

Collaborative Research and Innovation at the heart of Competitiveness: Support for a strong Pillar 2 in FP10

17 April 2025 – As the European Commission is set to reach a decision on the new Framework Programme (FP10), the ETIPs and organisations noted here as signatories strongly advocate for political support and increased funding of “Pillar 2”. As the part of Horizon Europe that funds collaborative research, Pillar 2 is essential for Europe’s future in innovation and subsequently, industrial competitiveness in the renewable energy sector. Therefore, an ambitious Pillar 2 will ensure sufficient investment in Europe’s future competitiveness.

The next Framework Programme must be equipped with the tools to ensure its successful achievement of the EU’s ambitious goals – including a sufficient budget of at least 200 billion euros. The Pillar 2 budget should also be reinforced to boost European industry by supporting research and innovation. However, the focus should be on supporting promising innovative research opportunities rather than fulfilling arbitrary consortium requirements; therefore, we also advocate that exclusion criteria – for instance, exclusion due to an inability to form a consortium with a predetermined number of Member States - are softened.

Pillar 2’s achievements are evident: there have been numerous success stories from Horizon Europe projects – including those listed in the tables below – which have progressed technologies from low TRLs to high TRLs and contributed significantly towards European industrial competitiveness across renewable energy sectors. These successes show the promise and the future of continued support for collaborative research and innovation within the Framework Programme (see **Table 2**, where CorPower Ocean has gone from single-wave energy device demonstration at low-TRLs in Horizon Europe projects to now developing the largest wave farm project in the world, and **Table 4**, where heterojunction solar cells projects lead to Europe’s future largest solar cell factory in [3SUN](#)). Radical innovation instruments would ensure these success stories transfer even more quickly towards market-ready technologies.

To compete in a global market, European companies stand stronger united; a collaborative research landscape will create more efficient, more optimised and more sustainable solutions in a shorter amount of time.



Table 1: Pillar 2 Success Stories

Pillar 2 Success Stories	
<p><u>Project title:</u> Hydropower Solutions for Developing and Emerging Counties</p> <p><u>Web:</u> https://www.hyposo.eu</p> <p><u>Acronym:</u> HYPOSO</p> <p><u>Duration:</u> 2019-2023</p>	<p>HYPOSO supported the European hydropower industry and fostered sustainable development in selected target countries in Africa and Latin America. HYPOSO activities in Bolivia, Cameroon, Colombia, Ecuador and Uganda included framework analyses for small hydropower (SHP) up to 30 MW, mapping of more than 2,000 potential hydropower sites, capacity building, and the elaboration of 15 dedicated business case studies of SHP projects. HYPOSO succeeded in stimulating interest in European small-scale hydropower technologies and resulted in strong commercial initiatives towards the implementation of projects identified and developed within the HYPOSO project.</p>
<p><u>Project title:</u> Enabling interoperability of multi-vendor HVDC grids</p> <p><u>Web:</u> https://interopera.eu/</p> <p><u>Acronym:</u> InterOPERA</p> <p><u>Duration:</u> 2023 - 2027</p>	<p>InterOPERA set up the world's first multi-vendor, multi-terminal HVDC system. Via this project, electricity produced offshore was efficiently transported to the shore using HVDC systems designed for interoperability. This crucial innovation will ensure that offshore wind energy can be integrated to the grid more efficiently, representing a significant step forward for European industrial competitiveness.</p>
<p><u>Project title:</u> Hydropower Extending Power System Flexibility</p> <p><u>Web:</u> https://www.xflexhydro.com/</p> <p><u>Acronym:</u> XFLEX</p> <p><u>Duration:</u> 2019-2024</p>	<p>The XFLEX project upgraded the capability of hydropower plants with minimal transformation and improved the quality and reliability of power in the grid. The power plants designed by the project are more flexible than traditional power plants and provide a range of services to ensure that local and regional power grids remain reliable and resilient to current and future energy supply disruptions. Using advanced software solutions and modest technological upgrades, the project proved that it is possible to extend the flexibility of existing hydropower plants – allowing for strong scalability across Europe.</p>
<p><u>Project title:</u> Increase Friendly Integration of Reliable PV plants considering different market segments</p> <p><u>Web:</u> https://trust-pv.eu/</p> <p><u>Acronym:</u> TRUST-PV</p> <p><u>Duration:</u> 2020-2024</p>	<p>TRUST-PV optimised solar power installations by supporting the development of solar PV components and solutions in solar power plants. This included a demonstrated increase in performance and reliability of solar PV components (O&M-friendly PV module design, robust reliable inverter solutions, aftermarket coatings), solar PV systems (disruptive engineering concepts, accurate design, construction, operation, repowering and decommissioning), and in large portfolios of distributed and utility-scale solar PV (digital twins, advanced forecasting, statistical analysis).</p>
<p><u>Project title:</u> Fishfriendly Innovative Technologies for Hydropower</p> <p><u>Web:</u> https://www.fithydro.eu/</p> <p><u>Acronym:</u> FITHydro</p> <p><u>Duration:</u> 2016-2021</p>	<p>The FIThydro project evaluated the impact of hydropower plants (HPPs) on native environments in the EU and developed solutions to maintain production rates while safeguarding fish populations and upholding environmental standards. This allows for generation of vast</p>

