



# IRENA Bulletin

**A Summary Report of the International Renewable Energy Agency (IRENA) Events at the World Future Energy Summit (WFES)**

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## SUMMARY OF THE INTERNATIONAL RENEWABLE ENERGY AGENCY (IRENA) EVENTS AT THE WORLD FUTURE ENERGY SUMMIT (WFES): 19-21 JANUARY 2015

### MONDAY, 19 JANUARY 2015

#### REGIONAL RENEWABLES: POWER WITHOUT BORDERS

Dennis Volk, International Renewable Energy Agency (IRENA), moderated the session. Gürbüz Gönül, IRENA, said that for many renewables, more competition could be key for reaching the next level of innovation and performance. Highlighting the importance of developing regional institutions and transmission infrastructure, he reported on IRENA's work on regional clean energy corridors.

Volk presented the new Regulatory Empowerment Project, which is already being implemented in the Southern African Power Pool project and is at the scoping stage in Central America. Following IRENA's work on zoning high-potential areas, he said this was the next step in bringing renewable energy resources closer to utilization.

Anders Plejdrup Houmøller, Houmoller Consulting, Denmark, explained how Nordic and Baltic countries trade electricity in a common market, including regulating power. He said a growing share of variable electricity sources require incentives for generation capacity that can be regulated up or down as required to maintain grid parity.

Bo Diczfalusy, Ministry of the Environment and Energy, Sweden, presented the Swedish green certificate system for renewable electricity generation in which certificates are traded on a parallel market, where demand is created by legal requirements but prices adapt to market forces. Diczfalusy highlighted that this is not financed via the state budget, minimizes the costs for consumers and allows for prompt delivery to preset targets.

Diczfalusy added that a common certificate market, as operated by Sweden and Norway since 2012, could further improve operability and cost-effectiveness. Noting that political will is required to agree on targets and accommodate national flexibilities, he highlighted prior market integration and roughly equivalent renewable potentials as facilitating factors.

Presenting the results of an IRENA report soon to be published, Houmøller reported on the lessons learnt from Swedish-Norwegian certificate market. He said simplicity, transparency and an overarching European Union (EU) target were key for its success.

**REGIONAL APPROACHES TO RENEWABLE ENERGY INTEGRATION:** Estella Pancaldi, Gestore dei Servizi Energetici Spa (GSE), emphasized the need to ensure



Participants entering the venue of the World Future Energy Summit

that all relevant stakeholders are on board and that there is consensus on integration. She also highlighted the need for: quantitative analyses; monitoring and evaluation; basic infrastructure; and common rules to provide investor certainty.

Peter Kaderják, Energy Regulator Regional Association (ERRA), discussed the Black Sea Regulatory Initiative, highlighting a joint transmission development project between Turkey and Georgia to develop Georgia's hydro resources for export to Turkey. On factors leading to success, he mentioned: physical integration of the two respective power systems, market integration and agreement on cross-boarder access rules.

Ahmed Al-Ebrahim, Gulf Cooperation Council Interconnection Authority (GCCIA), highlighted a super grid, linking the six GCC countries since 2009. Al-Ebrahim said recent studies suggest that savings of US\$1.8 billion could be made by exchanging power over the interconnected grid and that the next challenge is to create a power market. He noted that fuel subsidies distort the real price of electricity and diminish the benefits of a power market.

On the benefits of an integrated regional approach, Elijah Sichone, Regional Electricity Regulators Association of Southern Africa (RERA), observed that a Southern Africa power pool study indicated that the development of least cost

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L-R: Estella Pancaldi, Gestore dei Servizi Energetici Spa (GSE); Ahmed Ebrahim, Gulf Cooperation Council Interconnection Authority (GCCIA); Stefan Gsanger, The World Wind Energy Association (WWEA); Péter Kaderják, Regional Centre for Energy Policy Research (ERRA); Chaiwat Muncharoen, Asian Greenhouse Gas Management Center (AGMC); and Elijah Sichone, Regional Electricity Regulators Association of Southern Africa

projects could lead to savings of US\$48 billion by 2025. He noted that 95% of electricity is traded on bilateral basis, with studies indicating that by trading within the region, annual savings of US\$3 billion could be made. On challenges, he cited: the lack of a shared vision on regional integration with national policies failing to integrate regional commitments; high financial costs; bureaucratic harmonization processes; weak market oversight; absence of national electricity plans; prioritization of domestic interests over regional integration; and weak, understaffed regional institutions.

Chaiwat Muncharoen, Asian Greenhouse Gas Management Center (AGMC), provided perspectives from the Association of Southeast Asian Nations (ASEAN) region, noting that high population growth is resulting in an increasing demand for electricity. He emphasized the need for renewable energy assessment tools, noting that ASEAN countries are at different stages of development, which has implications for regional integration.

Stefan Gsänger, World Wind Energy Association (WWEA), discussed the required framework for wind investors and shared views on regional approaches. He noted that while in theory there is enough wind to cover global energy demand, in practice wind has to work with other solutions, noting that integration makes sense in larger regions after a 40% renewable energy uptake. Gsänger emphasized that investors need to be confident about recouping their investment so frameworks that incentivize flexible solutions are the best.

Wrapping up the session, Volk noted that to develop regional power markets, a clear goal and political will is required and that inclusion of renewable energy adds to the complexity. He noted that support schemes could allow for differentiated risk allocation to market players if the pricing frameworks are right and subsidies are addressed.

### ***SOCIO-ECONOMIC BENEFITS OF RENEWABLE ENERGY IN MIDDLE EAST AND NORTH AFRICA***

**INTRODUCTION TO THE SOCIO-ECONOMIC BENEFITS OF SOLAR AND WIND ENERGY:** Rabia Ferroukhi, IRENA, reported on IRENA's Multilateral Solar and Wind Working Group's econValue project in partnership with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and others, to analyze the socio-economic benefits of renewable energy deployment.

Anita Richter, GIZ, observed that the Socio-economic Benefits of Solar and Wind Energy report proves the potential for value creation, including jobs from solar and wind technologies and supporting activities.

### **MAXIMIZING SOCIO-ECONOMIC VALUE**

**CREATION THROUGH POLICIES:** This session moderated by Ulrike Lehr, Institute for Economic Structures



Ulrike Lehr, Institute of Economic Structures Research (GWS)

Research (GWS) addressed policies in the socioeconomic value chain that support deployment of renewable energy at country or regional level.

