Interreg Sudoe TR@NSENER
European Regional Development Fund

EUROPEAN UNION

Technological Energy Platforms on Energy in the SUDOE area

2019

Contents

Introduction

Since the late 1990s the French, Spanish and Portuguese governments have developed a policy that aims to set up high-level technological infrastructures. These high-level infrastructures have an environment in human resources and facilities that allow public research teams or companies to access the use of its infrastructures. All the equipment, human resources and services available constitute a technological platform.

Technological innovation platforms include shared infrastructure and equipment for R & D and innovation to provide services or resources (services, equipment rental, etc.). They are open to public and private actors, in particular to companies and in particular to SME's. They allow a community of users to carry out collaborative R&D work, tests, put into production the first series or even serve as living labs.

The expected positive externalities are numerous:

- To favor SMEs' access to infrastructures usually reserved for large companies because of the high cost they entail and the difficulty that these companies have to make this type of equipment profitable on their own;
- Increase the number of innovative projects and promote collaborative projects by providing premises, equipment and research staff and technicians dedicated to mixed R & D teams by allowing relationships between staff from a wide variety of backgrounds but sharing similar issues;
- Facilitate the industrialization of R&D results by offering test tools, demonstration tools or user laboratories.
- Contribute to the visibility and attractiveness of the territory, both nationally and internationally
- The emergence of advanced tools...

In Spain, the State and communities have developed investment policies in these

infrastructures. In Spain it is necessary to distinguish the great infrastructures gathered in a national organism the CIEMAT (Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas). The CIEMAT is an organism from the Ministerio de Ciencia, Innovación and Universidades through the Secretaría General de Coordinación de Política Científica focused mainly in the fields of energy and the environment as well as in related technological fields . CIEMAT platforms are located throughout the country. PSA centers near Almeria, CEDER in Lubia near Soria (Castilla y Leon) CIEDA in the same city, CETA in Trujillo (Cáceres) in Extremadura, CISOT in Madrid. Each one of these centers offers different infrastructures and resources.

In Spain, initiatives from regional governments (Comunidad Autonomica) have enabled institutes to set up technological platforms. This is the case, for example, of IMDEA in Madrid and CEMIC in Barcelona, which depends on Accio10, the agency of the Generalitat de Catalunya. Finally, there are also platforms implemented by University centers receiving support from institutions (State, Regional Government or other). The FuturEd network of institutions, innovative companies and technology platforms in the field of energy is identified and facilitated by CIRCE (Zaragoza) (https://www.futured.es/en/capabilities/)

In France we find an equivalent scheme, for years major infrastructures have been supported by the French State. For example THEMIS in the Eastern Pyrenees, other platforms were created at the joint initiative of major research organizations such as the CNRS (or university centers) with financing of building materials from regional or state governments (e.g. SYNERGY-LAAS in Toulouse and CESP in Perpignan).

In Portugal, the Foundation for Science and Technology (FCT) supports research infrastructures of strategic interest that consolidate scientific and technological advances and strengthen the capacity of the R & D community, to encourage their active participation in European projects and international. Recognizing that the

ability to provide services to the scientific, educational, commercial and industrial communities is at the heart of any research infrastructure, the FCT has created a National Roadmap for Strategic Interest Research Infrastructures for 2014-2020. .

In the field of energy, the roadmap lists the following platforms: the Biomass and Bioenergy Research Infrastructure (BBRI), the National Research Infrastructure for Solar Energy Concentration (INIESC), and the NZEB_LAB (Research Infrastructure on Integration of Solar Energy Systems in Buildings).) and SGEVL (Smart Grid and Electric Vehicle Laboratory). These infrastructures were created at the initiative of research organizations such as the National Laboratory of Energy and Geology, IP (LNEG), University of Evora and Institute of Systems Engineering and Computer Science of Porto. In addition to the infrastructures listed by FCT, other initiatives of universities and private associations can be considered: CISE, DNI Network, Renewable Energies Chair and Solar Oven Test Facilities.

The technological platforms that we have identified do not all correspond to the strict criteria that we defined at the beginning of our work. Many of them evolve in their activity; it is therefore necessary to update our database. The competitiveness cluster DERBI should therefore be responsible for an update each year.

In addition, we have created a network of SUDOE technology platforms (South of France, Spain, Portugal). This network will be run by DERBI in cooperation with FutuRed.

List of Technological Platforms in the field of Energy in the Sudoe Area

CD6 Centre de Desenvolupement de Sensors Instrumentcio i Sistemes - UPC	
Country	Spain
Address	Rambla de Sant Nabridi, 10 08222 Terrassa Valles Occidental
Contact	Director's name Santiago Royo Jaume Castellà Maymo - jaume.castella@upc.edu Phone number +34 937 398 314
Website	CD6
Laboratory or Institutional affiliation	UPC Universitat Politècnica de Catalunya
Keywords	Optical Engineering - Photonics – Software - Mechanics
Platform objectives	CD6 develops its activity in the field of Optical Engineering and Photonics. The center has staff with complementary specializations (Optics and Photonics, Electronics, Mechanics and Software) CD6 provides R+D solutions to almost all economics sectors (transport, automotive, health, etc.).
Activities description	The center has over 25years of experience in technology transfer companies. The last 10 years track record includes more than 120 projects for over 100 clients with an amount exceeding 12 M€
Equipment	Spectroscopic ellipsometer, Confocal and interferometric profilometer, Optical profilometer UV-VIS-IR spectrophotometer, Laser ultrasound (LUS) testing equipment, Laser vibrometer, Hyperspectral cameras