	amounts of clean energy with minimal environmental impact and while protecting fish populations.
<p>Project title: Augmenting grid stability through Low-head Pumped Hydro Energy Utilization & Storage Web: https://alpheus-h2020.eu/ Acronym: ALPHEUS Duration: 2020-2024</p>	<p>ALPHEUS developed two novel Reversible Pump-Turbine (RPT) technologies for high efficiency at low heads in both pump and turbine modes. This allows low countries such as the Netherlands and Belgium – which do not have the natural topography needed for pumped hydro storage (PHS) – to effectively utilise such technologies. This reduces fossil fuel thermal power plants in those regions, which were the almost exclusive method of peaking/backup power supplies. The technology developed by ALPHEUS therefore has a concrete economic and environmental impact.</p>
<p>Project title: Improving the Financeability and Attractiveness of Sustainable Energy Investments in Photovoltaics: Quantifying and Managing the Technical Risk for Current and New Business Models Web: http://www.solarbankability.org Acronym: Solarbankability Duration: 2015-2017</p>	<p>The project established a common practice for professional risk assessment for PV installations based on technical and financial due diligence. This reduces the risk associated with investments in sustainable energy projects and subsequently increases trust from investors, financiers and insurance companies.</p>
<p>Project title: Logistic Efficiencies and Naval architecture for Wind Installations with Novel Developments Web: https://leanwind.eu/ Acronym: LEANWIND Duration: 2013-2017</p>	<p>The LEANWIND project provided cost reductions across the offshore wind farm lifecycle and supply chain through the application of lean principles and the development of state of the art technologies and tools. This ensures the removal of unnecessarily complex or wasteful stages of the development process, enhanced quality and greater cost and time efficiency.</p>
<p>Project title: Boosting New Approaches for Flexibility Management by Optimizing Process Off-gas and Waste Use Web: https://bambooproject.eu/ Acronym: BAMBOO Duration: 2018-2023</p>	<p>The BAMBOO project developed new innovative technologies to address energy and resource efficiency challenges in four energy-intensive industries: steel, petrochemical, minerals, and pulp and paper. Under the BAMBOO project, these technologies were adapted, tested, and validated under real production conditions focusing on three main innovation pillars: waste heat recovery, electrical flexibility and waste streams valorisation. Through this process, BAMBOO allowed intensive industries to become more competitive in the use of natural resources in a broader context.</p>
<p>Project Title: Solar Heat for Industrial Process toward Food and Agro Industries Commitment in Renewables Web: http://ship2fair-h2020.eu/ Acronym: SHIP2FAIR Duration: 2018-2023</p>	<p>The SHIP2FAIR project demonstrated applications of solar heat in industrial processes at operational environments. The project aimed towards a strong penetration and spread of these systems in the agro-food sector encouraging the replication also in other process industries through: two dedicated tools (Control and Replication), a best practices guide for developing solar thermal projects,</p>

