

METAVERSO

“Predictive maintenance platform for virtual monitoring in the metaverse of photovoltaic installations”

Project Goals

- Development of a predictive maintenance solution, based on Artificial Intelligence techniques and virtual monitoring in the metaverse, for photovoltaic plants in a collaborative virtual environment as a control centre in the metaverse.
- Leveraging the capabilities of the new control centres in the metaverse, IoT sensors, AI systems, Big Data, etc... in order to obtain new solutions for photovoltaic installations that allow the optimization and automation of systems and error prediction.
- Obtaining an industrial-level solution that allows to reduce and optimize the costs per optimal maintenance action (predicted failure in a defined time), minimizing unplanned failure costs (corrective maintenance) as well as costs due to over-maintenance (preventive maintenance).

Project Financing

- AEI 2022 Grant Call Supporting Innovative Business Groupings
- Funds from the Ministry of Economy, Industry and Competitiveness
- PROJECT FILE NUMBER: AEI-010500-2022b-174



Budget and Implementation Period

- | | |
|--------------------------|--------------|
| • Implementation Budget: | 232.398,00 € |
| • ISFOC Budget: | 52.252,00 € |
| • Implementation Period: | 10 months |

Participants



INDAGA SOLAR

“Digital Innovation for the advanced management of large solar photovoltaic plants”

Project Goals

- Integrating Industry 4.0 technologies (Digital Twin, Cloud Computing, Artificial Intelligence, distributed IoT sensors, artificial vision, energy prediction algorithms, automated decision making, etc.) for the improvement of performance, quality and security in the operation and maintenance procedures.
- Boosting the digital transformation of the PV sector, while contributing to achieve the objectives of energy transition, sustainable development and climate neutrality.
- Demonstrating the benefits of integrating Industry 4.0 innovations and technologies to improve quality, performance and safety, as well as the environmental footprint resulting from the sector's operations.

Project Financing

- AEI 2022 Grant Call Supporting Innovative Business Groupings
- Funds from the Ministry of Economy, Industry and Competitiveness
- PROJECT FILE NUMBER: AEI-010500-2022b-224

Budget and Implementation Period

- Implementation Budget: 323.831,00 €
- ISFOC Budget: 83.630,00 €
- Implementation Period: 9 months

Participants



Project Goals

- Design and validation of a new sensor for photovoltaic installations to accurately monitor their maintenance status by measuring the amount of soiling accumulated on the surface of the modules. The collected data will be sent to the cloud in real time by using IoT communication network technology.
- Development of a predictive algorithm, based on artificial intelligence techniques, which will estimate the expected production of a self-consumption installation, and manufacturing a low-cost meteorological station prototype to collect and send to the central server the real weather information around the locations where the developed soiling monitoring sensors are deployed.
- Creation of a platform in the cloud to view and monitor the status of a solar installation, to collect estimated production information, and to connect agents in the photovoltaic solar energy sector (especially small producers and installers).

Project Financing

- AEI 2022 Grant Call Supporting Innovative Business Groupings
- Funds from the Ministry of Economy, Industry and Competitiveness
- PROJECT FILE NUMBER: AEI-010500-2022b-180

Budget and Implementation Period

- Implementation Budget: 145.203,40 €
- ISFOC Budget: 59.962,00 €
- Implementation Period: 10 months

Participants



SUNRISE PV

“New generation of photovoltaic technologies for energy cost reduction through circularity strategies”

Project Goals

- Optimization of renewable energy production (in this case of photovoltaic origin) with a very significant reduction in the energy and economic cost of the technology , as well as with significant progress in the efficiency, flexibility and manageability of PV plants, within a framework of environmental, economic and social sustainability .
- Research on new materials and manufacturing processes to optimize production, on new operation and maintenance processes to maximize the energy production of PV plants and on new recovery and reuse processes for critical materials and components to increase their value.
- Development of new circular business models to make PV systems as profitable as possible in the economic terms.

