EUROPEAN SMART & SUSTAINABLE ISLANDS

A BOOKLET OF FEDARENE ISLANDS COLLEGE

FEDARENE

Our members active on islands

- **CY |** Cyprus Energy Agency (CEA)
- **EL|** Regional Development Fund of Crete (RDFC)
- **EL |** Aegean Energy & Environment Agency (AEGEA)
- **MT |** Malta Intelligent Energy Management Agency (MIEMA)
- **ES |** Canary Islands Institute of Technology (ICT)
- **PT |** Madeira Regional Agency for Energy & Environment (AREAM)
- **FR |** Ponant Islands Association (AIP)
- **IE |** Tipperary Energy Agency (TEA)
- **IE |**European Small Islands Federation (ESIN)
- **FR |**Reunion Island SLP Energies
- **UK |** Community Energy Scotland (CES)
- **NL |** Province of Fryslan
- **DK |** Samso Energy Academy (SEA)
- **SE |** Southeast Sweden Energy Academy (SYDOST)
- **HR |** Regional Energy Agency Kvarner (REA KVARNER)

Islands in FEDARENE

FEDARENE was created on 8th June 1990 at the initiative of 6 regional authorities – Rhône-Alpes, Provence-Alpes-Côte-d'Azur, Wallonie, País Vasco, Aquitaine and Nord-Pas-de-Calais. The Brussels office opened its doors for the first time in November 1991 and 4 years later the organization counted already 40 members.

The successive enlargements of the European Union extended FEDARENE's sphere of influence and today more than 70 organizations from 20 European countries form the FEDARENE network of cooperation. It is now a crossroads for a wide array of agencies which are not only the driving force behind the development of the network, but also play an essential role in policy-making. They act as producers of ideas on the regional, national, European and international levels, and as implementers of decisions emanating from these levels.

FEDARENE is one of the founding partners of the Covenant of Mayors for Climate and Energy, the world's largest movement for local climate and energy actions, bringing together over 7,700 signatory local authorities, as well as supporting organizations who strive to fast- track local climate and energy action and go beyond the EU's 40% green-house gas-reduction target by 2030.

Since 2018 a new islands college has been formed in FEDARENE involving 12 island energy agencies and similar organizations. Additionally, 4 mainland energy agencies have been working on islands for some time now. In total, FEDARENE is present in the majority of Member States with islands and provides technical assistance and support to a very large number of islands, including the 1.640 small islands covered by ESIN.

The establishment of this college responds to our need to channel our collective expertise towards European institutions and Member States, in order to ensure that technical and financial assistance designed for the energy transition of islands responds to well-identified challenges, and ultimately delivers tangible improvements in islands' policy and regulation, both at EU and Member States level.

In our view, the energy transition on islands can and must be seen through the lenses of an integrated approach. An approach that maximizes synergies between energy, water, waste, transport, is underpinned by ICT, facilitates access to innovative territorial investment tools and supports enhanced multi-level and multi-lateral governance.

Our story

We, European island energy agencies and similar organizations, have been working together for almost 30 years now in pursuit of a common goal: to help our islands embark on a sustainable development paradigm that harnesses the significant local clean energy potential, creates sustainable growth and offers high-quality of life to locals and visitors.

ISLENET, the European Islands Energy and Environment Network, was the first cooperation framework (1993) between islands that sought to promote sustainable energy and environmental management on islands.

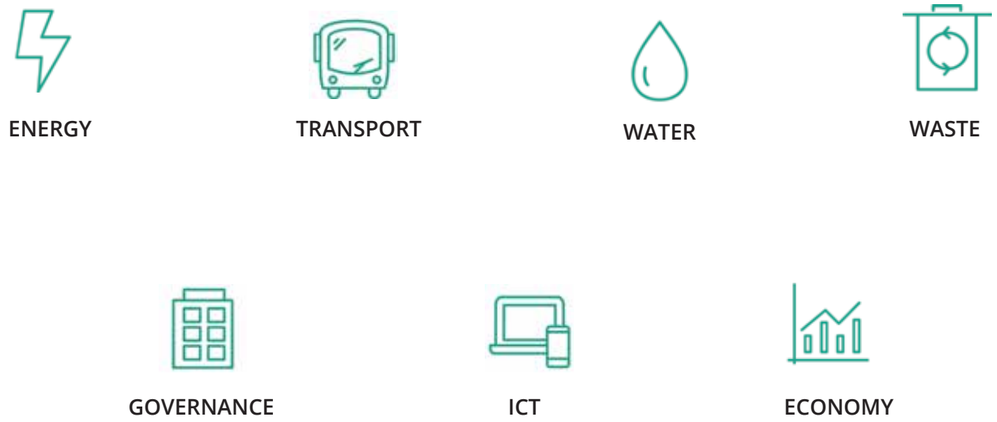
Years later and after a number of opinions, resolutions and projects that shed light on islands' intrinsic challenges associated with local energy planning, funding was made available through the **ISLE-PACT** project (2009) for islands to come forward with solutions to those challenges. The project gave birth to the **Pact of Islands** (2011) which today counts 117 island signatories. The Pact of Islands is a political initiative, similar to the Covenant of Mayors, through which island municipalities and regions pledge to go beyond the EU 2020 climate and energy targets by developing and implementing island Sustainable Energy Action Plans on their territories.

Expanding their cooperation, islands worked intensively during **SMILEGOV** project, (2013-2015), in order to create synergies, exchange knowledge and develop solutions to barriers associated with the implementation of sustainable energy projects. These barriers are often the result of limited understanding of the island context and poor multilevel governance. Overall, SMILEGOV offered valuable insights on what it takes for islands to develop sustainably. These findings crystalized into a concrete vision for creating smart, inclusive and thriving island societies, manifested in the **Smart Islands Strategy**. The strategy proposes to move away from an energy-centered approach towards a systemic one, where synergies are identified and exploited between energy and transport, water, waste and ICT, in order to ensure the optimal use and management of local resources and infrastructures.

After the successful finalization of SMILEGOV, we decided to further mature our work on the Smart Islands Strategy by developing the **Smart Islands Declaration**, the cornerstone document of the **Smart Islands Initiative**. The Declaration was signed in in the European Parliament (2017) with the support of 10 MEPs and your honorary presence and is now supported by more than 200 EU islands.
The Smart Islands Initiative highlights the potential for islands to be frontrunners in Europe as laboratories of a smart, sustainable and integrated territorial development.

These findings crystalized into a concrete vision for creating smart, inclusive and thriving island societies, manifested in the Smart Islands Declaration, the cornerstone document of the Smart Islands Initiative. The Initiative was officially launched (2017) in the **European Parliament** with the support of **MEPs**, the endorsement of the **European Commission** and the active participation of over **100 stakeholders**. More than 200 island authorities, networks of islands and organizations from across Europe have signed up to the Initiative, which aims to mobilize combined investment tools for unlocking islands' potential to embark on a smart and integrated territorial development path.

Key areas of intervention



Islands in EU policy

Europe is pursuing the systemic transformation of its energy system in order to become a prosperous, modern, competitive and climate-neutral economy by 2050. Against this backdrop, and with a new type of energy market in our doorstep, in which the supply of energy is increasingly decentralized, new business models emerge, consumers are in control of their energy consumption and production and innovative technologies are penetrating the market with demand-side measures receiving priority, islands have a real incentive to kick-start their clean energy transition now, reap the benefits that come with it and act as lighthouses of Europe's decarbonisation.

Acknowledging this, the European Commission launched the Clean Energy for EU Islands Initiative and established a Secretariat to provide technical assistance to islands ready to embark on a decarbonisation pathway.