Lehr and Barbara Breitschopf, Fraunhofer Institute for Systems and Innovation Research jointly presented relevant policy fields and their implementation. They noted that greening of an economy requires mainstreaming of energy efficiency into all policies in order to enhance value creation.

Deployment policies they reported are instruments that support demand for renewable energy technologies and consequently promote value creation through increased investment in the energy sector. They emphasized political and economic stability as key elements affecting financial markets for renewables, certainty of foreign investment and long-term planning. They observed that for successful local content policies, the size of the expected market is an important consideration and that for companies operating in countries with smaller markets, a regional approach is best suited.

Steffen Erdle, GIZ, explored key tradeoffs and priority issues for optimizing socio-economic benefits of renewable energy. He remarked that the Global South has distinct circumstances that often go unrecognized by policy makers and investors in the Global North, such as: frequent supply crunches amid growing demand; serious supply bottlenecks for capital, technology and other inputs; and vertical integration and monopolization of existing electricity systems. Erdle said that these circumstances require special frameworks for renewable energy investment and deployment, which must prioritize objectives for energy security, environmental sustainability, economy, and other socio-political goals. He said that prioritizing these objectives yield policy tradeoffs between: short-term project costs versus longer-term socio-economic



Steffen Erdle, GIZ

outcomes; manufacturing versus labor markets; and the openness of the grid to participation of small, private producers and investors.

**PRIVATE ENTERPRISES:** Khalid Benhamou, Managing Director, Sahara Wind, using the experience of Morocco presented the role of private sector in a bottom up process. Emphasizing the role of local players in financing, research and opening markets in the value chain, he noted that the steel industry in Morocco has opened markets for steel trading with solar and wind energy sectors.

Giovanni Simoni, CEO Kenergia Srl, discussed the link between renewable energies and economic growth through the Solar Breeder Initiative aimed at developing and managing an industrial district in Morocco. The initiative, he noted, will enhance co-investment and involve local and international energy and water markets and improve value chains of local companies.



Giovanni Simoni, CEO  
Kenergia Srl

**REGIONAL APPROACH:** El Habib El Andaloussi, UN Economic and Social Commission for Western Asia (UNESCWA), reported on regional initiatives including the Fifth International Forum on Energy for Sustainable Development held in Tunisia in November 2014.

Ashraf Kraidy, League of Arab States, highlighted the Arab Energy Framework aimed at harmonization of standards among Arab states, noting the need for development of a global policy framework and indicators to better assess socio-economic impacts of renewable energy.

**METHODOLOGIES FOR ASSESSING SOCIO-ECONOMIC IMPACTS AND CRITERIA FOR THE SELECTION OF THE RIGHT TOOLS:** Breitschopf and Lehr presented methodologies for assessing socio-economic impacts and criteria for selecting methodologies appropriate to policy goals.

Breitschopf stressed the need to consider both benefits and costs of renewables as well. She identified several questions policy makers should consider before embarking on assessments, including the level, actors, types of impacts to be considered. Giving examples of two kinds of models—an employment factor and input-output approach—she illustrated the relevance of model choice to various policy questions, such as job creation, the distribution of costs and benefits, and cross-sector interactions.

Álvaro López-Peña, IRENA, conveyed key messages from IRENA's econValue report on the selection and application of tools to assess the socio-economic impact of renewables. He noted that, while complex and time consuming, sound quantitative analysis of the expected socio-economic effects of renewable deployment is essential to making informed policy choices. He offered guidelines for conducting sound assessments, underscoring the importance of reliable



Barbara Breitschopf,  
Fraunhofer Institute for  
Systems and Innovation  
Research (ISI)

information to communicating benefits to the public and ensuring the economic sustainability and stability of policies over the medium-term.

Natalia Caldes, Spanish Research Centre for Energy, Environment and Technology (CIEMAT) presented a model for understanding the effects of renewable energy. She noted that even though the model has not been used in the energy sector it could provide a “clinical diagnosis” of the sector's performance tailored to both grid and off-grid energy parameters.

In ensuing discussions, participants noted, *inter alia*: a need for IRENA to assist countries applying models for socio-economic impact assessments; and that financial institutions would benefit by assessing the benefits versus costs of projects they fund.



Seleha Lockwood, IRENA

#### **FUNDING OPPORTUNITIES FOR RENEWABLE ENERGY PROJECTS IN DEVELOPING COUNTRIES THROUGH THE IRENA/ABU DHABI FUND FOR DEVELOPMENT PROJECT FACILITY**

Seleha Lockwood, IRENA, presented on funding opportunities for renewable energy projects in developing countries. She explained that, as part of the UAE's bid to host IRENA, the government pledged

US\$350 million in concessional loans over seven annual cycles through the Abu Dhabi Fund for Development (ADFD) for renewable energy projects recommended by IRENA in developing countries, with around US\$50 million committed to each annual project cycle. She noted that the loan amount for each project is up to 50% of the estimated total project cost and ranges from US\$5 million to US\$15 million per project. Lockwood emphasized that projects must be transformative, replicable scalable, innovative, improve energy access and address energy security.

Lockwood noted that: only IRENA members are eligible to apply; projects must be for renewable energy or renewable energy combined with energy efficiency; loans should be used for activities or assets directly related to the projects; and that ADFD requires applications to be supported by a government guarantee.

She explained that in the first cycle US\$41 million in concessional loans was allocated with US\$42 million from other sources, which resulted in 21 MW of new capacity. Beneficiaries included Ecuador, Mali, Maldives, Mauritania, Samoa and Sierra Leone.

In the second cycle she reported that US\$57 million was allocated with matching funds of US\$83 million from other sources, resulting in 35 MW of new capacity for the following countries: Argentina, Cuba, Iran, Mauritania, and Saint Vincent and the Grenadines.

Lockwood pointed to improvements in the third cycle, highlighting better lending terms, reduced interest rates of one percent for low-income countries and two percent for middle-income countries and a 20-year loan period with a five-year grace period. She said there is increasing focus on leveraging co-funding.

Responding to a question she said individuals can apply but they would need a government guarantee letter, which means that most projects are government initiated. She clarified that concentrated solar power (CSP) projects could be supported if they met the other criteria.

