IRENA
International Renewable Energy Agency

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INTERNATIONAL RENEWABLE ENERGY AGENCY
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Annual report of the Director-General on the Implementation of the Work Programme and Budget for 2014-2015

Table of Contents

IRENA Highlights 2014

- IRENA membership rose to **139 countries** with additional 32 in the process of accession.
- The first institutional publication, ***REthinking Energy***, was released in September 2014 with presentations in Abu Dhabi, Paris, New York and Tokyo.
- Worked with nearly **90 Members** under various regional initiatives since 2011.
- ***REmap 2030 – A Renewable Energy Roadmap*** launched at the SE4ALL Forum in June 2014, complemented by roadmaps on manufacturing and biomass supply and demand, and country reports for China, UAE and USA.
- Additional Renewables Readiness Assessments conducted in 2014 brought the total to **22 countries** in Africa, Asia, the Caribbean, Latin America, Middle East and the Pacific since 2011.
- In cooperation with ADFD, allocated **USD 41 million** in concessional loans to six projects in January 2014, leveraging additional USD 42 million.
- ***Renewable Energy and Jobs-Annual Review 2014*** launched in May 2014.
- IEA/IRENA Global Renewable Energy Policies and Measure Database, which currently holds around **1,800 policies from 116 countries**.
- The **Renewable Energy Forum** in Apia, co-hosted with New Zealand and Samoa, convened some 300 participants.
- **400 participants** attended the second International Off-Grid Renewable Energy Conference, **IOREC**, in Manila, Philippines, organised in partnership with the Asian Development Bank and the Alliance for Rural Electrification.
- Delivery of nearly **40 programmatic activities** around the globe as part of IRENA's knowledge dissemination strategy.
- IRENA led the renewable energy action area for the **UN Secretary-General's Climate Summit.**
- The **Africa Clean Energy Corridor** was endorsed by Heads of State and Government at the Climate Summit, with 31 additional government, private sector and other partners joining the initiative
- SIDS Lighthouses initiative launched at the Climate Summit and joined by **27 SIDS and 14 other partners.**
- More than **25 publications** released.
- **4,600** media news items in at least 107 countries, garnering nearly 80 million potential viewers.
- **3.5 million** page views for the IRENA website and more than **9 million** page views for IRENA publications.
- **255,000** social media followers.
- **26 Permanent Representatives** appointed to IRENA, from two in January 2014.
- Members' portal, **REmember** has 500 users from 120 countries.

1. In its third session, the Assembly decided to approve the biennial work programme and budgetary cycle effective 2014-2015 as the first biennium, and requested the Director-General, "to continue to submit annual reports on the progress in implementation of the biennial work programme and budget as well as requests for adjustments, as required". The present report provides a detailed account of the Agency's performance in 2014, the progress made in the implementation of the biennial Work Programme and results delivered.

2. In 2014, IRENA continued to foster its leading position in providing support to governments in their transition to a renewable energy future by serving as a global hub for renewables, a source of advice and assistance to countries, and a principal platform for international cooperation. As the transformation to a clean energy system has risen to the forefront of the global agenda, so has the relevance of IRENA's mission.

3. In its first edition, released in September 2014, IRENA's institutional publication REthinking Energy examined the role of renewable energy in the transformation towards a clean energy system. Focused on the power sector, it explores the change underway, presents what an energy system powered by renewables might look like, and underlines how policy makers can further support the transformation. REthinking Energy sends a clear message that a renewable energy future is possible, cost effective and will have dramatic benefits for the whole society. It also highlights that the transformation requires the collective, long-term commitment of all stakeholders, including governments, citizens, financiers, private sector and international agencies.

4. Declining technology costs, clear examples of success around the world, better business models and available investment have created a momentum of opportunity that is increasingly being seized. The competitiveness of renewables is increasingly evident. The latest example of a bid by Saudi Arabia's Acwa Power in response to a public tender launched by Dubai's electric utility for 100 MW of photovoltaic capacity demonstrates that renewables are competitive in a fully commercial, unsubsidized setting. Unprecedented 5.98 USD cent/kWh bid reflects the continuing technical, commercial and financial innovation in the renewable energy sector. The Bloomberg New Energy Finance (BNEF) records show that over USD 175 billion was invested in renewable energy power in the first nine months of 2014, a 16% increase compared to the same period last year.

5. The need to decarbonise energy to address climate change is becoming a driving force for deployment of renewable energy. IRENA's REmap 2030, a roadmap for doubling the share of renewable energy in the energy mix, shows that not only can renewable energy meet the world's rising demand, it can do so more cheaply than conventional technologies, while setting the world on a pathway to limiting global warming to under 2 degrees Celsius. In January 2014, IRENA has been called upon to take the lead on catalysing action on renewable energy in the context of the UN Secretary-General's Climate Summit that took place in September 2014. In preparation for the Summit, IRENA focused on mobilising action in two of its programmatic activities, namely the Africa Clean Energy Corridor (ACEC) and the new SIDS-focused initiative, the Lighthouses. Both initiatives gained a significant momentum, culminating at the Climate Summit where Heads of State and Government, CEOs and financing institutions voiced their strong support and commitment to realising the ambition of these initiatives.

6. The Climate Summit created a new impetus for the role of renewable energy as one of the critical means to reducing greenhouse gas emissions. A wide number of countries, the private sector, and civil society groups voiced support for a clear, long-term goal to shift from fossil to clean energy. For example, coalition of 160 institutions and local governments, and more than 500 individuals committed to divesting USD 50 billion from fossil fuels in next three to five years and reinvest in new energy sources. IKEA and a dozen other companies made the ambitious pledge to source 100% of their power from renewable energy, with the plan to recruit a total of 100 companies to make similar commitments by 2020.

7. With the backdrop of the Climate Summit, the COP 20 Presidency, Peru, made the action on climate change and engagement of all stakeholders central to the two-week conference. With energy being a major emission contributor, positive developments in the renewables sector were welcomed by the climate community, and IRENA used the Conference to engage with a range of stakeholders to discuss the opportunities for accelerating its deployment. With an important milestone of the upcoming COP 21 in Paris, France, IRENA is positioning its programmatic work to capture the momentum these events are creating.

8. Around the world, policy makers are pursuing renewable energy technologies not only for greater energy security or environmental considerations, but for the socio-economic benefits they generate. IRENA's Renewable Energy and Jobs-Annual Review 2014, launched at the Clean Energy Ministerial (CEM) meeting in Seoul, Korea demonstrated that the renewable energy sector has become a significant employer, with 6.5 million direct and indirect jobs in the renewable energy industry today (excluding hydropower) and the potential for millions of jobs worldwide in the coming years.

9. IRENA is working with countries, the private sector and other constituencies and organisations to maintain and expand the scope of the Agency's engagement and amplify the impact of its work. The Director-General, together with the Chief Executive Officer of Acciona, is co-chairing the Renewable Energy Committee of the Sustainable Energy for All (SE4ALL) Advisory Board to facilitate a focused action of this network of partners and expand the reach of IRENA's work. In June 2014, IRENA presented to the Advisory Board the outcome of the Committee's work, and formally launched REmap 2030 at the SE4ALL Forum in New York. This Forum, envisaged to be an annual event in the course of the SE4All decade, gathered some 2000 participants, and provided IRENA a unique opportunity to reach a wide-ranging audience and garner support for using REmap 2030 as a tool for doubling the global share of renewable energy.