As members of FEDARENE's Islands College, we welcome these steps and express our strong willingness to contribute to the realization of ongoing and forthcoming initiatives concerning EU islands.

We have a thorough understanding of the technical, regulatory, licensing, financing and ownership barriers that currently prevent decarbonisation from materializing on islands and can therefore table meaningful proposals and offer technical assistance to overcome those barriers.

Our added value

Being the actors who support local and regional authorities and citizens to deliver the energy transition locally, our added value can be summarized as follows:

1. Maturing and realizing a significant number of sustainable energy projects on islands;
2. Building extensive knowledge of the specific challenges associated with islands' energy transition, which in many cases differ from one Member State to the other and requires addressing them;
3. Delivering solutions that are tailored to local island ecosystems and socially-inclusive;
4. Building local capacity in order to ensure the sustainability of the developed visions and plans; and
5. Acquiring hands-on experience with cutting-edge technologies and business models that fit well with islands' needs.

FEDARENE Island members & projects

- Cyprus Energy Agency - CEA
- Samso Energy Academy -SEA
- Canary Islands Institute of Technology - ITC
- Horizon Reunion
- Aegean Energy & Environment Agency - AEGEA
- Regional Development Fund of Crete - RDFC
- Institution Regional Energy Agency Kvarner - REA KVARNER
- Malta Intelligent Energy Management Agency - MIEMA
- Province of Fryslan
- Regional Agency for Energy and Environment of the Autonomous Region of Madeira - AREAM
- Energy Agency for Southeast Sweden - SYDOST
- Community Energy Scotland - CES
- The European Small Islands Federation - ESIN

Cyprus Energy Agency

Cyprus Energy Agency

www.cea.org.cy

@CyprusEnergyAgency
@CyEnergyAgency
@CyprusEnergyAgency
@CyEnergyAgency
Cyprus Energy Agency

Organization

CEA is an independent, non-governmental, non-profit organization, founded in February 2009, with the aim to contribute actively to the conservation of energy sources, the protection of the environment and the improvement of the quality of life.
It was co-funded by the European Commission, through the “Intelligent Energy for Europe” program and by the Cyprus Union of Communities, for its establishment and first three years of operation.
CEA has eventually become an information point for the local society, providing education and vocational training. It participates in projects in partnership with local, European and international organizations, contributing to innovation, research and sustainable development. It also enhances the role of local authorities in sustainable energy planning, providing technical support for developing and implementing actions to mitigate and adapt to climate change.
Finally, it participates in the Cypriot Consortium that coordinates the Regional Innovation and Entrepreneurship Plan of the European Institute of Innovation and Technology for Levantine region (Climate – KIC RIS), focusing in education, networking, and the development and promotion of innovative solutions for the shaping of a low-carbon economy.

EU Projects

YENESIS

Youth Employment Network for Energy Sustainability in Islands

Funding: EEA Grants

Keywords: #GreenJobs #SustainableIslands #SustainableTourism #SustainableMobility #EnergyEfficiency

www.yenesis.eu @YenesisProject @YenesisProject

HAPPEN

Holistic AProach and Platform for the deep renovation of the med residential built Environment

Funding: Horizon 2020

Keywords: #EnergyEfficientBuildings #nZEB #DeepRenovation #FinancialGuarantees #one-stop-shops #LocalSupplyChains #BuildUp

@happen-project @HAPPEN_PROJECT

RESOR

Supporting energy efficiency and renewable energy in European islands and remote regions

Funding: Interreg Europe

Keywords: #EuropeanOutermostRegions #EnergyEfficiency #RenewableEnergies #CO2reduction

www.interregeurope.eu/resor/ @RESOR.project @RESORproject

BRICK OF SKILLS

Funding: Erasmus + program

Keywords: #EnergyEfficiency #Education #Training #Construction

www.bricksofskills.eu @bricksofskills

SUSHI

Sustainable Historic Districts

Funding: EIT Climate-KIC

Keywords: #HistoricalCities #SystemicChange #SocialChange #Innovation #Sustainability #ClimateChange #ClimateChangeMitigation #ClimateChangeResilience

ENERJ

Joint Actions for Energy Efficiency

Funding: Interreg – MED program

Keywords: #LocalAuthorities #EnergyEfficiency #PublicBuildings #EnergyPolicy #ClimatePolicy

www.enerj.interreg-med.eu @EnerjMED @EnerjMED EnerjProject

LOCAL4GREEN

Local Policies for Green Energy

Funding: Interreg MED

Keywords: #GreenPolicies #GreenTaxation #RESsystems

www.local4green.interreg-med.eu @local4green

TEESCHOOLS

Transferring Energy Efficiency in Mediterranean SCHOOLS

Funding: Interreg MED

Keywords: #EnergyEfficiency #MediterraneanSchools

www.teeschools.interreg-med.eu teeschools @teeschools

VIOLET

preserVe tradItiOnal buiLdings through Energy reducTion

Funding: Interreg MED

Keywords: #TraditionalBuildings #EnergyReduction #EnergyEfficiency

www.interregeurope.eu/violet @VioletEUProject @VioletProject

Compete4Secap

Helping local authorities put their existing Sustainable Energy Action Plans (SEAPs) into action

Funding: Horizon 2020

Keywords: #LocalAuthorities #SEAPs #EnergySavings #EnergyEfficiency

www.compete4secap.eu

EMPOWER

The island figures

Area: 9.251 km²
Member state: Cyprus
Main economic activities: tourism, real estate, energy
Electrical system: Non-interconnected
RES share in the local energy mix: 10%

The project

During the 3 years of its duration, the co-financed by the European Regional Development Fund and the Republic of Cyprus through the Research and Innovation Foundation RESTART 2016-2020 project EMPOWER has an ambitious goal: to modernize the Cyprus power system, equipping it with state of-the-art tools and cutting-edge technologies that will improve the stability and reliability of the island's power system, even in the presence of a very high penetration of renewable energy sources.

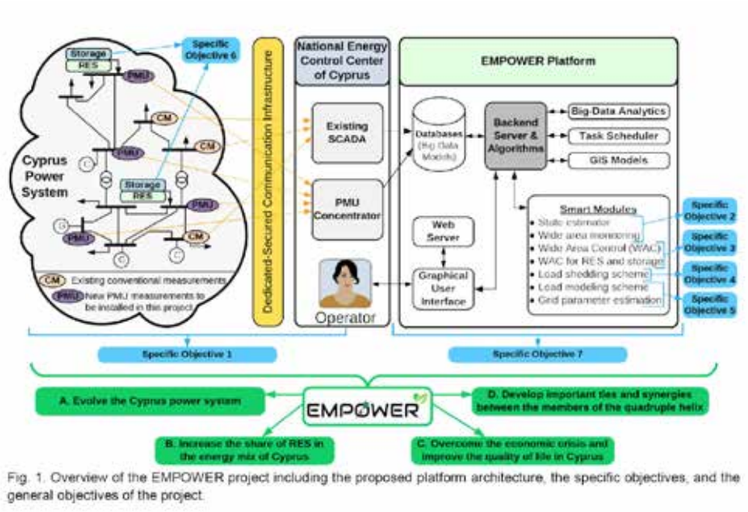


Fig. 1. Overview of the EMPOWER project including the proposed platform architecture, the specific objectives, and the general objectives of the project.