CEDINT - UPM Open-IoT Solution	
Country	Spain
Address	CeDInt-UPM, Campus de Montegancedo, Pozuelo de Alarcón, Madrid, 28223, Spain
Contact	Director's name Asunción Santamaría Galdón Email address info@cedint.upm.es Phone number 0034 91 336 45 00
Website	CEDINT
Laboratory or Institutional affiliation	Technical University of Madrid (CeDInt)
Keywords	Internet of Things - Energy Efficiency Management - Outdoor Smart Lighting - Smart Buildings - Smart Greenhouses - Communication Protocol Integration (open hw, sw, standard protocols).
Platform objectives	Monitoring and control of infrastructures (smart buildings, renewable energy, smart street lighting and greenbuilding) by means of a wireless sensor network based on 6LoWPAN protocol.
Activities description	This platform's goal is approached through the installation of a set of devices used to monitor important parameters such as temperature, humidity, luminosity, noise or power consumption. These devices are also used to modify the value of a set of parameters which manage lighting systems, HVAC systems or presence controlled systems. These functionalities are managed through a middleware and a set of applications which allow users to monitor and interact with those parameters.
Equipment	**Green Labs pilot:** • 2 BatLinks. Gateway / Central platform which provides network connection and centralized control to devices connected to it. It also contains the middleware which manages the behavior of applications and the users' access to data and those apps• 70 single-phase BatMeters used to monitor the energy consumption in 420 independent circuits. • 10 BatSenses, which measure temperature, humidity and luminosity inside the greenhouse. • 25 actuators BatDimmers which control the LED's luminosity. **Smart Lighting:** • 2 BatLinks • 69 BatStreetLighting. Each one installed in a streetlamp • 2 BatPlugs used to manage the buildings lighting systems

	• 2 BatMeters **Smart Building:** • 1 BatLink • 40 BatSenses. They measure temperature, humidity, luminosity level, ambient noise and power. • 30 three-phased BatMeters. They measure the energy consumption of 540 circuits inside the building. • 1 BatWater. This device includes a volume flow rate and thermal sensors. • 1 BatLamp. It controls the wavelength of a LED component. • Meteorological station **Smart Home:** • 20 BatLinks • 20 BatMeters • 60 BatPlugs
Number of staff attached	12 researchers (engineers and PhDs), 3 support staff (IT, maintenance and administrative).
Legal status	University
Main funders	Spanish Government (MEC, MINECO), European Commission Horizon 2020, CDTI, Fondo Europeo de Desarrollo Regional (FEDER Main Industrial partner - T6000, Philips Lighting, Ferrovial, Gas Natural SDG, S.A., Indra, etc
Main Industrial partners	T6000, Philips Lighting, Ferrovial, Gas Natural SDG, S.A., Indra, etc

CEMIC Centre d'Enginyeria en Micro i Nanosistemes per a Instrumentacio i Comunicacions UB	
Country	Spain
Address	Marti i Francesc 1, planta 2, 08028 Barcelona Barclones
Contact	Director's name: Dr Josep Maria Lopez Villegas Email address: Dr Esteve Juanola Feliu – ejuanola@el.ub.edu Phone number: +34 934 037 247
Laboratory or Institutional affiliation	UB - Universitat de Barcelona
Keywords	electronics – miniaturizing – IT – nanoplatelets - nanofibersè nano sencors
Platform objectives	The CEMIC Center is a research and technology center that works in the fields of electronics engineering and IT. The CEMIC focuses its efforts on the development of European and national projects, it is proactive in promoting and retaining the loyalty of is industrials partners on R+D projects
Activities description	A flexible and multidisciplinary team carried relevant projects; DNA electrochemical sensor, Miniaturization of a capsule endoscope, Nano sensors integrated on monolithic ceramic micro technology, Research to obtain graphen oxide nanoplatelets using carbone nanofibers, Interaction of a Dopler radar sensor in the seat of vehicle. Design and manufacture implantable antennae for biotelemetry. Detection and identification of toxic gases
Equipment	Microprocessor laboratory, circuit design and texting equipment, instrumentation, control and power equipment optical instrumentation, EMC

CESP – UPVD	
Country	France
Address	Rambla de la thermodynamique, 66100 PERPIGNAN
Contact	Director's name: Jean-Baptiste BEYSSAC Email: addresscesp@univ-perp.fr Phone number: +33 468556852
Website	CESP
Laboratory or Institutional affiliation	PROMES and Université de Perpignan Via Domitita
Keywords	Solar Energy- Solar water heat - product certifications
Platform objectives	CESP is specialized in building issues and provide tests services for research laboratories and industrial companies in the field of solar material tests and calibration of measuring devices.
Activities description	Test of solar thermal equipment in real conditions: solar thermal collectors, PV panels, ageing studies. Calibration of measuring devices: CO2 sensors, temperature sensors. Ageing test in climatic chamber for broad range of materials (-40 °C – 180 °C).
Equipment	• Solar tracker attached to hydraulic regulation loop • Mechanical test benchs (snow and wind) • Climatic chamber.
Number of staff attached	2 researchers
Legal status	Public research
Main funders	UPVD, CNRS, Perpignan Méditerranée Métropole, ADEME
Main Industrial partners	CETIAT, PYRESCOM, WAGNER SOLAR, BOSCH, LI-MITHRA

CISE - Electromechatronic Systems Research Centre	
Country	Portugal
Address	CISE, Department of Electromechanical Engineering, University of Beira Interior, Calçada Fonte do Lameiro, 6201-001 Covilhã, Portugal
Contact	Director's name : Antonio J. Marques Cardoso Email address: cise@ubi.pt
wEBSITE	CISE
Laboratory or Institutional affiliation	UBI - University of Beira Interior
Keywords	Electric Grids - - Electrical Machines - Power Electronics - Renewable Energies – Reliability - Energy Efficiency
Platform objectives	The general objectives of CISE are focused on the areas of: fault diagnosis; fault tolerance; reliability; energy efficiency; asset management; control, design and characterisation of electrical machines, power electronics, and electric grids.
Activities description	CISE comprises four dedicated research facilities, the Electromechatronic Systems Laboratory (LSE), the Laboratory of Electric Energy Systems (LSEE), the Laboratory of Electromechatronic Systems Modelling (LESM), and the Guarda International Research Station on Renewable Energies (GIRS-RES). LSE is equipped for simulation studies and experimental tests in some of the research areas of the electromechatronic systems domain. At LSEE the research work is focused on fault detection and diagnostics of transmission and distribution network components and power systems protection devices. LESM facilities provide the tools required to the development of research activities aiming the theoretical and computational modelling of electromechatronic systems.
Equipment	The research activities are complemented by GIRS-RES, which is especially dedicated to the renewable energies study. This facility provides, among others, the appropriate conditions for the installation of bulky equipment, both indoor and outdoor.
Number of staff attached	40
Legal status	Public R&D Unit
Main funders	Portuguese Government (FCT), European Regional Development Fund (ERDF)
Main Industrial partners	KSB, WEG, Reel, Yaskawa, Pegop.

