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## **RENEWABLE ENERGY APPLICATIONS FOR ISLAND TOURISM EVENT IN CYPRUS: 29-30 MAY 2014**

The Renewable Energy Applications for Island Tourism Event, held in Cyprus on 29-30 May, explored applications and solutions for the energy-intensive tourism sectors of island nations struggling with the high costs of imported fossil fuels. Organised by the International Renewable Energy Agency (IRENA) and the Government of the Republic of Cyprus, the two-day event examined the increasing energy needs of the global island tourism sector and explored renewable energy solutions to provide the necessary energy services.

H.E. Nicos Anastasiades, President of the Republic of Cyprus, addressing the event on the second day, stressed that the accelerated deployment of renewable energy sources could play a pivotal role in overcoming the country's current economic troubles. IRENA presented findings from its forthcoming study on renewable energy solutions for island tourism, underlining the opportunity to save costs and add economic value.

Some 120 guests and participants from around the globe attended the meeting, held at the Aphrodite Hills Resort Hotel near the city of Paphos. Key topics of discussion included renewable energy applications for water desalination, electric vehicles for island tourism, the use of algae for biofuels, and the increasing use of biofuels for air transportation, as well as solar water heating systems for hotels and resorts, and the benefits and advantages of solar and seawater air conditioning. Other sessions examined the business case for solar photovoltaic systems in island hotels, including both grid-connected and off-grid installations; international funding and cooperation possibilities for renewable energy projects; and the main enabling factors as well as challenges and barriers affecting the broader adoption of renewable energy sources.

### **OPENING SESSION:**

The event opened with addresses by IRENA Director-General Adnan Z. Amin and H.E. Yiorgos Lakkotrypis, the Minister of Energy, Commerce, Industry and Tourism of the Republic of Cyprus. Mr Amin underscored the opportunities presented by renewable energy, noting that it was "no longer a niche industry but a significant global player" and the cheapest option for many countries. Minister Lakkotrypis said Cyprus aimed to achieve or exceed binding targets for 2020, including 13% of gross final energy consumption from renewables.

### **SESSION 1: The Business Case for Renewable Energy in Island Tourism**

Prof. Costas Papanicolas, president of the Cyprus Institute and chief executive of the Cyprus Research and Educational Foundation (CREF), discussed possibilities for water desalination bases on renewable energy. Prof. Papanicolas stressed the need for the co-generation of electricity and desalinated sea water (DSW) via concentrated solar power (CSP), which is ideal for the environmental conditions in

Cyprus and throughout the Mediterranean, the Middle East and North Africa. In all those regions, the need for water is increasing – a problem exacerbated by growing tourism.

Edison Yin, business development manager at BYD Europe, offered a presentation on the use of BYD electric buses on the Dutch island of Schiermonnikoog, while Alex Schroeder, Technology Deployment Manager for Fuels and Vehicles at the National Renewable Energy Laboratory (NREL) in Denver, Colorado, discussed the use of electric vehicles in Hawaii as a means to integrate electricity from variable renewable energy technologies into the transportation sector.

Dr Alexandros Charalambides of the Cyprus University of Technology outlined the growing possibilities of harvesting algae for biofuels. Dr Alejandro Ríos Galvan, Director of the Sustainable Bioenergy Research Consortium in Abu Dhabi, highlighted the readiness of biofuels for air transportation.

To close the session, Mario Gamberale, chief executive of Exalto Energy and Innovation and AzeroCO<sub>2</sub> in Italy, discussed projects aimed at accelerating the deployment of renewable energy on 42 small islands in Italy, only four of which are connected to the national grid.

## **SESSION 2: Solar Water Heating Systems for Island Hotels**

Jeffrey Skeer, IRENA's senior programme officer for technology cooperation, presented a technology and cost overview of solar water heating systems for island tourism facilities and resorts. George Roditis, of the Cyprus Solar Water Heaters Laboratory, described the comparatively good infrastructure in place in Cyprus, noting that the country is a global leader in the use and manufacturing of solar water heating systems. He also made the case for greater international standardisation of solar water heating systems. Tassos Frantzis of the Cyprus Union of Solar Energy Industrialists (EBHEK) offered various case studies from the country.

## **SESSION 3: Renewable Energy for Air Conditioning in Island Hotels**

Panagiotis Tsekouras, of Greece's Centre for Renewable Energy Sources and Saving (CRESS), examined the technologies and costs of solar air conditioning, including successful solar-powered chiller installations at the Rethimno Village and Lentzakis hotels on the island of Crete. Dr Georgios Florides of the Cyprus University of Technology offered a look at solar cooling and heating applications in the university's mechanical engineering laboratories, adding that a similar application for a comparably sized hotel (280 kilowatt cooling load) would cost an estimated EUR 250 000, with a payback period of three to seven years.

Makai Ocean Engineering, from Hawaii, gave an overview seawater air conditioning technology and costs in the US Pacific island state. The session ended with Chrysis Chrysanthou, who offered a look at the 465 kW geothermal heating, ventilation, and air conditioning system installed at the Ayii Anargyri Spa and Hotel Resort in Cyprus.