1

Development of cutting-edge solutions based on ICT for evolving the Cyprus power system

2

Increase the share of Renewable Energy Sources (RES) in the energy mix of Cyprus for achieving 13% of its electric energy to be produced by renewable energy sources by 2020, as required by the European Commission

3

Overcome the economic crisis and improve the quality of life in Cyprus by gradually decreasing the electricity's cost and minimizing the environmental footprint

4

Develop important ties and synergies between members of the quadruple helix to guarantee the successful completion of the project

Samso Energy Academy

www.energiakademiet.dk
@energyacademiet
@energyacademiet
@Samso Energiakademi
@samsoenergiakademi

Organization

Samso Energy Academy (SE) is the knowledge centre of Samso, Denmark's renewable energy island since 1997. The Energy Academy disseminates know-how and hands-on experience to public bodies, businesses and private consumers related with renewable energy projects, including: on-shore and off-shore wind turbines, home wind turbines, straw-based district-heating, solar collectors, household photovoltaic systems. SE has successfully implemented 100% RES production on Samso, while ensuring a very high level of local ownership and participation.
Among other things, SE has been involved in pioneering EU island cooperation projects (SMILEGOV) and initiatives (Pact of Islands) as well as in producing master plans and SEAPs for the Municipality of Samso, Central Denmark Region and a number of other island authorities.

SMILE

SMart IsLand Energy systems
Funding: Horizon 2020
Keywords: #SmartIslands #EnergySystems #smartgrids #storage #demand-response #DistributionNetwork #E-mobility #RES

www.h2020.eu @h2020smileproject @H2020SMILE @h2020smileproject

Night Light

Improving regional policies to reduce light pollution and protect and valorise dark night skies
Funding: Interreg Europe
Keywords: #LightPollution #DarkSky #ecotourism

www.interregeurope.eu/nightlight/ @nightlighteu9

Islands of Innovation

Innovation Policies for Sustainable European Islands
Funding: Interreg Europe
Keywords: #eployment #population #housing #innovation

www.interregeurope.eu/islandsofinnovation @islandsofinnov7

SMARTEES

Social innovation Modelling Approaches to Realizing Transition to Energy Efficiency and Sustainability
Funding: Horizon 2020
Keywords: #PolicyPathways #citizen_inclusion #energyTransition

www.local-social-innovation.eu @SMARTEESproject

A battery driven marina in Ballen, Samso (SMILE)

The island figures

Permanent population: 3.700
Governance: Municipality of Samso
Distance from mainland: 1 hour
Regional authority: Central Denmark Region
Main economic activities tourism, agriculture
Interconnection status: electric cable to the mainland
RES share in local energy mix: 100% net annual balance

The project

The project

Ballen marina, Samso, is a test marina in the pioneering European project “SMILE”. During 2019, Ballen marina is energy-optimized by storing energy in a large battery. The battery supplies up to 340 boats in the marina with solar energy — even after sunset. The objective is to help island communities increase their use of sustainable energy.

Main outcomes

1

Expected solar panel self-consumption: over 89%

2

Marina expected self-supply: over 47% (26% without battery)

3

Number of electric connection points for boats: 340

4

Marina electricity consumption: 100.000 kWh per year

5

Expected energy from solar panels: 56 000 kWh per year

6

Nominal size of battery: 240 kWh

7

Nominal size of PV plant: 60 kWp

Canary Islands Institute of Technology

www.itccanarias.org
@ITC.Gobcan
@ITCCANARIAS

Organization

ITC is a non-profit public organization that was founded in 1992 by the Regional Government of the Canary Islands. ITC operates under private law, has offices in Tenerife and Gran Canaria and currently employs 180 staff. The Renewable Energy department employs 30 physicists and engineers and is tasked with supporting the Government of the Canary Islands in the definition of the regional energy policy, especially regarding the promotion of renewable energy and energy efficiency.
Locally, ITC manages public national and EU regional development programs and supports the seven island authorities and 88 municipalities in their local efforts to promote renewable energies, energy savings and reduction of CO_2 emissions. ITC has been strongly cooperating with all European island regions for more than 20 years and has a leading role promoting RES and energy efficiency in the European Outermost Regions.
ITC also supports efforts to transfer clean energy technologies to neighbouring countries of the Western African Coast. Overall, ITC has more than 15 years of experience designing and installing RES-hybrid systems in rural areas of these countries.

SOCLIMPACT

DownScaling CLImate imPACTs and decarbonisation pathways in EU islands, and enhancing socioeconomic and non-market evaluation of Climate Change for Europe, for 2050 and beyond.
Funding: Horizon 2020
Keywords: #ClimateChange #MathematicalModelling #ImpactChains #BlueEconomy #EuropeanOutermostRegions
www.soclimpact.org @soclimpact

RESOR

Supporting energy efficiency and renewable energy in European islands and remote regions
Funding: INTERREG-EUROPE
Keywords: #EuropeanOutermostrRegions #EnergyEfficiency #RenewableEnergies #CO2reduction
www.interregeurope.eu/resor/ @RESOR.project @RESORproject

MAGIC

Moving towards Adaptive Governance in Complexity: Informing Nexus Security
Funding: Horizon 2020
Keywords: ##EnergyWaterNexus #EnergyModelling
www.magic-nexus.eu @MagicNexusEu @MAGIC_NEXUS

TILOS

Technology Innovation for the LOcal Scale, Optimum Integration of Battery Energy Storage
Funding: Horizon 2020
Keywords: #Microgrid #EnergyForecastingModels #EnergyManagementSystem #HighRESPenetrationIsland
www.tiloshorizon.eu @TilosHorizon @TilosHorizon

SiNGULAR

Smart and Sustainable Insular Electricity Grids Under Large-Scale Renewable Integration progress.
Funding: EC FP7
Keywords: #Planning #DemandManagement #RESPenetrationInIslandSystems
www.cordis.europa.eu/project/rcn/106012/reporting/en @SingularFP7

Lighthouse Project

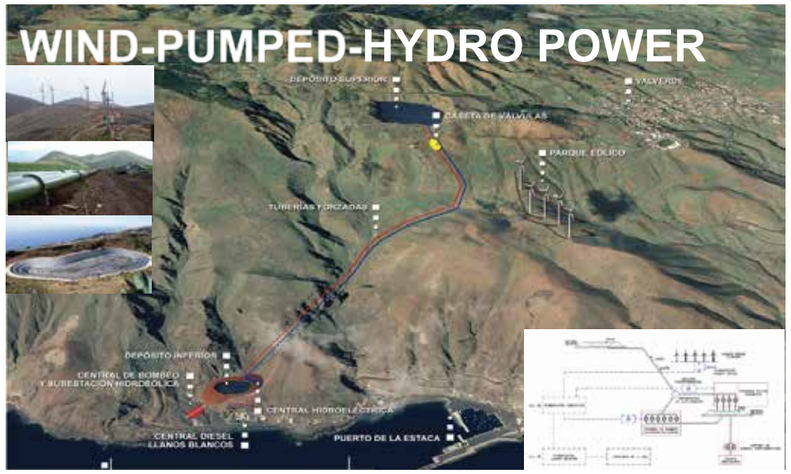
Wind-Pumped-Hydro power station of El Hierro

The island figures

Permanent population: 10.587
Area: 268,71 km^2
Distance from mainland: 2.5hrs by plane
Local authority: Island Authority of El Hierro
Regional authority: Regional Government of the Canary Islands
Main economic activities: tourism, agriculture, fishing
Electrical system: Non-interconnected
RES share in local energy mix (electrical): 57.5% Wind

The project

- Design, construction and operation of a Wind-Pumped-Hydro system for maximizing RES penetration in the small and weak isolated island grid of El Hierro
- Initial phase carried-out in the EC 5th FP Project that had as main deliverables the creation of the Company GORONA DEL VIENTO, that has been in charge of constructing and operating the power station
- Company owned by the Island Authority of El Hierro (60%), ENDESA-ENEL (30%) and the Canary Islands Institute of Technology – ITC (10%).
- Perfect example of public private partnership that has allowed for collaboration beyond the timeframe of the European 5th FP project
- The technical partners ITC maintains an important role in consultancy for improving operation of the system