CITCEA Sistemes Research – Control de la Energia i el Moviment, Instrumentacio i Istemes. Research and Technological Innovation. – UPC	
Country	Spain
Address	Avda Diagonal 647 – Planta 2 - 08028 Barcelona Barcelonès
Contact	Director's name Daniel Montesinos Miracle Mail/ Jordi Giral Guardia – Jordi.giral.guardia@citcesa.upc.edu Phone number : +34 93 401 67 27
Website	CITCEA
Laboratory or Institutional affiliation	Universitat Politècnica de Catalunya BarcelonaTech (UPC)
Keywords	energy renewable – electronics – mechatronics - smart grids – simulation - hybridation
Platform objectives	CITCEA is a technology transfer center (2001) UPC it's specialized in responding to electrical and electronic technological challenges. It's dedicate to create functional prototype that will serve the companies to develop a new commercial product or to solve the new technological problem.
Activities description	The expertise of CITCEA lies all kind applications on energy area; enertronics, mechatronics - smart grids, wind energy, transmission, HDVC, solar energy, emulation - smart rural grid, Energies hybridation– Intelligent integration of electric vehicle – Digital control, analogical conversion, non-linear and adaptive control – Electrical machines design motors and generators
Equipment	Tools and simulation programs (EMPT, Matlab, Digsilent, PSS:E, PSCAD for integration renewable generation- smart renewable with integration intermittent resources – Low and high power converters

DNI Network	
Country	Portugal
Address	Palácio do Vimioso Largo Marquês de Marialva, Apart. 94 7000 - 809 Évora
Contact	Director's name: Manuel Collares Pereira Email address: collarespereira@uevora.pt Phone number: 266 740 800
Website	DNI
Laboratory or Institutional affiliation	DNI
Keywords	Solar Radiation -Solar Instrumentation – Calibration- Assessment - Measurements
Platform objectives	DNI assessment
Activities description	The main objective is to assess the annual DNI availability and its interannual variability in Southern Portugal to identify the best places for CPV and STE applications
Equipment	Solar radiation Instrumentation such as: Pyranometer, Pyrheliometer, Solar Tracker, Sun Sensor Meteorological Instrumentation: 2d and 3d anemometer, barometers, ambient temperature and relative humidity Data acquisition: Data logging systems
Number of staff attached	1
Legal status	Private Association, ONG
Main funders	Universidade de Évora Adene Areanatejo ISQ Enercoutim Raul César Ferreira, S.A. Capwatt - Brainpower, S.A. Inegi EDP Inovação Efacec TUV Energyin Credite, S.A. SunOk, Lda
Main Industrial partners	Promanec

Electrochemical Devices Testing Lab (EDTL)	
Country	Spain
Address	Avenida Ramon de la Sagra 3 Parque Tecnologico de Mostoles E-28935 Mostoles, Madrid, Spain
Contact	Director's name: Jesus Palma Email address: jesus.palma@imdea.org Phone number: +34 917371120
Website	EDTL
Laboratory or Institutional affiliation	IMDEA Energy Institute
Keywords	Electrochemical Energy Storage – Battery – Supercpacitor - Performance tests Aging tests - Accelerated tests
Platform objectives	EDTL offers electrical characterization services of electrochemical cells and modules. The platform is specialized in non-conventional testing, performance and endurance evaluation, and accelerated ageing assessment.
Activities description	Emulation of electric vehicles drive and recharge cycles Emulation of power and energy stationary applications (peak shaving, ramp smoothing, power deferral...) Control and performance of redox flow batteries Control and performance of electrochemical reactors (capacitive deionization systems for water treatment) Accelerated endurance and aging tests Electrochemical Impedance Spectroscopy
Equipment	Testing facilities: • 3 test channels 8 kW, 120 V / 200 A max. per channel • 4 test channels 300 W, 80 V / 50 A max. per channel • 16 test channels 30 W, 5 V / 6 A max. per channel • 64 test channels 50 mW, 5 V / 10 mA max. per channel • 1 climatic chamber
Number of staff attached	3 scientists + 2 technicians
Legal status	Non-profit research foundation
Main funders	Community of Madrid, EU Structural Funds Annual income :Not applicable
Main Industrial partners	REPSOL, IBERDROLA, PV Hardware, GS Inima,

EURECAT Centre Tecnologic de Catalunya	
Country	Spain
Address	Avda Diagonal, 177, 08018 Barcelona Barcelonès
Contact	Director's name: Xavier Lopez i Miquel Rey Email: Anna Pamiès comunicacio@eurecat.org Phone number: +34 932 381 400
Website	EURECAT
Laboratory or Institutional affiliation	IMDEA Energy Institute
Keywords	IT – materials - Big data - robotic
Platform objectives	EURECAT supplying industrial sector with advanced technology and knowledge in response of the innovation needs. Eurecat generates an annual turnover of 36M€ - Eurecat has facilities in Barcelona, Canet d.M., Cerdanyola d. V., Girona, Lleida, Manresa, Mataro and Reus.
Activities description	The added value: fast track innovation eliminates expenditure in technological infrastructures and reduces risks Multidisciplinary teams dedicate to 160 applied R&D pojects of high strategic value. Expertise fields; materials, new manufacturing processes, industrial robotics, functional printing, functional textile, Big Data, audiovisual technologies, smart management, IT-security, e-health - 450 professionals 160 R & D projects +1,000 corporate clients 73 patents 7 spin-offs
Equipment	Big Data, Plastic Processing, Advanced Manufacturing, USIRP industrial robotic, Reimagine textile, Water management

IK4-CIDETEC	
Country	Spain
Address	Gipuzkoa Science and Technology Park Pº Miramon / Miramon Pasealekua, 196 20014 Donostia - San Sebastián
Contact	Email address: cidetec@cidetec.es Phone number: 34 943 309 022
Website	CIDETEC
Keywords	Ion Lithium Batteries - engineering of packs – Electrode - Flow batteries - fuel cells - supercapacitors
Platform objectives	CIDETEC is an organization for applied research that integrates three international reference institutes in the fields of energy storage, surface engineering and nanomedicine.Experts through the whole value chain -From materials to cell - Testing & characterization - From cells to packs
Activities description	General technological and social challenges of battery storage technology: Coste Density of Energy Safety and sustainability Capacities; Our capabilities throughout the value chain: • Advanced materials and materials • Electrode formulation and scaling • Manufacture and prototyping • Modules and packs • Modeling and simulation Scope; A technological offer at three levels: • Basic research oriented "New concepts for specific challenges". • Technological development "Giving shape and viability". • Transfer to industry "Adapting to customer needs". Specialization; A technological offer at three levels: • Ion Lithium Batteries • Advanced and next generation battery technology Other energy technologies: Flow batteries, fuel cells, supercapacitors.
Equipment	Electrode manufacturing room for electrodes • Preparation of electrode inks • Deposition or application of continuous inks (in aqueous base and organic solvents) calandrado

