meetMED

Mitigation Enabling Energy Transition in the MEDiterranean region

Together We Switch to Clean Energy

SUSTAINABLE ENERGY SOLUTIONS FOR ISLANDS AND REMOTE AREAS:

Front-Runners for the Energy Transition in the Euro-Mediterranean Region

7th Medener International Conference on the Energy Transition in the Mediterranean Region

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The meetMED project is a two-year project funded by the EU and jointly carried out by the Mediterranean Association of the National Agencies for Energy Management (MEDENER) and by the Regional Centre for Renewable Energy and Energy Efficiency (RCREEE). Its main goal is to reinforce regional cooperation aimed at fostering the energy transition in Algeria, Egypt, Jordan, Lebanon, Libya, Morocco, Palestine and Tunisia under the umbrella of the UfM REEE platform.

The meetMED team in Brussels coordinates the project partners and experts in implementing the project activities, in the following areas of work: assessing EE and RES strategies and policies; advancing vocational training and public awareness; attracting sustainable RE and EE investments; supporting the UfM Renewable Energy and Energy Efficiency Platform.

The meetMED activities target and benefit a wide range of stakeholders, including policy makers, public authorities, investors and financial institutions as well as local communities and final customers. meetMED supports regional cooperation by building the technical capacity and raising the public awareness necessary to implement RE and EE projects and solutions, while creating synergies with other initiatives targeting energy transition in the Mediterranean region.

MEDENER is an international non-profit organization gathering agencies from the northern and southern Mediterranean countries in charge of implementing public policies on energy efficiency and the promotion of renewable energy sources, by implementing regional projects facilitating the sharing of know-how and best practices among its members and international partners, as well as accelerating the transfer of skills, methods and technologies in the field of energy efficiency and renewable energy.

RCREEE is an intergovernmental organization aiming at enabling the adoption of renewable energy and energy efficiency practices in the Arab region. RCREEE brings together regional governments and global organizations to initiate and lead clean energy policy dialogues, strategies, technologies and capacity development in order to increase Arab states' share of tomorrow's energy. Its key work areas are capacity development and learning, policies and regulations, research and statistics, and technical assistance.

Acknowledgements

This report on the 7th MEDENER conference is a valuable contribution to the dialogue on renewable energy sources and energy efficiency in the Mediterranean region.

By taking a closer look to the experience of islands and remote areas as frontrunners for the energy transition, experts from the national energy agencies CRES (Greece), ANME (Tunisia), ENEA (Italy), IDAE (Spain), ADEME (France) and from the national Energy Water Agency of Malta, the DAFNI Network of Sustainable Greek Islands, the Azorean Directorate for Energy and from the Lebanese Ministry of Energy and Water examined national case studies that promote energy efficiency and the integration of renewable energy sources. Experts from Clean Energy for EU Islands, REN21, Greening the Islands, CLIMA-Med, the Aragon Hydrogen Foundation, the Alliance for Rural Electrification enriched the discussion by sharing their experiences on development cooperation for the energy transition in islands.

The preparation of the Conference was coordinated by the meetMED project with the invaluable support of the MEDENER President and Secretary General. The CRES and the Municipality of Rhodes ensured a charming venue and the warmest welcome to the participants in the islands of Rhodes.

The drafting of this report is indebted to the kind availability of all the speakers and of the experts from the Greek energy agency CRES.

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Executive Summary

The 7th MEDENER International Conference on Energy Transition in the Euro-Mediterranean Region was held on 26 September 2019, at the Museum of Modern Greek Art-New Wing of the Nestoridion Melathron in Rhodes, Greece. This year the Conference focused on the 'Sustainable Energy Solutions for Islands and Remote Areas: Frontrunners for the Energy Transition in the Euro-Mediterranean Region'.

The event was organized by MEDENER in cooperation with the Greek Centre for Renewable Energy Sources and Saving (CRES) as part of the activities of the meetMED project, funded by the European Union and jointly implemented by MEDENER and RCREEE.

The Conference highlighted the additional challenges islands have to face when it comes to the energy transition due to the peculiarities of insularity and identified the similarities with some remote areas.

Islands in the Mediterranean region are considered frontrunners in the energy transition and showcase innovative solutions in response to the constraints of lacking infrastructure for the energy, water, communication and transport networks. They also share common challenges with remote areas in the Southern and Eastern Mediterranean countries: Among others, fossil fuel dependency, insufficient transportation networks, inefficient water and waste management.

During the Conference, urgency to tackle the challenges related to energy transition, to improve resilience to climate change and to implement circular economy solutions emerged. At the same time, it was noted that both systems could immediately benefit from technological innovation, including the maximization of RES penetration, energy storage and smart grids, energy efficiency, demand side management, low-carbon transportation, integrated water and waste systems.

For all the aforementioned reasons, the 7th MEDENER International Conference focused also on the latest solutions for energy efficiency, renewable energy production, energy storage facilities, demand response systems, low carbon

transport and sustainable water and waste treatment. It also emphasized the role of circular economy investments that boost economic self-sufficiency and inclusive growth in isolated territories and in the Mediterranean region.

The Conference was opened by representatives of CRES and MEDENER. The first session focused on the 'institutional' aspects, with speeches from representatives from the DG Energy (EU Commission), the RCREEE and the Clean Energy for EU Islands.

Keynote speeches were delivered by the Chair of REN21, the GTI Observatory Coordinator of Greening the Islands and the CEO of the Energy Water Agency of Malta. This session focused on the innovative solutions for energy transition, including energy production and storage, mini- and off-grids, energy efficient buildings and industries, digitalisation and demand side management, low-carbon transportation and integrated water and waste systems.

The first technical session involved case studies from the islands. Representatives from ANME, ENEA, ALMEE, CRES, IDAE, DAFNI Network and the Azorean Directorate for Energy elaborated respectively on innovative solutions for energy transition in the Tunisian island of Djerba, on the energy transition agenda in the Italian small island of Salina, on the energy transition and circular economy technologies in the virtual island of Heliosthana 2030, on the challenge of the energy transition for the Greek islands, on the role of Islands in the Spanish Energy Strategy, on the smart islands Initiative and more specifically on the case of Kythnos Smart Island and on the goals, challenges and needs for energy in the Azores.

The second technical session focused on technology solutions for power generation, storage, mini- and off-grid and included presentations from representatives of CLIMA-MED, the Aragon Hydrogen Foundation and the Alliance for Rural Electrification, who discussed respectively energy security and climate adaptation in islands focusing on the CLIMAMED experience, the Big Hit Project experience in building innovative green hydrogen systems in isolated Territories and the key industry and technology trends to foster the integration of remote communities.

The closing remarks of the Conference were made by representative of CRES and MEDENER and are available in Annex 1.

1. Opening Remarks

Dario Chello
Former President, MEDENER

Dr Chello welcomed the participants. He stressed that nowadays multilateralism is struggling whilst populism and souverainism seem to prevail. This new trend affects tremendously all modern cross-cutting challenges, being climate change the most relevant of them. Nonetheless, everyone is convinced to be able to solve climate and migration problems alone. Whatever attempt to help solving a national problem is, thus, identified as post-colonial actions - quoting the Brazilian President speaking about the possible solutions to the so-called “Amazon crisis”.

Customs laws protecting internal markets lead to bad reciprocity, meaning that foreign States might decide to apply equivalent laws against who initially implemented them, thus causing further isolationism. Going back in time by ignoring the achievements of the modern times remains a simple, useless attempt to oppose the positive effects of the economic, cultural and social globalisation, which cannot be stopped but by violent means.

Oil companies act in the same contradicting way. Indeed, if it is true that their CEOs certainly reaffirm their willingness to fight climate change through adaptation measures, every day they also announce new investments in the upstream, particularly since in some parts of the world unconventional and cheap hydrocarbons are still easy to exploit. Therefore, they minimise energy efficient policies and measures by reducing them to final users’ simple ethical choices.At the same time, hydrocarbons will soon be over and that is a fact no one can deny. It would be therefore cautious and sensible to prepare the humankind to that inevitable event.

MEDENER and the meetMED Project strongly believe the role RE and EE play is huge. Indeed, technologies and innovative products for sustainable energy are available in the market and apt to move from the current situation to a new scenario, where oil will play a marginal role in supplying the Euro-Mediterranean Region.

Many of these innovative solutions have been tested in the Mediterranean islands, which are the best laboratory to assess not only their affordability but

also their replicability in areas that share the same peculiarities, such as the remote - often desertic - areas of many countries in the Mediterranean Region.

7th MEDENER Conference represents another step forward towards our common goal to achieve the energy transition in the Mediterranean Region before 2040. For this reason, he wished a fruitful continuation of the meetMED activities in the years to come in order to fulfil higher and higher clean energy objectives, which will make our objectives of today, tomorrow's reality.

Vassilis Kilias
CRES Representative

Mr. Kilias stressed that the situation in places with autonomous systems like islands or isolated systems require particular focus, since many of them rely on diesel generation for electricity supply. He indicated though that the evolution of technology provides the potential for reducing these costs, while innovation has led to energy efficiency measures in buildings and industry. Alongside with the evolution of technology, he pointed out the rise of new business concepts and innovation in financing that may support clean energy solutions, thus creating new economic opportunities and local jobs as well as supporting a clean environment. In the case of communities' involvement in these new business models, Mr. Kilias emphasized that 'the active community engagement in the processes of planning, implementation, ownership and operation of clean energy solutions, will increase the access to energy commodities and cope with energy poverty'.

According to Mr. Kilias, islands and isolated places could become frontrunners of the energy transition, by integrating local renewable production into their energy systems, installing storage technologies, elaborating demand response solutions, promoting clean transport and energy savings solutions. Therefore, not only a new energy paradigm would be established, and additional jobs and economic growth generated but also the protection of the environment and climate change mitigation would be enhanced while reducing household bills and improving their quality of life.

Islands and isolated places have the potential to be leaders in demonstrating new technologies and innovative solutions to achieving clean energy transition, concluding that "our vision is to convert the disadvantage of geographical isolation into an advantage for innovation".