10. A number of country REmap reports are being prepared to provide the countries view to demonstrate the renewable energy potential within specific circumstances. First in the series of country report, *Renewable Energy Prospects: China*, was released in Beijing in November 2014. The report shows that China can increase its use of renewable energy from 13 to 26% by 2030, representing nearly a fourfold increase in the share of modern renewables between 2010 and 2030. The report, prepared by IRENA in association with the China National Renewable Energy Centre, also says China can expand renewables in the power sector from 20 to 40% by 2030, making it the world's largest renewable energy user. The report has acquired special significance following the announcement that the country intends to cap carbon dioxide emissions by 2030 and expand the share of non-fossil energy in total primary energy supply to around 20% by 2030, as part of an emission reduction statement jointly made by China and the US. REmap China will be followed by imminent release of REmap UAE and US reports, as well as additional six countries in the course of 2015.

11. Outreach is central to IRENA's mission to both promote the work of the agency and seek avenues to strengthen the programmatic focus and implementation. The Director-General attended high level meetings and met with government officials in a variety of settings. This included the participation in the seventh Joint Annual Meeting of the ECA Conference of African Ministers of Finance, Planning and Economic Development and AU Conference of Ministers of Economy and Finance in Abuja, Nigeria where he presented the ACEC initiative and emphasised its far-reaching implications for a clean and secure energy future in Africa. On the occasion of the launch of REthinking Energy in Paris, France, the Director-General used the opportunity to meet with Government officials to discuss cooperation with IRENA, including in the context of preparations for COP21.

12. Upon invitation of New Zealand, the Director-General participated in the New Zealand/EU High-Level Mission to the Pacific. During the visit to four Pacific Islands, including Samoa, Tuvalu, Kiribati

and Cook Islands, he had an opportunity to discuss with government officials how to best meet their needs and to witness first-hand the impact of renewable energy projects on the ground. Of note is IRENA's participation in the Third International Conference on Small Island Developing States (SIDS) in Apia, Samoa. The event attracted twenty-one Heads of State and Government and 3,500 delegates, including representatives from private sector and civil society. The outcome document entitled "SIDS Accelerated Modalities of Action (SAMOA) Pathway" has a strong focus on renewable energy and urges all stakeholders to join forces in supporting SIDS in the development and implementation of their national, regional and interregional sustainable energy plans and strategies. It also identifies IRENA as one of the key partners in this effort.

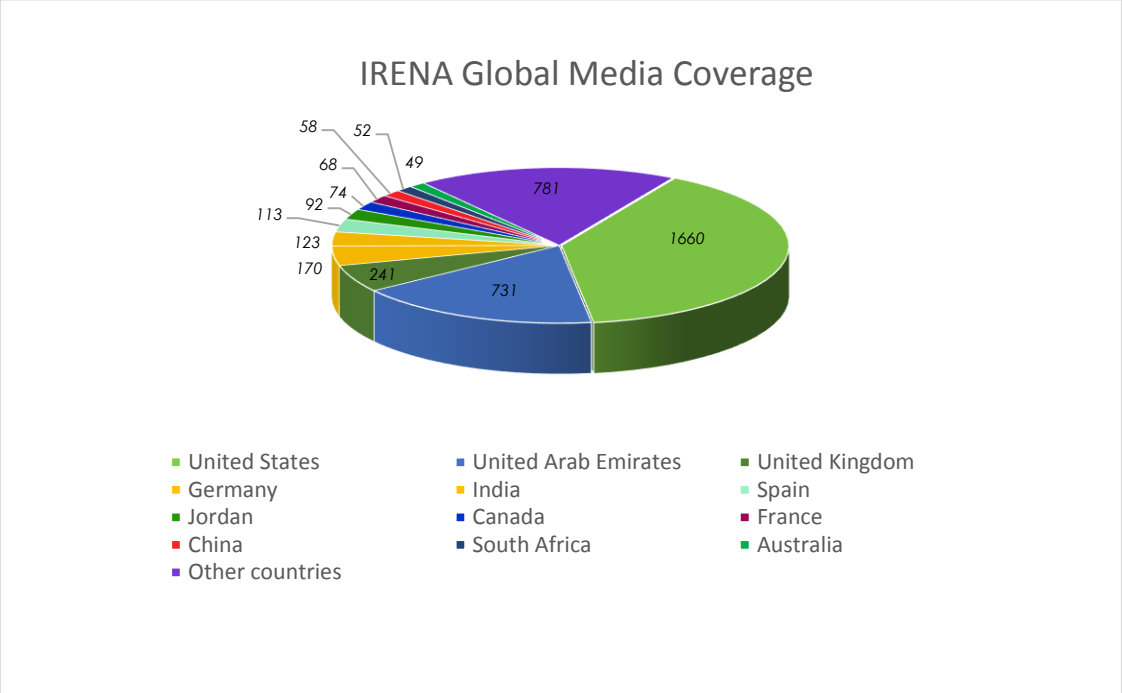
13. Furthermore, on the occasion of the second World Summit of Legislators, organised by the Global Legislators Organization (GLOBE) in Mexico, the Director-General shared with the parliamentarians the latest information on the socio-economic benefits of renewables, declining technology costs and the job creation potential. He also met with Government officials to discuss cooperation with Mexico and the region. Furthermore, in the margins of the COP20 in Lima, the Director-General participated in another GLOBE meeting, which provided an opportunity to have a focused discussion with the parliamentarians on the renewables in the climate context.

14. IRENA has also focused on reaching out to the private sector constituencies. Select events include the Director-General's participation in the 11th Wall Street Renewable Energy Finance Forum in New York, the 15th Annual Symposium of the French Renewable Energy Association in Paris (SER), France and the 10th International Renewable Energy Conference in Tehran, where he addressed the topics of energy transformation, the changing dynamics in the renewable energy markets, the positive trends in renewable energy financing and its increasing cost-competitiveness. In cooperation with SER, IRENA will work on the preparation of the Renewable Energy Day during the COP21 in Paris in December 2015.

15. In the fourth year since the Agency's official establishment, IRENA's substantive products have gained global recognition and are contributing substantially to increasing awareness about renewable energy. IRENA's costing data and analyses, together with the jobs studies, REmap 2030 and the flagship REthinking Energy report, are the most recognised and quoted IRENA products this year, with some 4,200 media news items in at least 107 countries and references in publications such as New Climate Economy, IPCC report, and REN21. IRENA's social media platforms have over 240,000 followers, which amplified reach to millions of additional social media users. Records to date show that there have been more than 3.5 million page views for the IRENA website and more than 9 million page views for IRENA publications.

16. The graphs below reflect that, unlike in 2013 when a sharp decrease was seen after the Assembly and WFES period, media interest in IRENA is more sustained, with noticeable peaks at the time of programmatic events or release of substantive products. In May, "Renewable Energy and Jobs – Annual Review 2014" garnered significant attention in mainstream and niche media outlets and continues to be cited and quoted in traditional and social media. The figure of "6.5 million jobs in the renewable energy industry" continues to get mentioned in mainstream and new media platforms, including being used as source data for custom infographics by other organisations. Also contributing to the jump for the month of May was IRENA's prominent participation in the Abu Dhabi Ascent, an event hosted by the UAE in preparation for the UN Secretary-General's Climate Summit in 2014. In June, substantial coverage of IRENA's REmap 2030 report launch together with coverage of IRENA's International Off-Grid Renewable Energy Conference in Manila fueled the year-on-year growth. In September, the launch of REthinking Energy, coupled with IRENA's active participation in the Climate Summit 2014, together with the Agency's active role at the Third International Conference on Small Island Developing States in Samoa made for the second most active month for IRENA media coverage in 2014.