	• Validation of materials services • Validation of Ion Li
Number of staff attached	180 (45% PhD)

iK4-IKERLAN Mondragon	
Country	Spain
Address	Paseo de Arizmendiarreta, 2 20500 Mondragón (Guipúzcoa)
Contact	Director's name: Francisco J. Blanco Barro Email address: fjblanco@ikerlan.es Phone number: +34 943217400
Laboratory or Institutional affiliation	MONDRAGON Company and we are connected to IK4 Research Alliance.
Keywords	Electronic power - power converters – control - storage technologies, - energy management - machines
Platform objectives	To solve the challenges of companies with development of efficient solutions for the integration, control and storage of energy is the reason for living of the Energy and Power Electronics Unit. Specialised in storage technologies, energy management, power electronics and electrical machines
Activities description	The development of efficient solutions for the integration, control and storage of energy is the reason for living of the Energy and Power Electronics Unit. We are specialised in storage technologies, energy management, power electronics and electrical machines for e-mobility (vehicles, railway transport, aeronautics, elevators....) and stationary applications (renewable energy, electrical grids...). These applications are always oriented to obtain solutions energetically more efficient, more reliable, more compact and lower cost. Electricalmagnetism ans electrical Machins Integral design and devlpt of: - Electrical machines and drives - control strategies- Static and dynamic contactless charging systems - Induction heating applications - Inductance and transformers
Equipment	Custom design tools _ Simulation tools used: Flux 2D/3D, Maxwell, Matlab/Simulink, PLECS, MotorCAD - Development of real-scale prototypes in railway traction, aeronautics, lifting, renewable energies, industrial heating, household appliances applications,
Number of staff attached	15Phd, 22 Ingeneers
Main Industrial partners	ABC, ACCIONA, ENERGIA, AIRBUS, D&S, AMOPACK, AMPO , BAHÍA de BIZKAIA, GAS, BATZS, BETSAIDE, BEXEN, CEGASA, PORTABLE ENERGY, CETEST, CIKAUTXO CONATEC COPRECI DORLET ERREKA FAGOR ARRASATE FAGOR AUTOMATIONFAGOR EDERLAN FAGOR ELECTRÓNICA FAGOR INDUSTRIAL GENERAL ELECTRIC ..

INIESC	
Country	Spain
Address	Universidade de Évora - Cátedra Energias Renováveis Palácio Vimioso | Largo Marquês de Marialva Ap.94 7002-554 Évora
Contact	Director's name: Manuel Collares Pereira Email address: catedraER@uevora.pt Phone number: +351 266 706 581
Website	INIESC
Keywords	solar concentration - therma conversion - solar energy storage - solar fuels
Platform objectives	INIESC offers a wide variety,of services, such as the product development; engineering consultancy; prototype testing; materials characterization and studies; solar fuels production and molten salt testing facility.INIESC is focused on thermal conversion of solar energy at medium/high temperatures.
Activities description	INIESC integrates two institutions: the University of Évora (UEvora) and the National Laboratory for Energy and Geology (LNEG)-comprising in their respective Solar Energy units the most significant expertise and infrastructures available in Portugal in this field; it is likely and desirable that others will join in the future. Integrating the most prominent European R&D initiatives in the management of these infrastructures, the establishment of INIESC enables an ideal framework for the activities already in progress by both partners at computational (modeling and system simulation), laboratorial (materials and solar fuels), ...
Equipment	infrastructural (solar concentrators testing bench, solar concentrator collector fields with molten salts as HTF and heat storage fluid, technological development of line-focus Fresnel and other concepts) and capacity building (full academic offer) levels
Number of staff attached	30

IREC Institut de Recerca en Energia de Catalunya	
Country	Spain
Address	Jardins de les Dones de Negre 1, Planta +2 08930 Sant Adrià de Besòs (Barcelona)
Contact	Director's name: Manuel Sanmartí Email address: msanmarti@irec.cat Phone number: +34 933 562 615
Website	IREC
Laboratory or Institutional affiliation	UB - Universitat de Barcelona
Keywords	energy management – simulation – microgrid - measurement technologies
Platform objectives	IREC Energy Smartlab has unique testing and emulation equipment and infrastructures, offers two types of services; Smart Grids and micro networking testing platform- Platform for the development of electrical equipment or systems for smart grids and micro networks - Validation platform
Activities description	IREC's Electrical Engineering department has a laboratory called IREC Energy Smartlab. It has unique testing and emulation infrastructures and equipment, since it offers a micronet with great flexibility, modularity and configurability, to adapt to any need. The laboratory can be seen in the following video: https://vimeo.com/111393514 The micro-network of IREC Energy Smartlab is a low voltage 200kVA installation consisting of several configurable units that includes generation, storage and consumption of various kinds.
Equipment	It is a platform at laboratory level, the aim of which is to investigate the challenges and develop all technologies and tools related to distribution networks, integration of renewables, electric vehicle, management and control, and micro-nets;