2. Overview of the Challenges

Leonidas Kioussis
Senior Expert, DG ENERGY, EU Commission

According to Mr. Kioussis, the experience of dealing with energy transition in remote areas and insular territories can be a significant contributing factor for accelerating the overall process of energy transition. This Conference on energy transition comes "at a time of major changes, for the European Union in general and for the European energy policy in particular". The newly elected President of the Commission Mrs Ursula von der Leyen, in her political guidelines, has put forward a vision for a climate neutral Europe by 2050, a vision that is to be achieved inter alia, through a "European Green Deal" aiming to make Europe the first climate-neutral continent by 2050, with energy considered to be central to the European Green Deal, since it represents the 75% of the Union's greenhouse gas emissions.

This political engagement of the EU President comes at a moment when the UN recognises the issue of climate change as "the defining issue of our time". The policy proposals of the new Commission continue the legislative and regulatory initiatives undertaken by the previous one, namely the Clean Energy for All European Citizens package or the Long Term Strategy, known also as the "Clean Planet for all" strategy, which lie as a basis for the European Green Deal.

In this context, one of the most relevant initiatives was the Clean Energy for EU Islands Initiative established in May 2017, that recognized that planning the clean energy transition on islands (or in general on isolated or remote areas that are cut off from the main energy system of a country) brings specific advantages. The Clean Energy for EU islands initiative aims to promote energy self-reliance of islands by helping them to tap into local renewable sources, encourage the reduction of the dependency on costly and polluting fossil fuel imports, easing the strain on public budgets as well as deliver best available technologies to islands and using best practice in financial and regulatory instruments.

Given the foreseen increase of final energy and electricity consumption in Southern Mediterranean countries, the implementation of energy efficien-

cy measures and the deployment of renewable energy would be further favoured. Accelerating the energy transition in the Mediterranean would help control the energy demand, promote renewable resources and finally optimize the use of fossil resources. Although in many South Med countries there has been a significant increase in renewables deployment, this has been "eaten up" by high demand growth.

As stated by Mr. Kioussis, South Med countries face some similar and some different problems compared to EU member states due to significant weakness of law enforcement, lack of awareness, inadequate clean energy incentives, limited bank involvement and reluctant utilities. In order to underpin the energy transition, countries need energy transition laws with long-term goals for renewables and energy efficiency, energy subsidy reforms, an enabling framework to mobilise private finance, independent energy regulators, law reinforcement and a more regionally integrated market.

Events like this Conference should build on the experience of the Clean energy for EU islands Initiative to better target the assistance to any isolated and closed community and inspire action. The initiative has been supported by establishing a Secretariat that will provide to more than 50 islands with different levels of support until June 2020, particularly technical assistance to prepare decarbonisation and energy transition plans. This Secretariat is also establishing a Transition Hub network in the EU in order to enable the sharing of the best practices between islands. According to Mr. Kioussis, although there are many ways in which the islands differ – i.e. size, geographic location, the renewable energy potential linked to it - the key issues are shared among them and relate, for instance, to the connectivity to the mainland grid and the current energy supply. The European Commission is working to develop instruments to cater to different conditions and situations of the islands' communities in the EU.

Mr. Kioussis concluded that combining the islands' engagement and resolve with the public sector support and the help coming from the EU in the form of technical assistance and funding, will be key to successfully meet the challenge of decarbonizing islands. As Mr. Kioussis stressed, the EU can really help by playing a coordinating role but also, very concretely, by ensuring that EU funds cater to small, distributed generation projects and not only to "big, easy targets, such as a 100MW wind project".

Antonia Proka
Energy Expert, Clean Energy for EU Islands

The Clean Energy for EU Islands Initiative has been presented by Ms. Proka. After illustrating the peculiarities of islands and the challenges posed by their characteristics, Ms. Proka explained the main challenges are linked to the lack of capacity and experience in the following areas: the development and monitoring of decarbonisation plans, the establishment of energy communities and the mobilising of local stakeholders, the development of financing and investment plans, the introduction of options for sustainable mobility on and to/from the island, the launch of energy saving measures and inspiring rational energy use.

As described by Ms. Proka, the Clean Energy Secretariat constitutes a European initiative supporting and facilitating the clean energy transition of EU islands with a bottom up approach. By providing technical support and setting up capacity building initiatives, the Secretariat aims to the strengthen the collaboration among stakeholders on islands, between islands and technology providers, academia, civil society organizations and public institutions, as well as among decision-makers.

The Secretariat aims to play an important role with respect to the decarbonisation of the EU islands. The transition towards clean energy sources involves much more than a technological shift, thus the aim should be to 'co-create' not merely participate, to empower and involve actors from different societal sectors and backgrounds while ensuring time-investment and commitment.

The Clean Energy Secretariat reinforces the movement working towards the clean energy transition via technical support, capacity building and EU-wide community building. The Secretariat's technical support includes the development of a Clean Energy Transition Agenda, technical feasibility assessments of a community's existing plans, technical or project assistance on individual projects, assistance for developing a financing plan and helpdesk support. Twenty-six islands have already launched clean energy transition processes thanks to the EU Islands Secretariat support.

More analytically, the aforementioned technical support comprises ongoing support on the development of Clean Energy Transition Agendas, including the publication of a guidebook and on-going project-specific support. The capacity-building activities are mainly thematic workshops for island communities on financing, community engagement and technology, advising via the helpdesk and best practice guide, and sharing a list of publication via the Secretariat's website. Finally, community engagement activities include networking events, an online engagement platform, the organization of forums and technical fairs, the development of online community engagement tools and the distribution of the Island pledge.

In conclusion, the Secretariat supports a joint push for the decarbonisation of the EU islands, which can be achieved only by strengthening collaboration among the stakeholders on the island, between Islands and Technology providers, Academia, Civil society organisations and public institutions as well as among decision-makers, both at local and EU level. The transition towards clean energy sources involves much more than a technological shift: it is necessary to co-create, empower and involve actors from different societal sectors and backgrounds as well as ensure time investment and commitment.

3. Keynote Speeches

Innovation for Sustainable Energy in Islands and Remote Areas

Arthouros Zervos
Chair, REN21

Status of Sustainable Solutions for Islands

Prof. Zervos started his intervention by presenting REN21, a policy network to build a sustainable energy future with renewables. Then, he gave some very interesting statistical data concerning the annual additions of renewable power capacity in 2018, as well as the energy needs distribution: 181 GW renewable energy generation capacity were installed worldwide, slightly above 2017 additions, and total installed capacity grew more than 8%; heating and cooling accounted for around 51% of final energy use, transport for 32%, and final electricity demand (excluding the purposes of heating, cooling or transport) for around 17%.

Prof. Zervos continued by analysing the sustainable energy trends in islands and remote areas emphasizing on the fact that hybridization helps capturing the full potential of local renewables. In parallel, there are some technologies and trends that support RES installations: for instance, “islanded” micro grids enable costs reduction, enhanced stability, and resiliency. Some best practice examples were presented in detail, such as El Hierro island (Canary) in Spain that has 5 wind turbines, 2 water deposits, 4 hydraulic turbines, and 1 pumping station. The storage station is supplied with water pumps running on wind power. Also, in Greece, the Tilos island project has an 800 kW wind turbine, 160 kW PV panels, 2.8 Mwh battery packs, 20 kW inverters. Furthermore, variable renewables provide an opportunity for sector coupling. For instance, in Scotland, Orkney islands have self-sufficient community-owned wind turbines electrifying a village. Surplus of generated power is used by islanders to charge electric vehicles at no cost. The Island’s wind, wave and

tide generators are expected to produce hydrogen for fuelling ferries (Power-to-X). In addition, it is necessary to build an energy community by rising public awareness and building social acceptance.

Electricity from variable wind energy and solar PV achieved high penetration levels in several countries in 2018. Variable renewables met high shares of generation in Denmark (51%), Uruguay (36%), Ireland (29%), Germany (26%) and Portugal (24%). Overall at least nine countries produced more than 20% of their electricity from variable renewables in 2018.

Global pumped storage capacity reached some 160 gigawatts (GW) in 2018, with 1.9 GW of new capacity added over the course of the year, down from the more than 3 GW commissioned the previous year, while global battery storage capacity totalled just over 3 GW in early 2019. This includes primarily large, grid-connected (utility scale) installations but excludes most smaller, behind-the-meter installations. Utility-scale batteries are being built to indirectly enable higher VRE shares by broadly supporting greater grid flexibility and resilience.

Regarding the off-grid electricity access, 2018 set another record for energy access investment, with an estimated USD 512 million in corporate-level investment flowing into off-grid electricity access companies – a 22% increase from 2017. Off-grid solar systems, backed by the Pay-As-You-Go (PAYG) model, continued to attract most of the investments as they became established as the most cost-effective and fastest option to provide electricity access to rural and remote populations. It amounted to USD 339 million in 2018, a 6% increase compared to 2017. Africa (particularly East Africa) remained the main recipient of capital inflows for off-grid solar systems. Mini-grids also are gaining momentum to become the much-anticipated game changer in the sector as the appropriate enabling ecosystem is established with regard to technology, regulations, financing and business models. The sector attracted USD 289 million from 2010 to 2018, or 17% of the total corporate-level investment.

Concerning the electric passenger vehicle stock, global stock of passenger EVs (electric cars) reached over 5.1 million units in 2018 – a 63% increase from 2017. Around 2 million new electric cars were sold during 2018, a sales increase of 68% from the previous year. Nonetheless, electric cars still represented a small share of all passenger vehicles, at just over 2.1% by year's end. These markets also remain highly concentrated: as of late 2018, 40% of all EVs in use were clustered in just 20 cities that together account for 3% of the

global population. China had nearly 50% of the global EV stock by the end of 2018, followed by the United States at 22%. Sales of new EVs reached nearly 1.3 million units in China, including just over 1 million passenger EVs, sales of which increased more than 80% year-on-year. Norway remained the leader in the total market share of new electric cars, and around half of new cars registered in the country in 2018 were either battery electric vehicles (BEVs) (30%) or plug-in hybrid electric vehicles (PHEVs) (20%). The next-largest markets were Iceland at 19%, Sweden at 8% and the Netherlands at 7%.

Prof. Zervos concluded that solar PV and Wind are the cheapest in islands, and perfectly suited for hybridization with other renewables. Integrated policies must enforce energy efficiency measures and the uptake of renewable energy. In parallel, social acceptance must be built, and local jobs must be supported.