Project Financing

- Granting aid for the “Science and Innovation Missions Program”, 2022 call.
- PROJECT FILE NUMBER: MIG-20221002

Budget and Implementation Period

- Implementation Budget: 6.551.170,00 €
- ISFOC Budget: 1.007.444,00 €
- Implementation Period: 2022 - 2025

Participants



TECNICAS REUNIDAS





OPTIMA

“Optimization of PV technology for self-consumption in buildings”

Project Goals

- Design, prototyping and validation of a complete state-of-the-art PV system for self-consumption, distinguished by its high efficiency and adapted for its installation on large flat roofs, mainly commercial and industrial roofs that typically have high energy costs.
- Maximization of electricity generation by applying the latest advances in photovoltaic, mechanical, electronic and computational technologies, as well as their intelligent application in buildings.
- Obtaining a unique photovoltaic system on the market that will transfer the advantages of large photovoltaic plants installed in rural areas to urban photovoltaic self-consumption installations, making the most efficient use of the solar energy received. This solution is emerging as an optimal solution for Energy Communities.

Project Financing

- Granting aid for “Public-Private Partnership projects”, 2021 call.
- PROJECT FILE NUMBER: CPP2021-008620

Budget and Implementation Period

- Implementation Budget: 769.742,41 €
- ISFOC Budget: 185.482,24 €
- Implementation Period: 2022 - 2025

Participants



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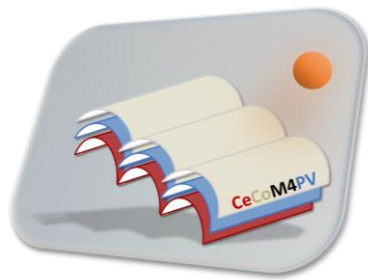


Plan de Recuperación,
Transformación y Resiliencia



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BARCELONATECH





CECOM4PV

“CEramic and COmposites Materials for PhotoVoltaic devices”

Project Goals

- Development of new products and a disruptive technology from ceramic and composites-based products of traditional building envelopes, to be used in energy-efficient building envelopes such as roofing elements, tiles, etc., that will integrate the generation of electrical energy from PV elements.
- PV modules become a constructive component of the buildings (BIPV), on the way to achieving Nearly Zero Energy Buildings (nZEB) or even Positive Energy Neighborhoods (PEN).
- To develop a potential portfolio of BIPV products with high technical and aesthetic value, based on standard ceramic products used in building envelopes, as well as new trending products for the construction sector made of composites.

Project Financing

- Granting aid for “Public-Private Partnership projects”, 2021 call.
- PROJECT FILE NUMBER: CPP2021-008637

Budget and Implementation Period

- Implementation Budget: 897.106,16 €
- ISFOC Budget: 155.583,72 €
- Implementation Period: 2022 - 2025

Participants



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Plan de Recuperación,
Transformación y Resiliencia



CENER





BUILT4ENERGY (B4E)

“Hybrid concentration systems for intelligent energy supply in positive energy buildings”

Project Goals

- Development of an energy solution for its integration in buildings that allows on-site generation of electricity and heat. In addition, it must have an intelligent management system to select the energy vector to generate according to the prediction of the building's energy demands.
- Development of an intelligent energy management system based on a hybrid solar electricity and/or heat generator integrated as a constructive element in glass facades of buildings, which also includes improvements in energy storage elements with phase change materials and developments in heat pumps for an efficient management of the thermal component of the generation system.

Project Financing

- Granting aid for “Public-Private Partnership projects”, 2021 call.
- PROJECT FILE NUMBER: CPP2021-008721

Budget and Implementation Period

- Implementation Budget: 1.235.982,78 €
- ISFOC Budget: 204.821,80 €
- Implementation Period : 2022 - 2025

Participants



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Construcción



Universidad
Politécnica
de Cartagena

PreAirQuality

"Predictive System for Air Quality Management"

Project Goals

- Development of an intelligent system, with low implementation cost, to facilitate the management of air quality in a city, region or specific area.
- Development of a network of devices, maintenance-free and easy-to-install, to collect and transmit relevant air quality data for further analysis.
- Development of a software application to make easier the consultation of data related to air pollution at a given location, and its analysis with the different indicators to implement actions to improve its quality.
- Validation of the technology employed, the predictive models and behaviours defined during the development of the project.