## TUESDAY, 20 JANUARY 2015

### MINI-GRIDS OUTLOOK: POLICY AND TECHNICAL INNOVATION

Rabia Ferroukhi, IRENA, introduced a panel moderated by Salvatore Vinci, IRENA, on policies and regulations for scaling up mini-grids.

Nico Peterschmidt, Managing Director, INENSUS, explained that the financial viability of mini-grids depends on a range of factors, including the size and economic strength of the community to be serviced, density of the population, distance to the national grid and complexity of the terrain. He stressed that private sector investment requires the possibility of profit, which rests on both financial factors, such as accessibility to debt finance and foreign exchange risks, as well as regulatory ones, including cost-covering tariffs, supportive legal framework and assurance that mini-grids will not face competition from the arrival of the national grid in the near future.



Nico Peterschmidt, INENSUS GmbH

Daniel Kammen, University of California, Berkeley, highlighted the “sweet spot” where mini-grids can deliver modern energy services to rural areas at an affordable cost. Kammen noted the need to pool technical and social experiences and other resources to encourage operators to scale up mini-grids. He also underlined the need for regulations that support operators, for example with billing and banking services that enable mini-grids to deliver services on par with the national system.

Ernesto Macías Galán, President, Alliance for Rural Electrification, said that technical solutions are not yet fully developed, cautioning that technical complexity can jeopardize projects. Nevertheless, he indicated that advanced photovoltaic

(PV) modules, electronics and other technological innovations

have made forms of power management possible that were infeasible only a few years ago. He also cited the importance of combining public and private finance as well as local partners and additional resources, and he recognized the contributions from IRENA in SE4ALL to this end.

Dilip Kumar Khare, Ministry of New and Renewable Energy, India, remarked that mini-grids offer an important means of bringing electricity to the 300 million people who lack it in his country. He noted that India’s delicensing of power generation and transmission has opened new possibilities for scaling up mini-grids in rural areas but said a significant need remained for training local people and building capacity for system operation and maintenance. Khare also cited the need for reduced cost lending and guarantees to rural people to make finance viable.

During the ensuing discussions, Kammen remarked that what seems like hardware problems are often social challenges, for instance, involving, utility billing and collection of payments, stressing the value for early community engagement to avoid future inefficiencies and backlash. Peterschmidt noted that projects must be of sufficient scale to cover a company’s fixed costs in order to attract private investment. Other topics included the incorporation of mini-grids into the national grid, impact of advancing technology on financial viability and tailoring solutions to local conditions.

**CURRENT TECHNOLOGICAL CHALLENGES AND FUTURE INNOVATION TRENDS ON MINI-GRIDS:** Doff Gielen, IRENA, introduced the session. Xavier Vallvé, Trama TecnoAmbiental, Spain, elaborated on the definition and differentiation of mini-grid systems. On challenges for mini-grid deployment, he mentioned that battery storage becomes the highest cost item in micro-grid systems, particularly now that fuel prices are coming down, noting that lifetime considerations, replacement issues and environmental impacts are also significant. On remote monitoring, he said it is important to reduce the cost of the supervisory management of plants. On IRENA’s role he said the Agency can support:



Ernesto Galán, Alliance for Rural Electrification



L-R: Ruud Kempener, IRENA; Yannick Julliard, Siemens; Xavier Vallvé, Trama Tecno Ambiental; Oussama Chehab, SMA Solar Technology AG

the development of policy and regulatory frameworks; country data and statistical compilation; and technical assistance to governments.

Yannick Julliard, Siemens, discussed sustainable infrastructure for micro- and mini-grids. He observed that micro-grids are almost as complex as grid-connected systems and that micro-grids now have the option to be fueled with renewables. On technical issues, he noted that too many mini-grids have been fueled with diesel, which presents social and economic challenges. He said maintenance of voltage and frequency balancing is an issue and that storage and demand side management systems are needed. He highlighted that for island and remote communities fuel transport costs are a considerable expenditure and that long-term sustainability of fuel supply is also an issue.

Ruud Kempener, IRENA, highlighted technological trends on electricity solutions for mini-grids, noting that electrical storage systems are rapidly developing and reducing costs.

Oussama Chehab, SMA Solar Technology AG, discussed the current status and future technological trends on control systems for a user uptake of renewable energy based mini-grids. On technological challenges, he highlighted: security of power supply; grid quality; and management of back up power capacity. He observed that SMA has developed a fuel saver controller that allows for the smart integration of PV systems on gensets without batteries.

#### **GULF COOPERATION COUNCIL REGIONAL ENERGY MARKET ANALYSIS**

##### **RENEWABLE ENERGY IN THE GULF**

**COOPERATION COUNCIL:** Rabia Ferroukhi, IRENA, moderated the session, reporting that the growing demand for energy in the GCC region is one of the highest in the world and that reduced earnings from fossil fuel exports is driving the growing need for energy diversification through renewables. Solar in the GCC, she noted, has the potential to create over 100,000 jobs and is competitively lower priced than gas, adding that renewable energy use in the GCC could reduce water withdrawals for power generation by 20% in 2030.

##### **REGULATION AND POLICY: BARRIERS AND**

**OPPORTUNITIES:** Hannes Reinisch, Ministry of Foreign Affairs, UAE, invited the panel to provide an overview of current developments in their countries. He highlighted policy adaptation to dynamic cost reductions as a challenge, asking whether the halving of oil prices could lead to a doubling of renewable energy targets in the GCC region.

Reporting on projects in Kuwait, Ayman Al-Qattan, Kuwait Institute for Scientific Research, said new energies were increasingly in the focus of governmental stakeholders. Recalling the Renewables Readiness Assessment (RRA) and other work with IRENA, he underscored the need to “not only have studies on our shelves, but also projects on the ground.”

Fahad Abu-Mouti, King Abdullah City for Atomic and Renewable Energy (KACARE), Saudi Arabia, highlighted local value and job creation as a major impetus behind the initiative. He said that GCC countries need not “import the

sun.” Reporting on recent progress on grid and electricity law reform, he cautioned that change after decades of business-as-usual requires “partners, not force.”

Noting that specific policy schemes were soon to be adopted, Fahad Hamad Al-Tamini, Qatar Petroleum, said his country was working to be a renewable energy leader. Noting a steep decline in the breakeven point of renewable energies in Qatar, he predicted that with the correct math and an institutional framework in place, “money follows opportunity.”