ISOM -UPM Institute of Optoelectronic Systems and MicrotechnologySOM UPM	
Country	Spain
Address	ISOM E.T.S.I. de Telecomunicación de la Universidad Politécnica de Madrid. Edificio López Araujo (Edificio C) Avda. Complutense, número 30. Madrid - 28040 (España)
Contact	Director's name: Prof. Claudio Aroca Hernández-Ros Email: claudio.aroca@upm.es sanchez@die.upm.es Phone number: 34 91 336 68 32
Website	ISOM
Laboratory or Institutional affiliation	Polytechnical University of Madrid (UPM)
Keywords	Nanotechnology - Semiconductors materials/devices - Magnetic materials/devices – Graphene - Optical /Electrical /Magnetic / Structural characterization - Processing (evaporation, plasma etching, lithography)
Platform objectives	The goal of ISOM is to perform research in the fields of detection, processing, transmission and recording of information by means of Magnetic-, Opto- and Micro-electronics, and to transfer the results to the industry.
Activities description	ISOM-UPM develops projects in the fields of optoelectronics, magnetic materials/systems and micro/nanotechnology. ISOM facilities comprise a 400m2 Clean Room, 300m2 for characterization laboratories, and 200m2 for electronics and instrumentation laboratories, providing services in technology, processing and characterization.
Equipment	Molecular Beam Epitaxy (MBE),Magnetron Sputtering, UV Photolithography aligners, nanolithography (e-beam) system,CVD and PECVD, Joule and e-beam systems, RTA, RIE and ICP dry etch, Microsoldering, Characterization of Materials and Devices (XRD, SEM, AFM,
Number of staff attached	Research Staff: 35 Administrative personnel and technicians: 5
Legal status	Public research
Main funders	UPM, Comunidad Autónoma de Madrid, Spanish state, European Regional Development Fund
Main Industrial partners	Huawei Technologies CO ltd. - REPSOL SA.- AFFORD - MEDLUMICS- INDRA S.A y NIT (New Infrared Technologies) - ACCIONA ENERGIA SOLAR - SIMAVE S.A - METRO MADRID S.A

KIRAN-42 IMDEA High-Flux Solar Simulator	
Country	Spain
Address	Avenida Ramon de la Sagra 3 Parque tecnologico de Mostoles E-28935 Mostoles, Madrid, Spain
Website	KIRAN-42
Laboratory or Institutional affiliation	IMDEA
Platform objectives	Is an experimental aimed at conducting high flux/ high temperature solar thermal, PV and thermochemical R&D. Supplying high power density beams like commonly used in concentered solar energy environments. The facility includes two enclosures which the test beds and high flux solar simulator.
Activities description	Mains applications; - Solar concentration optics – Solar receivers and reactors – Advanced thermal fluids for high trmperature applications – High temperature energy storage(thermochemical, latent and sensible heat) – High flux/high temperature characterization techniques. (Irradiance CCD and CMOS cameras, gardon-type radiometers – Contact and non-contact temperature measurement. Services; Thermo-chemical tests under high-flux and/or high temperature environments. Solar and thermochemical assessment under high temperature Materials durability – Thermal treatments of materials Syntheses of nanomaterials or high –temperature materials
Equipment	General specification; total electric power 42 kWe –total available radiation power 14kW – Radiation peak flux 3.6 MW/m; radiation flux density 2.7 MW/m at 140 A rated current Lamps: 7 Xenon short-arc lamps – Electrical power per lamp 6 kW (35V. 170 A)

LNF (Laboratorio Nacional de Fusión). CIEMAT	
Country	Spain
Address	Av. Complutense 40 28040 Madrid Spain
Contact	Director's name :Joaquin Sanchez Email: joaquin.sanchez@ciemat.es Phone number: +34 913466387
Website	LNF
Laboratory or Institutional affiliation	CIEMAT
Keywords	Fusion Science and Technology - Fusion Plasmas - Materials for Fusion - TJ-II stellarator
Platform objectives	The main goal of the plasma science branch of the LNF is the development of the "stellarator" concept. This has been tackled through the scientific exploitation of the TJ-II stellarator device, located at Ciemat, within the framework of the European Fusion Program.
Activities description	Scientific and technical research at the LNF, on a European and international level, is based on two main activities: on the one hand, the study of high temperature confined plasmas in the TJ-II stellarator and other international devices, and on the other, the development of technology needed to construct and operate fusion reactors: materials, tritium production, energy extraction, etc. The plasma research activities are organized in four main technical units: TJ-II Operations and Experimental Physics Divisions, and Engineering and Plasma Theory units. The Fusion Technology Division, supported by the Engineering unit mentioned above, carries out the technology activity. Moreover, the LNF leads the Spanish participation in the construction of ITER and the European fusion programme.
Equipment	As regards the high temperature plasma research, the main facility is the TJ-II stellarator (major radius 1.5 m, minor radius 0.2 m, magnetic field 1 T, plasma volume 1 m3) and its associated systems: -ECRH (Electron Cyclotron Resonance Heating) system
Number of staff attached	45
Legal status	CIEMAT, which is a public research and development center, depending on the Spanish Ministry of Science, Innovation and Universities.
Main funders	Funding of LNF comes essentially form public sources (2016 data) Baseline CIEMAT funding (Spanish Government) is 7.6 M€ (3.6 M€ correspond to salaries of the permanent employees and 4 M€ overhead (buildings, central services,

	electricity, communications,
Main Industrial partners	Telstar, JEMA, ENGAGE consortium, Elytt Energy Iberdrola Iberdrola/Elytt/ASG consortium, TECNATOM , ,Energhia consortium, IDOM, INEUSTAR. ENSA, SGENIA,INDRA Empresarios Agrupados Internacional (Madrid) Metallied Power Solutions (Guipúzcoa) INDRA Sis

NZEB_LAB	
Country	Portugal
Contact	Director's name: Helder Jose Perdigão Gonçalves (LNEG) nzeblab@lneg.pt
Website	NZEB-LAB
Keywords	new buildings concepts - solar thermal - solar energy integration
Platform objectives	The Research Infrastructure on Integration of Solar Energy Systems (NZEB_LAB) is a set of Portuguese Research facilities performing Research, Technical activities andService in all aspects related to the integration of Solar Energy in Buildings both existing and new. From the strategic and applied R&D.
Activities description	Through the research developed by NZEB_LAB, the RI strategy aims to develop and promote optimal pathways for achieving zero energy buildings standards, widespread adoption at national level by 2020, of optimized NZEB energy design and operation concepts suited to Portuguese climatic conditions and construction practices, in association with generation of nearly zero energy buildings prepared through their flexibility to respond to user's needs and to become active contributors of energy production in the neighborhoods, districts and city context); c) Technology transfer and input to national policy and industry, preparation of swift market implementation, influence relevant EU and national standards, building codes, directives and strategic plans.
Equipment	SOLAR XXXL : Test rooms -BIPV system (Building Integrated Photovolatic) -BIPV-PCM system (Building Integrated Photovoltaic with thermal storage Phase Change Materials). - Ground cooling system LES : Test bench for solar liquid heating collectors according to ISO 9806 Test bench for solar thermal systems according to EN 12976-2:200 Test bench for storage tanks of hot water according to EN 12977-3 Test bench of solar thermal systems and / or heat pumps for DHW assisted by solar energy Spectrophotometer UV-VIS-NIR PVE PVPM 6020C – portable Peak Power