Main outcomes

1

The wind-pumped- hydro power station was commissioned in 2014

2

Uses a wind farm as the main energy source for power generation, and a system of two connected water reservoirs that is used as a supplementary source of energy. Surplus energy from the wind farm, is used to pump water from a lower reservoir at sea-level, into an upper reservoir at 700 m

3

Hybrid closed-loop wind-hydroelectric system concept

4

In 2018 it allowed for RES penetration of 57,5 % in the yearly balance

5

The system mitigates the risk of intermittent and variable wind power output with the highly predictable characteristics of a hydro system. The reservoirs essentially form a “rechargeable battery”, thereby permitting maximum use of the wind resource by decoupling the temporal dependence of customer load demand from the wind generation cycle

Horizon Reunion

https://energies-reunion.com
@splhorizonreunion
@spli_horizon
@horizon-reunion-spl

Organization

Since 2013, the local public company Horizon Reunion has supported Reunion island towards becoming energy self-sufficient through the use of RES by 2030. Formerly called Energies Réunion, the company changed its name in February 2019, following the diversification of its portfolio with new services in the fields of environment, biodiversity and climate. Today, Horizon Reunion employs 76 staff and its role is to support local authorities in implementing concrete projects that maximize RES use, save energy and promote sustainability.
Energy poverty is a flagship initiative of the organization with the provision of home energy audits to more than 17,000 families, the support of regional schemes such as “Photovoltaic Check” to families and farmers and “Eco-solidaire” for families to purchase solar water heaters.

Horizon Reunion provides local authorities with technical assistance for the uptake of RES, through for example PV installation with charging stations for electric vehicles.

Local Scheme for Energy Efficiency (SLIME)

The island figures

Permanent population: 862.308
Area: 2504km²
Governance: Overseas Department and Region
Main economic activities: tourism, agriculture, fisheries
Electrical system: Non-interconnected
RES share in local energy mix: 36% (Hydropower, 20% Bagasse 7% PV/Wind power/ biogas 9%)

The project

The Local Scheme for Energy Efficiency (SLIME) was rolled-out in 2014 in order to combat fuel poverty. Horizon Reunion is in charge of implementing and promoting the project together with EDF and the support of the Regional Council.

SLIME helps local authorities in providing concrete solutions to fuel poverty, reducing the energy demand from the grid and finally decreasing GHG emissions. Fuel poor households are identified and supported in adopting measures that reduce energy use.

SLIME is a truly innovative project, since it has managed to mobilize the energy retrofitting market via the installation of solar water heaters, replacement of in-efficient household appliances and insulation works, and catalyze cooperation with stakeholders from the housing and social services sectors.

1

17.570 householders benefited from an energy audit

2

More than 90000 energy efficient devices delivered

3

Savings of 6 GWh / year

Aegean Energy & Environment Agency

www.aegean-energy.gr
@aegean.energy
@aegean.energy

Organization

Non-profit organization founded in 2008 to support the members of DAFNI Network of Sustainable Greek Islands in their energy transition. Today AEGEA employees 15 staff and provides services to 51 islands spread in the Aegean and Ionian seas, with a permanent population of 606.357. Tourism holds the largest share of islands' economic activity, while the often-intense seasonal demand for services takes a heavy toll on local infrastructures and resources. To mitigate this and unlock their potential to develop sustainably, AEGEA offers islands the technical assistance needed to develop energy transition plans and mature integrated projects in the fields of renewable energy and energy efficiency, sustainable transport, sustainable waste and water management and sustainable tourism.Over the past years AEGEA has prepared over 20 iSEAPs (Pact of Islands) and SEAPs (Covenant of Mayors) for island municipalities, various technical and socio-economic studies and capacity-building programmes for local decision-makers and citizens on cutting-edge technological solutions, policy developments and alternative investment schemes.

Moreover, AEGEA cooperates with academic institutions to set-up R&D projects that can offer solutions to lasting challenges related with infrastructure management on islands. AEGEA is involved in EU advocacy initiatives for islands, holding the Vice-Presidency for Smart and Sustainable Islands within FEDARENE and coordinating the Smart Islands Initiative.

EU Projects

INSULAE

Maximizing the impact of innovative energy approaches in the EU islands

Funding: Horizon 2020

Keywords: #SmartIslands #EnergySystems #smartgrids #storage #InvestmentPlanning #E-Mobility #bioeconomy #BigData #LocalEnergyCommunities

@INSULAE_H2020

STEPPING

Supporting The EPC Public Procurement IN Going-beyond

Funding: Interreg MED

Keywords: #EfficientBuildings #EPC #Mediterranean #PublicBuildings #ESCOs

www.stepping.interreg-med.eu @SteppingMed

MOTIVATE

Exploiting social media and crowdsourcing techniques to reinforce SUMP development in Med cities with seasonal demand

Funding: : Interreg MED

Keywords: #SustainableMobility #SUMPs #MEDcities #ICT #seasonality #TripDiaries

www.motivate.interreg-med.eu @MotivateMed @MotivateInterregMED

YENESIS

Youth Employment Network for Energy Sustainability in Islands

Funding: EEA Grants

Keywords: #GreenJobs #SustainableIslands #SustainableTourism #SustainableMobility #EnergyEfficiency

www.yenesis.eu @YenesisProject @YenesisProject

WiseGRID

Wide scale demonstration of Integrated Solutions and business models for European SmartGRID

Funding: Horizon 2020

Keywords: #SmartGrids #storage #DemandResponse #ElectricVehicles #EmpoweredCitizens #innovation

www.wisegrid.eu @wisegrid @wiseGRID_H2020

IMPLEMENT

Improving Local Energy and climate policy through quality management and certification

Funding: Horizon 2020

Keywords: #EuropeanEnergyAward #ClimateAction #EnergyEfficiency #CO2reduction

www.european-energy-award.org @IMPLEMENTH2020 @IMPLEMENTH2020

HAPPEN

Holistic AProach and Platform for the deep renovation of the med residential built Environment

Funding: Horizon 2020

Keywords: #EnergyEfficientBuildings #nZEB #DeepRenovation #FinancialGuarantees #one-stop-shops #LocalSupplyChains #BuildUp

@HAPPEN-PROJECT @HAPPEN_PROJECT @happen-project

SMILE

SMart IsLand Energy systems

Funding: Horizon 2020

Keywords: #SmartIslands #EnergySystems #smartgrids #storage #demand-response #DistributionNetwork #E-mobility #RES

www.h2020.eu @h2020smileproject @H2020SMILE @h2020smileproject

Lighthouse Project

Kythnos Smart Island

The Island figures

Permanent population: 1608
Seasonal peak population: 5600
Area: 99.43km²
Distance from the mainland: 2 hours by boat
Local authority: Municipality of Kythnos
Regional authority: Region of South Aegean
Main economic activities: tourism, construction, fishing
Electrical system: Non-interconnected
RES share in local energy mix: 5% Wind, 10% PV

The project

In the next three years Kythnos will become a true “living lab” of innovative solutions for the efficient upgrade and smart management of local infrastructures. With a budget of approximately 8 million euros, “Kythnos Smart Island” is the biggest research and development project ever to be implemented in the Greek islands.
Cutting-edge technologies will be introduced in nine intervention areas, including:

- the installation of a smart energy control center on the island along with smart electrical appliances and smart meters in households and businesses;
- the modernization of the existing and set-up of a new micro-grid;
- the replacement of existing with energy efficient LED luminaires and integration of smart controls;
- the installation of RES in the desalination plant, partial replacement and deployment of smart water sensors in the water distribution network;
- the optimization of existing solid waste recycling system and operation of a decentralized micro-anaerobic digester combined with an aerobic MBR system;
- the uptake of electric mobility on land (EVs and charging stations) and at sea (small scale electric shipping);
- the transformation into Nearly Zero Energy Buildings of two buildings hosting cultural and scientific events and yearlong educational trainings.