Taher Diab, Dubai Supreme Council of Energy, highlighted that, in the case of Dubai, bringing together all key stakeholders under a single institutional umbrella was key to organizing a very structured deployment process, which “build up the appetite” and leads to low solar pricing. Noting that a broader policy including efficiency measures would still take time, he questioned whether now is a convenient time to reduce oil subsidies and channel that money into renewables investment.

Imtiaz Mahtab, Middle East Solar Industry Association, noted that while the market had expanded significantly, the GCC region had not advanced as fast as expected. Noting that projects like Masdar City are geared towards renewable growth, he said, “we are on track and only need to speed up a little.”

**FINANCING SCHEMES IMPLEMENTED IN THE GCC:** Moderator Gus Schellenkens, PricewaterhouseCoopers, noted that the levels of risk that investors are willing to take would determine the pace of renewable energy uptake in GCC countries. Rajit Nanda, ACWA Power, noted that the GCC would see great progress in PV uptake since local banks are willing to take long-term credit risks in renewables, leading

to a highly optimized capital structure. In the past, he noted, investors have had to carry out awareness building and present the rationale of investments in renewables in order to gain financiers’ interest.

Dana Younger, International Finance Corporation, said the private sector and banks play an important role in the development of key markets in renewables and highlighted several initiatives of his organization in GCC in solar and wind.

Daniel Zywiets, CEO, Enerwhere, presented his organization’s financing models for solar-diesel hybrid energy solutions for off-grid and temporary power markets. He reported that unlike others, they are providing small-scale solutions in commercial and domestic sectors including rural electrification projects.

In ensuing discussions, participants noted the need to remove inefficiencies in markets that cause higher tariffs in energy; that there will be more financing developed towards



**Taher Diab**, Dubai Supreme Council of Energy



**Ayman Al-Qattan**, Kuwait Institute for Scientific Research



**Dana Younger**, International Finance Corporation

hybrid renewable energy solutions; and that the GCC has both financial and human capacity to drive innovation through creative financing.

**SOCIO-ECONOMIC BENEFITS AND THE NEXUS DIMENSION:** Moderator Rabia Ferroukhi, IRENA, invited views on job creation and industry development in the renewables sector. Raed Bkayrat, First Solar, highlighted that both PV and CSP provide great opportunities for job creation. Observing that manufacturing capacities do not rank very high in this respect, he said existing local commercial capacities could often be adapted to take on the new tasks. Steve Griffiths, Masdar Institute, drew attention to high-skilled jobs created in research and development. Amro Elshurafa, King Abdullah Petroleum Studies and Research Centre (KAPSARC), stated that it had been confirmed by economists that renewables require more workforce per kWh than conventional energy. By implementing the Dubai Integrated Energy Strategy 2030, for example, it has been estimated that 177,000 jobs would be created, Ivano Iannelli, CEO, Dubai Carbon Centre of Excellence, said. Glada Lahn, Chatham House, identified the setting of standards in new skills and trainings as an opportunity for cooperation in the GCC region.

Ferroukhi then solicited views on the water, energy and food nexus. Bkayrat clarified that, in contrast to widespread belief, photovoltaic solar energy cells deployed in the desert could be cleaned without using any water. Elshurafa advocated electricity-based solutions that could then be run with clean energy, for example in desalination plants.

Discussions ensued on the relative merits of renewables as compared to oil-driven solutions. Lahn said that adequately reflecting the costs of conventional energy along the whole value-creation chain would result in higher estimates of savings through renewable energies, for example in the agricultural sector.

**REGIONAL COOPERATION:** Roula Majdalani, UNESCWA, moderated the session. Ahmed Ali Al-Ebrahim, CEO, GCCIA, said promoting power trading in GCC states faces several challenges due to poorly designed subsidies and the lack of harmonized regulatory frameworks and agreements to ensure interconnection.

Bkayrat presented examples of his organization's contribution to sustainability in renewables.

Hassan Qasem, Kuwait Institute for Scientific Research said his organization is supporting GCC countries by enabling collaborative regional research. He noted the support of IRENA in this regard and the need for application of research results to provide recommendations for improved regional standards and sharing of technologies.

### **A FRAMEWORK FOR ENHANCED RENEWABLE ENERGY TECHNOLOGY ADOPTION IN DEVELOPING COUNTRIES**

Moderator Dolf Gielen, IRENA, said that technology transfer is often misunderstood to consist in the licensing of a technology only, when in fact a whole policy framework needs to be in place for it to really happen.



Linus Mofor, IRENA

Linus Mofor, IRENA, explained that developing countries need not only to deploy renewables but also localize the value-chains of the required technologies. He then presented a framework for enhanced technology transfer, the proceeds



Claudia do Valle, Universidade Federal do Rio de Janeiro

step-by-step: choose a suitable technology; identify cross-sectoral linkages; analyze barriers and challenges; create an enabling environment; adopt a strategy for technology acquisition; and develop the required capacity accordingly.

Claudia do Valle, Universidade Federal do Rio de Janeiro, showed how this framework applies to bioethanol from sugarcane in Africa. Besides the maturity of

the technology, she said the choice of bioethanol was rooted in the great productivity of sugarcane in 37 African countries with four already producing fuel-grade bioethanol. She highlighted cross-sectoral linkages to land tenure and land use, food security, trade and water management, observing that specific barriers and solutions must be considered on a country-level. In creating an enabling environment, she highlighted the need for clear goals and standards that enhance security for investors as well as integrating key actors along the whole supply chain, in this case the automobile and petroleum industries.

Reflecting on lessons learned from this case study, Mofor cautioned that compared to Brazil, African water resources are less abundant and investments in biofuel technology had not been as consistent. Gielen remarked that applying this framework to other technologies may yield less complex results.

Monga Mehlwawa, Economic Commission for Africa (ECA), presented the Localization of Clean Energy Technologies in Africa project, which is assessing how countries can: assess and select appropriate technologies and business models; link technologies to skills development, knowledge and technology transfer; contribute to industrial policy; and address policy regulation barriers. He concluded that in the case of biofuels, even though the value chain may provide benefits to rural communities, the requirements for food and water override benefits accrued in energy.

In ensuing discussions, participants called on IRENA to take on the challenge of ensuring technology transfer to developing countries, noted that ethanol production and potential in Africa has been compromised by falling prices of crude oil in the past years, and observed that there is a need for clear justification due to competing land-use concerns.

