The management of energy and innovation in Andalusia
Andalusia has a very **high potential of renewable resources** due to its geographical situation, climatology and morphology.

The use of renewable energies has tripled in the last 10 years and currently contributes up to 20% of the total energy consumed.
The Andalusian energy sector has experienced an important growth of renewable energy in recent years which has generated a new business field. The sector as a whole is formed of more than 7,800 companies (17.4% in renewables) that generate 125,000 jobs (36.2% in renewables.)

Experience in the implementation of a wide set of programmes aimed at improving energy efficiency in construction, tourism and industry, with an important number of companies, some of them being leaders in their field.

Experience in the construction sector, with a high volume of skilled workers in the different industries linked to it and several centres and research groups with experience in the development of new material, such as multifunctional, ceramics or micronised marble that play an important role in knowledge transfer and technology with the sector.

World leader in some areas and technologies of renewable energy, such as solar energy, biomass and biofuels.

Research centres of reference in these areas, such as the Solar Platform of Almeria - considered as one of the most important technological research centres in the world, biomass testing facilities, as well as the Solúcar Platform in Sanlúcar la Mayor (Seville).
Smart Specialisation Strategy on Energy

Renewable energy, energy efficiency and sustainable construction

Development of land and marine renewable energy
Energy smart grids
High capacity systems of energy storage
Energy efficiency in businesses, houses and institutions
Energy sustainability in rural areas
New construction designs and materials and sustainable processes

Principle of governance
Regional Policy for a low carbon economy in 2014-2020

SMART SPECIALISATION

PLANNING

REGIONAL POLICY INSTRUMENTS

LOW CARBON ECONOMY
Regional Policy for a low carbon economy in 2014-2020

- Reduce by 25% the tendential primary energy consumption
- Provide 25% of final gross energy consumption with renewable energy
- 5% self-consumption of electricity generated with renewable sources
- Decarbonize the energy consumption by 30% compared to 2007
- Improve by 15% the quality of energy supply
Energy and Innovation in the Regional Policy for a low carbon economy 2014-2020

- Incentives for energy innovation and transfer of results
- Dissemination and commercialisation of research results and promotion of technology transfer
- Internationalisation of the Andalusian energy sector: improvement of the capacities of Andalusian companies to favour their presence in international markets
- Innovation in energy technologies and increase in the potential and use of autochthonous energy resources
- Roadmap for the development of biorefineries in Andalusia
- Development of the hydrogen economy in Andalusia
## Energy and Innovation in the Industrial Policy

### Industrialise Andalusia

- **More and better companies**
  - Raise the GVA in Andalusia to 18%
  - + 50% of GVA generated by medium and high technology activities
  - + 20% of manufacturing companies and industrial services of between 10 and 50 people
  - - 5% energy intensity of Andalusian industry

### Increase industrial employment

- **More and better quality jobs**
  - + industrial employment
  - + employment in advanced services
  - - 10% temporality
  - -30% serious and fatal accidents

### Improve innovation in industry

- **More innovation**
  - Innovative manufacturing companies X 2
  - + 20% innovation intensity of the companies with innovative activities of the industrial sector
  - + 50% number of national patent applications
  - + 100% companies of the industrial sector incorporating into the digital market

### Industrial internationalisation

- **More exporting companies and greater foreign investment**
  - + 20% exporting companies of the manufacturing industry with an export volume of more than 50,000 € annually
  - + 20% amount of exports of manufacturing industries
  - + 50% of exports in medium and high technology activities
  - + 30% FDI in the manufacturing industry and in advanced scientific and technical services in the framework 2014-2020

### Relational capital of the industrial system

- **More cooperation and collaboration**
  - + 50% of companies in the manufacturing industry with innovations in products or processes realised in collaboration
  - + 20% of directivas companies in the manufacturing industry and in advanced scientific and technical services
Energy and Innovation in the Industrial Policy

**Energy R+D+i**
- 43 Hybridization of energy sources
- 44 Smart energy storage
- 46 Production oriented at bioeconomy

**Distribution**
- 47 Smart Grid
- 48 Smart logistics in new hydrocarbons
- 49 Distribution grids

**Auxiliary energy**
- 50 Tractor integration for renewables
- 51 International expansion of renewables
- 52 Energy efficiency services and products

**Chemical**
- 54 Innovation in biorefineries
- 55 Efficient chemical logistics
- 56 Energy efficient chemistry
- 57 Tractor integration for chemical industries
Regional Policy: Budget distribution (by programmes and beneficiaries)

- Need for concentration in the regional Operative Programme
- Need to incorporate the following concepts:
  - Specialisation and integration of the value chain
  - Innovation, knowledge, added value
  - Creation of quality employment
  - Need for integration of policies to generate wealth: reindustrialisation
Regional Policy: Budget distribution (by programmes and beneficiaries)

255.3 M€

Programme:
- PYME sostenible: 36 M€
- Construcción sostenible en Andalucía: 189 M€
- Public administ.: 30.7 M€

Beneficiaries:
- Public administ.: 54.5 M€
- Citizens: 82.3 M€
- Companies: 118.5 M€
Why cooperation is important to better implement your RIS3 energy-related priorities?