These interventions will allow Kythnos to extend its tourism season beyond traditional peak periods and strengthen the interdependence of its primary, secondary and tertiary sectors; ultimately, building a local economy that is diverse, circular and sustainable.

Main outcomes

1
Automated and efficient operation of the electrical system with integration of flexibility at the demand side

2
Increased self-consumption and lower grid losses in micro-grids

3
Energy efficient and dynamic street lighting network

4
Circular agro-waste management for biogas production

5
Reduced cost of water production and losses at distribution system

6
Electrification of road and seaborne mobility

7
Local participation and ownership

8
Uptake of thematic scientific tourism

Regional Development Fund of Crete
Regional Energy Agency of Crete

www.pta.gr
@pta_kritis
@pta_kritis

Organization

The Regional Development Fund of Crete (RDFC) is a public entity operating under private law, supporting the Region of Crete in regional development planning. RDFC has managed more than 135 European competitive programs and has also participated in the implementation of many of them. Under RDFC Crete operates the Regional Energy Agency of Crete (REAC), established in 1994, as one of the first Energy Regional Agencies in Europe and the first at national level.

The Regional Energy Agency of Crete:
1. designs and implements energy and climate policies, particularly on RES, sustainable transport and energy efficiency;
2. helps attract investments and deploy pilot projects;
3. runs awareness-raising and dissemination campaigns.

REAC is the Territorial Coordinator for the region of Crete under the Covenant of Mayors and founding member of the Pact of Islands. Since it was founded, it has participated in more than 65 European competitive programs and projects and in many pilot and innovative activities at local, regional, national and European level. In 2001 REAC was honored by the European Commission with the first prize for developing and realizing Renewable Energy projects at regional level.

ENERMED
Funding: Interreg MED
Keywords: #RESmunicipalities #SEAPs #CovenantofMayors

SMART WATERS
Funding: EEA Grants
Keywords: #RESwatermanagement #MultilevelEnergyWaterManagement
www.smartwaters.gr

MEDEEA
Funding: Interreg MED
Keywords: #SEAPs #EuropeanEnergyAward #CovenantofMayors #EmpoweredMunipalities

ENERGEIN
Funding: Interreg Greece-Cyprus 2007-2013
Keywords: #SustainableEnergy #CreteCyprus #RegionalEnergyPlanning #InsularPolicies #InsularEnergyPlanning #SustainableBuildings

Sustainable-clean energy transition of the Crete island

The island figures

Permanent population: 680.000
Annual tourists arrivals: 4.500.000
Area: 8.336km^2
Distance from mainland: 339km^2
Regional authority: Region of Crete
Main economic activities: tourism, agriculture, trade
Electrical system: Non- interconnected
RES in local energy mix: 25%

The project

In the next years the island of Crete will draw a participatory plan and implement various projects to accelerate its clean energy transition, while meeting the regional and national energy and climate targets.

Crete will capitalize on ISLEPACT project and the strategic study “Energy planning or the Region of Crete” and channel the support it will receive from the Clean Energy for EU Islands Secretariat towards establishing a roadmap for its clean energy transition. Different RES technologies will be considered (on-shore and off – shore wind, PV, thermal solar and agricultural biomass), as well as, energy storage (reverse pumping / batteries) and smart grids. Energy saving and rational energy we will be a priority across all sectors, while sustainable transport is also a priority. The existing 16 municipal SEAPs will have to be coordinated with the iSEAP in place and the upcoming “Climate Change Plan”.

Main outcomes

1

Built-up a common vision and consensus for the energy transition

2

Combine Sustainable Energy and Climate Action Plan of the whole island (SECAP-I) with the 24 municipal (SECAPS).

3

Establish an efficient electricity management system combining the electricity interconnections and the local RES electricity production.

4

Maximize the RES penetration in the energy system.

5

Prioritize energy efficiency and energy saving in all activity sectors.

6

Attract and support sustainable energy and energy efficiency investments.

7

Combine the Smart Regional Specialization of the Crete Region with pilot and innovative energy projects.

8

Design and implement a continuous and multi faced communication – dissemination – promotion plan for the regional energy transition.

Institution Regional Energy Agency Kvarner

REGIONALNA ENERGETSKA AGENCIJA KVARNER

www.reakvarner.hr

Organization

Regional Energy Agency Kvarner was established in 2009 by the Primorje-Gorski Kotar County (PGKC). The activities of the Agency include drafting of energy balance sheets and action plans (SEAPs, PEAPs, LCTPs. zero carbon emission plans), EE measures implementation, stimulating the use of RES (including also innovative systems such as solar cooling), providing information, support and technical assistance to different regional public stakeholders, i.e. the Agency has recently been involved in the project development of the solar power plant Orlec Trinket (6.5 MW) on the island of Cres, the biggest such power plant in Croatia.

Today the Agency has 7 employees and provides services to 35 municipalities in PGKC region, out of which 11 are located on islands. There are 55 islands in the Kvarner archipelago with a total of 13.800 inhabitants. This number of people, however, grows significantly in summer periods leading to water and energy shortages and a number of other resource and infrastructure challenges.
The Agency provides technical and expert support to islands in developing different clean energy transition projects coupled with other sectors like water management (desalination plants), waste (biogas production) transport (electro mobility) and also sustainable tourism, aiming to unlock islands' potential for integrated territorial development.

INSULAE

Maximizing the impact of innovative energy approaches in the EU islands

Funding: Horizon 2020

Keywords: #SmartIslands #EnergySystems #SmartGrids #storage #InvestmentPlanning #E-Mobility #bioeconomy #BigData #LocalEnergyCommunities

@INSULAE_H2020

LOCATIONS

Low Carbon Transport in Cruise Destination Cities

Funding: Interreg MED

Keywords: #LocationsProject #SustainableMobility

locations.interreg-med.eu

Unije – Energy Independent island

The island figures

Location: Kvarner Bay, located south-west from the island of Losinj
Permanent population: 88
Seasonal peak population: 800
Area: 16.77km^2
Primary energy consumption: 57% RES, 43% fossil fuels
Carbon intensity: 372t CO_2/MWh
Main challenges: fresh water security, RES curtailment, tourism seasonality, lack of citizen participation in the energy system, insecurity of supply

The project

The Unije Island was selected by the regional authority as a pilot project to become the 1st energy independent island in the Kvarner bay.
"Unije Island Energy Development Scenario" (2011), a study prepared by the Agency in cooperation with the University of Zagreb Faculty of Mechanical Engineering and Naval Architecture, examined different scenarios until 2020 or 2030, and a number of concrete actions have already been conducted. The Agency:

- developed a conceptual design and selected a location for the construction of a photovoltaic power station (capacity of 1 MW);
- produced a study examining the connectivity of a power station (capacity of 1 MW) including a battery system (capacity of 1 MW) with an existing submarine electric power grid;
- developed the main design and oversaw the construction of a desalination unit on the Unije Island; a project of introducing a rooftop photovoltaic system (capacity of 7kW) in order to supply the desalination unit was implemented subsequently;
- implemented a project introducing an energy-efficient street LED lighting system.