### **THE NEXT GENERATION OF RENEWABLE ELECTRICITY POLICIES: HOW RAPID CHANGE IS BREAKING DOWN CONVENTIONAL LABELS**

Rabia Ferroukhi, IRENA, moderated this session. Salvatore Vinci, IRENA, presented the 'Adapting Renewable Energy Policies to Dynamic Market Conditions' report, highlighting that policies have driven advances in renewable energy markets. He observed that



Rabia Ferroukhi, IRENA

keeping pace with rapidly decreasing costs of technology is a challenge for policy makers, highlighting among others the difficulty of integrating renewables into the grid system.

Victoria Healey, Clean Energy Solutions Center, presented her organization's work in supporting government design and adoption of policies for deployment of clean energy technologies. She highlighted the "ask an expert" forum, which responds to assistance requests on strategies, regulations, standards, financial incentives and deployment programs for a broad range of clean energy sector technologies.



Victoria Healey, Clean Energy Solutions Centre

Toby Couture, Director E3 Analytics, discussed the 'Next Generation of Renewable Electricity Policy' paper, which analyzes how rapid change is breaking down conventional labels given to renewables in electricity policy. He reported that with the absence of new labels, policymakers have mostly continued to use the same policy labels despite the fact that they are no longer referring to the same processes. He further said that policy makers are combining policy design elements, giving rise to the new next generation renewable electricity policy, even though most of these labels are misleading and it remains unclear what the policies are intended to achieve and why.



Toby Couture, Director, E3 Analytics

Jörg Mayer, German Solar Industry Association, presented the challenges Germany faces in adapting its legislation, which has led to 80 percent variable wind and solar electricity at peak times and contributed to a 68% decline of photovoltaic prices. To enter the final stage of phasing renewables into the market, he reported that guaranteed feed-in tariffs for plants with a nominal output exceeding 500 kWh had been replaced by a flexible direct-to-market premium, providing incentives

to recoup a larger share of the costs at the market. The next steps, he said, consisted of introducing auctions and creating incentives to provide flexibility, both in generation and consumption, as outlined in the government's Green Book on electricity market design.

In the ensuing discussions, the audience highlighted that while the tools were known and all at hand, the challenge was to adopt the right mix of instruments in accordance with varying priorities and preconditions. Ferroukhi drew attention to IRENA's report on designing auctions. Couture noted that standardized tendering functions much like feed-in tariffs. Mayer said that these would still be required in the foreseeable future, unless meaningful carbon pricing was introduced. Couture advocated net metering and self-consumption as an alternative, which unlike large-scale auctions, enhance energy security by stimulating local capital markets.

Discussions also highlighted the importance of price signals. In enhancing flexibility, Couture recommended looking into the demand-side as well. Mayer explained that dispatching demand at solar peak times would facilitate refinancing at the market. Couture suggested redesigning the projects and services traded at the electricity market.

### **RENEWABLE ENERGY KNOWLEDGE – GLOBAL CHALLENGES**

Moderator Nicolas Fichaux, IRENA, noted diversity in the renewables sector and the need to be in the position to capture trends and predict what will happen in the future.

Christine Lins, Executive Director, Renewable Energy Policy Network for the 21<sup>st</sup> Century (REN21), presented on capturing the market transformation in renewable energy. She explained that REN21 is a multi-stakeholder network dedicated to the rapid uptake of renewable energy worldwide. She highlighted that the projected levels of renewable energy for 2020 had already been surpassed in 2010 and that 27% of global power generation capacity today is from renewables. She noted that the heating and cooling sector needs more attention in the context of renewables, which account for only 10% of usage in the sector.

On the renewable energy policy landscape, she reported that 144 countries have renewable energy targets and at least 138 countries have renewable energy policies, out of which 95 are in developing countries. She noted: that global perceptions on renewable energy have shifted; the need to improve energy data to monitor advancements in achieving renewable energy



L-R: Rabia Ferroukhi, IRENA; Toby Couture, Director, E3 Analytics; Salvatore Vinci, IRENA; Jörg Mayer, German Solar Industry Association; Victoria Healey, Clean Energy Solutions Centre

transition; the need for a level playing field in the entire energy sector; and the importance of long-term and differentiated policy frameworks to sustain and increase investment levels.

Paolo Frankl, IEA, presented on capturing the market transformation and forecasting market trends in renewable energy, noting that renewable energy is projected to scale up by 45 percent from 2013 to 2020 and that the heat sector is the most difficult to track, with the market being much more fragmented. He noted that the biofuels market is stalling, with prospects looking doubtful in the absence of clear policy and the fallout from low oil prices, noting the correlation between GDP and electricity growth. He highlighted the IEA/IRENA Renewable Policy and Measures Database and the IEA Medium Term Renewable Market Report 2014 Analysis and Forecast of Investment.

Martin Hiller, Director General, Renewable Energy and Energy Efficiency Partnership (REEEP), highlighted the imperative of new systems to organize the explosion of climate and energy knowledge, saying there is a danger of “getting lost in this growing ocean of information.” He highlighted the Climate Knowledge Brokers (CKB) Group’s efforts to make information more accessible and transparent by: understanding user needs, signposting platforms, connecting climate websites and encouraging peer-to-peer learning. He described how one software tool, called Climate Tagger, is bringing together users under a common vision by standardizing terminology in a manner that makes widespread data sharing possible.



Martin Hiller, Director-General, REEEP further discussions on the draft outcome document

Tareq Emtairah, Executive Director, Regional Center for Renewable Energy and Energy Efficiency (RCREEE), and Nurzat Myrsaliev, RCREEE, presented their organization’s work monitoring renewable energy developments in the Middle East and North Africa. Emtairah highlighted RCREEE’s publications on renewable energy and energy efficiency as resources that inform interested investors with valuable country information. Myrsaliev offered further details on RCREEE’s Taqawise project, an initiative that uses international standards and open data to ensure accessible and quality information on various topics, including laws, energy prices, policies and regulations, energy statistics and key stakeholders.

Adam Brown, IEA, presented on the need for better knowledge about market transformations in the transport and heating sectors. Noting that the electricity sector is comparatively well tracked, he said the disparate and less-



Adam Brown, IEA

regulated transport and heating sectors post a much more difficult challenge. He said that it is crucial to improve data collection for these sectors now in anticipation of future growth over the next five to ten years, particularly in the areas of solar thermal for buildings and heat pumps for household heating and cooling.