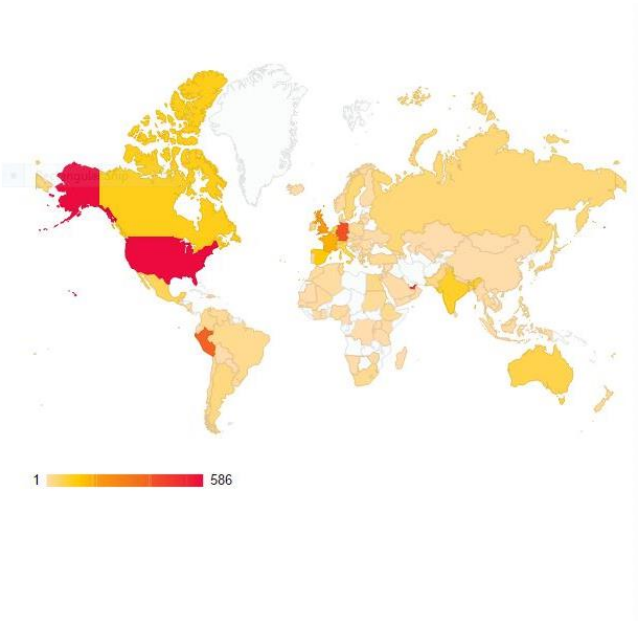
Global media coverage January to September 30th 2014



17. Through its studies, workshops, training, and technical support to countries described in this report, IRENA seeks to generate and share knowledge that will lead to investments in energy services, improved livelihoods and transition economies around the world. A critical part of the Agency's work is effective communication and outreach. The Agency conducted an intensive internal three-day communications workshop to chart a comprehensive communications strategy. The workshop was a productive step in integrating the various communications modalities, including Member communications, publications, media relations, digital, stakeholder outreach and internal communication, and in laying out a coherent and comprehensive planning process. The workshop outcome included communication and outreach strategy that will guide the Agency's work ahead, embedding it into the core of Agency's substantive products from the outset.

18. One of the immediate results was the creation of IRENA newsroom website (www.irena.org/newsroom). The newsroom was launched for the UN Climate Change Conference in Lima to cover renewable energy news and IRENA activities during the conference. In 11 days, 30 stories and updates were posted and promoted on social media, garnering more than 4,000 views from 125 countries. In addition, the material was re-blogged onto 7 separate sites. During the Conference, IRENA's peak reach on Facebook was more than 4,200 people per day – quadruple from the previous record high, and followers on Facebook and Twitter increased by 500 and 350 respectively. The site will remain the official news portal of the Agency and will be used to cover the upcoming Assembly and other events in a similar fashion.

Country	Views
United States	586
United Arab Emirates	523
Germany	393
Peru	385
United Kingdom	188
France	173
Spain	117
Canada	100
India	90
Australia	67
Belgium	63
Italy	62
Netherlands	62
Mexico	56
Switzerland	39
Russian Federation	37
Sweden	37
Argentina	31
Taiwan	28
Ireland	28
Pakistan	27
Egypt	25
Japan	25
Republic of Korea	23
Austria	23
Tunisia	22



IRENA's Newsroom views during COP20 in Lima, Peru

19. To ensure effective management and administration of programmatic activities, the Work Programme has been structured along 31 projects, covering 123 deliverables. The implementation rate to date indicates that projects are on track to be completed within the timeframe of the biennium. The matrix annexed to this report contains a detailed account of the implementation status and will be used to evaluate the impact of the Agency's work at the end of the programmatic cycle.

20. The progress to date has been greatly facilitated with the timely receipt of the Members' contributions. To date, USD 18.8 million has been received in assessed contributions for 2014, with USD 1.2 million outstanding. USD 4.5 million was received from Germany and 7.4 million was received from UAE as part of budgeted Voluntary Contributions. In addition, USD 9.1 million was pledged in additional Voluntary Contributions from Belgium, France, Germany, Iceland, Japan, New Zealand, Norway, Switzerland and UAE with USD 5.1 million received to date. There is a pressing need however for voluntary contributions to the Fund for Developing Country Representatives (FDCR), as the Fund is expected to witness financial shortfalls for the fifth session of the Assembly.

Thematic Programme Areas

I. Planning for the global energy transition

21. This thematic area addresses planning needs required to mainstream renewable energy options and strategies in national and regional energy plans, covering IRENA's role as the SE4ALL Renewables Hub, the recently released REmap 2030 analysis, work on cities, water, energy and land nexus, transforming power grid infrastructure, innovative planning tools, and renewable readiness assessments and advisory services.

Sustainable Energy for All renewables hub

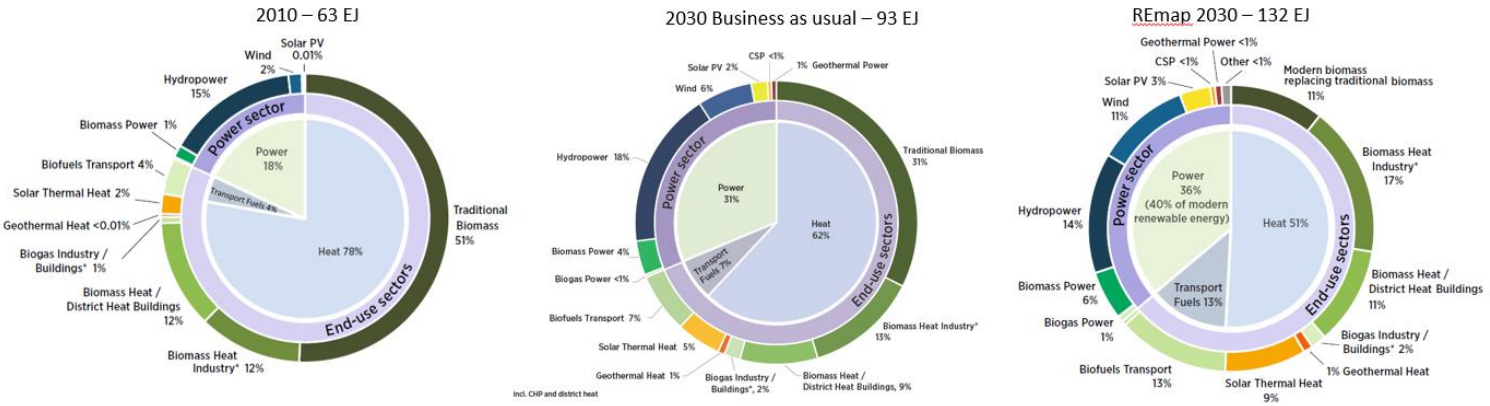
22. In recognition of the need for concerted international action to ensure a sustainable energy future, the United Nations General Assembly (UNGA) declared 2014 as the beginning of the International Decade for Sustainable Energy for All. IRENA is the Renewable Energy hub within the UN Secretary-General's SE4ALL Initiative - a global energy partnership and campaign aimed at achieving three aspirational goals: ensuring universal access to modern energy services, to double the global rate of improvement in energy efficiency; and to double the share of renewable energy in the global energy mix by 2030.

23. In the course of the past year, IRENA has focused on refining its role as the Renewable Energy hub. In this context, IRENA and Acciona cohosted the SE4ALL Renewable Energy Committee meeting in Madrid, Spain, where government, private sector and civil society participants discussed how to advance the objective of doubling the share of renewable energy in the global energy mix by 2030. The outcome of this discussion was taken to the first annual Sustainable Energy for All meeting in June 2014. At this occasion, IRENA launched its *REmap 2030 – A Renewable Energy Roadmap* report, which was warmly welcomed by some 500 participants who attended the session.

24. In recognition of the role renewable energy is playing in the work of all SE4ALL hubs, namely access, efficiency, finance and capacity building, IRENA is actively engaged in their work both through the SE4ALL Global Facilitation Team and directly with hubs. In this context, IRENA participates in the selected activities of the Access hub. For example, IRENA has initiated discussions with Rwanda, the Gambia, SE4All Africa Hub, the United Nations Development Programme (UNDP) and the New Partnership for Africa's Development (NEPAD) to partner in the development of the country's SE4All action agenda as well as the investment prospectus. IRENA also continues to provide substantial contribution to the Global Tracking Report, led by the World Bank and the IEA. The Agency has also collaborated with the World Bank in the Readiness for Investment in Sustainable Energy (RISE), which aims to provide indicators that compare the investment climate of countries across the three focus areas of the SE4ALL initiative. Finally, IRENA is exploring possibilities for linking its programmatic activities with the Efficiency, Finance and Capacity Building hubs.