PAC AERO Pile A Combustible dans l'AEROnautique - LAPLACE TOULOUSE	
Country	France
Address	118, route de Narbonne 31062 Toulouse cedex 9
Contact	Director's name: Turpin Christophe Email: christophe.turpin@univ-tlse3.fr Phone number: Tél : 33 (0)5 61 55 67 97
Website	PACAERO
Laboratory or Institutional affiliation	LAPLACE
Platform objectives	From the point of view of the scientific objectives, this tool aims at the experimental study of the potentialities of the technologies hydrogenate H2 (fuel cells, electrolysers of water) by looking for a synergy between the aeronautical micro-electricity networks and those ground.
Activities description	In an aeronautical context, the PACAERO project consists, on the material plan, in spreading (surface and way of tests) the platform H2 introduced in 2011 by the LAPLACE. Besides the LAPLACE, three other laboratories are involved from now on on this platform: the CIRIMAT, the LGC and the IMFT

PILOT PLANT – IMDEA Pyrolisys & HBO	
Country	Spain
Address	Avenida Ramon de la Sagra 3 Parque tecnologico de Mostoles E-28935 Mostoles, Madrid, Spain
Website	www.energy.imdea.org
Platform objectives	Pilot plant for for the production and development of advanced liquid biofuels from lignocellulosic biomass. Txo main sections; pyrolysis and HBO which are able to work independently or I, series.
Activities description	The pyrolysis and HBO pilot plant is fully automated and configured to be capable of functioning in any of its operation modes; thermal/catalytic pyrolysis of biomass, HBO processing of any kind of oil and even the HDO treatment of the bo-oil generated in situ by the pyrolysis reactor. Services: Preparation and characterization of any kind of biomass. Thermal/catalytic pyrolysis of biomass at steady state operation conditions for prolonged periods of time by means of this double-hopper biomass feeding system HBO of bio-oil at steady state operating conditions with a continuous gas/liquid separation system and gas product continuously analyzed. Studes of the catalytic activity of any catalyst in HBO process and assessment of their long term stability
Equipment	Max reactor temp °c Pyr700 HDO 550 Max pressure (atm) Pyr 1 HDO 50 Processing capacity Pyr 1,5 kg/h HDO 1,5 L/h Gas max flow rate (L/h) Pyr N 200, HDO H 5 Max pre-heaters temp °C Pyr 400 HDO 400 Max cyclones temp°C Pyr 400 Biomass

PMLab IMDEA	
Country	Spain
Address	Avenida Ramon de la Sagra 3 Parque tecnologico de Mostoles E-28935 Mostoles, Madrid, Spain
Website	www.energy.imdea.org
Platform objectives	Pilot Plant for photosynthetic microorganism cultivation in photo bioreactors, especially for microalgae and cyanobacteria. The pilot plant includes two types of bioreactors; bubbled columns (13/ 1m3) and raceways (2/ 1m3), designed to be highly versatile and flexible
Activities description	Scale up of microalgae and cyanobacteria production under control conditions Cultivation of photosynthetic microorganisms at optimal conditions (media, composition, illumination, CO…) Isolation and cell wall characterizations Biofuels production bioethanol and biogas Biomass chemical characterization Nutrient recovery from liquid effluents; biomedication by means of photosynthetic microorganism nutrient uptake Population dynamics of the different microalgae and cyanobacteria strains developed under different operational conditions applied to the photo bioreactors • . feeding organic loading rate • . Changes in temperature • . pH changes • . Air and CO2 supply • . Illumination • . Mixing
Equipment	Inoculation zonz: Low volume inocula; illuminated metallic shelves for different bottle sizes Pre-inoculum; illuminated bubbled column of 0.1 m3, Preparation of cultivation media2 plastic tanks 150l agitator – Ultraviolet to avoid bacterial contamination

PRIMES: Plateform for Research and Innovation on Mechatronics, Energy and Systems	
Country	France
Address	67, Boulevard RENAUDET 65000 TARBES Hautes-Pyrénées FRANCE
Contact	Director's name : Jose FERRAO Email: jose.ferrao@enit.fr Phone number: +33 677 719 325
Website	PRIMES
Laboratory or Institutional affiliation	INP-ENIT, and CNRS – UPS III – INPT for LAAS, LAPLACE, CIRIMAT and IUT de Tarbes labs. and UPPA for LaTEP lab
Keywords	Power Mechatronic - Power Integration - Power Electronic - Wide band gap technology and process – Reliability - Characterization
Platform objectives	• Power Mechatronic (combination of mechanics, electronics and real-time computing) • Experimental reliability • Wide band gap technology and process
Activities description	The objective of this innovation platform is to develop exchanges and collaborations between public research and industry around these themes : • Electric Engineering • Engineering and systems sciences • Physics • Dedicated to energy efficiency of power electronics
Equipment	• Experimental building 2700m2 • Prototyping platform (micro-assembly clean room, 250 m² ISO5/ISO7)) • Realibility platform : 6 Climatic equipement; temperature, humidity and pressure testing (combined tests) • 10 x 80kW electrical box
Number of staff attached	2 engineers and administrative staff
Main funders	European Regional Development Fund, French State, Occitanie Region, Departemental council, Tarbes Metropole, BDE.
Main Industrial partners	Alstom, Safran, DEEP Concept, Cissoïd, Boostec, Tomoadour, Cirtem, aPSI3d, ISP system...