Carlo Maria Drago
GTI Observatory Coordinator, Greening the Islands

Islands as a Laboratory of Innovation

Mr. Drago presented the Greening the Islands Initiative, which is an innovative organization that supports self-sufficiency and sustainability of islands worldwide, by also matching the needs and solutions enabling cooperation between local authorities, business, citizens and academia. The GTI Observatory in particular, constitutes a global initiative that aggregates key stakeholders to match island needs and innovative solutions in energy, water, mobility and environmental sectors facilitating the development of shared strategies between governments and corporates. The GTI Observatory Context is framed by the results of COP 21, the Clean Energy for EU Islands initiative, the political declaration of Malta in 2017 and the approach of several global institutions, such as UN and IRENA. Its main activities are the selection of islands, plenary and island meetings with members and the elaboration of reports on a wide range of including the environmental status of the islands, policies and regulations, incentive schemes, permitting, technologies and solutions, cost, public/private funds, recommendations for decarbonisation plans, best practices, sustainable tourism opportunities.

The Observatory collected data on the aforementioned topics, then organised a two-day meeting in each island of the Observatory, hosted by the Islands' Governments and involving all key local stakeholders, corporate and

industry associations members. Such meetings were held in Crete/Greece, Helgoland/Germany and in Favignana/Italy, with the aim to run a deep dive into islands status and needs, facilitate the origination of projects also through site visits. In each case, an analysis on the current priorities related to energy and mobility was elaborated.

In parallel, the Conference of Peripheral Maritime Regions (CPMR) and its Islands Commission (IC) have announced a crucial new collaboration with Greening the Islands that will boost co-operation between businesses and island governments to enhance the sustainability of European islands. Additionally, CPMR Islands Commission and Greening the Islands, held a meeting in Brussels, with the support of the Committee of the Regions to propose closer collaboration as a key step towards promoting low-carbon solutions for European islands.

The islands benefit from their participation in the Observatory thanks to the analysis on the status of the island for the areas involved in the study by specialized professionals, the identification of innovative solutions, the recommendations of actions for the local population and enterprises, the benchmarking with the other selected islands, finance opportunities and the promotion of the island as a green destination for a tourism oriented to sustainability.

At a more global level, the Greening the Islands Observatory Global Index constitutes a new way to measure environmental actions on islands around the world. The index will be produced as part of the GTI Observatory's work to measure the progress that islands around the world are making towards a greener future and how islands are designing and implementing policies for sustainable development. Governments/Municipalities of any island that have made or started actions to reduce CO_2 emissions in their territories can apply to the Greening the Islands Observatory Global Index. The topics include the environment, culture, traditions and local economy.

Since 2014, Greening the Islands has organized nine international and national conferences promoting the enlarged concept of circular island economies, developing the nexus between energy, water and mobility and embracing also waste, agriculture, tourism, culture and traditions; while, since 2015, the Greening the Islands Awards have given due recognition to the best solutions on energy, water and mobility, awarded according to the votes received by prestigious jury members but also by community members.

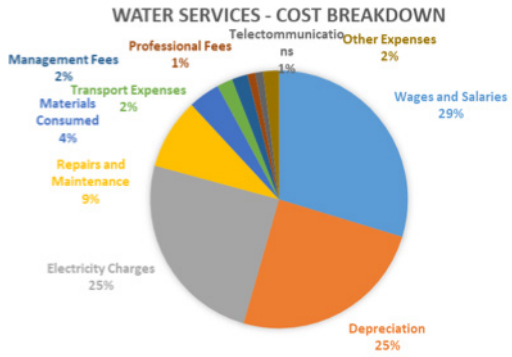
Manuel Sapiano
CEO, Energy and Water Agency, Malta

Integrated Management of Energy and Water Resources

Mr. Sapiano's presentation introduced the concept of scarcity of natural resources: namely, he made reference to freshwater and to the fact that natural water resources (if used sustainably) in Malta are not sufficient to meet national demand. As a result, the production of alternative (non-conventional) water resources is a necessity.

Within a context of water production and distribution and wastewater collection and treatment, the energy requirements for the delivery of water services is an important factor for the national energy demand. Production of water is by far the main user of energy, in particular due to the use of sea-water desalination plants, which account for around 60% of the total production of potable water.

Since energy costs are therefore one of the important cost items in the accounts of the water services provider, energy efficiency becomes an important consideration in all aspects of water services provision, in particular, when looking at the financial sustainability of water utilities.



Regarding sea-water desalination, the biggest challenge in operating desalination plants according to Mr. Sapiano is to control the energy used in converting seawater into fresh potable water. Regarding groundwater, the specific energy required to produce 1m^3 of water from groundwater sources has remained relatively stable over the years at a level of around 0.8 kWh/m^3 with limited margins for improvement given that primarily energy use depends on pump-efficiency and groundwater depth.

According to Mr. Sapiano, the distribution network management presents an opportunity for the application of energy efficient measures. Water Demand

Management (water efficiency) also leads to energy savings (energy efficiency) as it results in lower volumes of water moving in the urban water cycle. At the national/regional level, distribution network leakage identification and control are the most effective measures to optimize the effective use of water.

In parallel, Demand Management Measures are also acknowledged to be important for the user while efficiency measures addressing water consumption (aerators, water efficient showers and appliances etc) also result in energy efficiency due to a lower use of heated water.

Mr. Sapiano concluded that energy efficiency can be applied at various operational levels (water production, water distribution, wastewater collection, wastewater treatment) and plays an important role in the future planning of water utilities, in particular to ensure their financial sustainability and lower their environmental impact.

4. **Session 1:** Case Studies from the Islands

Hassen El-Agrebi
Head of International Cooperation, ANME

Innovative Solutions for Energy Transition in the Tunisian Island of Djerba

Mr. El- Agrebi presented the Tunisian energy transition strategy and the main tools for its implementation. These are important elements concerning the security of energy supply, especially for the electricity sector while also constituting important economic issues.

The Tunisian energy transition strategy has three main objectives, namely: the production of 30% of electricity from renewable energies by 2030, which is also the objective set in the Tunisian Solar Plan; the 30% reduction of the primary energy demand compared to the Business as Usual Scenario by 2030, mainly through all the Energy Efficiency programs that will be realized in the framework of the Energy Transition Fund, created in 2005; and, the reduction of 41% in carbon intensity by 2030 compared to 2010 base year and the installation of 2.5 million SWH by 2030. Mr. El-Agrebi emphasized the need for a favorable framework and tools to achieve these objectives, namely:

- an institutional framework: the ANME is responsible for the implementation of the state policy in the field of the Energy conservation (RE and EE), so Tunisia is the first country in the MENA region and in the African continent operating in this area, which is currently in charge of planning and monitoring of the ongoing accelerating plan;
- a fiscal framework: through the exemption from VAT of certain components of RE and EE;
- an incentive framework: through the Energy Transition Fund, whose allocations and areas of intervention have increased, including subsidies and premiums, credit investment funds and equity participation and funds guarantee.

Another very important tool, among others, is the Helpdesk that will assist the private sector to invest in the field of Renewable Energies.

Mr. El-Agrebi mentioned several programs under development in the aforementioned framework as well as the announced new target of 2200MW. There are about 60 Tu nisian islands and islets, and in some of them (Kerkennah island,etc) energy potential studies are underway. Especially in the case of Djerba, the socio-economic, environmental and energy challenges and the main energy consumption features (hotels, residential sector, water desalination) suggest that making Djerba a green island has now become urgent. The actions undertaken so far are not enough and mainly concern solar thermal and energy efficiency measures. An action currently underway is making make Djerba a pilot island with total LED lighting (for both municipalities and hotels), as part of a project with the GEF.

Mr. El-Agrebi, then, suggested some ideas and programs related to innovative energy transition solutions to make Djerba a 100% green island. These include exploiting the technologies of floating solar PV to supply the island with power and tidal installation. Likewise, he mentioned the Zarzis-Djerba eco-solar village project, which aims to implement renewable energies for sustainable development through the creation of a competitiveness cluster in the region around a technopole dedicated to renewable energies, energy efficiency and biological agriculture.

Mr. El-Agrebi concluded urging to act immediately to save islands, and providing some suggestions for ‘ green islands in Tunisia’, such as a feasibility study, sharing experiences with the Northern shores of the Mediterraneant (Greece, Italy) for the development of twining programs, developing a sustainable action plan or implementing a pilot project to make Djerba a green island.

Roberta Boniotti
Advisor on European Affairs, ENEA
and MEDENER Secretary General

Energy Transition Agenda in the Italian Small Island of Salina

As Ms. Boniotti stressed, in May 2017 the European Commission, together with 14 Member States, signed the “Political Declaration on Clean Energy for EU Islands” under the Maltese Presidency. This Declaration was born out of the recognition

that islands and island regions face a particular set of energy challenges and opportunities due to their specific geographic and climatic conditions. The opportunities have the potential to make Europe's island communities innovation leaders in the clean energy transition for Europe and beyond. In cooperation with the European Parliament, the Commission in 2018 set up a Secretariat to deliver the objectives of the Clean Energy for EU Islands Initiative. The Secretariat acts as a platform of exchange of best practice for islands' stakeholders and provides dedicated capacity building and advisory services. Within this framework, six (6) pilot islands and twenty (20) more islands were chosen.

The Clean Energy Transition Agenda is a strategic roadmap for the transition process towards clean energy and provides a vision of the island shared by the members of the island community. Preparing the Clean Energy Transition Agenda entails gathering the Transition Team (local authorities, representatives from community organisations, local businesses and schools/universities), mapping the island dynamics, developing the island transition paths, monitoring the processes and disseminating the results.

Salina was selected as 2019 Pilot Island by the Secretariat of the Clean Energy for EU Islands Initiative. The objective of the elaboration of a Clean Energy Transition Agenda for 2030 was the more than 40% reduction of CO_2 emissions in the atmosphere.

The implementation of the aforementioned methodology in the island of Salina ends with an analysis of the barriers and the opportunities that arise. Some of the barriers mentioned include the variation of the number of inhabitants, the significant seasonal variation in the demand for electric power, the distribution of electricity through medium and low voltage networks of limited extension, inertia and resilience, the high cost of fuel that needs to be shipped by boat in the absence of a distribution network, including gas for cooking uses and for heating houses, the very limited water resources and little use of rainwater accumulation. Additional barriers refer to more technical issues related to the exploitation of photovoltaic and wind energy, like the need to foresee significant accumulations of energy, the stability of the electricity grid, the seasonal energy shift, other than authorization issues regarding the visual and landscape impacts. The problems are mitigated today, following the entry into force of the Italian DPR No. 31/2017, which identifies the interventions excluded from the landscape authorization and those subjected to simplified authorization procedure.