It is expected that Unije will achieve a 100% share of RES in the energy mix at the end of project INSULAE.
Pilot project on the Island of Unije, if managed and implemented properly, can later on be replicated in a number of similar small island communities in the Adriatic, contributing not only to their survival in terms of preventing the total depopulation, but also to their socio-economic development. With the fulfilment of all the planned measures, the Island of Unije would become the first energy self-sufficient island in Croatia and thus the best practice example and a model for all other small island communities.

1

Joint management of hybridized RES and storage: the 1MW solar plant of Unije will be complemented with a 1MW BESS. This installation will be managed as an energy buffer for the whole archipelago.

2

Smart integration and control of water and energy systems: in order to make an optimal use of water produced for vineyards irrigation, it is planned to set up a system of smart agriculture/vineyards that will monitor soil and environmental parameters to gather the necessary information for implementing adaptive algorithms optimizing agricultural production, water use and energy use. Also, the desalinization plant of Unije will be managed to attend agricultural and human needs while having a positive impact in the energy system.

3

Empowerment of islands' energy communities through 5G and IoT: a complete deployment of Smart Boxes connected though 5G will be done in the island. This will allow the inhabitants to monitor and manage all their consumption. Each house will be connected to the control centre. The inclusion of Blockchain for citizens to participate in the energy market will facilitate the creation of a local energy community.

Malta Intelligent Energy Management Agency

www.miema.org
@miema

Organization

MIEMA has been founded in 2007, it provides support to policymakers, develops and implements projects, offers training courses, carries out energy audits, draws up energy plans (like SEAPs) and organizes public awareness campaigns.

Over the past ten years, MIEMA has implemented more than 20 European projects, all related to sustainable energy, under a range of different programmes. Its engineers have conducted numerous energy audits and provided consultancy and advice on clean energy issues to local councils and other public entities. Some of its projects included the installation of PV systems and energy efficiency measures in 35 low-income households (Elih-Med), the award of the European Energy Award to four Maltese Local Councils (MEDEEA), the development of energy training courses (BUS-Malta, BUS-Trainers, SEOP, EHCmap, Eneplan, Eresplan), and the implementation of a pilot smart energy grid (Empower), amongst others.

At present, MIEMA has ongoing projects funded through the Interreg Europe, Interreg MED, Horizon 2020 and Erasmus+ programmes.

STEPPING
Supporting The EPC Public Procurement IN Going-beyond
Funding: Interreg MED
Keywords: #EfficientBuildings #EPC #Mediterranean #PublicBuildings #ESCOs
www.stepping.interreg-med.eu @SteppingMed

PEGASUS
Promoting Effective Generation and Sustainable USes of electricity
Funding: Horizon 2020
Keywords: #SmartGrids #EnergyConsumption #RES #EnergyManagement
www.pegasus.interreg-med.eu

LOCAL4GREEN
LOCAL Policies for GREEN Energy
Funding: Interreg MED
Keywords: #localfiscalpolicies
www.local4green.interreg-med.eu

MAESTRALE
Funding: Horizon 2020
Keywords: #BlueEnergy #BlueLabs #BELs
www.maestrale.interreg-med.eu @maestrale.project @maestrale.MED

LIFE GREENCHANGE
Green infrastructures for increasing biodiversity in Agro Pontino and Maltese rural areas
Funding: LIFE
Keywords: #RuralAreas #biodiversity #lifeprogramme #GreenInfrastructures #Natura2000
www.lifegreenchange.eu @lifegreenchange

BuS.Trainers
Building up Green Skills for trainers from the construction industry
Funding: Erasmus +
Keywords: #elearning #SustainableBuildings #LifeCycle #LCA #LCC #sustainability #ConstructionIndustry
www.ecotrainers.eu @Bus.Trainers

Energy Refurbishment for Public Buildings in the island of Gozo (ECOGozo)

The island figures

Permanent population: 32.800
Area: 67km^2
Distance from mainland: 25' by boat from Malta
Island authority: Ministry for Gozo
Main economic activities: tourism, agriculture, craftmanship
Electrical system: Fully interconnected
RES in local energy mix: 0.5% Wind, 6.5% PV

The project

The Ministry for Gozo started a large-scale energy refurbishment project in the island of Gozo in 2015. The project is still ongoing and is expected to be completed by the end of 2019. The project is being implemented as one of the measures supported by the ECOGozo policy which aims to foster the transformation of Gozo into an Eco-island by 2020. The project focuses on the investment in alternative energy sources and energy efficiency interventions aimed to help mitigate climate change. The project mainly focuses on the installation of photovoltaic system on public facilities, the transformation of the Ministry's building in a NZEB by 2020 and the general improvement of energy efficiency in public buildings, through the installation roof insulation, double glazing, a centralized heating/cooling system and replacement of lighting. The project has a total budget of €1.4 million, financed by the ERDF programme and the Ministry for Gozo.

Main outcomes

1

Transformation of the Ministry for Gozo building in nZEB

2

Energy efficiency interventions in public buildings to the installation of roof insulation, centralized heating and cooling system, double glazing and replace of lighting to LED

3

Total renewable energy generation of 822MWh/yr though installation of photovoltaic systems on 6 buildings owned by the government

4

Reduction in $C0_2$ emissions by 575,400 ton $C0_2$/yr

Province of Fryslan

provinsje fryslân
provincie fryslân

www.fryslan.frl
@provinciefrylan
@provfryslan

Organization

The Province of Fryslan is one of the twelve Dutch regional public authorities, responsible policy-making in a range of sectors, including energy, transport, economy and environment. Regarding energy in particular the Province is pursuing the transition to a low-carbon economy, with priority on the promotion of biogas, sustainable heating and cooling and the exploitation of wind and solar energy.

The regional authority works closely with the Wadden Islands Cooperation Network, an association of the five Dutch Wadden Sea Islands of Texel, Vlieland, Terschelling, Ameland and Schiermonnikoog. On average the islands have a population of 25,000 inhabitants, their local economy is mostly depended on tourism and less so on agriculture and fisheries, while a declared goal of the municipalities is for the islands to become energy and water self-sufficient.

Islands of Innovation

Innovation Policies for Sustainable European Islands
Funding: Interreg Europe
Keywords: #eployment #population #housing #innovation
www.interregeurope.eu/islandsofinnovation @islandsofinnov7

Inno-Quarter

Open Innovation Quarters for quick end-user feedback and support of new products and services
Funding: Interreg North Sea Region
Keywords: #innovation #startups #entrepreneurship #quadruplehelix #festivals
www.northsearegion.eu/inno-quarter/ @Innoquartereu @Innoquarter.eu

Delta Lady

Floating Cultures in River Deltas
Funding: Interreg Europe
Keywords: #ecosystemservices #heritage #innovation #cross-learning
www.interregeurope.eu/deltalady @interregDeltaLady

Night Light

Improving regional policies to reduce light pollution and protect and valorise dark night skies
Funding: Interreg Europe
Keywords: #LightPollution #dark_sky #ecotourism
www.interregeurope.eu/nightlight/ @nightlighteu9

Lighthouse Project

Solar Park Ameland

The island figures

Permanent population: 3500
Seasonal peak population: 600.000
Area: 1268.50 km^2
Distance from the mainland: 1hour by boat
Local authority: Municipality of Ameland
Regional authority: Region of Flysland
Main economic activities: tourism
Electrical system: Fully interconnected
RES in local energy mix: 20%

The project

Since 2015, a 10-hectare plot of land in the Ballum airport of Ameland hosts 23.000 solar panels. The solar park is the first of its size in the Netherlands, and already covers the electricity needs of the more than 1700 households on Ameland.

The Ameland Energy Cooperative, where Fyslan Province is a member, the Township of Ameland and Dutch energy supplier Eneco are partners in the project and are responsible for re-investing the returns of the solar park in in other sustainable energy projects on Ameland.

