership Joint Call 2023** has two parts:



# Joint Call 2023 timeline





# CETPartnership Joint Call 2023

## Call topics

# CETPartnership Joint Call 2023 Call topics

No.	Title	Contact
CM2023-01	Direct current (DC) technologies for power networks	<a href="mailto:TRI1@cetpartnership.eu">TRI1@cetpartnership.eu</a>
CM2023-02	Energy system flexibility: renewables production, storage and system integration	<a href="mailto:TRI1@cetpartnership.eu">TRI1@cetpartnership.eu</a> <a href="mailto:TRI2@cetpartnership.eu">TRI2@cetpartnership.eu</a>
CM2023-03A/3B	Advanced renewable energy (RE) technologies for power production	<a href="mailto:TRI2@cetpartnership.eu">TRI2@cetpartnership.eu</a>
CM2023-04	Carbon capture, utilisation, and storage (CCUS)	<a href="mailto:TRI3@cetpartnership.eu">TRI3@cetpartnership.eu</a>
CM2023-05	Hydrogen and renewable fuels	<a href="mailto:TRI3@cetpartnership.eu">TRI3@cetpartnership.eu</a>
CM2023-06	Heating and cooling technologies	<a href="mailto:TRI4@cetpartnership.eu">TRI4@cetpartnership.eu</a>
CM2023-07	Geothermal energy technologies	<a href="mailto:TRI4@cetpartnership.eu">TRI4@cetpartnership.eu</a>
CM2023-08	Integrated regional energy systems	<a href="mailto:TRI5@cetpartnership.eu">TRI5@cetpartnership.eu</a>
CM2023-09	Integrated industrial energy systems	<a href="mailto:TRI6@cetpartnership.eu">TRI6@cetpartnership.eu</a>
CM2023-010A/10B	Clean energy integration in the built environment	<a href="mailto:TRI7@cetpartnership.eu">TRI7@cetpartnership.eu</a>

# Transition Initiatives (TRIs)



**TRI 1: Integrated Net-zero-emissions Energy System**



**TRI 2: Enhanced zero emission Power Technologies**



**TRI 3: Enabling Climate Neutrality with Storage Technologies, Renewable Fuels and CCU/CCS**



**TRI 4: Efficient zero emission Heating and Cooling Solutions**



**TRI 5: Integrated Regional Energy Systems**



**TRI 6: Integrated Industrial Energy Systems**



**TRI 7: Integration in the Built Environment**

# CETPartnership and Mission Innovation GPFM Joint Call Module

## CM2023-02 Energy system flexibility: renewables production, storage and system integration



Call module developed with

- Mission Innovation **Green Powered Future Mission**
- **TRI 1** and **TRI 2** experts and Partners



This Call Module brings **the contribution of CETPartnership at a global level** and gives a **global dimension to funded projects**, which will benefit from work and exchange with project partners from different world regions



### Domain

**11 GPFM Innovation Priorities** clustered into 5 R&I themes:

1. Large-scale renewable generation and system flexibility and reliability
2. Energy storage technologies and systems for flexibility services
3. System integration and flexible operations
4. Innovative flexibility sources and flexibility markets
5. Energy data management and security



### Objective

Address key aspects to accelerate the uptake of highly innovative replicable and scalable solutions, preferably built on top of existing initiatives or assets



### Call main focus

R&D projects dedicated to technological development, system integration, digitalization, standardisation relevant to the Innovation Priority themes of the Module Domain

Target groups

Private/regulated sector actors such as

- system operators
- SMEs and spin-off companies
- Research Technology Organisations (RTOs)

TRL

Start from TRL  $\geq 3$

Achieve TRL 5-6

Budget

A contribution ranging from 0.5 to 1.5 M€ would allow to co-fund sound project proposals

# TRI 2. Enhanced zero emission Power Technologies



Leading expert: Francesco Basile (MUR-IT)

Office : Maria Rachele Nocera (MUR-IT)

CoLead: FECYT (ES)

TRI 2's Mission is to develop a pool of zero-emission power technologies and solutions based on Renewable Energy Sources (Ocean Energy; PV; CSP, Wind, and Bioenergy) as the backbone of the future energy system, being able to deliver carbon-neutral electricity accessible to all and to contribute to the resilience of the system

**CM2023-03A calls for ROA (Research-Oriented Approach) projects targeting TRL4 or above**

**CM2023-03B calls for IOA (Innovation-Oriented Approach) projects targeting TRL6 or above**

# TRI2: Call Module 03A/03B

CM2023-03A calls for ROA (Research-Oriented Approach) projects targeting TRL4 or above

CM2023-03B calls for IOA (Innovation-Oriented Approach) projects targeting TRL6 or above

## Expected Impact (03A/03B)

- Address zero emission power production technologies; Bio Energy, CSP, Ocean, Off-shore, PV, and Wind
- Integrating different RE power production technologies
- Coupling/hybridizing RE technologies (co-generation of power and other energy carriers)
- Increase the energy conversion efficiency
- Increase technology performance and/or lifetime
- Develop innovative technologies and components
- Decrease investment cost and LCOE and/or improve the overall economics
- Demonstrate the feasibility of scaling up
- Demonstrate the technology in different geophysical/weather conditions
- Reduce environmental impact or improve multiple use of occupied land surface / or maritime space
- Minimize the use of critical raw materials (CRM), apply circularity-by-design approaches