On the other hand, the opportunities that have emerged refer to the high solar irradiation levels, the low theoretical availability of biomass for maintenance of public and private green areas and agricultural pruning. According to Ms. Boniotti, an adequate forest management plan could bring the total amount of biomass available to 800 ÷ 900 t per year, together with the presence of wind energy, in particular offshore, the availability of marine energy and the presence, in the Aeolian archipelago of significant geothermal resources. The complete picture regarding the opportunities include also the significant targets for the exploitation of renewable sources indicated recently (2017) by national regulations:

- in 2020, Salina is required to install 580 kW of electricity by RES and 570 m^2 of solar collectors for hot water production,
- the publication of the regulation to grant incentives for the construction of renewable energy plants in the small Italian islands in August 2019,
- the presence of strong indications and commitments for the energy transition of the smaller islands in the new Environmental Energy Plan of the Regione Siciliana (PEARS), which is under approval.

Ms. Boniotti illustrated the Salina Transition Path, which includes the governance organization, the implementation of the island's energy consumption monitoring systems, the conclusion of energy efficiency work on the main public buildings on the island and on the large-scale application of RES (photovoltaic, wind power, wave, biomass) by 2020, the partial transfer of power generation plants to biofuels, the implementation of full electric or hybrid local public transport, the achievement of RES objectives fixed by the Decree 14/02/2017, the achievement of 25 % penetration of RES into the electrical energy mix and the implementation of smart island systems by 2025. The Roadmap includes provisions for the achievement of 50 % penetration of RES into the electrical energy mix and 50 % of public and private electric or hybrid mobility by 2030. As the energy system in 2018 entailed 98.5% of fossil fuels and 1.5 % of RES, the target for 2030 corresponds to 50% of fossil fuels and RES, while the target for 2050 corresponds to 100% of RES in the energy mix.

Ms. Boniotti concluded by stressing the need to involve all the stakeholders, from the legislative to the technical ones, at the European, national, regional and local level by creating a permanent Governance system. Furthermore, the full engagement of the whole community will be necessary in order to

build a shared vision among the members of the community, that will take into account the morphological peculiarities of the island. Monitoring and self-assessment as well as relevant RES technical choices tailored on the island's peculiarities will also be necessary to move forward and make energy efficiency triumph on islands.

Adel Mourtada

Energy and climate-change expert, ALMEE

Energy Transition and Circular Economy Technologies in the Virtual Island of Heliosthana 2030

Mr. Mourtada started his presentation emphasizing the non-viability of the linear model of waste treatment, due to the high increase of the population. More specifically, he highlights that with 9 billion people by 2030, challenges of meeting demand for goods and services is unparalleled, while global solid waste volumes are projected to increase from 1.3 to 2.2 billion tons by 2025. Due to the aforementioned reasons, he suggested the need to move from a linear economy to a circular economy. In this framework, he presented the implementation of circular economy to the virtual country Heliosthana, a 'front-runner in terms of sustainable energy, intelligence-based digital solutions, carbon-neutral circular economy, low-emission solutions and zero waste reforms since 2014 and up to today, in 2031'. The projection of its characteristics involve 19 million of inhabitants, with the vast majority concentrated in two cities, with an awaited income level in between Turkey and Morocco, with the main economic activities before 2010 being fisheries, agriculture, craft, manufacturing industry and in 2031 renewable energy technologies, renewable electricity, IT (reliable, clean and cheap electricity), biodiesel from microalgae, circular economy road map, sustainable buildings and transport.

Heliosthana is presented as the second country in the world (after Finland) to prepare a national road map to a circular economy in 2017, a country that foresaw a national renewable energy plan increased uptake of renewable energy to 42% of the mix and 100% RE Electricity in 2030, developed a 'Grid Code' in 2014, which will be reviewed in 2022 and published several guides like "infographics regarding the life cycle of materials". The policy context of circular economy at Heliosthana, comprises of Heliosthana's 2030 Strategy for smart and sustainable development and a second Sustainable Development Action Programme (2021-2025). According to Mr. Mourtada, a supporting framework

involves design and innovation on large scale RE projects, skills development, a digital platform Market for the reuse of the materials; but also a coherent clean product policy, eco-design, biogas, biodiesel from microalgae, RE water desalination, RE electricity storage in Electric Vehicles, the enablement of investments, a broad stakeholder cooperation, addressing waste as a resource (which presumes long term growth, better risk management, brand equity and reputation), and the setting of a resource efficiency target.

Mr. Mourtada stressed that 'Europe is currently in the midst of two transitions: the creation of a more circular economy and the digital revolution. These two major developments have the power to transform our economy and society. Major efforts are currently being taken by the European Union (EU) and national policymakers to promote both transitions. However, these efforts are rarely aligned. In doing so, the ultimate goal should be to ensure that all the efforts contribute to long-term sustainable economic, social and environmental prosperity, in line with the UN Sustainable Development Agenda and the commitment of the Paris Agreement. They should share the objectives of mitigating climate change, addressing environmental challenges like resource depletion and pollution, increasing competitiveness and innovation, contribution to industrial modernization and security, and supporting social cohesion'.

To this end, the scaling of circular economy would help. It requires though the existence of an adequate governance framework and economic incentives, the improvement of the use of natural resources, design, production, consumption, reuse, repair, remanufacturing, recycling and the overall waste management, new business models – service-based solutions and the creation of a digital road map for circular economy.

In conclusion, the way forward requires thinking systemically - define a vision and act, consensus, collaborative approaches and common understanding. The shift to a circular economy and the formulation of road map require action by all the Mediterranean Countries. A simulation Game "Heliosthana 2020 Forum" was prepared by Planpolitik and WWF in 2012 on how to prepare stakeholders consultations on EE & RE strategy of a country. It was very successful, and several trainings were conducted on this game at the UfM (Barcelona) and in Morocco, Tunisia, Lebanon, etc. Now a new Simulation Game "Heliathana 2030 Forum" (Road Map to a Circular Economy) is under preparation by ALMEE.

Markos Damasiotis
Head of Development Programmes Division, CRES

The Challenges of the Energy Transition for the Islands of Greece

According to Mr. Damasiotis, the two main challenges of the energy transition for the Greek islands are the interconnections of non-Interconnected Islands (NII) as well as the intelligent and energy Islands. Regarding the current situation of the electricity system of Greek islands, the electricity market of NII consists of thirty-two (32) autonomous systems - some consisting of several islands, where the Hellenic Electricity Distribution Network Operator (HEDNO S.A.) is in charge of the operation and management of the relevant Markets and networks. Nineteen (19) "small" autonomous systems have a peak demand up to 10 MW, eleven (11) "average size" autonomous systems have a peak demand from 10 MW to 100 MW and two (2) "large" autonomous systems have a peak demand exceeding 100 MW, i.e. Crete (with peak demand over 600 MW) and Rhodes (peak demand~ 200 MW). At the same time, islands have to deal also with the oversizing of power plants, pollution from oil, black outs during summer periods and expensive electricity systems. The energy mix is made of oil (80%) and RES (20%), while the electricity cost is around 250 €/MWh.

The responsible authority operator of the interconnection plan is the Operator of the Hellenic Electricity Transmission System (ADMIE). According to Mr. Damasiotis, investments of more than 3 billion euros will be required, which will be covered primarily by European funds and private investment and secondarily by the system usage fees (consumers), which in any case will directly take advantage of net economic benefits due to the reduction of Service of General Interest charges. The 1st phase of the interconnection of the Cyclades was completed, including the interconnection of Paros (including Naxos, Antiparos, Ios, Sikinos, Folegandros), Syros and Mykonos. Within the period 2020-2030, the majority of the Aegean islands will be interconnected, starting from the interconnection of Crete with the mainland.

Benefits from the interconnection of the islands include having more reliable supply with more economic fuel mix and the avoidance of charges of Services of General Interest in electricity bills connected to a more expensive electricity production because of the use of imported fuel oil, which will result in annual savings of SGI charges of €400-450 million. In addition, energy dependency will be reduced by 3%, as well as GHG emissions, RES potential in

the islands will be exploited more economically, electricity and services of the same quality will be provided to the citizens and the requirements of environmental legislation will be fully respected.

For those islands that are expected to remain non interconnected, at least for a long time, the aim is to largely reduce the use of oil for electricity production thanks to the installation of modern RES units in combination with storage technologies through either private investments or pilot projects, but also with the use of technologies like electrification of naval and road transportations, installation of charging stations using RES, the use of energy storage, renewable energy sources (wind, PV, geothermal), energy efficiency, energy storage and microgrids/demand response systems.

Indicative pilot projects were presented: namely, the project for the conversion of Agios Efstratios into a “Green Island”, the project “Smart Islands” (Kastelorizo, Astypalea , Symi), the hybrid RES station already in operation on the island of Tilos, the Kythnos smart island project and the wind + water pumping and storage project in Ikaria. An explanation of the Agios Efstratios System was also provided.

Mr. Damasiotis concluded by stressing that Greece is actively involved in the new EU initiative “Clean Energy for EU Islands”, along with 13 other Member States.

Santiago Gonzalez Herraiz
Head of Projects, Department of Regulatory Framework for Energy Transition, IDAE

Islands in the Spanish Energy Strategy

Mr. Santiago Gonzalez Herraiz started by presenting the decarbonization roadmap to 2030. This consists of four pillars: energy efficiency, RES at large scale, the decentralization of energy shares in the total energy system and the mass electrification of other sectors.

Very interesting data for RES installation by 2020 and predictions for 2025 and 2030 were presented, by highlighting the high potential of RES in the country. Energy storage combined with a high-quality demand side management could favour the network integration. At the same time, RES systems are used according to their actual readiness.

In parallel, it is very important to understand the added value of those projects, in which citizens are involved. These projects increase the potential scope of investors, by taking into account the potential suitability of the project to local needs/context. The direct involvement of citizens in the local and decentralized energy model is a good opportunity to raise awareness and foster responsibility – taking measures while reaping and retaining the local benefits within the territory.

In Spain, significant measures for the enforcement of other sectors such as transport electrification are also in place. Public funds of € 1000M have been made available until 2025 and tax reforms were undertaken in order to reinforce and implement measures for the electrification of the vehicles fleet in the country.