PSA (Plataforma Solar de Almería) – CIEMAT	
Country	Spain
Address	Carretera a Senés, km5 Tabernas 04200 - Almería SPAIN
Contact	Director's name : Dr. Julián Blanco Gálvez Email: Julian.blanco@psa.es
Website	PSA
Institutional affiliation	CIEMAT
Keywords	Solar Energy - Solar Concentration - Solar Photochemistry - Solar Desalination - Solar Thermal Elecricity (STE) - Concentrating Solar Power (CSP)
Platform objectives	Implementation of a sustainable clean world energy supply; Promote the market introduction of solar thermal technologies and those derived from solar chemical processes; devlpt of a competitive solar thermal export industry; Strengthen cost-reducing and provide scientific & technical support to industry
Activities description	Development of new components for concentrating solar systems (receivers, concentrators, control systems, etc.), with better price ratio; Development of new experimental capabilities and simulation tools for characterization, analysis and diagnosis (optical, thermal, etc.) of this type of solar systems; Promotion of innovative actions related to concentrating solar technologies, pathing the way to technological improvements in the mid and long; Qualification of new components and training services, testing of new thermal storage materials for latent and sensible heat, Evaluation and development of innovative concepts for water desalination systems; Devlpt and testing of solar systems for water disinfection and detoxification water; Development of new standards
Equipment	The main PSA test facilities are: • CESA-1 and SSPS-CRS central receiver systems, 7 and 2.7 MWth respectively • DISS 1.8-MWth test loop, an excellent experimental system for two-phase flow and direct steam generation in parabolic trough collectors
Number of staff attached	46 people (staff) + 44 people subcontracted for O&M
Main funders	Spanish Government (55%) and own incomes from services and participation in R&D projects (45%)
Main Industrial partners	At present PSA has links with most of the major industrial players involved in the market of concentrating solar thermal systems and applications (RIOGLASS, SENER, ACCIONA, ACS-COBRA, IDOM, ABENGOA, ...) and it also collaborates with the Spanish and Europea

PV plateform	
Country	France
Address	Rambla de la thermodynamique, 66000 Perpignan
Contact	Director's name : Thierry Talbert Email: thierry.talbert@promes.cnrs.fr Phone number : +33 (0)4 68 68 27 04
Website	PV
Laboratory or Institutional affiliation	Laboratory PROMES-CNRS
Keywords	Photovoltaic - characterization of materials - smart-grid - defaults
Platform objectives	The objectives are : • Provide means of characterization of materials, PV/CPV cells, PV/CPV modules and scale-scale testing of solar devices from component to system (services / projects) • Service activities: support for research • Innovation / transfer assistance: support for industry and start-up
Activities description	**PV plateform :** • Electrical characterization of PV cells and PV modules (Rs, Rp ,Bypass diodes, Thermal parmeters) • Measurements (Full day with 2 axes tracker, Natural sunshine, Partial and/full shading) • Thermal constraint for PV cells/modules and CPV cells • Electrical modeling for PLECS and/or PSIM software **Smart-grid platform :** • optimize energy and economic management of microgrids by developing control strategies, including new uses such as self-consumption, electric vehicles and storage. • Short-term Solar Forecasting • Electric Power Load forecasting • Microgrid Modelling • Electric Vehicle Modelling • Energy and Economic Optimization
Main Industrial partners	Nexeya, Engie-Green

Renewable Energies Chair – University of Évora	
Country	Portugal
Address	Palácio Vimioso, Largo do Marquês de Marialva 7000-809 Évora, Portugal
Contact	Director's name: Manuel Collares Pereira Email: catedraER@uevora.pt Phone number 0351 266 706 581
Website	http://www.catedraer.uevora.pt
Laboratory or Institutional affiliation	University of Évora
Keywords	Solar Energy - Concentrated Solar Power - - Solar Photovoltaics (Energy Storage - Energy Management
Platform objectives	The Renewable Energies Chair was created in 2010 and it is now also the INIESC – National Research Infrastructure in Solar Energy Concentration. Focus its activity on Concentrating Solar Power, developing and testing new technologies to capture and convert solar radiation into heat (for environment
Activities description	Innovative (patented) concepts of Etendue Matched Concentrators of Linear Fresnel Reflector concept. - Development of stationary or quasi-stationary Compound Parabolic Concentrator for medium temperature applications and for soar thermal electricity R&D in solar concentrated driven systems modeling (e.g. for combined heat and power production end industrial process heat). Solar Thermal energy storage (solid storage and molten salts storage) BIPV (with PV electricity stored in VRB- Vanadium Redox batteries and lithium-ion batteries) with a special concern for the engineering of the interface between PV power production and buildings or other applications Materials related research and processes in particular dust control deposition in mirrors and coversand detoxification water; Development of new standards
Equipment	Services Provided: • Product development • Engineering consultancy • Solar Resource data and data forecasting • Optical characterization of different collector components Prototype testing • Materials characterization and durability • Solar fuels

Number of staff attached	15
Main funders	University of Évora, LNEG
Main Industrial partners	SECIL -Companhia Geral de Cal e Cimento, SA (Portugal) MCG Metalúrgica, SA (Portugal) ELAIA - Investimentos SA (Portugal) EDP/EdPi (Portugal) EFACEC (Portugal) ISQ (Portugal) CapWatt- Brainpower (Grupo Sonae) (Portugal) Enercoutim (Portugal) Solar Balance

SEIL IMDEA Smart Energy Integration	
Country	Spain
Address	Avenida Ramon de la Sagra 3 Parque tecnologico de Mostoles E-28935 Mostoles, Madrid, Spain
Website	www.energy.imdea.org
Laboratory or Institutional affiliation	University of Évora
Platform objectives	The SEIL platform allows analysis, development and testing of realistic scenarios for energy integration in both AC and DC networks and also operation of distribution power networks, islanded networks and micro grids. The results obtained are more reliable and accurate that, any computer based simulation
Activities description	**The SEIL activities:** • Simulation of electrical grids • Control strategies • Energy management • Electrical vehicle • Integration of renewable resources • Power electronic applications • Electronic systems prototyping **Services:** • Emulation of power networks in operation • Implementation of energy management scenarios • Power integration of generation systems • Energy efficiency studies • Power electronics design and control
Equipment	Total power 210 kVA Triphase systems Power electronics 4x15 Kva AC/DC & 2x75 KvA AC/DC Converter Configuration as AC/DC/AC 1x9 kW DC/DC converter Battery ; Energy 47,5 kwh – Li-ion cells Bat. Managt. & protect. syst. Configurable Loads 30 kw three

SGEVL PORTO INESC	
Country	Portugal
Address	INESC TEC Campus da FEUP Rua Dr. Roberto Frias 4200 - 465 Porto Portugal
Contact	João Abel Peças Lopes (INESC Porto) T. +351 222 094 000 E. info@inesctec.pt
Website	SGEVL
Laboratory or Institutional affiliation	University of Évora
Platform objectives	The SGEVL constitutes a physical space integrating systems and equipment designed to support the development and testing of solutions and pre-industrial prototypes, promoting active and intelligent management of electric grids, in scenarios with progressive integration of distributed energy resource
Activities description	The Laboratory of Smart Grids and Electric Vehicles, which was a result of project REIVE, constitutes a cutting edge and unique technological infrastructure to identify, specify, develop and test innovative solutions to actively and intelligently manage electric power grids. This infrastructure is intended to support the necessary developments for the new energy paradigm, characterized by a higher use of distributed renewable energy sources, in a framework of increasing demand-side management, increasing energy efficiency using a systemic connection between the generation and demand dynamics. This project aims promote the creation of qualified manpower in the North region, based on the technological development and in the improvement of the efficiency of the industrial processes.
Equipment	The purpose was to attain a progressive technical and commercial integration of microgeneration systems and electric vehicles (EV), without having to reinforce the grids, and simultaneously maximizing the integration of renewable sources of energy