REmap 2030

25. IRENA continued to develop its work on the roadmap for doubling the share of renewable energy in the global energy mix by 2030, based on the in-depth analysis of 26 countries accounting for three quarters of global energy demand today. *REmap 2030 – A Renewable Energy Roadmap* found that the doubling of the share of renewable energy by 2030 was technically feasible and, when accounting for externalities (climate change and human health), doubling can be achieved with cost neutrality or even cost savings. With the right energy efficiency policies and modern energy access, REmap 2030 analysis shows it is possible to reach a global renewable energy share of as much as 36% by 2030.



26. Furthermore, the REmap 2030 analysis identified the potentially transformative role of biomass, accounting for 60% of the total renewable energy use in 2030 when the potential of all technologies identified implemented. The REmap 2030 analysis demonstrates that further potential for growth in renewable energy shares exists in both the power and heating and fuel applications in the end-use sectors. Finally, the REmap 2030 analysis maintains that all countries and regions have a role to play in doubling the share of renewables in the global energy mix, noting the central importance of international co-operation which encourages innovation and can propel the global community beyond a doubling of the global renewable share by 2030.

27. REmap 2030 results are currently being presented in meetings, conferences and workshops worldwide and the analysis is expanding beyond the initial 26 countries. Work was initiated with new countries, namely Argentina, Belgium, Colombia, Dominican Republic, Egypt, Ethiopia, Iran, Kazakhstan, Kenya, Poland, Sweden, and Uruguay. Regional analysis is ongoing for South-East and South Asia, and the Latin America and the Caribbean (LAC) region.

28. IRENA has worked with national experts to translate the results for the China, Mexico, the United Arab Emirates (UAE) and the United States of America (USA) into action options, through the preparation of comprehensive country reports. Expansion of this work was made possible with in-kind support by governments, and through voluntary contributions of the Governments of Germany and Japan. The China REmap 2030 analysis has resulted in broader cooperation with the China National Renewable Energy Centre (CNREC) to cover scenario analysis, costing and renewable energy policy analysis.

29. To facilitate the REmap 2030 process, IRENA continues to develop technology briefs to inform policy makers about markets, costs and performance and barriers. In September 2014, IRENA launched a package on ocean energy, consisting of four technology briefs of tidal, wave, salinity gradient and ocean thermal energy, as well as a comprehensive report on ocean energy technology readiness levels, deployment status, patents in ocean energy technologies and their market status and outlook. Technology briefs on solar heating for industrial applications, solar heating for domestic applications, biogas production, biomass production and logistics, biomass for heat and power, RE integration and hydropower have also been launched, and updates for solar PV and liquid biofuels technology briefs are underway.

30. IRENA will launch a manufacturing industry renewable energy roadmap and supporting working paper as part of the REmap 2030 package in February 2015. These reports will close an important knowledge gap in the assessment of the renewable energy potential for the manufacturing industry which is so far overlooked. The renewable energy for manufacturing industry roadmap identified six priority areas that warrant action from both policy makers and industrial stakeholders, namely energy-intensive sectors, small and medium size enterprises (SMEs), biomass, solar thermal systems, electrification and regional aspects. In addition, a bioenergy working paper on demand, supply, costs, and sustainability and policy issues was published in September 2014. This working paper has already stimulated focused discussion on the role of bioenergy in the energy transition. The also paper sets the stage for a better understanding of country priorities for IRENA's bioenergy work for the coming years.

Biomass generation in Zambia

31. Preparatory work was initiated in the establishment of three REmap 2030 action teams in the transport sector, energy efficiency, and REmap 2030 SE4ALL framework for cooperation. A joint working paper by IRENA and Copenhagen Centre for Energy Efficiency (C2E2) to deepen the understanding of the synergies between renewable energy and energy efficiency will be published by early 2015. The findings will inform SE4ALL country action agendas led by the SE4ALL Access hub. REmap 2030 findings also inform the climate process, and have been widely quoted in recent months. They have helped to raise policy-makers' and public awareness in cost-effective renewable energy potentials and have facilitated debate on the ambition in renewable energy projections.

REpowering cities

32. The rapid population growth and urbanisation trends foresee that almost 66% of the world population will be urban by 2050 in comparison to 30% in 1950. Almost 90% of the increase will be concentrated in Asia and Africa where new and rapidly evolving cities shall face a host of sustainable development challenges. In this regard, IRENA aims to assist municipalities with viable business models where the private sector is willing to bear the technical and financial risk of investing in renewable energy technologies, as mutually beneficial public / private partnerships. IRENA organised a conference at the World Future Energy Summit to showcase viable business models for specific renewable energy technologies in the areas of (1) waste to energy; (2) solar thermal, photovoltaic and building integrated photovoltaic applications; and (3) outdoor lighting.

33. The participating mayors and city representatives expressed their interest in sharing experiences and best practices through capacity building initiatives facilitated by IRENA, the outcomes of which have shaped the work plan for the year. Two practitioners' guides are being developed in support of municipalities' ability to continue to promote the deployment of renewables. A *Practitioners' Guide to Wind Energy* will be released early in 2015 to assist municipalities better understand the various approaches to the deployment of wind energy. A *Practitioners Guide to Procuring Outdoor Lighting*, prepared in partnership with the Global Lighting Association and the Global Off-grid Lighting

Association, will be released during IRENA's fifth Assembly. IRENA is also developing a simplified methodology to address the lack of knowledge of the techno-economic potential of available biomass resources critical to enable municipal decision-makers and private sector entities to exploit such resources effectively. A series of case studies for solar rooftop systems deployed in commercial settings, as well as a guide for commercial retail outlets for procurement and deployment of solar roof top systems, is also under development.

Water, Energy and Land Nexus

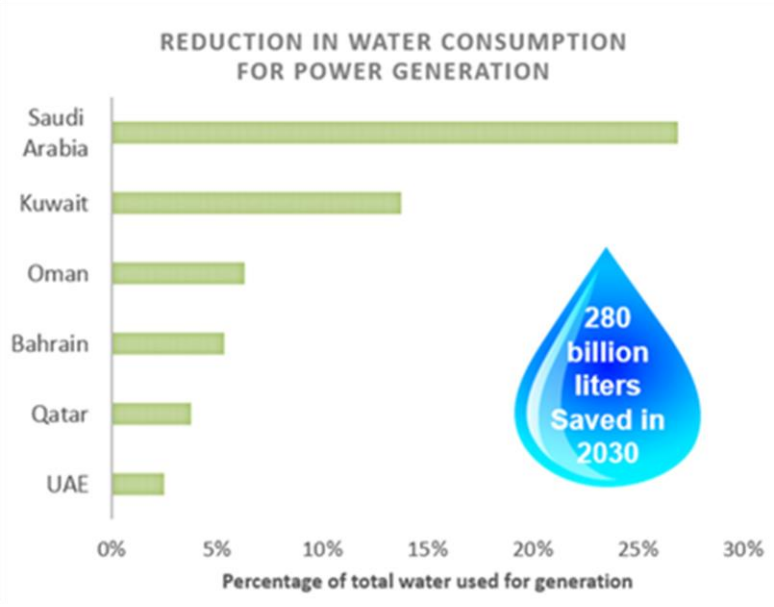
34. In an increasingly resource constrained environment, meeting growing demands for water, energy and food is becoming progressively challenging as trade-offs and competing needs for resources intensify. Renewable energy technologies offer innovative, integrated solutions to address these challenges, however qualitative evidence on this topic remains relatively dispersed and limited.