Kostas Komninos
General Director, DAFNI Network of Sustainable Greek Islands

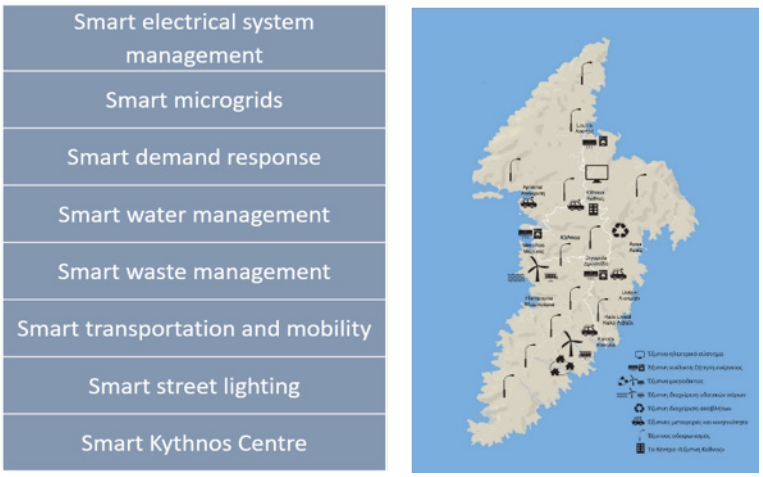
Kythnos Smart Island: A Lighthouse Island Decarbonization Project in the Aegean Sea

Mr. Komninos presented the DAFNI network, by emphasizing the role played by the network to support sustainable development in the Greek islands through integrated actions in the fields of energy, environment and culture.

DAFNI also coordinates the Smart Islands Initiative promoting islands as ideas areas for innovative projects in the fields of energy, environment, transport and mobility. This is a bottom up effort of the European island authorities and communities, which aim to promote the significant potential of islands to function as laboratories for technological, social, environmental, economic and political innovation. Local authorities of these islands commit to become “smart” by taking action to mitigate and adapt to climate change and by building resilience at local level, by introducing sustainable mobility as well as by reducing water scarcity and ensuring the optimal management of resources and infrastructures. The key areas of intervention are energy, transport, water, waste, governance, ICT, economy.

Mr. Komninos continued by illustrating the "Kythnos island" case as a best practice example of sustainable local development. Kythnos is a small island of 1600 inhabitants, easily accessible, not very touristic, non-interconnected. The electrical system consists of several generating sets, one wind farm (not in operation) and some PVs distributed in the island. Kythnos island constitutes a Living Lab of technological innovation for the clean energy transition, aiming at:

1. integrating in the holistic infrastructure planning some smart and innovative solutions in the sectors of energy, water, waste, transport and mobility, taking into account the expansion of the tourism period.
2. Exploiting the island's natural and cultural resources, which will boost the development as a smart and sustainable destination.



With respect to the smart electrical system, the objective is to develop an energy control centre, ensuring RES penetration and investigating the integration of storage at the grid level. At the same time, on the demand side, the installation of smart and energy efficient electrical appliances in most of the households and the installation of smart home control units in the respective households in order to allow control and monitoring of the appliances' operation is planned. Smart microgrids, smart water resources management, smart waste management, smart transport and smart street lighting are also foreseen. The Kythnos Smart Island Centre and Smart Training Lab are converted to nZEB and Kythnos Energy community has already been established. The budget of the project is € 8M and the duration is two years (2019-2021).

Mr. Komninos explained also the functioning of the Ikaria's hybrid station. This consists of a hydroelectric power plant and a wind power plant; its guaran-

teed power is 2,55 MW, when the 5-year Average Peak Demand of Ikaria is 7,3 MW. He continued by presenting also the Tilos project. This is an Horizon 2020 EU-funded project, whose main objective is to develop and operate a prototype battery system based on NaNiCl2 batteries (2,4MWh) with Wind turbines (800 kW) and PVs (160 kW), provided with an optimum, real-environment smart grid control system.

He concluded by providing an overview of the connections of non-interconnected island electrical systems to the mainland, which either completed or in progress in Greece.

Guilherme Silva

Energy policy expert, Azorean Directorate for Energy

Azores Goals, Challenges and Needs for Energy

Azores is an archipelago composed by nine inhabited islands, with a population of 250k people and an economy that relies mainly on the dairy industry and tourism.

As explained by Mr. Silva, in the Azores the aim is to provide clean, secure and competitive energy for all: through clean and sustainable energy system, that respects the planet and its ecosystems, and secure and reliable energy, that is available when needed and in appropriate form and quality but also by leveraging competitiveness and by making energy accessible for all, especially by those in greater difficulty.

Energy flows in the Azores are distributed among gasoline, diesel, fuel oil and LPG that are used to meet the islands' needs, such as road/sea transport, agriculture and fishing, industry, services and residential use. Today, 40% of electricity are produced from renewable energy sources (RES) but this share is expected to increase to 56% by 2023.

Some successful case studies on RES installations, concerning PV installations, geothermal heat pumps, and electrical vehicles in several islands of the archipelago were also presented. Public awareness on these innovative solutions are raised via conferences, public events and distribution of communication material (videos, flyers etc).

5. **Session 2:** Technology solutions for power generation, storage, mini- and off-grid

Amel Makhlouf
Key expert, Clima-Med Maghreb

Acting for Climate in South Mediterranean

Ms. Makhlouf presented in detail the CLIMA-MED project, which is part of the EU "Energy security and Climate action in the Southern Neighbourhood 2017-2018" programme, adopted in 2017m and largely a continuation of previous projects, such as CLIMA-SOUTH, SUDEP and CES MED. It mainly focuses on climate policies, on the preparation of SEACAPs and climate finance, by identifying and prioritizing bankable projects and facilitating their financing and implementation. The main objective of this project, which began in June 2018 and will finish in June 2022, is enhancing energy security and adaptive capacity of partner countries while fostering their transition to low carbon and climate-resilient economy, thereby contributing to more stable, efficient, competitive and climate-resilient socioeconomic contexts.

One of the expected results of the Clima-Med Project is enhancing the capacities of the local authorities in order to contribute to the implementation and update of the NDCs, to develop adaptation and mitigation plans (NAP) and LED Strategies and to apply Measurement, Reporting and Verification (MRV) methods in good collaboration with the relevant government, and regional, national and subnational stakeholders. Other expected results are the increased number of local Sustainable Energy Access and Climate Action Plan (SEACAPs) as well as the improved access to funding mechanisms.

The activities for the improvement of the climate change governance and for mainstreaming climate action entail developing coordination capacity on climate policy, mainstreaming climate adaptation and actions into national

strategies and policies and raising public awareness as well as promoting the dialogue among stakeholders. Other Clima-Med initiatives are meant to promote sustainable actions at the local level, such as the Helpdesk for Covenant of Mayors Office's functions, the assistance in the design, implementation and monitoring of SECAPs, awareness campaigns to increase the number of SECAPs. Finally, the identification of financing possibilities, the classification of suitable projects for financing and the boost of innovative public-private partnerships have been inserted in the Project to improve the access to finance leading to more sustainable actions.

Ms. Makhlouf stressed that addressing the challenge of formulating a good climate policy should require not only long-term actions but also immediate and short-term actions that are urgently needed, including rapid replicable demonstrative actions, mobilization and fast intervention approaches. Actions specifically undertaken by Clima-Med project were presented in detail and are the following:

Long term actions

- Ensure coordination of key actors through National Coordination Groups
- Agree on and prepare a coordinated Climate Action Strategy
- Propose Climate Finance Strategy that directs local authorities towards:
  - > Reform of financial planning, management, regulations, results-based investment
  - > Focus on funding realistic, nationally concerted, locally formulated and prioritized actions
- Setup Climate Action and SEACAP Support Mechanisms
- Climate Action Planning: prepare SEACAP through a capacity building approach

Immediate and Short-term actions

- Better orientation of allocated national budgets and targeting projects
- Guide the State's budget-allocation to your needs
- Skilful budgeting: Do the best with what you have

- Explore, lobby to allow independent raising of your own revenues
- Attract private sector, with innovative schemes (e.g. facilities, land provision, PPP etc.)
- Prepare and advance demonstrative, replicable, easy-to-implement pilot solutions & realistically bankable investment models
- Apply awareness raising and community work: low cost tool that yield high results
- Create your own Municipal Technical Team from within your staff or from external volunteers
- Know well and well use national financing opportunities
- Scanning of opportunities, Intelligent responding to call for proposals

Alicia Tsitsikalis
Project Manager, ADEME

Energy Transition in Islands and Remote Areas: the French Experience

Ms. Tsitsikalis presented ADEME, the French environment and energy management agency, which is a public body founded in 1990 to be the reference point for RES, circular economy and air pollution in France.

She continued by illustrating the approach to the energy transition in overseas territories followed in France. Four studies for decision making support were launched by ADEME so far:

- «Towards Energy autonomy» study
- «Small MDE» (Energy demand management) tool for measuring avoided costs and evaluation of energy demand
- Transportation–25 actions for efficiency and RE inclusion
- Impacts on employment

These studies aim to give answers regarding the feasibility of providing electricity from RES in islands as well as the optimal RES production, its geographic share, the impact for consumer, the needs in terms of infrastructures, in terms of balance and system services. For this reason, five scenarios were examined:

1. **Trend Scenario:** Current constraints / RE part optimized
2. **Scenario «Thermal advantage»:** Economic background enabling conventional energy, energy demand reduced, efforts made on EE, RE part optimized.
3. **Scenario «Technological advantage»:** Technical background optimistic, that means new RE technologies, higher spread of EE technologies and measures, RE part optimized.
4. **Scenario «All green lights»:** Less regulatory and social constraints, reaching 100% RE mix in 2030 (electric autonomy)
5. **Scenario «Energy autonomy»:** Transportation sector using electric vehicles (ex. heavyweight), reaching 100% RE mix in 2030 (electric autonomy + transportation)

According to the results, in Reunion Island, Martinique and Guadeloupe, an electric mix 100% RE is feasible, if storage capacity is enough. Energy autonomy, especially for transportation, needs above all great efforts in terms of energy efficiency. Regulatory constraints and institutional capacities are the main barriers to a fast deployment of RE. Based on the studies conducted in the three territories, it is, then, recommended to:

- Anticipate a mix > 80% RE, thanks to the high competitivity of RE storage compared to fuel/diesel already in 2025. In this sense, it also needed to adapt distribution regulation as soon as possible in order to include the new capacities installed and operation to face new challenges, such as seasons, daily constraints, demand driven management, reduction of system instability;
- Foresee energy autonomy, by developing intermodality for last km, by softening regulatory constraints for deployment of high potential renewable sources (hydraulic, wind, geothermal) and by strengthening local markets and growth while renovating fiscality.