Solar Oven Test Facilities	
Country	Portugal
Address	Palácio Vimioso, Largo do Marquês de Marialva 7000-809 Évora, Portugal
Contact	Director's name: Manuel Collares Pereira Email: collarespereira@uevora.pt Phone number: 266 740 800
Laboratory or Institutional affiliation	University of Évora
Keywords	Solar Oven - Thermal Performance- Solar Oven Standarization – Testing - Solar Cooking
Platform objectives	Solar Oven testing and characterization
Activities description	Testing and characterization of solar ovens. Thermal performance analysis. Development of new standards. Solar Oven modelation
Equipment	Solar Ovens Thermocouples Data acquisition system Ambient temperature sensor Wind speed sensor pyranometer
Number of staff attached	1
Legal status	Private Association, ONG
Main funders	Universidade de Évora Adene Areanatejo ISQ Enercoutim Raul César Ferreira, S.A. Capwatt - Brainpower, S.A. Inegi EDP Inovação Efacec TUV Energyin Credite, S.A. SunOk, Lda
Main Industrial partners	Promanec

SYNERGY	
Country	France
Address	7 avenue du colonel Roche, BP54200, 31031 TOULOUSE Cedex 04
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Website	SYNERGY
Laboratory or Institutional affiliation	LAAS-CNRS
Keywords	renewable energies – microgrid - smart energy management - living lab
Platform objectives	Instrumented experimental building for the implementation and testing of energy management technologies (hardware and software) within a context of renewable energies and storage technologies deployment
Activities description	Test of new energy technologies in real conditions: PV panels, converters, optimization algorithms, storage elements, ageing studies
Equipment	• Experimental building "Living lab" 1700m2 • 6000 sensors/actuators and associated data base: https://syndream.laas.fr/ • 100kWp photovoltaic production • Storage: Pb (900 kWh) and Li-ion (60 kWh) batteries, supercapacitors (286 Wh) • Dedicated char
Number of staff attached	4 engineers, 2 technicians
Legal Status	Public research lab
Main funders	CNRS, Midi-Pyrénées Region, French state , European Regional Development Fund, Toulouse Métropole, Institut Carnot, IDEX UNITI (Université Fédérale de Toulouse)
Main Industrial partners	TOTAL, EDF, CEA, SOLVEO, CARRE PRODUCTS, QUANTUM

THEMIS SOLAIRE INNOVATION	
Country	France
Address	Route de Thémis 66120 Targasonne
Contact	Director's name: Gautier Pépin Email: gautier.pepin@cd66.fr Phone number: + 33 4 68 30 46 00
Website	THEMIS
Laboratory or Institutional affiliation	CNRS - Promes
Keywords	Solar Energies - Concentred Solar Power – Photovoltaic - Thermodynamic, Fluid Transfert - Energy Storage (Electrical and Thermal) - BIPV
Platform objectives	Conception and prototyping thermal and electric solar energy systems Implementation and testing solar energy pilots on real outdoor condition
Activities description	Conception & test of new energy technologies in real conditions: PV panels, CSP Pilot, Storage elements, Heliostat, PV Tracker, BIPV Technologies.
Equipment	• Experimental test area (100 000m²) • High solar irradiation environment • Fab Lab "Sol I Lab" 300m² • 1 CSP Tower Pilot • 1 CPV Pilot • 1 CSP Fresnel Direct Stream Pilot • On ground PV Tracker Power station • BIPV Installation • Meteorol
Number of staff attached	6 engineers, 6 technicians
Legal Status	Public Administration
Main funders	Pyrénées Orientales Department, CNRS, Occitanie Region, French state , European Regional Development Fund
Main Industrial partners	EDF EN, ENGIE GREEN, CNIM, METEO FRANCE, SUBSOL

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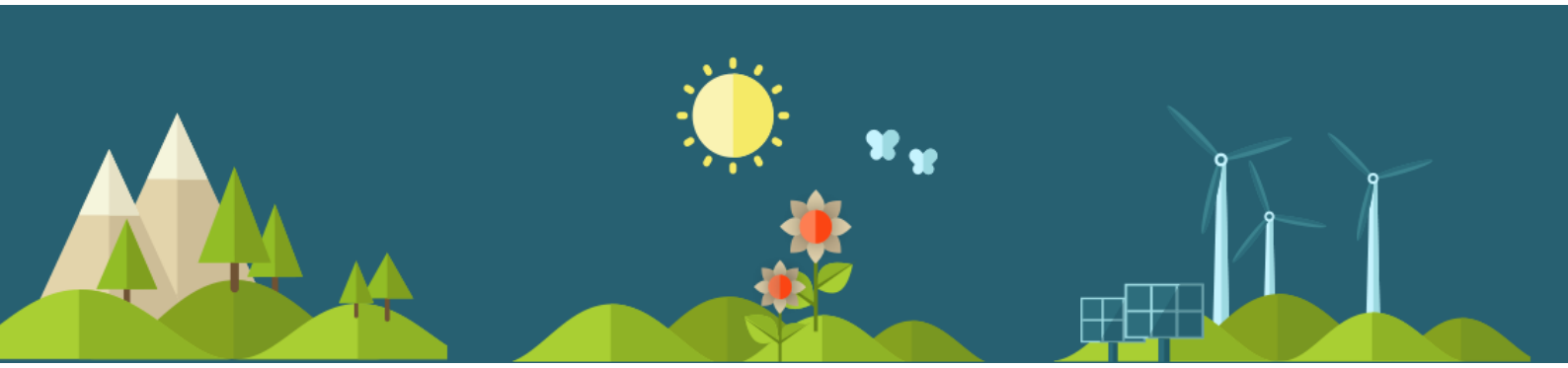

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