	and a capacity building program for relevant professionals and students. The project has successfully delivered and operated 3 industrial solar thermal systems in France (meat processing), Italy (liquors) and Spain (winery) demonstrating solar steam generation, solar thermal cooling, and process and space heating.
<p><u>Project Title:</u> Sun coupled innovative heat pumps</p> <p><u>Web:</u> https://sunhorizon-project.eu/</p> <p><u>Acronym:</u> SunHorizon</p> <p><u>Duration:</u> 2018-2023</p>	<p>SunHorizon has demonstrated innovative and reliable heat pump solutions coupled with advanced solar thermal or PV-thermal panels and thermal storage solutions providing heating and cooling to residential and tertiary buildings. During the project, six demo sites were successfully operated across Europe to evaluate energy solutions in different types of buildings and climates as well as to test the hardware, smart monitoring and management tools in different contexts and countries.</p>
<p><u>Project title:</u> Advanced materials and processes to improve performance and cost-efficiency of Shallow Geothermal systems and Underground Thermal Storage</p> <p><u>Web:</u> http://www.geocond-project.eu/</p> <p><u>Acronym:</u> GEOCOND</p> <p><u>Duration:</u> 2017-2021</p>	<p>The GEOCOND project developed solutions to increase the thermal performance of Shallow Geothermal Energy Systems (SGES) in order to decrease costs. Reducing costs by 25% means a significant increase in competitiveness for geothermal installations. Concretely, objectives were to improve geothermal pipes with thermomechanical ageing resistance and surface properties, to have new additives for grouting and tailor-made performance grouting and to optimize efficiency and minimize costs.</p>
<p><u>Project title:</u> Novel Drilling Technology Combining Hydro-Jet and Percussion for ROP Improvement in deep geothermal drilling</p> <p><u>Web:</u> https://www.orchyd.eu/project/</p> <p><u>Acronym:</u> ORCHYD</p> <p><u>Duration:</u> 2021-2024</p>	<p>ORCHYD's new drilling technology will increase hard rock drilling rates from the current range of 1-2m/h to up to 4-10 m/h. The novelty is to combine two, previously separate, mature technologies: High Pressure Water Jetting (HPWJ) and Percussive Drilling, in a system customised for hard rock geothermal reservoirs to depths of 6 km.</p>
<p><u>Project title:</u> Deployment of novel GEOthermal systems, technologies and tools for energy efficient</p> <p><u>Web:</u> https://geofit-project.eu/</p> <p><u>Acronym:</u> GEOFIT</p> <p><u>Duration:</u> 2018-2022</p>	<p>GEOFIT tested and validated a set of tools for geothermal heating and cooling, ranging from the excavation process to the design and installation of ground source heat pumps. An exemplary result is the adoption of radar-based technologies previously used to detect superficial objects for detecting underground objects, thereby reducing the project costs and risks significantly.</p>
<p><u>Project title:</u> Delivery of sustainable supply of non-food biomass to support a "resource-efficient" bioeconomy in Europe</p>	<p>The S2BIOM project supported the sustainable delivery of non-food biomass feedstock at local, regional, and pan-European level through developing strategies and roadmaps informed by a computerized, simplified toolset</p>

<p><u>Web:</u> https://www.s2biom.eu/ <u>Acronym:</u> S2BIOM <u>Duration:</u> 2013-2016</p>	<p>and databases. This impacted the whole biomass delivery chain from primary biomass to end-use of non-food products and from logistics, pre-treatment to conversion technologies. By integrating these aspects, the project was able to develop a strategy for optimal biomass delivery chains and networks at the European, national, regional, and local scale.</p>
<p><u>Project title:</u> Quantifying and Deploying Responsible Negative Emissions in Climate Resilient Pathways <u>Web:</u> https://www.negemproject.eu/ <u>Acronym:</u> NEGEM <u>Duration:</u> 2020-2024</p>	<p>The NEGEM project was aimed at better understanding the quantitative potential, effectiveness and impacts of negative emission technologies and practices (NETPs). The project used a multidisciplinary approach to determine the extent to which NETPs are needed to achieve climate neutrality and how their associated technical, economic and socio-political impacts could limit their contribution. These results are essential to identify the actions needed to achieve climate neutrality.</p>
<p><u>Project title:</u> Hub of circular cities boosting platform to foster investments for the valorisation of urban biowaste and wastewater <u>Web:</u> https://hoopproject.eu/ <u>Acronym:</u> HOOP <u>Duration:</u> 2020-2025</p>	<p>About one third of all waste that ends up in landfills is organic and could have been decomposed. The valorisation of waste can help reverse this trend. The HOOP project supported selected European cities to implement the most appropriate technologies for recycling biowaste and developed large-scale urban circular bioeconomy initiatives that will focus on making bio-based products from urban biowaste and wastewater. Through the HOOP Urban Circular Bioeconomy Hub, the project also created an online platform to foster knowledge exchange and replication in cities and regions across Europe.</p>
<p><u>Project title:</u> Renewable and Waste Heat Recovery for Competitive District Heating and Cooling Networks <u>Web:</u> https://www.rewardheat.eu/ <u>Acronym:</u> REWARDHeat <u>Duration:</u> 2019-2024</p>	<p>REWARDHeat developed a new generation of low-temperature district heating and cooling networks that will recover low-grade renewable and waste heat available at low temperatures. This enabled new ways to provide heating and cooling to buildings, accelerating this evolution of advanced DHC solutions and creating cost-effective, high-tech and sustainable solutions to support Europe's Fit for 55 goals.</p>
<p><u>Project title:</u> Cool ways of using low grade heat sources from cooling and surplus heat for heating of energy efficient buildings with new Low Temperature District Heating (LTDH) solutions <u>Web:</u> https://www.cooldh.eu/ <u>Acronym:</u> COOL DH</p>	<p>The COOL DH project demonstrated how entire neighbourhoods can be heated using recycled low-temperature heat (low-temperature district heating, or LTDH solutions). This resulted in new products on the market and underlined the cost benefits of deploying the latest generation of district heating systems in refurbishment projects. One of the project's key innovations was the development of a new type of PE-RT</p>