# CM2023-03A/03B: technology areas (not prescriptive)

## Bioenergy for power generation

- High efficiency biomass (co)generation of power with improved performance and higher share of power production ratio, using residues and wastes as feedstocks, and with negative carbon emission
- Integrated CHP systems enhancing annual total efficiency and power capacity factor and negative carbon emission

## Concentrated solar power (CSP) / solar thermal energy (STE)

- Line-focus solar power plants technology: Component development, process innovation and cost optimisation for molten salts systems; Solar collector fields with silicone oil as heat transfer fluid (HTF)
- Central Receiver power plants technology (concepts, materials and components): optimisation of central receiver molten-salt technology; Solar tower with particle receiver technology
- Turbo-machinery developed for specific conditions of solar thermal power plants: expansion turbine technologies for advanced CSP power blocks or supercritical CO<sub>2</sub> cycles
- **Cross-cutting issues:** Digitalisation of CSP plants; Innovative coatings for CSP mirrors

## Ocean energy

- 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 blades: Improving the survivability and efficiency of tidal blades to enhance performance and reliability of the device
- Connection systems: Reduce the cost of connection and cabling systems, as well as maintenance requirements and costs
- Innovative solution such as salinity gradient energy

# CM2023-03A/03B: technology areas (not prescriptive)

## Offshore renewables (marine renewables, floating wind/PV, etc.)

- New materials or novel applications of existing materials for moorings, foundations and components: Materials with improved fatigue, damping, stiffness, bio-fouling management or other cost-reducing characteristics
- Mooring and connections: Improved moorings, foundations, connections and cabling systems; Dynamic cable repair solutions
- O&M: innovative solutions to reduce costs of operations and maintenance
- Site-specific marine observation, modelling and forecasting: marine / meteorological data to improve performance, reliability, availability of offshore renewables through better design and efficient operations

## Solar photovoltaics

- Performance Enhancement and Cost Reduction through Advanced PV Technologies: Perovskite / Silicon Tandem-Solar cells and modules / Thin film cells etc.
- Lifetime, Reliability and Sustainability advanced PV technologies, manufacturing and applications: Low environmental impact materials, processes, products
- Digitalisation for O&M: advanced data analytics, digital twin of assets and components, predictive maintenance
- New Applications through Integration of PV: Agrovoltaic and landscape integration; Floating PV; IIPV-Infrastructure Integrated PV; Low power PV



# CM2023-03A/03B: technology areas (not prescriptive)

## Wind energy (offshore and onshore)

- Next generation of wind turbine technology: cost-efficient, energy-efficient, low environmental impact, scalable wind energy converters and turbines
- Atmospheric modelling: Improved understanding of atmospheric and wind power plant flow physics; Predicting environmental parameters
- Digital twins for turbine and for optimised wind energy applications
- O&M: solutions/digital solutions for wind energy operation, maintenance & installation
- Landscape integration of wind energy in the natural and social environment

## Hybrid-RES solutions

- Site integration optimisation: PV+CSP; PV+Wind, CSP-Wind, Ocean-Wind, etc.
- Integration with storage: Optimise RE power production, site and technology integration with energy storage
- Hybrid systems: Combined electricity generation with heat or other energy carriers in hybrid systems (PVT, PV-Hydrogen, CSP-ST)

TRL

**CM 03A - ROA:** research and innovation action (final TRL $\geq$  4)

**CM 03B - IOA:** Innovation action (final TRL $\geq$  6)

# TRI 7. Integration in the Built Environment

Leading expert: Stefan Nowak, (Nowak Energy & Technology- CH)

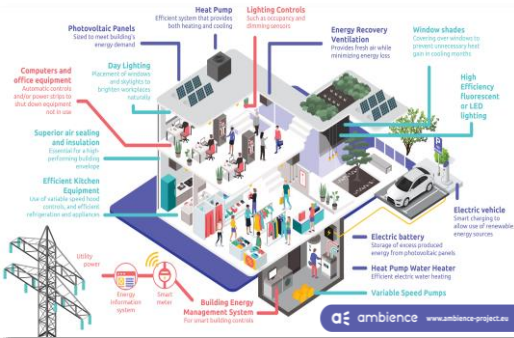
Office : Thomas Biel , (Nowak Energy & Technology- CH)

CoLead: FECYT (ES), MUR (IT)

TRI 7 mission is to provide solutions and technologies for existing and new buildings to become an active element in the energy system, with enhanced capability to produce, store and efficiently use energy in the residential and non-residential sector, comprising public and commercial buildings, service and mobility infrastructure buildings, etc



# Identifying the focus of TRI 7



Individual Technologies

Integration in Buildings

Areal Concepts

**TRI 7: Focus on the Interface  
- Emphasis on Integration**

# Focus of TRI 7

- Interface between individual technologies and the system
- Addressing the building / built environment related aspects
- Identification of the integration aspect
- Generation, Use and Storage (electricity, heat, cold)
- Network issues (electricity, heat, cold)
- Smart operation and management
- Role of Digitalization

# TRI 7 and solar energy

Examples of possible solutions (not exhaustive!)

- Climate neutral buildings with emphasis on local energy production
- Building and built infrastructure integrated PV
- Active facades incl. PV-hybrid solutions
- Solar assessment and solar cadastres
- Energy communities, towards positive energy districts

*Focus on the integration aspect!*

# Thank you for your attention

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