In the ensuing discussions, panelists reflected on strategies to link IRENA’s Resource, a renewable energy information repository, with other knowledge tools and the possibility of creating standards to extend data sharing into the agricultural and water sectors. Brown commented that while even the most robust market scenarios encounter surprises, cross-scenario comparison can often anticipate critical developments. Lins noted, however, that the maturation of renewable technologies and markets have dramatically improved the accuracy of projections over the last decade ago. One participant remarked that rapid expansion of solar photovoltaics would likely make data collection more difficult.

#### **FINANCING SMALL SCALE RENEWABLE ENERGY PROJECTS**

This event was moderated by Amit Jain, IRENA. Henning Wuester, IRENA, introduced the session, noting impressive growth in investment in last few years but the need to find financing solutions for small-scale renewable energy projects. He said small and medium-sized enterprises are entering the market in developing countries.

Saleha Lockwood, IRENA, highlighted the ADFD and the need for exploring different sources of funding since the Fund is only able to provide US\$50,000 per year but has received requests for concessional loans amounting to US\$1.3 billion.

Roberto Ridolfi, European Investment Bank (EIB), observed that it is easier to finance larger projects, stressing the need for decentralized approaches to energy access. He highlighted the Electrification Financing Initiative (ElectriFI), which aims to generate business opportunities by supporting the private sector. He explained that electricity is provided for economic activities, which in turn cross-subsidize the cost of electrification to the local communities.



L-R: Ernesto Galán, Alliance for Rural Electrification; Roberto Ridolfi, European Investment Bank; Anthony Jude, Asian Development Bank (ADB); Nico Peterschmidt, INENSUS GmbH



Anthony Jude, Asian Development Bank (ADB), observed that rural electrification has been delegated to the NGO sector and that it is not acceptable to discriminate against rural populations. He highlighted the Simpa project aimed at facilitating better access to electricity in rural India through Simpa networks, by sales of off-grid, pay-as-you-go solar energy solutions. He explained that from the Bank's US\$2 million investment an additional US\$8 million was leveraged. Citing a biogas project in Viet Nam, he said if governments are willing to borrow, ADB could work with them, however cautioning that one size does not fit all.

Nico Peterschmidt, INENSUS, noted that business models only become financially viable when they reach a certain scale and that selling electricity for small amounts is a complex process requiring substantial resources.

Participants then discussed: definition of energy access; cross subsidization; partnering with the NGO sector; and due diligence.

## WEDNESDAY, 21 JANUARY 2015



Adnan Amin, Director-General, International Renewable Energy Agency (IRENA)

### **FINANCIAL INSTRUMENTS AND APPROACHES TO ADDRESS THE RISKS AND BARRIERS OF INVESTING IN RENEWABLE ENERGY - PRACTICAL WAYS TOWARD IMPLEMENTATION**

Adnan Amin, Director-General, IRENA, welcomed participants to the IRENA Expert Meeting. The first

session was moderated by Michael Eckhart, Citigroup.

Aleski Lumijärvy, IRENA, presented findings from IRENA's analysis on risks and barriers of investing in renewable energy and the effective utilization of risk mitigation instruments. He noted that most risk mitigation instruments are underutilized due to a lack of user demand. Key findings in the analysis, he said, include the need to address: elevated investment risks in developing countries; tailored risk instruments; and liquidity risks.

Sean Flannery, Meister Consultants Group as consultant for IRENA, spoke about the role of structured finance in mainstreaming renewable energy investment in developing countries. He said that policy makers must approach the challenge from an investor's perspective to attract greater institutional investment, highlighting securitization and credit rating criteria as instruments to evaluate mechanisms and lower transaction costs.



Sean Flannery, Meister Consultants Group

Michael Liebreich, Bloomberg New Energy Finance (BNEF), in reaction to Flannery's presentation, supported the approach of 'thinking like an investor,' noting that risk

mitigation tools should be designed to meet the needs of investors. He agreed on the need to focus on risk mitigation in contrast to the prioritization of subsidies and other support mechanisms that typify policy discussions. He further emphasized that when setting up risk mitigation instruments policy makers should not strive to eliminate all risks but only policy-related risks while also considering the impact of policies on barriers to entry, price discovery, and the ability of the private sector to raise capital.

Sean Kidney, CEO, Climate Bonds Initiative, underscored the importance of structural finance, and securitization in particular, to attracting capital from institutional investors. He pointed to standard contracts for wind and solar projects as an effective means to develop securitization markets, thereby reducing the cost of capital for such fragmented and disaggregated investments.

Christian Erich Grütte, Leonardo Venablers, noted a "cultural clash" between financiers and project developers. He said there is an overlooked need for developers to think about developing projects backwards by clarifying financial issues at the beginning, noting that the reverse is often true and that many otherwise good projects accordingly go unfunded.

Kasper Dalsten, Director, Vestas Wind Systems, remarked on the need to differentiate the forms of policy risk to investment in developing versus developed countries. He noted that projects in developing countries often have trouble securing investment even where renewables are more cost-effective than conventional sources, saying that standardization and flexible products can help remedy the situation. He also recommended a focus on addressing risks related to PPAs.

During the following discussion, participants addressed the need to reconcile cultural differences between investors and developers and underlined the importance to IRENA of building ties with the private sector. They also discussed the appropriate roles of the public and private sectors, the challenge of scaling up risk mitigation instruments and the need for conventional power to reflect its true costs.

**FACILITATING RENEWABLE ENERGY PROJECTS AND ADDRESSING RISKS AND BARRIERS:** Gauri Singh, Ministry of New and Renewable Energy, India, moderated the session.

Henning Wuester, IRENA, discussed IRENA's role in facilitating renewable energy projects and addressing risks and barriers. He explained that IRENA is setting up a project facility platform (PFP), a virtual marketplace to look at project initiation, provide technical tools to set up projects, facilitate project development and bring together financing institutions, instruments and investors. He said the platform will have an online component where proposed technically viable projects



Henning Wuester, IRENA, and Michael Eckhart, Citigroup

will be showcased. He added that a confidential part of the platform where deals can be negotiated will also be included in the platform as well as a risk mitigation facility.

Wuester said IRENA's goal is to launch the PFP during COP 21 in Paris at the end of 2015 and would initially focus on the African Clean Energy Corridor.