Main outcomes

1

Annual harvest of 5.9 million kilowatt hours of sustainable energy

2

Reduced reliance on fossil energy from the mainland

3

Energy self-sufficiency during off-season periods

Regional Agency for Energy and Environment of the Autonomous Region of Madeira

www.aream.pt

@aream.pt

Organization

AREAM is a private non-profit making association, recognized as a public utility, in the Autonomous Region of Madeira, Portugal. Established in 1993 and currently employing 10 staff, AREAM aims to promote energy efficiency, renewable energy resources and environmental protection, by supporting local and regional authorities, energy suppliers and end-users, as well as developing research activities, studies and projects in these areas.
In the scope of carrying out its objectives, AREAM provides support in the elaboration and implementation of the regional energy and environmental policies (2 iSEAP, 10 SEAPs and 5 on-going SECAPs) as well as, to the economic players to promote efficient technologies compatible with sustainable development.

AREAM is active in the Autonomous Region of Madeira, which includes Madeira Island and Porto Santo Island, covering an area of 801 km2, a population of 267.785 inhabitants and main economic activities being tourism and agriculture. .

EU Projects

CIVITAS DESTINATIONS

Funding: H2020

Keywords: #civitas #SustainableMobility

www.civitas.eu/destinations @Sustainable.Tourism.and.Mobility @CIVITAS_DSTNTNS

C-TRACK50

Funding: Horizon 2020

Keywords: #CarboNeutrality #ctrack50

www.c-track50.eu @CTrack50

SOCLIMPACT

Funding: Horizon 2020

Keywords: #ClimateChange @Blue_Economy #decarbonization #EUislands

www.soclimpact.org @soclimpact

ENERMAC

Funding: Interreg MAC 2014-2020

Keywords: #EnergyEfficiency #RenewableEnergy

www.proyectoenermac.com @proyectoENERMAC @proyectoENERMAC

ADAPTaRES

Funding: Interreg MAC 2014-2020

Keywords: #SaveWater #ClimateAdaptation #SmartWaterManagement

www.adaptares.com/

ARCWIND

Funding: Interreg Atlantic Area

Keywords: #offshorewind #RES #BlueGrowth #MarineTechnologies

www.arcwind.eu/ @arcwindproject @ArcwindProject

SEAFUEL

Funding: Interreg Atlantc Area

Keywords: #seafuel #hydrogen #SustainableMobility

www.seafuel.eu @SEAFUEL.EU @SEAFUEL.EU

RESOR

Funding: Interreg Europe

Keywords: #resor #CohesionPolicy #EnergyEfficiency #RES #islands

www.interregeurope.eu/resor @RESORproject

YENESIS

Youth Employment Network for Energy Sustainability in Islands

Funding: EEA Grants

Keywords: #GreenJobs #SustainableIslands #SustainableTourism #SustainableMobility #EnergyEfficiency

@YenesisProject @YenesisProject

Porto Santo - Smart Fossil Free Island

The island figures

Permanent population: 5482
Seasonal peak population: 15.000
Area: 43 km^2
Distance from the mainland: 1,5 hour by airplane
Local authority: Municipality of Porto Santo
Regional authority: Regional Government of Madeira
Main economic activities: tourism, commerce, construc-
Electrical system: Non- interconnected
RES in local energy mix: 11% Wind, 5 % PV

The project

The project aims to help the island of Porto Santo transition away from fossil fuels into 100% renewable. The long-term strategy includes interventions in electricity generation, mobility and transports, buildings and industry. AREAM developed the initial project idea and an action plan to deliver the project, in collaboration with the regional and local authorities and the Electricity Company of Madeira. The latter is now the implementing the project and to this end supported by AREAM, the regional government and the municipality:

- Installing smart meters to all electricity users in the island.
- Installing a 4 MW / 3 MWh battery to allow a higher penetration of RES.
- Running a pilot project with Renault of 20 electric vehicles used by companies, public services, taxis and families aiming to monitor the energy consumption and test smart charging and vehicle-to-grid solutions.
- Efficient street lighting with efficient luminaires and remote management.

1

Transition to renewable energy sources

2

Large scale energy storage for RES

3

Smart features in the electric grid, integrating sensors, smart metering, monitoring, energy efficiency, self-generation, storage and electric mobility

4

Electric mobility and smart charging

5

Efficient street lighting

Energy Agency for Southeast Sweden

www.energikontorsydost.se

@EnergikontorSydost

@energikontorSO

Organization

The Energy Agency for Southeast Sweden was established in 1999 and since 2007 operates under the Energy Agency for Southeast Sweden Ltd with a track record of participation in over 100 EU funded projects.

The agency is jointly owned by an association of regions, counties and municipalities from Blekinge, Kalmar and Kronoberg, 28 in total and employs 25 energy experts. The three regions have over 100 inhabited islands including the island of Öland, with 25,000 inhabitants.

The agency is a regional supporter for the CoM for Climate and Energy and is working to initiate, coordinate and implement projects aimed at improving the energy efficiency and increased supply of renewable energy in all sectors of society.

EU Projects

ActNow

Action for Energy Efficiency in Baltic cities

Funding: Baltic

Keywords: #EnergyEfficiency #PublicBuildings #PrivateBuildings #capacity

www.actnow-baltic.eu

BIOFIT

Bioenergy Retrofits for Europe's Industry

Funding: Horizon 2020

Keywords: #fossilFree #renewables #industry #h2020

www.biofit-h2020.eu

Co2mmunity

Co-producing and co-financing renewable community energy projects

Funding: Interreg Baltic Sea Region

Keywords: #energy #community_energy ##ownership

www.co2mmunity.eu

CoBIUM

CargO BIkes in Urban Mobility

Funding: Interreg South Baltic

Keywords: #cargobikes #transport #cities #mobility @urbanMobility

www.cobium.eu

EMPOWER

More Carbon Reduction by Dynamically Monitoring Energy Efficiency

Funding: Interreg Europe

Keywords: #energymonitoring #SmartCities #EnergyEfficiency

www.interregeurope.eu/empower/

ENERMAN

ENErgy MANagement schools

Funding: Erasmus +

Keywords: #education #methodology #students #energysaving #sustainableDevelopment

www.biofit-h2020.eu

ENERSELVES

Policy instruments for energy self-consumption in buildings

Funding: Interreg Europe

Keywords: #PrivateProduction #RenewableEnergy #PolicyImprovement

www.interregeurope.eu/enerselves @enerselvesproject

RESOLVE

Sustainable mobility and the transition to a low-carbon retailing economy

Funding: Interreg Europe

Keywords: #SustainableCities #EmissionDecreasing #transport

www.interregeurope.eu/resolve @ResolveEurope

READY

Resource Efficient cities implementing ADvanced smart citY solutions

Funding: 7th Framework Programe for research, technological development & demonstration

Keywords: #EnergyEfficiency #SmartCities #sustainable_solutions

www.smartcity-ready.eu

SB Well

Funding: Interreg South Baltic

Keywords: #sustainable_tourism #smart_services #RenewableEnergy

www.southbaltic.eu/sb-well

TRIS

Transition Regions towards Industrial Symbiosis

Funding: Interreg Europe

Keywords: #industrial_symbiosis #SustainableGrowth

www.interregeurope.eu/tris/ @trisproject

Small Scal CHP

Different techniques for small-scale combined heat and electricity production.

Funding: LIfe+

Keywords: #demonstration #biomass #CHP #industry_energy

Biogas - the world ’s most sustainable fuel

The island figures

Area of 1,342km^2 (518 square miles) Separated from the mainland by the Kalmar Strait and connected to it by the 6-kilometre Öland Bridge, since September 1972. Population of 26.000 in winter, but 250.000 in summer as it is a very popular tourist destination. One camping hosts 10.000 people, making the biggest “town” on the island. Two municipalities, one in the south and one in the north.