35. As a first step towards bridging this knowledge gap, IRENA is finalising a study on the benefits of renewable energy in managing resource challenges. The study will also present a conceptual framework for a tool that can quantitatively assess the impact of renewable energy on the nexus. It will serve as the foundation for carrying out country-level analyses to demonstrate the role renewable energy has or can play in addressing the challenges posed by the nexus. IRENA is presently developing the concept for the country case studies, formulating parameters for selection of countries considering the diverse contexts and identifying potential institutional partners in this initiative.

36. The study is being carried out in collaboration with relevant stakeholders across the three sectors and participating in the "Water, Energy and Food Nexus" High Impact Opportunity led by the Food and Agriculture Organization (FAO) and Germany within the SE4ALL Initiative. Preliminary findings from the ongoing study have been presented at several international platforms, including the Stockholm World Water Week 2014 and The Nexus Conference 2014 at Chapel Hill, University of North Carolina. The study will be launched at IRENA's fifth Assembly in January 2015.

Renewable Energy and the Water-Energy Nexus: GCC region

The GCC region has among the lowest renewable water resources in the world and the demand for water is expected to increase five times by 2050. Extraction of fossil fuels and cooling during power generation requires water. This results in demand for desalination as treated water is needed for extraction and in thermal pollution as water used for cooling is returned at a higher temperature to the aquifer/sea. It is estimated that realizing the renewable energy plans for GCC by 2030 will result in an overall reduction of 21% in water consumption for power generation and fuel extraction*. This is equivalent to an annual saving of 280 billion litres of water within the electricity sector. Analysis shows that most of this saving will come from the largest economy in the region, Saudi Arabia, due to its heavy reliance on electricity generation from crude oil that requires significant amount of water for extraction.



*The analysis considers water consumption for power generation in all GCC countries and includes water use for fuel extraction only for those countries using high shares of domestic oil resources (Saudi Arabia). Water consumption factors for different technologies are derived from "*A Review of Operational Water Consumption and Withdrawals Factors for Electricity Generating Technologies" (2011)* and does not consider the sources of water due lack of available data.

Transforming Power Grid Infrastructure

37. Alongside growing energy demand is the increasing ability for renewable energy technologies to provide cost effective, viable solutions. Globally, renewable power markets are outperforming national targets. At the same time, the contribution of variable renewables to global electricity generation remains at a limited 3%, and is not expected to rise beyond 30% by 2030[1]. This shows that a transition to electricity systems dominated by variable renewables will require a paradigm shift in the operation, management and flexibility requirements of the grid. It also demonstrates that there is still significant potential to continue to grow the renewables base.

38. In this context, IRENA has developed a technology roadmap for renewable energy grid integration that compiles and structures the key activities required to support a transformation towards renewables. This roadmap includes important new information regarding features, cost and benefits of smart grid technologies for integration of variable renewables, an overview of demonstration projects, and a new methodology and case study assessment on the impact of renewables on grid investment streams. The analysis shows that smart grid investments make economic sense, as they contribute to the reduction of non-technical losses and black-outs. Smart inverters and smart meters are only marginally more expensive than conventional technologies, but have short pay-back times due to reduced operational and maintenance expenditure. Preliminary results have already been used to support a roundtable on a regional strategy for smart grids and renewables in the Association of South East Asian Nations (ASEAN) region with final results to be discussed in a dedicated workshop beginning 2015.

39. IRENA has also started a technology roadmap on electricity storage. Based on the results of a kick-off workshop in Dusseldorf in March, attended by 15 IRENA Member countries and some 30 electricity storage experts, three critical areas for electricity storage for renewables were identified: 1) mini-grids and islands, 2) residential battery storage applications for solar photovoltaic integration, and 3) utility-scale renewable grid integration into weak grids. A technology outlook report on battery storage for renewables was published and additional workshops will be held in Tokyo (November 2014) and New Delhi (December 2014). This work is supported through Voluntary Contributions of the Government of Japan.

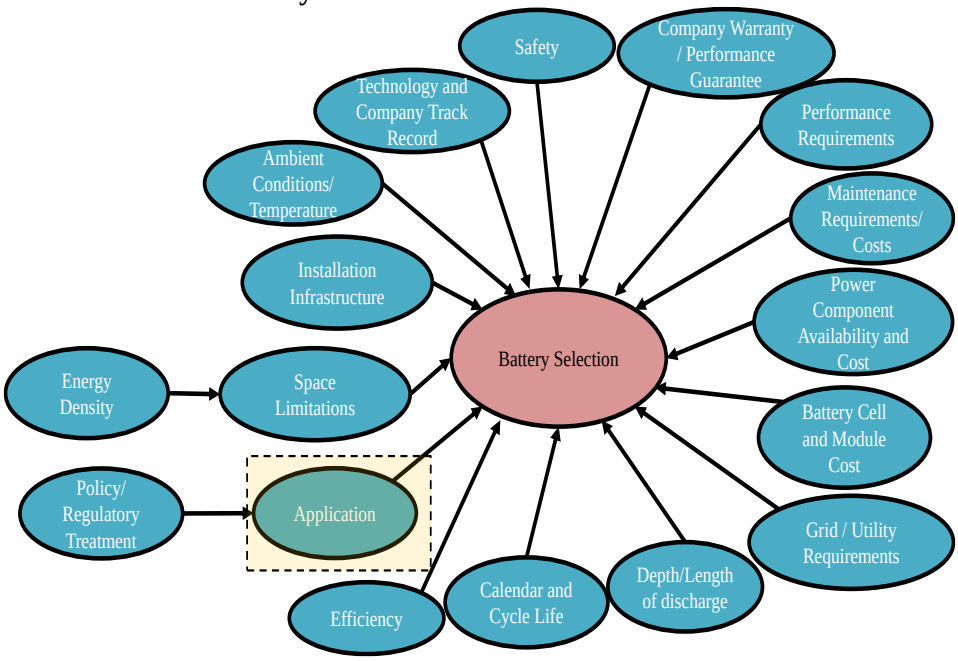
[1] Based on REmap 2030.

The Market Status and Technology Outlook
Key Application Areas and Considerations for Battery Storage

Energy storage in the power sector has been traditionally dominated by pumped-hydro storage. Accelerated renewable energy deployment and policies to modernise production and consumption of electricity have started to affect change in the sector. Battery storage is increasingly a viable option despite integration barriers such as performance and safety issues, regulatory barriers, and utility acceptance.

The Market Status and Technology Outlook presents key considerations and drivers for renewable battery storage and provides a timely update of market developments.

Important Considerations for Battery Selection



Report findings demonstrate that islands and remote areas represent today an attractive opportunity for battery storage in conjunction with variable renewable energy deployment. The use of batteries for self-consumption of renewables is another area that can revolutionise the electricity system. In some situations, battery storage may also be the preferred solution for fast, short-term (seconds) regulation as opposed to fossil fuel generated storage.

Although in many cases, dispatchable plants, interconnection, and demand-side management can provide the necessary resources to accommodate a higher share of renewables, the versatility of battery storage in the power sector, increasing operational experience, and market developments are leading to increased deployment of battery technology.

Second International Energy Storage Policy & Regulation workshop

Building upon the outcome of IRENA's initial workshop in Dusseldorf, Germany, a second "International Energy Storage Policy and Regulation Workshop" was held on 7 November 2014 in Tokyo, Japan. The aim of this specific workshop was to identify key technology solutions, regulatory challenges and policies needed to support the accelerated deployment of renewables at a residential level, and to identify opportunities for international cooperation and exchange of best practices and lessons. Some 50 workshop participants comprised policy makers, industry representatives, academia, and technical experts from the International Electrotechnical Committee (IEC).

The main conclusion of the workshop was that technologies for residential electricity storage for rooftop solar PV systems can – in the medium term – revolutionize grid infrastructure and operations. It also emphasiesed that international cooperation can significantly contribute to the advancement of residential electricity storage, including by growing experience and best practices, expert workshops, taskforces, and international cooperation to support RD&D and the development of standards and grid codes.