Project Financing

- AEI 2021 Grant Call Supporting Innovative Business Groupings
- Funds from the Ministry of Economy, Industry and Competitiveness
- PROJECT FILE NUMBER: AEI-010500-2021b-46

Budget and Implementation Period

- Implementation Budget: 190.780,00 €
- ISFOC Budget: 76.375,00 €
- Implementation Period: 9 months

Participants



EMPLEASOLAR

“Collaborative Platform for the Virtualization of the Training and Promotion of Labor Insertion in the Photovoltaic Sector”

Project Goals

- Improve training quality and competitiveness in the PV sector through virtualization techniques and Industry 4.0 innovation.
- Promote quality employment and improve the availability of skilled personnel in the PV sector to foster economic, social and territorial cohesion through this innovative platform for collaboration and training.
- Boost the digital transformation of the PV sector, contributing to achieving the goals of energy transition, sustainable growth and climate neutrality.
- Demonstrate and evaluate the advantages of the Collaborative Platform (employment and training) in the PV sector and its economic viability.

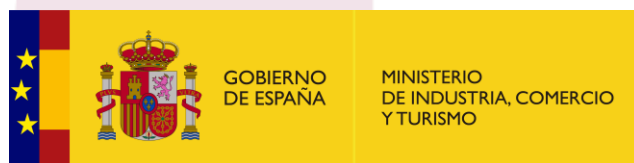
Project Financing

- AEI 2021 Grant Call Supporting Innovative Business Groupings
- Funds from the Ministry of Economy, Industry and Competitiveness
- PROJECT FILE NUMBER: AEI-010500-2021b-7

Budget and Implementation Period

- Implementation Budget: 213.227,00 €
- ISFOC Budget: 79.138,00 €
- Implementation Period: 10 months

Participants



COMETA

“Advanced Energy Communities”

Project Goals

- Development of a centralized, intelligent and advanced management system, hosted in the cloud, that facilitates the evolution of energy communities, taking as a reference the current legal framework and laying the technological foundations for their development in order to turn them into a key element to change the current energy system as well as to optimize the use of energy and minimize the return on investment of the installations.
- Development of a prototype node, located locally in the energy communities as part of the generation system, which will be the mediator between the platform and the devices located in these energy communities through a web application to make data accessible to users.
- Characterization and development of software packages to simulate the behaviour of different typologies of energy communities, both residential and industrial.

Project Financing

- AEI 2021 Grant Call Supporting Innovative Business Groupings
- Funds from the Ministry of Economy, Industry and Competitiveness
- PROJECT FILE NUMBER: AEI-010500-2021b-68

Budget and Implementation Period

- Implementation Budget: 134.283,00 €
- ISFOC Budget: 59.802,00 €
- Implementation Period: 10 months

Participants



Project Goals

- Search for robotic solutions and configurations based on Industry 4.0 technologies adapted to conventional productive sectors such as energy, agriculture, livestock, construction, mining, logistics and transport.
- Analysis of specific problems in the productive sectors of vine growing and photovoltaic installations.
- Experimental development of a management system of collaborative robotic missions directly applied to both photovoltaic and wine sectors, which will allow to facilitate and automate the decision making.
- Generalization and standardization of the operation to address new problems and applications in other sectors through open innovation and collective intelligence.

Project Financing

- Grants Programme to foster R&D Regional Cooperation 2014-2020. Feder interconecta 2018
- Funded by CDTI
- PROJECT FILE NUMBER : ITC-20181090

Project Site

- Puertollano (Ciudad Real)

Budget and Implementation Period

- Implementation Budget: 2.236.395,00 €
- ISFOC Budget: 419.253,00 €
- Implementation Period: 2018-2021

Participants





CPV4H2

“Solar Hydrogen Production Pilot System with High Conversion Efficiency Through Concentration Photovoltaics”

Project Goals

- Development and construction of a hydrogen generation system based on water electrolysis using electricity generated by a high concentration photovoltaic system, which will allow to achieve higher STH (Sun To Hydrogen) efficiency values.
- Implementation of a mathematical model for the hydrogen production system based on water electrolysis by means of electricity coming from high photovoltaic concentration.
- Development of a control and monitoring system for the pilot project and validation of the models and technologies developed.