Harmonize technology deployment taking into account network and system constraints through local calls for tenders and the promotion of short circuits and decentralized solutions for storage. Finally, Mrs Tsitsikalis raised the topic of energy access in remote areas in Africa. France and India are co-leaders of the “off-grid access to electricity” challenge and, in this framework, they launched a call for proposals on «Innovative solutions for off-grid access to

energy», in 2018. They selected 9 projects for a global budget of € 5.8 million, while ADEME's aid was € 1.8 million. The beneficiary countries were Benin, Burkina Faso, Cape Verde, Madagascar, Mauritania, Uganda and Togo. Importance was given to the involvement of local actors (appropriation, training), to the durability, the capacity to scale up the project and to gender.

Guillermo Figueruelo Malo
Business Development Manager, BIG HIT

Big Hit, a New Concept, Hydrogen Territories

Mr. Figueruelo Malo started by introducing the Aragon Hydrogen Foundation, an organization that supports the development of strategic projects to create employment, generate wealth and improve the competitiveness of the industrial sector in the Aragon region. Its mission consists in developing a strategic agenda and strategic projects and in promoting knowledge by companies and society.

Then, Mr. Figuerelo presented the transition to a low carbon economy in the Orkney islands (North UK) by using the hydrogen. This is a demo project, co-funded by the European Commission and the Scottish Government, with participation of 12 EU partners, that is coordinated by the Aragon Hydrogen Foundation. In 2016 renewable electricity generation in the Orkney Islands produced the equivalent of 120% of their annual electricity demand, which demonstrates that transition to a local low carbon economy in Orkney is a significant opportunity.

The BIG HIT project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking, which receives support from the European Union's Horizon 2020 research and innovation programme.

With the participation of the Scottish and Aragon's government as well as twelve partners from Europe, a first H2 production site - Green H2 being produced from tidal & wind electricity on Eday - was commissioned, while a second production site– Green H2 being produced from wind electricity on Shapinsay - is at the final stage of commissioning. Trial runs were performed for transportation of H2 on ferries: first route (Eday-Kirkwall) was completed and a second route (Shapinsay-Kirkwall) is ongoing. In parallel, suitable vehicles refilled with local green hydrogen are already on the streets of Orkney. Emphasis was also put on dissemination activities aimed at exchanging in-

formation and exploiting replication possibilities in other regions. A working group for replicability is being developed. Tools are being designed to verify the techno-economic viability of the different business cases detected by the regions. Several explanatory webinars will be carried out.

The risks and challenges of the project were presented in detail. Stakeholders engagement is crucial, but the project must not overpromise. Technical and operational risks, such as allowances for project management, engineering and logistical challenges (geography, climate) should be taken into account.

David Lecoque
Senior Policy and Business Development Manager, ARE

Key Industry and Technology Trends to Foster the Integration of Remote Communities

Mr. Lecoque presented the Alliance for Rural Electrification (ARE) in detail, by emphasizing its aim to promote sustainable energy industry, activate markets and create local jobs worldwide. “Access to affordable, secure and clean energy for everyone in the world” is the vision of this international business association.

In islands and remote islands, the key challenges are the absence of networking, as there is low interaction between the local markets and the outside market players, the policy and regulatory uncertainty, the funding shortfall to achieve SDG7 goals as well as the insufficient technical and business skills among market players on the ground.

Then, Mr. Lecoque presented some successful case studies, such as the ENSOL project, that is about the energy production from RE in Mpale village, in Tanzania. The project deployed 48-kW solar hybrid mini grid that generates AC 3 phase electricity via a 5 km low voltage distribution line. High quality deep cycle batteries provide 265 kWh storage capacity, together with a 50 kVA back up genset to guarantee 24/7 uninterrupted service to customers. As a result, 102 out of the 250 customers have electricity connections. 30 new businesses were established due to availability of electricity. A 24/7 healthcare facility was created as well as direct and indirect employment. Additionally, further 15 villages were identified for project replication.

Another project based on energy access to RES in the local markets is Mlinda

in the Sundarbans West Bengal, India. Mlinda designed and developed the solar mini grids for the market space by completely giving up diesel and switch over to a solar facility. Mlinda conducted in depth assessment on load profiling, existing diesel tariffs and paying capacities of the shop owners. As a result, the systems now are owned, run and managed by the local rural entrepreneurs. Mlinda acts as the overall integrator of the ecosystem, building the capacities of the local entrepreneur as well as taking care of the local repair and maintenance. This switch to a solar based mini grid resulted in minimum savings of INR 1,000 (EUR 12.50) per month.

The acciona.org Foundation implemented “Luz en Casa Amazonia” to supply third generation solar home systems (3 GSHS) with a pay as you go system (PAYG), in Amazonia, Brazil. The beneficiary of the pilot project in the Napo basin, where the use of the electric lighting is provided with the 3 GSHS for an average of six hours daily. The main uses for that lighting are study, work, and preparation of meals. Replication with 3 GSHS strategies is being negotiated to be included in the Peruvian regulatory framework.

Ankur Scientific Biomass gasifier for rural electrification provides electricity to around 100 houses in Thakurwadi (Tribal area) in Thakurwadi, Maharashtra. The Ankur Scientific supplied, installed and commissioned the Biomass Gasification System with a suitable 100% producer gas genset of 10 kW rating and provided training to the local villagers for them to operate and maintain the plant smoothly. The biomass solution was chosen because of local availability of woody biomass, power demand, and ease of operation.

Finally, with respect to the companies, Mr. Lecoque recommended that the business models should be sustainable, commercial, scalable and replicable. It is important to manage risks and governance structures, to prove the financial sustainability in the mid and long term. At the same time, it is important to invest in the local management and to pursue important socio-economic impacts at the local level. In parallel, the financial and technical assistance, the tender procedures based on both price and qualitative criteria, the reduction of red tape from project identification to implementation are some of the recommendations mentioned for policy makers to achieve the goals of decarbonization.

Fadi Georges Comair
General Director, Lebanese Ministry of Energy and Water

The Three Tenants of Geopolitics in the Middle East: Nexus Water, Energy and Food

The geopolitics of "water, energy and food" is one of the most important strategic issues for the security and social stability of the Arab region. It has national, regional and international dimensions due to the interdependence of water and energy and their economic and political importance for all the states in order to meet their needs and the development of their economies.

Water has become an urgent need for sustainable development in the Arab World, as the total volume of available surface water resources in the Arab countries is estimated at 277 billion m^3 per year, of which only 43% originates from Arab countries, while the rest is coming from outside the region.

Satisfying the growing demand for water is the first challenge for policy makers in different countries, while the second challenge is the availability and the access to fresh water (the share of fresh water per person in the Arab region being the lowest in the world with a value of 800 m^3 per year while the world average value is 7500 m^3 per year).

The Arab region suffers from water depletion and exhaustion. This highlights the need to resort to non-traditional means (industrial) in this area in order to produce fresh water suitable for consumption and irrigation.

Climate change, water scarcity, agricultural land degradation and desertification reflect negatively on food production in the region, thus prompting some countries to import quantities of needed products.

The increase in fuel prices has led to the deprivation of large quantities of food on the world market, such as rice and sugar. These consequences have negatively affected the populations of the region and some countries have taken extraordinary measures to ensure some food for their citizens: Egypt, for instance, has deliberately banned the export of rice from its territory in order to keep it for the local market.

Conditions of occupation and internal conflicts lead to malnutrition and food insecurity, especially among the poor.

Regional cooperation is - now more than ever - a mandatory condition for achieving the common development goals and the desired prosperity in the Arab region.

Based on the information presented above, the establishment of a high authority for water, energy and food, which is responsible for identifying all the needs of the Arab countries, is proposed. This will be needed to identify all the needs across the Middle East and to develop general guidelines and a comprehensive road map that should be adopted by Arab governments at very high level in order to face all risks and to solve the problems related to water, energy and food in the Arab world, while relying on the concept of integrated management. This will help ensure social security for future generations.

ANNEXES

Annex 1:
Conference Conclusions

Participants in the 7th MEDENER International Conference - organized in the framework of the meetMED project and hosted by the Municipality of Rhodes and the Greek Centre for Renewable Energy Sources and Saving (CRES) - discussed sustainable energy solutions for islands and remote areas as frontrunners for the energy transition in the Euro-Mediterranean region.

MEDENER members and experts in the field of energy transition acknowledged the difficulties and the challenges that islands, and remote areas face in relation to energy efficiency: the integration of large amounts of variable renewable energy sources in the power systems, energy storage, demand response systems, low carbon transportation and sustainable water treatment.

Climate change is a common concern and 'isolated' national solutions are insufficient to boost energy transition. Multilateral and regional cooperation, instead, has the potential for multiplying the effects of sustainable energy strategies and for disseminating technological solutions by means of technical assistance, capacity building and community engagement.

Islands and remote areas can be fuelled by sustainable energy mainly thanks to wind, solar and hydro energy, coupled with biofuels and geothermal sources. The use of renewable energy sources in islands and remote areas should be promoted not only for power generation but also to meet heating, cooling and transport needs. Energy storage through batteries and pumped hydroelectric, energy micro-grids and demand-response systems underpin the integration of large amounts of variable energy in not- interconnected power systems, such as the ones in islands and remote areas.

Investments in e-mobility and charging stations fed by electricity from RE systems are also recommended to face the challenge of grid stability. Innovative solutions in energy storage include the newly EU-supported concept of hydrogen territories, including fuel cells and hydrogen technologies. The integration of renewable energy sources and energy efficiency measures with water management facilities is also important, with a focus on resource management and financial sustainability.

All the afore-mentioned technology solutions serve the successful outcome of the transition of islands and of remote areas to clean energy. Policy decision- making should consider them according to their life cycle assessment, regarding costs, affordability, and sustainability.