The project

Filling station of purified Biogas for vehicle use. A project of €2,5M and developed as a private-public partnership. The regional procurement for public transport in 2017 demanded 100% renewable fuel whereof the major part would be biogas.
The local bus company set up a bus filling station and the municipality provided funding to make a public filling station. Both for their own vehicles as for the public. Procurement was made in 2015 and it is now running 2 years in operation.

Main outcomes

1

Bus drivers could start from the island in the morning instead of going to the mainland = they can keep on living on the island

2

The municipality could change many of their cars to biogas cars

3

Commuters to the mainland can get biogas cars as it is 10% less expensive than fossil fuels

4

Increased sustainable service for tourist with biogas cars

5

When number of biogas vehicles increases, a local production of biogas can start

6

Excellent example of local circular environmental economy

The European Small Islands Federation

www.europeansmallislands.com

@EsinEuropeanSmallIslandsFederation

Organization

ESIN, the European Small Islands Federation, represents 11 islands federations and organisations from Åland, Croatia, Denmark, Finland, France, Greece, Ireland, Italy, Scotland and Sweden. It was founded in 2000 and is currently chaired by the Scottish Islands Federation. ESIN represents 360.000 islanders on 1.640 islands, bringing together the small, very small and tiny islands united by a definition of a small island as one which has a maximum of 5000 inhabitants, no fixed links to the mainland and less than 1000 km^2 dry area, is below the NUTS 3 coverage and in most cases has no jurisdiction of its own. The ESIN islands' economy is mostly based on agriculture and fishing, with an increasing reliance on tourism, with high seasonality issues and impact on the islands' fragile environment that this bring. 3 million people use the small islands as summer homes, and 30 millions use them as holiday resorts.

ESIN aims to act at two levels, local and European:
On a local level, ESIN aims to facilitate exchange of information, knowledge and good practice between its members, including energy savings and the transition to a fossil fuel free economy. At European level, ESIN's mission is to bring a greater awareness of the smaller islands' issues and challenges to the EU institutions and campaign for a better deal for the islands large or small.

Smart Islands through Exchange and Collaboration

Funding: LEADER

Keywords: #SmartIslands #RenewableEnergy #Innovation #ElectricVehicles #EmpoweredCitizens

www.scottish–islands-federation.co.uk

Smart islands in Scotland and Ireland: supporting Enterprise and Young People

Funding: LEADER

Keywords: #SmartIslands #YoungPeople #SocialEnterprise #EmpoweredCitizens

www.codel.scot

The Gigha Vanadium Flow Battery project

The island figures

Permanent population: 160
Distance from the mainland: 30’ by ferry
Area: 13.95 km²
Regional authority: Argyl and Bute Region
Community owned by: the Gigha Heritage Trust
Main economic activities: farming, fish farming, fishing, tourism
Electrical system: Weakly interconnected
RES in local energy mix: max 65% Wind

The project

Gigha installed one of the first community windfarms in Scotland with three original Vestas V27 turbines and a combined capacity of 675 kW, allowing profits from the wind farms to be reinvested on the island.
Weak connection to the mainland by an 11V cable meant that its renewable energy capacity was constrained, so that Gigha’s plan to generate more electricity with a fourth 330 kW turbine without applying constraints on the voltage therefore required an innovative solution.

The solution was to provide a 1,68MWH energy storage system through a Flow Battery project initiated with funding from the UK government. The modular 15kW/240kW tanks of Vanadium redox flow electrolytes housed within seven 20 foot shipping containers with an eighth housing the power control system was meant to allow for an increase of 20% in wind energy generation, enabling the community to generate income from selling wind energy to the market at times of high demand and higher price.

This project aimed to demonstrate a utility scale system in a demanding application and support the commercial scale –up and production of flow batteries. Today, off grid islands of Scotland and isolated peninsulas are looking at replicating this model for a better performance of their renewable resource.

1

Flow battery chemistry is well suited to storing energy over periods of several hours so the technology is ideal for balancing variable energy generation form renewable energy resources like wind for time-shifting.

2

Increasing grid capacity without undergoing upgrades, hence increasing use of onsite generation

3

Peak shaving by storing excess electricity produced during times of low electric demand and selling it during times of high electric demand.

4

Local participation and ownership

5

Providing a means for voltage control and frequency control for better power quality

6

Purpose designed and built battery can harness the full potential of renewable power

7

Vanadium flow batteries have a longer operational lifetime than other types of battery technology, in the region of 20-30 years and relatively straightforward to maintain.

Community Energy Scotland

www.communityenergyscotland.org.uk
@communityenergyscotland

Organization

Community Energy Scotland (CES) is a membership based Scottish Charity (non-profit NGO) whose aim is to increase confidence, wealth and resilience at a community level through sustainable energy development. CES has 19 staff and around 400 community members for whom CES provides support at both policy level and on practical project delivery basis, leading on projects ranging from micro to MW scales.
In total CES has supported the development of over 45MW of community owned generation capacity, through more than 600 individual projects.
CES has gained specific expertise in integrated local energy systems by developing over 20 energy systems projects to date, including energy storage and demand side management, as well as local finance business models and local energy supply.

CES has close working relationships with the Scottish Government and the Scottish enterprise agencies, as well as with Ofgem, the UK energy regulator, and the UK Department for Energy and Climate Change. Apart from FEDARENE, at an EU level, CES participates in the Rurener network, the RESCoop network and the European Small Islands Network (ESIN).

SMILE

SMart IsLand Energy systems
Funding: Horizon 2020
Keywords: #SmartIslands #EnergySystems #smartgrids #storage #demand-response #DistributionNetwork #E-mobility #RES

www.h2020.eu @h2020smileproject @H2020SMILE @h2020smileproject

BIG HIT

Funding: Horizon 2020
Keywords: #Hydrogen #EnergySystems #Fuelcell #storage #demand-response #DistributionNetwork #E-mobility #RES

www.bighit.eu

Lighthouse Project

SMILE (SMart IsLand Energy systems)

The island figures

Permanent population: 20.000
Area: 990km^2
Distance from the mainland: 1hour by boat
Local authority: Orkney Islands Council
Regional authority: Scotland
Main economic activities: tourism, agriculture, energy,
Electrical system: Weakly interconnected
RES in local energy mix: 120% of electricity (25% total) from wind

The project

The €14 million, four-year SMILE project sees Orkney, and fellow island communities of Samsø in Denmark and Portuguese Madeira, collaborate with technical, grid and academic partners across Europe. Across the sites, nine technological solutions will be applied where most appropriate, including:

- integration of battery technology
- power to heat
- power to fuel
- pumped hydro
- smart charging of electric vehicles
- electrical supply and powering of boats

In Orkney, SMILE particularly focuses on making local demand more efficient and smarter to deliver affordable heat to domestic households, help reduce curtailment of local community renewable generation and utilise community hydrogen assets. Local partners are installing established heating and energy storage technologies that are linked up in a 'grid-smart' manner, including:

- heat pumps
- phase-change thermal batteries
- electric batteries
- hydrogen electrolysis
- hot water stores
- smart EV chargers

Main outcomes

1

Integration of flexible demand from >40 household to increase electrical demand at times of high RES production

2

integrating the operation of the heat, transport and hydrogen

3

Setting standards for domestic and commercial DSM

4

Implementing commercial arrangements between RES owners, DSM asset owners and aggregators

5

Installation of renewable and electrical heating systems and >20 EV charging points

6

Installation of a Hydrogen electrolyser control system

FEDARENE