Project Financing

- Grants Programme to foster R&D Regional Cooperation 2014-2020. Feder interconecta 2018 call
- Funded by CDTI
- PROJECT FILE NUMBER ITC-20181066

Project Site

- Puertollano (Ciudad Real)

Budget and Implementation Period

- Implementation Budget: 1.285.284,00 €
- ISFOC Budget: 444.756,00 €
- Implementation Period: 2018-2021

Participants



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Desarrollo Regional (FEDER)
Una manera de hacer Europa

Collaboration:



Autoconsumo 4.0

“Intelligent management system for energy flows designed for its integration in residential, commercial and industrial markets, also called distributed generation”

Project Goals

- Design of an intelligent management system for energy flows in self-consumption photovoltaic systems for residential, commercial and industrial markets, through the implementation of Big Data and Cloud Computing technologies.
- Development of a smart system for renewable energy management of photovoltaic generation to maximize the income from generation surpluses sales, minimizing the cost of energy consumed, using prediction algorithms for the energy generated and the prediction of the optimal behavior of the system.
- These algorithms are developed from the use of modern techniques of Machine Learning implemented in a server hosted in the cloud.

Project Financing

- Grants to Support Innovative Business Groups (AEI), corresponding to 2020 year
- FILE NUMBER : AEI-010500-2020-53

Budget and Implementation Period

- Implementation Budget : 144.116,00 €
- ISFOC Budget : 54.547,00 €
- Implementation Period : 9 months

Participants



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ADOMIF

"Digital Assistance for the Operation and Maintenance of Photovoltaic Installations"

Project Goals

- Increase the competitiveness of the photovoltaic sector, through the integration of Industry 4.0 innovative technologies to improve its quality, performance and safety with regard to the techniques, technologies and methodologies currently used in the operation and maintenance of photovoltaic plants.
- Analysis of photovoltaic technology and its suitability for the improvement of O&M processes in the photovoltaic sector.
- Improvement of the quality and reduction of O&M tasks times through the digitalization of procedures.
- Increase safety and reduction of workplace accidents in photovoltaic plants labours.

Project Financing

- Grants to Support Innovative Business Groups (AEI), corresponding to 2020 year
- FILE NUMBER : AEI-010500-2020-54

Budget and Implementation Period

- Implementation Budget 202.032,00 €
- ISFOC Budget: 55.184,00 €
- Implementation Period: 9 months

Participants



PowerTree

“Concentration Photovoltaics Technology for Urban Environments”

Project Goals

- Development of a concentration photovoltaic system for high-efficiency electricity generation to be integrated in urban and residential environments, with delicately aesthetics and functionalities (vertical garden, advertising monolith, etc.).
- Development of a software platform for the energy management and monitoring, capable of programming the residential loads and managing the accumulated energy in batteries according to the weather forecast and the electricity market prices, optimizing therefore the energy expenditure.
- The system also integrates an electric vehicle charger.

Project Financing

- Retos Colaboración Programme
- PROJECT File Number: **RTC-2017-6064-3**

Budget and Implementation Period

- Implementation Budget: 727.704,34 €
- ISFOC Budget: 254.691,34 €
- Implementation Period: 2018-2021

Participants



Collaboration:



AROSA I+D
Consultoría especializada en
promover y rentabilizar su
actividad innovadora



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Drongeno

“Solar Hydrogen for the Autonomy of Drones”



Project Goals

- Design and development of a drone with high load capacity and large autonomy using hydrogen fuel cells.
- Design and development of an autonomous system, compact and high efficiency, for the generation and accumulation of energy using photovoltaic modules.
- Development of an electrolyser for the generation of hydrogen with in-house technology.
- Comparative, technical-economic, study with commercial electrolysers.
- Development of an ultralight fuel cell with 3D printing techniques.
- Integration of the electric and hydrogen generation platform in a transportable trailer.

Project Financing

- Retos Colaboración Programme
- Project File Number: **RTC-2017-6631-3**

Budget and Implementation Period

- Implementation Budget: 607.752,34 €
- ISFOC Budget: 236.095,70 €
- Implementation Period: 2018-2021

Participants



Collaboration:



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Consultoría especializada en
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actividad innovadora



BIPVBOOST

“Bringing down costs of BIPV multifunctional solutions and processes along the value chain, enabling widespread nZEBs implementation”

Project Goals

- Bring down the cost of building-integrated photovoltaic systems (BIPV), limiting their overcost with respect to traditional, non-photovoltaic, construction solutions and non-integrated photovoltaic modules.
- Development of construction systems and elements with architectural elements (pavements, façades, handrails, etc.) integrating photovoltaic technology.
- Effective implementation of short- and medium-term roadmaps to reduce costs by addressing the entire BIPV value chain.
- Demonstration of the contribution of the technology towards the mass implementation of near Zero Energy Buildings (nZEB).