The third energy storage workshop took place in Delhi, India, in December 2014.

Planning with Renewables

40. Energy planners in governments require proper energy statistics and planning tools to define long-term energy strategies. While IRENA's mandate is to support accelerated renewable energy deployment, the energy policy goals typically need to address other important aspects such as security of supply, energy access, affordability, environment, financial constraints, etc. For renewable energy to have a prominent role in the energy strategy of a country, energy statistics and planning tools need to allow for appropriate consideration of its potentials.

41. A number of methodologies are being developed and evaluated in order to improve energy planning with a greater share of renewable energy. However the findings have been confined within an academic and modelling sphere, and a link to energy planners in governments needs to be established. In June 2014, IRENA organised, together with the International Energy Workshop, a "*Brainstorming session on the modelling of renewables for policy making"*, attended by some 70 energy modelling professionals from around the world. Meeting outcomes have provided the basis for an assessment of current long-term planning methodologies for the integration of renewable energy into national and regional power systems. Following the success of the workshop, IRENA consolidated its work on the issue with a project aimed at improving a long-term system integration planning methodologies with a higher share of renewables. Technical expert meetings will be held during 2015 to continue discussions on mainstreaming renewables in energy planning.

42. Investment decisions made today on power plants and transmission grids can shape the energy system for decades. A long-term infrastructure planning is required to support cost-effective RE system integration. Least-cost energy system modelling is a tool that helps policy makers to explore which investment decisions would lead to optimal energy mix and transition pathways in the long-term. In this context, IRENA is completing the development of five African power pool system planning test models (SPLAT models), together with user manuals to support the use of these models. The models are developed to build capacity of energy planning offices of interested African member states and organizations, and the project has aready attracted many stakeholders. SPLAT training sessions were organised in cooperation with the International Atomic Energy Agency (IAEA) and Tunisian Utility Company STEG for Northern African countries, in cooperation with IAEA and Ministry of Research of

Cameroon for Central African countries, and in cooperation with United Nations Economic Commission for Africa (UNECA) and the Stockholm Environmental Institute (SEI) for Eastern African countries. Cooperation with regional power pools and organisations, such as CAPP, COMELEC, and ECREEE, has commenced to provide more systematic technical cooperation on expansion planning studies.

43. Using regional SPLAT tools, IRENA conducted analysis of prospects for renewables in the regional electricity mix until 2030 for five African regions including the CO_2 mitigation impact of the Clean Africa Energy Corridor (see Section VI Regional action agenda). This work, comprising three years of analytical and country level focus on long-term infrastructure planning, will be presented at a pre-assembly event in 2015 - Planning renewable energy strategies: Africa power sector.

44. IRENA is supporting the development of the ECOWAS National Renewable Energy Policy (NREP), administrated by the ECREEE secretariat. NREP is built on baseline power sector development projections and is a key input in the development of the SE4ALL Action Agenda. IRENA has provided the methodologies and base line projections computed from SPLAT models to interested ECREEE member countries. A capacity building training session on the use of the SPLAT models is being planned for the 1Q 2015.

45. In order to support long-term planning, IRENA assessed power production potentials from solar and wind using GIS maps from the Global Atlas, in collaboration with the Royal Institute of Technology in Sweden. Analysis shows that renewable energy source potential in the five African power pools is markedly different. This indicates the need for different strategies to develop resources. The analysis also highlights benefits regions can gain from improved interconnectivity and increased information exchange between the five regional power pools. The working paper entitled *Estimating the Renewable Energy Potential in Africa* was published in June 2014.

46. Finally, building upon IRENA's grid integration and regional energy planning knowledge, IRENA drafted a Position Paper to present the rationale behind the regional approach for scaling up renewable energy in the ASEAN region. The Position Paper will be used as a baseline document for further engagement with relevant countries in the region.

System planning test models (SPLAT)

SPLAT models are generation expansion planning models, which IRENA developed as long-term power sector planning tools to be made available for interested Member states in Africa. It is part of IRENA's capacity building effort in the region to help masterplan development with the latest renewable energy data and renewable energy assessment methodologies. SPLAT models may be used by individual countries (continental countries only) for their own energy planning needs, and may also be used regionally to assess regional interconnections and trade within each power pool. To date, a SPLAT model has been completed for Northern Africa, West Africa, Southern Africa, East Africa and Central Africa.

IRENA's SPLAT models are built on IRENA's generation potential assessment database from the Global Atlas project and renewable energy technology costing database, in addition to regional power infrastructures databases. The models calculate the least-cost generation expansion plans for the next 20-40 years, taking into account various operational constraints. IRENA's SPLAT models also allow policy-makers to assess least-cost investment options in light of a specific policy goal, for example a renewable energy penetration target, import dependency, affordability, CO_2 targets, or assess investment in international transmission lines on renewable energy deployment.

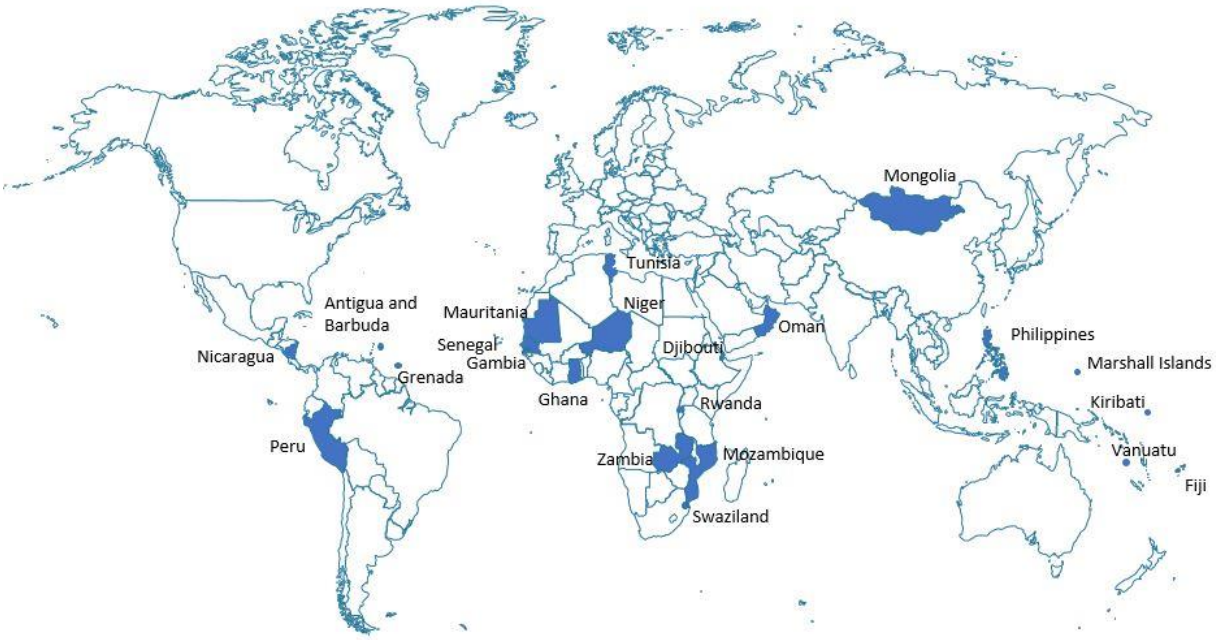
Renewables Readiness Assessment and Advisory Services

47. A Renewables Readiness Assessment (RRA) is a country-led process that evaluates key policies, potentials and technologies for renewable energy deployment and identifies the actions needed to overcome barriers to renewable energy deployment. IRENA provides technical support and expertise in the RRA process to facilitate consultations among different national stakeholders in shaping appropriate policy, technology and regulatory choices, consistent with national priorities.