Map of Smart Specialisation: **Eye@RIS3**
http://s3platform.jrc.ec.europa.eu/.

Towards a Model of Sustainable Construction and Energy Efficient Buildings.
European Partnerships in areas of interest for Andalusia

**European Partnership on Advanced Materials for Batteries**
- Led by Andalusia, Castille and Leon and Slovenia
- Wide Andalusian representation: 23 entities involved
- Wide support from the EC: 1 of the 6 strategic sectors
- 22 European regions, 15 countries
- 1st pilot project selected by the EC: Smart Campus

**European Partnership on Sustainable Buildings**
- Led by Andalusia
- 1st pilot project selected by the EC: Smart Campus
- 53 European regions, 23 countries
- First Partnership promoted by the European Commission in energy

**European Partnership on Heating and Cooling**
- Led directly by the European Commission
- 2nd pilot project selected by the EC: Network of networks
- 10 European regions, 8 countries
- Support to regions in their heating and cooling policies

*The European Commission foresees allocating 1,000 M Euros to projects promoted in the framework of these Partnerships. Good positioning of Andalusia.*
European Partnerships in areas of interest for Andalusia

The methodology, similar to Vanguard Initiative, has had a logical evolution that has been based on the following points:

- Discussion of common objectives and find complementarities between regions.
- Better understanding of regions’ industrial competencies and capabilities.
- Development of joint strategic action plans.
- Aligning regional strategic investments arising from these roadmaps.
Main aim: develop joint R&D&I projects on advanced materials for application in the field of batteries for electric mobility and to improve the capacity and performance of stationary energy storage

Key elements:
- Contribute to the modernisation of the industry in the field of specialised advanced materials for electromobility and stationary energy storage;
- Accelerate the transition from the laboratory to the market;
- Support the development of regional innovation ecosystems as catalysts for new innovative companies;
- Strengthen interactions between industry, SMEs and universities based on complementarities and promoting synergies; and
- Support industrialisation processes and the creation of complete competitive value chains in Europe.

Composition: 22 regions

Leaders
Led by Slovenia (SI), Castile and Leon (ES) and Andalusia (ES) the
# Advanced Material for Batteries Partnership – AMBP

## Energy Storage
- Batteries
- Advanced Materials for Batteries
  - PILOT (e.g.: Innovative Cell Manufacturing)
- Business Case (= Projects)

### Reaching the right Granularity - AMBP

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## PIOTs / Leading Region / Coordinator

<table>
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<tr>
<th>PIOTs / Leading Region / Coordinator</th>
<th>Partner Regions</th>
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<tbody>
<tr>
<td><strong>1. Solid state lithium-ion batteries</strong>&lt;br&gt;(Generation 4)&lt;br&gt;BAYARIA&lt;br&gt;Coordinator: Victor Trapp,&lt;br&gt;<a href="mailto:victor.trapp@isc.fraunhofer.de">victor.trapp@isc.fraunhofer.de</a></td>
<td>11: Auvergne Rhône Alpes (FR),&lt;br&gt;Nouvelle-Aquitaine (FR),&lt;br&gt;Flanders (BE),&lt;br&gt;Brussels (BE), Basque Country (ES),&lt;br&gt;Valencia (ES), Andalusia (ES),&lt;br&gt;Aragon (ES), Vestland (NO),&lt;br&gt;Viken (NO), Baden-Württemberg (DE)</td>
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<tr>
<td><strong>2. Sustainable Raw Material, Extraction and Processing</strong>&lt;br&gt;CASTILLA Y LEÓN&lt;br&gt;Coordinator: Santiago Cuesta (Fundación Icamcy)&lt;br&gt;<a href="mailto:director.general@icamcy.com">director.general@icamcy.com</a></td>
<td>3: Oulu (FI), Kainuu (FI), Central Ostrobothnia (FI)&lt;br&gt;Additional inputs by SIEMCALSA and the Iberian Sustainable Mining Cluster (ISMC)</td>
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<tr>
<td><strong>3. Recycling of existing Lithium-ion Batteries</strong>&lt;br&gt;BAYARIA&lt;br&gt;Coordinator: Victor Trapp,&lt;br&gt;<a href="mailto:victor.trapp@isc.fraunhofer.de">victor.trapp@isc.fraunhofer.de</a></td>
<td>7: Flanders (BE), Andalusia (ES), Aragon (ES), Castilla y León (ES), Auvergne Rhone Alpes (FR), Vestland (NO), Baden-Württemberg (DE)</td>
</tr>
<tr>
<td><strong>4. Liquid-based batteries (stationary)</strong>&lt;br&gt;BASQUE COUNTRY and VALENCIA&lt;br&gt;Coordinators: Mario Sanchez&lt;br&gt;(<a href="mailto:mario.sanchez@ite.es">mario.sanchez@ite.es</a>) &amp; Amaya Igarreta&lt;br&gt;(<a href="mailto:amaya.igarreta@tekniker.es">amaya.igarreta@tekniker.es</a>)</td>
<td>7: Aragon (ES), Slovenia (SL), Oulu (FI),&lt;br&gt;Central Ostrobothnia (FI), Bavaria (DE),&lt;br&gt;Andalusia (ES), Auvergne Rhône Alpes (FR)</td>
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<tr>
<td><strong>5. Network of research &amp; testing centers</strong>&lt;br&gt;WEST SLOVENIA&lt;br&gt;Coordinator: Robert Dominko,&lt;br&gt;<a href="mailto:Robert.Dominko@ki.si">Robert.Dominko@ki.si</a></td>
<td>8: Viken (NO), Vestland (NO), Andalusia (ES),&lt;br&gt;Auvergne Rhône Alpes (FR), Valencia (ES),&lt;br&gt;Aragon (ES), Castilla y León (ES), Basque Country (ES)</td>
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<tr>
<td><strong>6. Improved lithium-ion batteries</strong>&lt;br&gt;(Generation 3b)&lt;br&gt;AUVERGNE RHONE ALPES&lt;br&gt;Coordinator: Simon Perraud,&lt;br&gt;<a href="mailto:simon.perraud@cea.fr">simon.perraud@cea.fr</a></td>
<td>5: Nouvelle-Aquitaine (FR), Flanders (BE),&lt;br&gt;Brussels (BE), Baden-Württemberg (DE), Bavaria (DE)</td>
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### Unión Europea<br>Fundación Europea<br>Consejería de Hacienda, Industria y Energía<br>Agencia Andaluza de la Energía<br>Consejería de Hacienda, Industria y Energía
Sustainable Buildings Partnership