## **SESSION 4: The Business Case for Solar Photovoltaic Systems in Island Hotels**

George Karagiorgis, associate professor of mechanical engineering at the Frederick University in Cyprus, presented a technological overview of photovoltaics (PV). Mr Karagiorgis stressed the need for storage in Cyprus in view of the limited, isolated grid. Pumped storage could be ideal for similar islands, he added. IRENA's Peter Journeay-Kaler provided a cost overview for PV applications at island sites and a number of compelling reasons why PV was ideal for island tourism. Grid-connected tourism facilities

could offset utility costs by 100% through PV, while remote off-grid hotels and resorts could cost-effectively offset diesel consumption by as much as 90%, Mr Journeay-Kaler said. Bruce Clay of Clay Energy in Fiji examined PV/diesel hybrid systems, both with and without energy storage, including a large system installed on the privately owned Turtle Island resort, while Alessandro Venanzini of Nidec ASI in Italy offered a case study on a large PV hybrid system powering a smart micro-grid for a resort in Maldives.

#### **SESSION 5: Development Partners' Experiences**

Alexander Haack, team leader for energy at the German International Cooperation Agency (GIZ), discussed the organisation's experience as a key economic cooperation and development player operating in more than 130 countries worldwide. In 2012, the German government spent more than USD 1.9 billion on energy related projects in over 60 partner countries, making energy the largest sector for the Ministry for Economic Cooperation and Development, within which GIZ operates.

Adriana Valencia, team leader at the Inter-American Development Bank (IDB), examined the challenges facing the energy sector in the Caribbean, including heavy dependency on fossil fuels, disaggregated small and isolated loads that make economies of scale difficult to achieve, and high costs for interconnections. She introduced Caribbean Hotel Energy Efficiency Action (CHENACT), the main project assisting hotels in the island region with identifying and financing renewable energy and energy efficiency opportunities.

Sofía Gutiérrez, deputy director for sustainable development of tourism at the United Nations World Tourism Organisation (UNWTO), presented an overview of the organisation's central role in promoting the development of sustainable and universally accessible tourism, including supporting pilot programmes for energy efficiency and renewable energy.

#### **SESSION 6: Roadmap for Renewable Energy in Island Tourism**

Dolf Gielen, director, IRENA Innovation and Technology Centre, presented the intergovernmental organisation's findings from a forthcoming study, Renewable Energy Solutions for Island Tourism. The study outlines the business case for deploying renewable energy technologies – including solar water heaters, solar air conditioning, seawater air conditioning and solar photovoltaics – at island tourism facilities. Nicos S. Kyriakides, partner and head of financial advisory services at Deloitte Limited in Cyprus, discussed the financing of renewable energy projects in the country, including the chance to improve hotel performance through reduced energy costs; financing and support schemes, as well as barriers, for projects involving renewables; and the issue of grid stability.

#### **Session 7: Concluding roundtable on overcoming barriers to the deployment of renewable energy technologies in islands tourism**

Ilisoni Vuidreketi, chief executive of the South Pacific Tourism Organisation in Fiji, discussed the advantages of deploying renewable energy technologies on Pacific islands, including improvements to tourism products and services as well as benefits for local communities. He also examined barriers, including the geographical spread and isolation of Pacific islands, small population bases, inadequate infrastructure and limited domestic capital for investment, along with high upfront costs to install renewable energy technologies.

Gail Henry, sustainable tourism specialist with the Caribbean Tourism Organization, spoke about the need for local governments to create an enabling policy environment and encourage green

investment. She highlighted the critical role of private sector players in creating a sustainable renewable energy sector and noted that most hotels and resorts are looking for projects with a payback period of five to seven years, which have clearly defined cost savings and good opportunities for green marketing and branding. Capacity building is crucial both for the public and private sectors, she added, noting that facilities staff in hotels often lack knowledge of renewable energy systems.

Stelios Himonas, permanent secretary at the Ministry of Energy, Commerce, Industry and Tourism, and Angelos Loizou, president and chairman of the Cyprus Tourism Organisation, discussed particular challenges in Cyprus. Despite the opportunity for hotels to offset high cooling costs, there is a lack of knowledge on the function and benefits of renewable energy technologies in the tourism sector, they said, highlighting the need for tailored advice. More sophisticated information is needed on operation and maintenance costs, as well as on what to do with renewable energy systems at the end of their life cycle. Legislative and regulatory frameworks also need to be revised, so that tariffs reflect the cost of generation and renewables can compete in an open market with all other generation options.

#### **SITE VISIT AND DINNER AT AYII ANAGYIRI:**

The two-day event wrapped up with a trip to the Ayii Anagyri Spa and Hotel Resort, giving participants to chance to see a many different renewable energy technologies installed at the facility, including solar PV-driven pool pumps, solar water heaters, heat pumps and ground-source variable refrigerant volume (VRV) chillers.