The concrete experiences of smart strategies and innovative solutions implemented in the islands of Djerba (Tunisia), Salina (Italy), Ai Sratis, Tilos, Ikaria Kythnos (Greece), Canary and Balearic Islands (Spain), Azores (Portugal), and the virtual island of Heliosthana, highlighted that islands give the best evidence that a technological revolution towards clean energy is possible in the short term. The successful planning and the implementation of renewable energy and energy efficiency solutions and investments will require building up strong social acceptance and involving local communities through appropriate schemes like energy communities.

The EU supports the energy transition in the EU islands with initiatives like the Clean Energy for EU Islands. Such experiences and tools are useful to support relevant projects in the islands and / or remote areas of the Mediterranean region. Synergies among EU-funded projects should be further exploited, including those focusing on the role of circular economy investments, economic self-sufficiency and inclusive growth: Among others, the Clima-Med project, which supports sustainable local actions implementing the Sustainable Energy Access and Climate Action Plans (SEACAPs) and promotes access to financial mechanisms, such as innovative public private partnerships. Regional cooperation shall embody the water- energy-food nexus, due to the growing demand for water and its scarce availability as well as the difficult access to freshwater in the remote areas of the Mediterranean region.

The cooperation among national energy agencies, authorities and regional associations, like MEDENER and RCREEE, plays a key role in building the technical capacity required to implement sustainable energy solutions both in islands and remote areas.

In response to the need to create inclusive jobs and to mobilize sustainable investments, regional cooperation should focus on the professional training for energy managers, auditors and service providers across all sectors (appliances, buildings, power generation, industry and transport) as well as on removing barriers to - and risks for - private investments, including facilitating guarantees, funding, regulatory stability and market confidence.

Since markets for energy efficient equipment and systems are not isolated, on the one side, regional cooperation shall likewise contribute to building a regional network of quality infrastructures - including laboratories, testing facilities and inspection, certification or accreditation bodies. On the other side, the regional interconnections cooperation shall pave the way for setting up a plan for regional trade, aimed at harmonizing the national standards as well as the monitoring and evaluation tools.

Rhodes, Greece
Thursday, 26 September 2019

Annex 2 :
Conference Programme

Moderator: Stuart REIGELUTH, Founder, REVOLVE

08:30 - 09:00	**Registration of participants**
09:00 - 09:20	**Opening Remarks** • **Vassilis KILIAS,** CRES representative • **Giorgio GRADITI,** President, MEDENER
09:20 - 10:45 incl. Q&A	**Overview of the challenges** • **Leonidas KIOUSSIS,** Senior Expert, DG ENERGY, EU Commission • **Ashraf KRAIDY,** Planning Director, RCREEE • **Antonia PROKA,** Clean Energy for EU Islands Secretariat ***Key issues:*** *Challenges in supporting the energy transition in the Mediterranean region taking into account the experience of insular territories and communities.*
10:45 – 11.00	*Coffee break and family photo*
11:00 – 12.30 incl. Q&A	**Keynote speeches: Innovation for sustainable energy in islands & remote areas** • *Status of sustainable technologies for islands* - **Arthouros ZERVOS,** Chair, REN21 • **Carlo DRAGO,** GTI Observatory Coordinator, Greening the Islands • **Manuel SAPIANO,** CEO, Energy Water Agency of Malta ***Key issues:*** *Innovative solutions for energy transition, including energy production and storage, mini- and off-grids, energy efficient buildings and industries, digitalisation and demand side management, low-carbon transportation and integrated water and waste systems*
12.30 – 13.45	*Lunch break*
13:45 – 15:30 incl. Q&A	**Session 1: Case Studies from the Islands** • *Innovative solutions for energy transition in the Tunisian island of Djerba* - **Hassen EL-AGREBI,** Head of International Cooperation, ANME • *Energy Transition Agenda in the Italian small island of Salina* – **Roberta BONIOTTI,** Advisor on European Affairs, ENEA & MEDENER Secretary General • *Energy transition and circular economy technologies in the virtual island of Heliosthana 2030* - **Adel MOURTADA,** Senior Expert Energy & Climate change, ALMEE • *The challenge of the energy transition for the Greek islands* – **Markos DAMASIOTIS,** Head of the Development Programmes Division, CRES • *Islands in the Spanish Energy Strategy* - **Santiago GONZÁLEZ,** Head of Projects, Department of Regulatory Affairs for Energy Transition, IDAE • *Smart Islands Initiative – An Integrated Territorial Investment approach to enable EU islands' clean energy transition: The case of Kythnos Smart Island* - **Kostas KOMNINOS,** General Director, DAFNI Network of Sustainable Greek Islands • *Azores: Goals, Challenges and Needs for Energy* - **Guilherme SILVA,** Azorean Directorate for Energy
15:30 - 15:45	*Coffee break*

15:45 - 17:00 incl. Q&A	**Session 2: Technology Solutions for Power Generation, Storage, Mini- and Off-grid** • *Energy security and climate adaptation in islands: the CLIMAMED experience* – **Amel MAKHLOUF,** Key expert for the Maghreb region, CLIMA-MED • *New projects and studies on Non-Interconnected Areas (ZNI) in France* – **Alicia TSITSIKALIS,** Regional Mediterranean and African Cooperation, ADEME • *Nexus Water and Energy in Lebanon or the Region* - **Fadi COMAIR,** General Director, Lebanese Ministry of Energy and Water • *Building Innovative Green Hydrogen Systems in Isolated Territories (BigHit)* - **Guillermo FIGUERUELO,** Head of Business Development Department, Aragon Hydrogen Foundation • *Key industry and technology trends to foster the integration of remote communities* – **David LECOQUE,** Senior Manager Policy & Business Development, Alliance for Rural Electrification
17:00 - 17:30	**Conclusions & Closing Remarks** • **Markos DAMASIOTIS,** Head of Development Programmes Division, CRES • **Dario CHELLO,** former President, MEDENER

Annex 3:
Speakers

Matteo Barra
meetMED Project Manager

Dr. Barra is currently working as Project Manager for the meetMED Secretariat. His main responsibility is to lead the implementation of the meetMED Project by coordinating the work package leaders and monitoring the organisation of the activities in order to ensure that the deliverables of the project will be achieved. Matteo is also responsible for reporting to the European Commission on the implementation of the Project. In his former experiences, Matteo has worked as senior expert on investments at the Energy Charter Secretariat, acting mainly on ECT investment provisions and dispute settlement. Previously, he was associate with the international arbitration team of a large law firm in Geneva, where he acted in investment and commercial disputes concerning among others the electricity, gas and oil industry. Matteo holds a Ph.D. in International Economic Law (Bocconi) and an LL.M. in International Energy Law and Policy (CEPMLP).

Roberta Boniotti
MEDENER Secretary General

Since 2010, Dr. Roberta Boniotti has been the Advisor on European Affairs at the Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) office in Brussels. Previously, she was Member of the Board of Directors and Member of the Board of Auditors in several private research companies in Italy and the Head of Unit for “Company Relations Management” at ENEA Headquarters in Rome. She is an economist, holding a Master in Business Administration (MBA) from the University of Bologna, with almost 20 years of experience in research and innovation, in the fields of renewable energy, energy efficiency, climate change, environment and support to SMEs for technology

transfer. She is Secretary General of MEDENER, the Association of National Agencies for Energy Management in the Mediterranean Region, member of the Executive Working Group of TAFTIE, the European Association of leading National Innovation Agencies and ENEA's Representative in the network of European National Energy Agencies (EnR).

Dario Chello
Former MEDENER President

Since January 2016, Mr. Chello has been the head of European Union and International Organisations Unit of ENEA in Brussels. He has been elected Chair of MEDENER for the period 2017-2018, the Association of national Energy Efficiency and Renewable Energy Agencies of the Mediterranean Region, by the General Assembly, held in Marrakech as a side-event of the COP22. The MEDENER Presidency Office has been established in Brussels at ENEA premises. Eng. Chello became Senior Advisor for International Cooperation at the National Agency for Energy Efficiency of ENEA in February 2013. Since February 2007, he has been Director of Energy Efficiency and Investment at the Energy Charter Secretariat in Brussels. Before that, he worked as specialist member of the Technical Secretariat of the General Directorate for Energy at the Italian Ministry of Industry, now Italian Ministry of Economic Development, and, from January 1995 to May 1996, as consultant in the Policy Assessment Office of the Minister's Cabinet. In November 2004, he was appointed by the Director General to coordinate international relations and energy planning with reference to both EU and other international activities. He holds a Ph.D. in physics of energy systems at the University of Paris "Paris 7" in 1989.

Markos Damasiotis

Director of Development Programmes Division, CRES

Mr. Markos Damasiotis holds a master's degree in Electrical Engineering from the National Technical University of Athens (NTUA). He has more than 25 years of experience in the energy sector and he is currently the Director of the Development Programmes Division of the Hellenic Centre for Renewable Energy Sources (CRES). He has worked as project manager or senior expert in more than 60 national or international projects in the field of renewable energy (RES) and energy efficiency (EE), managing successfully, multidisciplinary and multinational scientific teams in the fields of technology analysis, energy systems analysis and planning, implementation of strategic programmes, market studies, research and training, awareness raising, innovative policy and financing mechanisms, approximation of legislations, business and financing issues of RES and EE sector. His professional experience, besides Greece and other EU countries, is geographically concentrated in South East Europe, Black Sea Countries and in the Mediterranean. He is member of the Board of Directors of MEDENER, the Mediterranean Association of National Agencies for Energy Management.

Carlo Drago

GTI Observatory Coordinator, Greening the Islands

In IBM since 1985, Mr. Carlo Drago has a 360° experience in IT serving large enterprise customers mainly in the energy sector. Carlo has deep understanding of the energy and utility industry processes having dealt with such customers for more than 30 years within commercial and technical roles. He is also familiar with international trends as he has been part of the IBM Global E&U Industry team. He has a multi-year managerial experience as first- and second-line manager in Service Delivery units. Previously, he has worked for several years as sales representative in the services organization, moving gradually to long term business development that became his predominant focus in the last 10 years. In this role, he has also led IBM participation in research projects funded by Italian and/or EU

programs. Civil engineer enrolled in the engineer ability list of Rome – Ordine degli Ingegneri – since 1984, in the late '90s he has obtained the internal IBM certification in Project Management followed by the successful Master exam at the Project Management Institute.