Leader
Andalusian Energy Agency, Spain

Co-Leaders
LENERG, North Great Plain Hungary and REGEA, North Croatia Energy Agency
Sustainable Buildings Partnership

Scope: Areas of interest/work for the partnership

**Topic 1:** New materials with low carbon footprint

**Topic 2:** Innovative constructive processes: light prefabrication of low-cost housing, advanced manufacturing for new construction elements

**Topic 3:** Bioclimatic solutions based on green bio elements (in roofs, facades etc.)

**Topic 1:** Innovative solutions of high energy efficiency: evaporative cooling, LED lighting, micro-cogeneration....

**Topic 2:** Smart energy management systems and IoT Internet of Things :

**Topic 3:** Advanced solutions for energy rehabilitation of historical heritage buildings

**Topic 1:** Climatisation with renewable energies

**Topic 2:** Self-consumption and energy storage

**Topic 3:** Low cost solutions aimed at vulnerable groups
Opening of collaboration business offers

Smart Campus Project:
Objective: improve the energy efficiency of University Campuses
Regions involved: Andalusia, LR (ES); Friuli Venezia Giulia Region, SC (IT); Algarve Region (PT); South Karelia (FI); Provence-Alpes-Côte-d'Azur (FR); Central Slovenia (SI)
Support from S3Platform and external experts

The pilot action will accelerate the work done within the TSSP

The focus will be on projects on higher TRLs (>5/6 TRL)
The results will feed the EC’s discussions for 2021-2027

Following a call for expression of interest in 2017
8 pilots were selected, with an additional 9th Pilot in 2019

- 3D Printing
- Cybersecurity
- High-tech farming
- Sustainable Buildings
- Batteries (from 2019)
- Bio-economy
- De- & Re-manufacturing for circular economy
- Marine renewable energy
- Traceability and big data

Context: Interregional Innovation Projects

Sustainable Buildings Partnership
Sustainable Buildings Partnership

Smart Campus Ecosystem

Cross-regional Interface: Supporting exchange and development of technologies between campuses, agreement on governance structure, IPR, data sharing, etc.

Participating Campuses
- University of Trieste
- University of Udine
- University of Ljubljana
- Eco campus de Sainte Tulle
- Aix Marseille University
- University of Malaga
- University of Algarve
- Lappeenranta University of Technology
- Green campus system

Technological solutions
- Real-time control and monitoring of electrical distribution grid
- Smart Fancoil and ambients through IoT
- Intelligent Indoor Environment Quality (IEQ)
- E-automated thermal comfort management
- Dynamic phase balancer
- Smart plugs
- Smart Charging of Electrical Vehicles

Solution Providers:
RTOs, Universities, Energy related companies, energy agencies, etc.

Ecosystem to transition technological solutions to market
- Business cases
- Investors
- Industry
- Clients

Testing and advancing Solutions
Thank you very much for your attention