Project Financing

- European Union’s HORIZON2020 research and Innovation Programme
- Grant Agreement: 817991

Budget and Implementation Period

- Implementation Budget: 11.443.289,00 €
- ISFOC Budget: 202.092,00 €
- Implementation Period: 4 years



This project has received funding from the *European Union’s Horizon 2020 research and innovation programme* under grant agreement N° 817991

Participants



NODUST PV

“Development of a Predictive Cleaning System and an Anti-soiling System”

Project Goals

- Modification of the glass and lens surfaces used in photovoltaic technologies so as to both increase their hydrophobic and oleophobic properties and repel dirtiness.
- Increase the wettability and the adhesion of the glass using atmospheric plasma, applying homogeneously coatings with hydrophobic and oleophobic functionalities on glasses and lenses, obtaining contact angles higher than 120° in water.
- Validation of the durability required to the coatings through accelerated aging tests such as light, temperature and humidity cycles both in indoor and outdoor laboratories.

Project Financing

- AEI 2017 Grant Call Supporting Innovative Business Grouping
- Funds from the Ministry of Economy, Industry and Competitiveness
- PROJECT FILE NUMBER: AEI-010500-2017-245

Budget and Implementation Period

- Implementation Budget: 142.851,00 €
- ISFOC Budget: 58.471,00 €
- Implementation Period: 8 months

Participants



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Project Goals

- Development of an automated system of autonomous drones fleets for the protection of critical infrastructures (commercial ports, borders, railways, electrical grids, etc.).
- Development of an automated drone recharging system, hybridizing solar photovoltaic and wind energy. The system will be integrated into a landing platform and drone shelter.
- The system, in an automatic way, will analyse and locate incidences and structural damage, with techniques of artificial vision and intelligence.

Project Financing

- FEDER-INNTERCONECTA 2016 Call
- R&D Programme for the benefit of companies
- PROJECT FILE NUMBER: 00099150/ ITC-20161257

Budget and Implementation Period

- Implementation Budget: 1.380.901,00 €
- ISFOC Budget : 282.740,00 €
- Implementation Period : 2017-2020

Participants



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Collaboration:



UNIVERSIDAD
DE MÁLAGA

THESEUS

“Development of low concentration photovoltaic systems with high efficiency solar cells and single axis trackers”

Project Goals

- Developing new single-axis tracking systems to minimize the cost.
- Developing high efficiency cells optimized to work in low concentration, taking into account technologies based in monocrystalline silicon and analyzing the potential of III-V technology.
- Defining and validating a design for the low concentration receiver.
- Developing new materials for the sunlight selective filtering in order to remove the solar spectrum that is not used with the aim of reducing significantly the operation temperature, thereby increasing the efficiency.
- Designing new heat dissipation systems to maximize the system thermal performance and reduce both the production and material costs.

Project Financing

- National R&D Program aimed at the Challenges of Society, 2014.
- PROJECT FILE NUMBER: **RTC-2014-2304-3**

Budget and Implementation Period

- Implementation Budget: 1.245.049,46 €
- ISFOC Budget: 205.758,50 €
- Implementation Period: 2014-2017

Participants

ABENGOA SOLAR

RIOGUASS
SOLAR

isfo
EXPANDING ENERGY HORIZONS



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Project Goals

- Selection and installation of 690kW of different CPV technologies from different manufacturers and their evaluation under extreme weather conditions, as in Abu Dhabi.
- Feasibility study focused on issues such as the effect of dust, ambient temperature, and mist on the energy production, analysing the reliability and availability of the different technologies.
- Promote the potential of CPV technology, fostering the exports and internationalization capacity of Spanish companies.

Project Financing

- Viability Study Funds (FEV) granted by the Spanish government to United Arab Emirates.
- Funds provided by the Spanish Development Aid Fund (FAD).

Budget and Implementation Period

- Implementation Budget: 5.000.000 €
- Implementation Period: 2011-2019

Participants