Guillermo Figuerelo
Business Development Manager, Aragon Hydrogen Foundation

Mr. Guillermo Figueruelo is an Industrial Engineer graduated from the Technical Engineer School of Zaragoza in 2014. In June 2015, he set up the Aragon Hydrogen Foundation working in the Consulting and Training Department, being involved in several FCH-JU projects, such as KnowHy, Hy4All, etc. Since November 2016, he is working as Business Development Manager and supporting strategic projects for the association, such as BIG HIT.

Santiago González
Head of Projects, Department of Regulatory Affairs
for Energy Transition, IDAE

Mr. Santiago Gonzalez has 20-year professional experience in the energy sector, as he worked both for national and European administrations as well as the private sector. He is been working at IDAE since 2002, as head of projects in the "Regulatory Framework and Corporate Strategy for Energy Transition" department. Previously, he covered other functions in other departments in IDAE (from renewables to transport and sustainable urban development). At the international level, he was Policy Officer at the DG ENERGY of the European Commission for 6 years as a detached national expert in the energy efficiency unit. Santiago is industrial engineer graduated from the Polytechnic School of Madrid with a specialization in energy; he also carried out postgraduate studies related to some aspects of the electricity markets/business regulation at the University of Comillas.

Vassilis Kilias
former General Director, CRES

Geologist and Energy Planning expert, Mr. V. Kilias joined CRES in 1996, where he acted as leader of the Energy Information Systems department (2000-2015), and then he held the position of General Director from 2015 to 2019. His main area of scientific expertise is energy analysis and planning methods as well as the development of energy information systems and models. He has developed innovation and international cooperation projects, and he has coordinated several projects for Energy Policy support funded by EU Structural funds. He has acted as a technical consultant for the Greek Ministry of Energy and he was appointed in the Coordinating Committee for the National Energy and Climate Action Plan, developed in 2019.

Leonidas Kioussis
Senior Expert, DG ENERGY, EU Commission

Mr. Kioussis holds a PhD in Operations Research from the George Washington University. In 1992, he joined the European Commission, where he has served consecutively in Eurostat, DG Transport, DG EuropeAID and DG Energy, being responsible for the management of a great number of EU programmes and projects. On 2009, Dr Kioussis was placed as a principal administrator and later as a senior expert in the International Relations unit of DG Energy, serving as desk officer for the EU relations – bilateral and regional – with the North African and Middle Eastern countries. Mr. Kioussis is currently responsible for energy cooperation with the MENA countries, covering the gas, electricity, renewable energy and energy efficiency sectors for both supporting the countries to promote the necessary regulatory reforms as well as for helping and facilitating investments in the framework of the Union for the Mediterranean (UfM).

Kostas Komninos
General Director, DAFNI Network of Sustainable Greek Islands

Mr. Komninos is the Director of the DAFNI Network of Sustainable Greek Islands, a network of 48 Greek local and regional authorities, coordinator of the Smart Islands Initiative and Vice President of FEDARENE on Smart and Sustainable Islands. He has significant experience in clean energy and local islands development projects especially in the Greek and European islands and has been working the last decade to narrow down the gap between policies designed at the EU level and projects realized locally. From 2015 till 2018, he served as a non-executive member in the Board of Directors of the Hellenic Electricity Distribution Network Operator S.A. (HEDNO), the Greek Distribution System Operator with a portfolio to promote innovative projects in the Greek islands where HEDNO is the sole system operator.

Ashraf Kraidy
Planning Director, RCREEE

Eng. Kraidy is an electrical engineer, RE and EE expert with more than 15 years of expertise in cost-effective policies design, support institution capabilities, technical assistance, and implementation strategies in the Arab region. Since 2016, he serves as Planning Director at the Regional Center for Renewable Energy and Energy Efficiency (RCREEE), where he is in charge of organizational planning, fundraising and communication development of RCREEE. Mr. Kraidy has participated in several projects, strategic activities and initiatives serving the transformation of the Arab region towards the adoption of sustainable energy solutions. He started his career in 2002 at the Syrian Ministry of Electricity in Damascus. In 2009, he started his working experience at RCREEE as a Senior Energy Expert and Initiations Portfolio Manager. In 2013, he was assigned to work as a Senior Advisor to the Energy Department at the League of Arab States on behalf of the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Building (BMUB). Mr. Kraidy obtained his master's

degree in Power Engineering in 2009, specializing on EE labels and standards for home appliances.

David Lecoque

Senior Manager Policy and Business Development, Alliance for Rural Electrification

Mr. Lecoque leads the policy and business development department at ARE, which is the biggest global business federation for the rural electrification sector, delivering on clean energy access across the developing world. In this role, he provides streamlined business development services to more than 130 ARE Members, which typically go from SMEs to blue chip corporates working along the RE value chain. He also develops strategic and commercial partnerships and he advises governments and donors on how to improve market conditions to achieve clean energy access (SDG7) and broader sustainability. Prior to joining ARE, he practiced and qualified as a lawyer at the Brussels Bar, dealing principally with energy and environmental matters in the top-tier law firms, Liedekerke and CMS. He was elected as one of Belgium's 100 most inspiring and sustainable young professionals. He speaks English, French, Dutch and German.

Amel Makhlouf

Key Expert, Clima-Med EU project for Maghreb region

Ms. Makhlouf is an International Expert in Climate, Energy and Sustainable Development in Africa, Europe and the Mediterranean regions. She gained a broad experience working at the United Nations, the African Development Bank, the World Bank, the European Union and the R20 (Regions20 for Climate Action) and became the first woman in Africa and in the Arab countries - and second in the world - to be an Aerospace engineering graduate of the International Institute for Aerospace Survey and Earth Sciences (ITC) at the University of Twente in Holland. She holds two MSc degrees in spatial analysis and photogrammetry with a PHD thesis on the structuring of spatial databases and was part of the

team of researchers who designed and developed the “IIWIS” GIS and implemented it at the National Autonomous University of Mexico (NAUM). Ms. Makhlouf is a member of the Council of Engineers of Tunisia, a visiting University Professor in Italian and Tunisian universities, a permanent member of the Council and General Assembly of the CMU (Community for Mediterranean Countries) in Italy and President of the Italian based EAMC / Women Engineers (Engineering Association for Mediterranean Countries).

Adel Mourtada

Senior Expert Energy & Climate change, ALMEE

Mr. Mourtada has 25 years’ experience as international expert in energy and climate change. He holds a degree in Building Sciences and completed two PhDs in Energetic and energy conversion in France. He is Director of Research in the field of RE & EE at the Lebanese University and Member of the Board of Directors of MEDENER and of the Lebanese Association for Energy Saving and for Environment (ALMEE), as well as of other energy associations such as the Lebanese Green Buildings Council (LGBC). He developed EE Building codes and green building rating systems for several countries (Lebanon, Morocco, Tunisia, Ivory Coast, etc.) and he carried out several market assessments to evaluate the potential of EE & RE projects and to better understand the barriers that have so far hindered the growth of RE, EE and environmental investments. Mr. Mourtada has been participating in more than 50 international and ENPI CBC projects and he has published more than 100 articles in peer journals and symposia proceedings in the field of EE, RE, and prospective studies.

Antonia Proka

Energy Transition expert, Clean Energy for EU Islands Secretariat

Ms. Proka is an energy transition expert at Climate Alliance currently involved in the Clean Energy for EU Islands Initiative. She has a background in Business Administration and holds an MSc degree in Environment and Resource Management (IVM, VU Amsterdam). Antonia's role in the Secretariat spans from coordination to methodological support; Antonia is glad to be putting her expertise and experience with renewable energy initiatives at the service of advancing a sustainable and just energy transition in EU island communities. Next to her work for the Initiative, Antonia is completing her PhD on the impact of the (self-)organisation of renewable energy initiatives on the energy transition in the Netherlands at DRIFT (Erasmus University Rotterdam).

Manuel Sapiano

CEO, Energy Water Agency of Malta

Mr. Sapiano is the Chief Executive Officer of the Energy and Water Agency (EWA) within Malta's Ministry for Energy and Water Management. In this role, he coordinates a team of experts with responsibilities for the formulation, evaluation, monitoring and implementation of national policies concerning the use of energy and water in a sustainable manner and the formulation of plans to meet National and EU energy and water resources management targets.He also coordinates EWA's identification of and participation in research and development initiatives in the energy and water sectors, mainly focusing on issues such as the water and energy demand management and use efficiency, renewable energies, groundwater resources management and policy assessment and formulation. Mr. Sapiano is a hydrogeologist, with specific specialisation in island and coastal hydrology. He has previously led the Agency's Water Policy Unit, where in particular he had the responsibility of coordinating the implementation process of EU related water legislation in the Maltese islands He has been involved in the implementation process of the EU Water Framework Directive since 2002, where within the Common Implementation Strategy of this Directive, he fulfils the role of Water Director for Malta.

Guilherme Silva
Energy Policy Expert, Azorean Directorate for Energy

Mr. Silva is an energy policy expert currently working as a technical advisor at the Azorean Directorate for Energy as well as a lecturer and researcher at the Université libre de Bruxelles and the Azores University. He holds a MSc in Aerospace Engineering from Instituto Superior Técnico in Lisbon, an Advanced Master in Management from Solvay Business School in Brussels and a PhD in Engineering Sciences and Technology from Université libre de Bruxelles in Brussels. He has an extensive experience on energy-related topics having worked on energy audit and certification as well as having authored significant research on small-scale energy storage systems, their coupling with the grid and local generation, and the energy policy related to its cost-effective implementation.

Arthouros ZERVOS
Chair, REN 21

Prof. Zervos is the Chair of the Renewable Energy Policy Network for the 21st Century (REN21) since 2013. He is also a Professor at the National Technical University of Athens. From 2009 to 2015, he has been Chairman and CEO of the Greek electricity utility Public Power Corporation (PPC) as well as Chairman of the PPC Renewables. He has more than 35 years of high-level expertise in policy, science, research and technology across the RE sector. He led key European and International RE bodies and has acted as policy advisor to Governments, EU bodies and policy fora. He has been President of the European Wind Energy Association (EWEA) from 2001 to 2013, President of the European Renewable Energy Council (EREC) from 2000 to 2012 and President of the Global Wind Energy Council (GWEC) from 2005 to 2010. In 2013, he received the “Poul La Cour” prize for outstanding achievement in wind energy. He is a graduate of Princeton University with a Bachelor and master’s degree of Science in Engineering as well as a Ph.D. Degree from the Université P. et M. Curie (Paris 6).

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