Harry Carpenter, European Bank for Reconstruction and Development (EBRD), welcomed the proposed PFP noting that many renewable projects are small and that the usual financing model is built around large projects. He pointed to an absence of accepted standard of risk allocation in power purchasing agreements (PPAs) and suggested that IRENA could play a role in addressing sensible risk allocation.

Michael Ahimbisibwe, Ministry of Energy and Mineral Development, Uganda, observed that in his country, banks give short-term loans because of the nature of business, while energy needs long-term financing. He highlighted a government credit facility to lengthen the lending period by leveraging funds for renewable energy financing. He noted that financing from the government is not sufficient and said IRENA could address capacity building for local financial institutions as well as policy harmonization.

Doreen Abeysundara, Sumimoto Mitsui Banking Corporation (SMBC) Europe Limited, highlighted two issues: pricing debt by insuring political and commercial risks; and working with credit worthy project sponsors on longer-term financing, tightening structures to ensure that money is paid back. She also pointed to the need for a stable policy and tariff regime.

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During in the ensuing discussion, participants debated the role that pension funds could play in providing financing and the need to structure products to attract pension funds. IRENA's role in addressing PPAs and technological risk was highlighted, with one participant observing that it is vital to avoid creating false expectations around technology.. Other comments were made on: currency risk; tools for customizing risk quantification; the need for standardized PPA formats; and the role of domestic capital in financing renewable energy projects.

**RENEWABLE ENERGY AND THE WATER, ENERGY AND FOOD NEXUS:** Rabia Ferroukhi, IRENA, moderated a panel discussion on integrated approaches to deploying renewable energy that maximize benefits across the energy, water and food sectors. She presented IRENA's 'Renewable Energy and the Water, Energy and Food Nexus' report, which highlights tradeoffs and decision-making tools across each dimension of the nexus, for example, energy for water security in arid regions, biomass for energy production or energy for irrigation.

Roula Majdalani, UNESCWA, said the nexus approach could bring coherence to the policy dialogue at the regional level and in the post-2015 agenda. She noted the approach extends the water community's debate on integrated water management into new sectors, lending a new way of thinking about cross-sectoral links and partnerships. She cautioned, however, that new links could also pose new threats, such as over-pumping groundwater with distributed solar power.

Simon Trace, Practical Action, noted that food, energy and water all face global shortages. He said that renewable energy will have a huge role to play in addressing these shortages by managing growth and improving access for the poor. He underlined that off-grid renewables, in particular, are needed to ensure universal energy access by 2030, adding that off-grid investments by development banks fall far short of what is needed.

Michele Ferez, EastWest Institute, endorsed the nexus approach as a pragmatic way to address risks and barriers. She also highlighted its usefulness as a tool to facilitate decision-making and open dialogue around political issues and policy tradeoffs but warned of the approach becoming a specialized dialogue that could preclude those discussions.

Manuel Pozo, Abengoa, said that it is important to devise legal and economic tools to encourage industry involvement. He offered success stories of how feed-in tariffs, subsidies and other mechanisms have made technologies commercially viable in the mining, waste and water sectors.

During the following question and answer period, participants explored various issues, such as the potential of the nexus approach for mediation and conflict resolution, and breaking down communication barriers between specialists. Other topics included off-grid energy solutions as a leapfrogging technology that democratizes power production and enhances disaster resilience; and the system-wide efficiencies that a nexus approach can provide.

### ***EVALUATING RENEWABLE ENERGY MANUFACTURING POTENTIAL IN THE MEDITERRANEAN PARTNER COUNTRIES***

**Opening session:** Mustapha Taoumi, IRENA, moderated this session. Gürbüz Gönül, IRENA, presented figures from a cost analysis of Mediterranean Partner Countries (MPC), noting that installation costs of solar and wind power were 25% lower in 2013 than in 2009. He reported on the collaboration with EIB to assess the capacity of the South Mediterranean region to attract investments. Eefje Schmid, EIB, said the possibilities of manufacturing renewable energy components in the region is great reporting on a total of €14 billion invested by her bank in the this region since 2002.

El Habib El Andaloussi, UNESCWA, discussed his organization's work in the region highlighting the fifth Beirut Energy Forum where a session was held on 'The Role of Renewable Energy in Socioeconomic Development in the Arab Region,' which



Michele Ferez, EastWest Institute

focused on the impact of renewables and efficient energy deployment and role of small and medium-sized enterprises in this respect.

Ashraf Kraidy, League of Arab States, said his organization supports renewable energy expansion in the region in partnership with IRENA, citing the 'Pan-Arab Strategy for



Gürbüz Gönül, IRENA



L-R: Khaled Elnimr, European Investment Bank (EIB); Ashraf Kraidy, League of Arab States; Eefje Schmid, EIB; Gurbuz Gonul, IRENA; El Habib El Andaloussi, UN ESCWA; and Mustapha Taoumi, IRENA

the Development of Renewable Energy Applications: 2010 – 2030,' which focuses on renewable energy technologies for electricity generation in the region.

**INTRODUCTORY SESSION:** Khaled Elnimr, EIB, moderated the session. Taoumi highlighted the renewable energy manufacturing potential study in Egypt, Morocco and Tunisia aimed at evaluating the potential for manufacture of components for renewable energy.

Alexis Gazzo, Ernst & Young, presented preliminary results of the study at an aggregate level. Across Morocco, Tunisia and Egypt, he noted that solar photovoltaics have very high job creation potential in downstream mounting, construction, electronics and cabling and a medium potential on raw material provision and module assembly. For CSP, he said potentials were high for construction, grid connection and mounting structures, medium for plant balancing and storage systems, and limited for the production of mirrors and receivers. Potentials for onshore wind, he added, mostly lie in upstream activities, but also in the production of masts, rotor blades and raw materials. On this basis, he shared recommendations for policies and regional cooperation that support local industry development, build R&D capacities and mobilize investments.

In the ensuing discussions, participants from the three countries expressed interest in: national workshops engaging industry representatives and a more detailed mapping of stakeholder relations; exploring the possibility of manufacturing PV inverters in the region; and comparing the feasibility of industry development with the policy alternative of imports. Due to budget constraints, Gazzo said that complementary work would be required to address these issues.