48. IRENA's RRA engagement has strengthened national level cooperation and enabled the Agency to engage with the relevant entities to contextualise initiatives at a national and regional level. RRA

experience has highlighted the benefit of regional market integration, a lesson embraced by many nations as they seek to further define benefits from regional initiatives and the role that they can play in them.

IRENA RRA Activities



49. Since 2011, IRENA has supported the RRA process in 22 countries, 19 of which are completed or progressing, and three remaining in a preparatory stage. RRA analysis was completed for Djibouti, Fiji, Gambia, Ghana, Grenada, Kiribati, Mauritania, Mongolia, Mozambique, Nicaragua, Niger, Oman, Peru, Republic of Marshall Islands (RMI), Senegal, Swaziland, Vanuatu, and Zambia. RRA reports for Mauritania, Mongolia, and Philippines are to be released in 2015.

50. RRA processes are yielding concrete results. Pursuant to the RRA action plan, Swaziland is now engaged in the development of an Independent Power Producer Framework and a Grid Code with support from the United States Agency for International Development (USAID) Southern African Trade Hub to strengthen the enabling framework for investment in grid-connected renewable energy. In Djibouti, the RRA highlighted significant geothermal, wind and solar resources that could meet the country's demand and export surplus potential, and USAID is framing its intervention in Djibouti's geothermal sector based on the findings from the RRA.

51. In Fiji, following the discussions at the RRA workshop, the Government has adopted a new approach for calculating the tariffs for independent power producers (IPPs), which has made the tariff more attractive for investors. The Vanuatu RRA stressed the need for an enabling framework that would allow the participation of IPPs. Following the RRA Workshop, the Utilities Regulatory Authority of Vanuatu announced a preliminary decision on Net Metering and Feed-in Tariffs and their decision to pursue the development of regulatory guidelines for IPPs and Power Purchase Agreements. In RMI, the RRA highlighted the need for an enabling legislative and institutional framework, accompanied by an action

plan using a system approach for grid-connected renewables and conversion of the existing diesel powered mini-grids to solar PV systems.

52. The RRA for Oman, IRENA's first RRA exercise in the Gulf Cooperation Council (GCC) region, explored sustainable and secure pathways for the deployment of renewable energy technologies with a particular focus on developing a business case for renewable power vis-à-vis highly subsidised natural gas based electricity. The RRA in Mongolia identified opportunities for exporting renewable energy, especially the wind. In the Philippines, the RRA was relevant to the on-going review of National Renewable Energy Roadmap (NREP), and helped identify the key missing links in the current energy regime that should be established in order to deliver an effective implementation of NREP.

53. IRENA complements the RRA process with relevant advisory services. In this respect, IRENA and European Investment Bank (EIB) have engaged in a joint study to evaluate renewable energy manufacturing potential in three south Mediterranean countries, namely, Egypt, Morocco and Tunisia. The study analyses supply chains for renewable energy manufacturing in the region, building on the renewable energy manufacturing roadmap developed by IRENA; and identifies the gaps in the development of local renewable energy manufacturing capacity with a set of recommendations to overcome them.

Nicaragua RRA

As part of its support to countries in the development and implementation of national and regional renewable energy strategies in Latin America and Caribbean, IRENA implemented the RRA in Nicaragua. An RRA expert workshop provided a discussion platform for identifying and addressing barriers to deployment of for biomass, geothermal, solar and wind technologies; grid integration; grid connection of small hydro projects; biofuels; and energy access, with a special focus on solar power, efficient cooking and productive uses of energy.

The RRA Nicaragua resulted in a number of recommendations in the areas of distributed generation, grid stability, renewable energy and energy access, geothermal master planning, sustainable use of biomass, and capacity development.

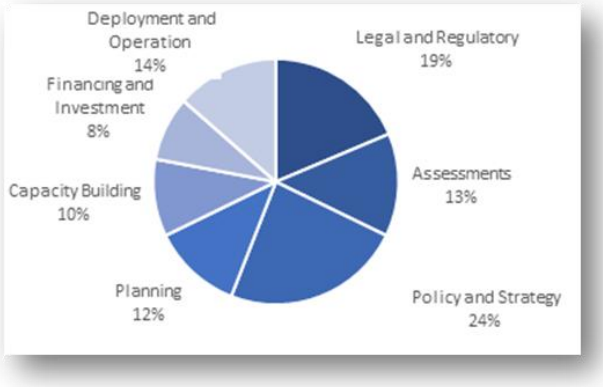
As part of strengthening the legal and regulatory framework of renewable energy, the Government is currently reviewing, "*Law on Promotion of Electricity Generation with Renewable Resources*" (Ley para la Promoción de Generación Eléctrica con Fuentes Renovables). Other recommendation included enhancing the local capacities of the renewable energy work force, and a post-RRA Capacity Needs Assessment is currently being conducted.

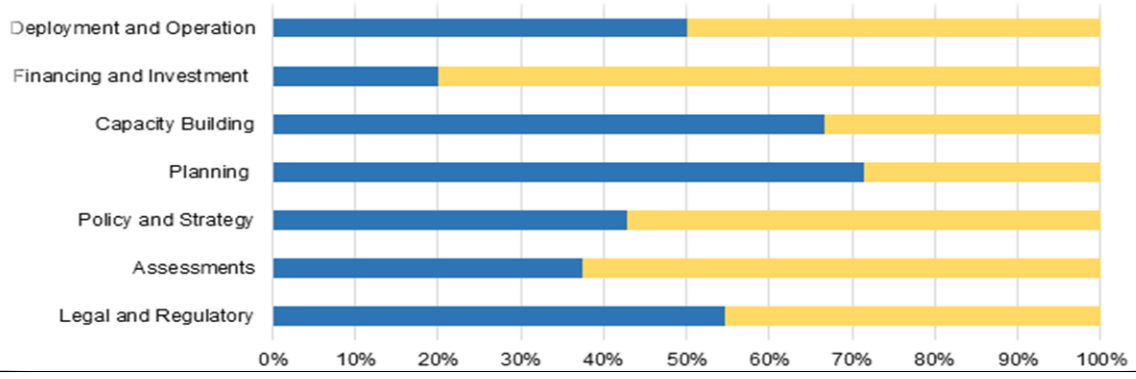
54. Capacity needs assessments are ongoing in Nicaragua and the UAE. Detailed discussions with the representatives from the Ministerio de Energia y Minas, Nicaragua were held to devise a capacity building strategy for renewable energy deployment. In the UAE, IRENA has facilitated a capacity needs assessment for the Dubai Water and Electricity Authority (DEWA) following their request, with a focus on the solar sector development.

55. IRENA's Geothermal Initiative in the Andes identified regulatory and legal legislation to promote geothermal energy and requisite technical capacity for deployment as critical gaps. A Geothermal Capacity Needs Assessment Methodology has been developed to assess the existing in-country capacities and to link the identified gaps to potential strategies and modalities for geothermal capacity building. The methodology was developed in collaboration with the Geothermal Institute, New Zealand and has been piloted in Bolivia, Chile, Colombia, Ecuador and Peru.

RRA in Focus

The RRA process is an inclusive and, at times, complex undertaking that requires time for adoption and implementation of its recommendations. IRENA has reviewed the 2012 RRAs (Grenada, Kiribati, Mozambique, Niger Peru, Senegal, The Gambia and Zambia) to assess possible trends as well as the impact to date. A total of 59 actions have been recommended, majority of which in the Policy and Strategy, Legal and Regulatory Framework and Planning areas. The figure below indicates that, as expected, the actions relating to Financing and Investment are most complex to implement. It also shows that the areas where post-RRA support is more advanced, such as in capacity building and planning, countries are making the most progress.