<u>Duration:</u> 2017-2022	pipe, which uses weldable polyethylene with raised temperature resistance. These pipes offer benefits including easier deployment, a leak detection system, better insulation and operation at higher pressures of up to 13 bar in LTDH systems, enabling reduced heat loss. The pipes also could use electrofusion welding, which would eliminate a bottleneck of skilled workers.
<u>Project title:</u> Recovery of Urban Excess Heat <u>Web:</u> https://www.reuseheat.eu/ <u>Acronym:</u> REUSEHEAT <u>Duration:</u> 2017-2022	The REUSEHEAT project demonstrated a first-of-its-kind advanced, modular and replicable system enabling the recovery and reuse of waste heat available at the urban level. It built upon previous knowledge from EU funded projects (particularly CELSIUS, Stratego and HRE4) to overcome both technical and non-technical barriers towards the unlocking of urban waste heat recovery investments across Europe.

Table 2: [CorPower Ocean's](#) TRL progress using Pillar 2

WaveBoost	HiWave-3	HiWave-5	EU-SCORES	Saoirse
Horizon 2020	Interreg North-West Europe	European Regional Development Fund	Horizon 2020	Innovation Fund
2016-2019	2018	2019-2023	2021-2025	2023-2029
Development of an innovative wave energy converter	Demonstration of a half-scale wave energy converter at a test site	Demonstration of a full-scale wave energy converter in real sea conditions	Demonstration of a 4-device array in real sea conditions	Deployment and operation of a 5MW wave energy pilot farm
TRL 4-5	TRL 6	TRL 7	TRL 8	TRL 8-9

Table 3: Floating Power Plant – Danish wave energy and floating wind developer

POSEIDON	MaRINET2	OESA	SEAWORTHY
Horizon 2020	Horizon 2020	Interreg North Sea Region	Innovation Fund
2015-2017	2017-2021	2019-2021	2023-
Validation of the prototype design and market development	Demonstration of a prototype in realistic conditions at a testing facility	Technical validation and development of an operation and maintenance plan	Building, testing and operation of a prototype in real sea conditions
TRL 4	TRL 5	TRL 5	TRL 6-8

Table 4: Heterojunction solar cells TRL progress using Pillar 2

HETSI	HERCULES	AMPERE	TANGO
211821	608498	745601	20220497
FP7	FP7	Horizon 2020	Innovation Fund
2008-2011	2013-2016	2017-2020	2021-2026
design, develop and test novel aSi-cSi Heterojunction solar cell structure concepts with high efficiency	second generation of high efficiency crystalline silicon solar cells and modules: heterojunction bifacial (SHJ) and Interdigitated Back contact (IBC)	AMPERE Project developed a highly automated silicon Heterojunction bi-facial photovoltaic production line in Catania (Italy), demonstrating the technical and financial feasibility of PV manufacturing capacity recovery in Europe. ¹	Installation of a 3GW production line for photovoltaic (PV) modules based on Hetero Junction Technology ("HJT").
TRL 4-5	TRL 6	TRL7	TRL 9

¹ [3SUN](#) started production through the project AMPERE in 2020 (500MW production), began larger-scale commercial production in 2024, and is planning to achieve a production of 3GW per year by 2026. This would make it Europe’s largest factory manufacturing solar cells and modules.