#### **PANEL DISCUSSION ON GOVERNMENT POLICIES AND MARKET SIZE FOR RENEWABLE ENERGY MANUFACTURING:**

Maged Mahmoud, RCREEE, moderated the session. Mohammed Mostafa El-Khayat, New and Renewable Energy Authority (NREA), Egypt, presented the experience of his country, noting that the study revealed that countries, financing institutions and investors need to consider development of: funding mechanisms, open and regulated markets; and incentives coupled with research and development.

Abdelkarim Ghezal, National Agency for Energy Conservation (ANME), Tunisia, said his country began promoting solar water heating in 2005. He reported local production of roof top solar components made affordable by reduced taxation of imported raw material. He urged progress in research on energy efficiency.

Christine Lins, REN21, emphasized the need for a flexible national energy regulatory framework, a large volume of energy capacity and stable political conditions in order to attract investment.

In ensuing discussions, participants discussed means of ensuring competitiveness of locally manufactured products against cheaper imported options from China and the need to enhance public sector involvement and cooperation.

**PANEL DISCUSSION ON PRIVATE SECTOR AND MANUFACTURING POTENTIAL:** José Donoso, Spanish Photovoltaic Union, explained that technology transfer in this sector is easier than for nuclear and fossil energy. Reporting on the development of manufacturing capacities in Spain, he highlighted market size as a key condition that is policy-driven. For sustainable industry development, he said it was crucial to provide a policy framework that is both stable and well coordinated for maximum cost efficiency.

Steve Sawyer, Secretary-General, Global Wind Energy Council (GWEC), underscored wind energy has a tendency to localize as much production as possible, so that even smaller markets could attract investments. As potential obstacles to investment, he mentioned local content requirements, lack of clarity in property rights and the limited availability of trained local specialists.

Khadija Dorra Esseghairi, Nur Energy, presented a CSP project in southern Tunisia. She highlighted that the technology is competitive and that many components such as mirrors, steel structures and cables can

be sourced locally. To overcome the limited incentives due to market size, she pointed to the importance of export and grid connections. She said local industry was enthusiastic once engaged and also stressed the role of clusters in connecting industry with R&D.

Khalid Benhamou, Managing Director, Sahara Wind, presented the Sahara Wind project based in Morocco. He explained that the cooperation with Mauritania helps source the raw materials for the wind power plants directly from the region. He reported that the best sites to exploit the North Atlantic trade winds are being tested with the support of local telecom operators. Noting that Morocco holds 75% of the world's phosphate reserves, he highlighted industrial synergies with the clean production of hydrogen.



José Donoso, Spanish Photovoltaics Union



Private sector and manufacturing potential panel discussants

In closing the event, Elnimir summarized the workshop discussions noting: the importance of technology transfer and capacity building; R&D; development of trade agreements in the region; improved competitiveness of local products; and the need for financial instruments, highlighting the role of EID.

#### **RENEWABLES READINESS ASSESSMENT: ANALYZING IMPACTS & READINESS FOR INVESTMENT IN SUSTAINABLE ENERGY**

Gevorg Sargsyan, World Bank, welcomed the participants. He said the new Readiness for Investment in Sustainable Energy (RISE) initiative, co-financed by IRENA, was not just a hypothetical exercise but a specific tool for states to “know where they stand and where to go” to reach the targets of the UN Secretary-General’s Sustainable Energy for All (SE4ALL) Initiative by 2030.

Gürbüz Gönül, IRENA, presented an analysis of the Renewables Readiness Assessment (RRA) conducted to date. He highlighted IRENA’s facilitative role in these country-driven, multi-stakeholder assessments that identify obstacles to renewable energy development on the ground and recommend policy solutions. He listed countries in which RRA recommendations have materialized into action, such as the Rural Electrification Agency in Niger and a tariff commission in Fiji. Among preliminary thoughts on how to make RRA more effective, he suggested enhancing visibility by launching events in the country and improving implementation via effective monitoring and donor coordination.

**PANEL DISCUSSIONS ON THE IMPACTS OF RRAS IN SELECTED COUNTRIES:** Gauri Singh, Ministry of New and Renewable Energy, India, noting that the large membership of IRENA presents a challenge for specific assistance, said RISE indicators provide building blocks for country-specific advisory services.

Energy sector directors from Mauritania, Nicaragua, Niger and Swaziland shared their experiences on RRA impacts on the energy sector, highlighting challenges and outcomes and gave feedback to improve the RRA process. They emphasized the need for capacity building and technology transfer and for the RRA to be publicly presented to stakeholders within their countries.

**PRESENTATION OF THE RESULTS OF THE RISE REPORT:** Sargsyan presented the RISE initiative of the World Bank in detail. To measure progress of individual countries in reaching the three SE4ALL targets, he explained that 28 indicators and 85 sub-indicators had been developed, focusing

on aspects of an enabling environment for renewable energy that policymakers can influence. While funding was secured to cover more than a hundred countries, he reported on findings of 18 pilot countries, revealing that many countries had no renewable energy policies in place and those that did often ranked poorly on accessibility, sustainability and predictability.

**PANEL DISCUSSIONS ON SYNERGIES BETWEEN RRA AND RISE:** Gürbüz Gönül, IRENA, moderated panel discussions on the synergies between RRA and RISE. Victoria Healey, Clean Energy Solutions Center, said her organization has a team of over 35 experts that provides support on clean energy policies and technologies useful for the RRA process.

Sargsyan highlighted that “if one has five minutes with a minister for energy, RISE provides the best way to articulate their country’s performance in energy access, renewable energy and energy efficiency.” He noted that one objective of this workshop was to obtain feedback from all stakeholders in order to refine indicators.

Participants discussed, among other things, that data gaps may give an impression of poor energy performance; the need to identify the audience for the indicators; and whether the presence or absence of a renewable energy agency is a suitable indicator of success.

In closing remarks, Gönül said that RRA could guide policy makers in planning and strategic development of renewables and that this process can build into the RISE outcomes and create a deeper dialogue. He said the challenge is how to align both processes in order to ensure outcomes aligned with government actions.

#### **GLOSSARY**

ADFD	Abu Dhabi Fund for Development
CSP	concentrated solar power
EIB	European Investment Bank
GCC	Gulf Cooperation Council
IEA	International Energy Agency
IRENA	International Renewable Energy Agency
PV	photovoltaic
RRA	Renewables Readiness Assessment
SE4ALL	UN Secretary-General’s Sustainable Energy for All Initiative