Gateway to knowledge on renewable energy

56. An important barrier to deployment of renewable energy is the lack of accurate, objective and reliable data and information. During the past year, IRENA has expanded its efforts to become the centre of excellence for global renewable energy information, to increase awareness and inform stakeholders of the state of play in markets, policies, financing, and technology options, including their costs and benefits.

Knowledge Gateway Platform

57. IRENA's Knowledge Gateway platform, *REsource*, will be launched at IRENA's fifth Assembly. REsource will enable public and free access to all IRENA renewable energy information and data through an intelligent search engine. Users will be able to view and query global energy statistics, cost and performance data, policies, information on countries regions, and technologies, as well as to view and analyse renewable energy trends. Of note is that, in the process of REsource development, IRENA has to standardize all of its virtual information. As as result, the Agency's products are now easily accessed through popular search engines, such as Google, Bing, etc. In subsequent phases, IRENA intends to further expand REsource to become the global hub for trusted and relevant renewable energy information and data, linking with and complementing existing renewable energy information providers.

REthinking Energy

58. IRENA's flagship series, *REthinking Energy*, represents a crucial platform to disseminate accurate and unbiased knowledge, assessments of the progress of renewable energy deployment and provide forward-looking analyses to inform policy-makers. The series brings together information and findings from IRENA's activities, as well as from credible third party sources, to stimulate informed debate on key issues and emerging trends in renewable energy policy, markets, finance and technology.

59. The first edition of *REthinking Energy*, launched in September 2014, analyses the ongoing transformation of the global power sector that has been set in motion by rapidly growing energy demand, global population growth, the threat of climate change and rapid technological advances in renewable energy. The report notes that renewable energy has moved from the margins to the mainstream in both investment and new capacity additions, representing a major portion of the global power supply today. The report emphasises that the role of renewable energy in the ongoing transformation will only strengthen as cost-competitiveness is reached in a wider range of contexts, the scale of deployment increases, financing becomes more accessible and affordable, and the broader socio-economic benefits gain recognition. This paradigm shift towards a new system based on renewables will enhance energy access and security, create jobs and safeguard health and the environment. To ensure that renewables play an ever-greater part in the world's energy mix, the report puts forth key focus areas for consideration of policy-makers in the short to mid-term, including the adoption of a system-level approach to policy-making, introducing measures to improve domestic market conditions and reduce deployment costs, and planning ahead to facilitate the physical and market integration of renewable energy.

60. *REthinking Energy* was launched in the UAE, France and Japan, as well as during the Climate Summit in New York in September 2014. The publication has been well received by the energy community and has received substantial coverage across various media outlets.

REthinking Energy: The Quest for Climate Change Solutions

IRENA's high-level policy debate at Climate Summit 2014, entitled "*REthinking Energy: The Quest for Climate Change Solutions*", provided an opportunity to engage leaders in a focused discussion on the latest policy trends in renewable energy, as well as to present IRENA's newly released flagship publication, *REthinking Energy*, to the wider Climate Summit audience. The event attracted a diverse audience, including government ministers, CEOs and civil society representatives, who shared their views and experiences on the transformation of the global energy system and the role of renewable energy in this context.

IRENA Director-General Adnan Z. Amin opened the discussion with a presentation of the *REthinking Energy* report. A panel discussion featuring both public and private sector perspectives followed, with Zimbabwe's Minister of Environment, Water and Climate taking part, along with a State Secretary at Norway's Ministry of Foreign Affairs and executives from multinational corporations (ENEL, IKEA) pursuing sustainability and renewable energy initiatives.

Renewable Statistics

61. Verified, global statistics not only promote the deployment of renewables but also help dispel myths and misperceptions around costs and feasibility of integrating renewables into energy systems. In April 2014, IRENA launched its second voluntary yearly renewable energy data collection cycle with the dissemination of a revised IRENA questionnaire. The network of data focal points has been expanded to include regional entities and industry associations in an effort to provide the most up to date statistics. The Agency also continues to closely build on international partnerships to avoid duplication of work and unnecessary reporting burdens on Members.

62. For renewable energy statistics, timely reporting is of the essence. Given the rapid growth of the renewable energy sector, renewable energy statistics with a time gap of one or two years would potentially miss market growth rates of 30% or more. IRENA's experience over the course of the two data collection cycles has highlighted that official statistics collected through questionnaires provide an official basis for the information, but often show a time gap of an average of two years. Therefore, IRENA is establishing partnerships to collect data from secondary sources (i.e. market analysts and industry associations), in order to estimate the market growth with a maximum time gap of six to nine months.

63. IRENA is also working to strengthen renewable energy statistics capacity through regional engagements and technical guidance. In August 2014, IRENA partnered with the Secretariat of the Pacific Community to hold joint training on data management processes. In addition, the Agency has initiated collaboration with the IEA and UNECA to build institutional and technical capacities for renewable energy data collection and dissemination in Africa. An initial consultation meeting on capacity building needs was held in December 2014 with various African National Statistical Offices during the meeting of the *First Joint Session of the Committee of Directors General of National Statistics Offices and the Statistical Commission for Africa* hosted by UNECA and the African Union. IRENA is also developing a renewable energy statistics manual to provide methodological guidance to Member countries in improving their renewable energy statistics, with a particular focus on challenging areas such as biomass data collection and estimation.

Global Atlas for Renewable Energy

64. IRENA's Global Atlas is today the world's largest database on renewable energy potentials. The Global Atlas links its Geographic Information System (GIS) to a number of data centers and renewable energy resource datasets worldwide. Since January 2014, international engagement in the Global Atlas initiative has risen to 67 countries and some 50 technical institutes and data providers. 45 national atlases are hosted through the interface referencing solar, wind, geothermal and bioenergy potentials. Global Atlas information is freely available online and promotes the work performed by national institutes and ministries. The Global Atlas also gives access to datasets that were previously not in the public domain such as private companies, or not accessible through interactive interfaces.

65. IRENA accelerated its efforts to compile geothermal-related information and has released new maps related to Enhanced Geothermal Systems (EGS). For bioenergy, IRENA has primarily focused on working with the FAO to further disseminate the revised Global Agro-ecological Zoning (GAEZ), and is considering the possibility of integrating the existing tools for bioenergy assessment.

66. IRENA is developing a second version of the Global Atlas website to feature a mobile application. The Global Atlas mobile application will be launched during IRENA's fifth Assembly.

Global Atlas facts

- Over 70, 000 users worldwide, 1000 active accounts on the GIS Client, 800 maps saved, and 58 maps published
- 67 countries and over 50 international institutes engaged in the Global Atlas
- 45 national atlases hosted, and more than 1,000 datasets publicly accessible through a single tool.
- Comprehensive solar and wind components
- Bioenergy and geothermal components in progress

67. IRENA has analysed the past and current measurement campaigns and mapping exercises to identify key activities that could accelerate the development of renewables in identified hotspots. The analysis shows that, in most locations, a limited amount of resources is needed to complete a zoning analysis that can help locate new projects. IRENA is publishing this analysis for the Philippines and selected Pacific islands. Analysis results will help governments and donors focus their investments on most pertinent aspects of resource assessment. The analysis is being progressively expanded to all islands of the GREIN resource assessment cluster and the Global Atlas consortium countries that do not have national atlas.

IRENA Renewable Energy Learning Partnership (IRELP)

68. The IRENA Renewable Energy Learning Partnership, IRELP, was formed in May 2012 to increase awareness of, and broaden access to educational opportunities and resources. In 2014, IRELP increased its coverage for Asia, Africa and Latin America and is examining education gaps that could hinder renewable energy development, particularly in these regions. IRELP facilitates the mobility of talented youth by hosting an internship database, and will aid educators to create renewable energy lesson plans with the release of a curriculum development database.

69. As part of the IRELP initiative, the IRENA Community was launched in May 2014. The IRENA Community is the first online community for renewable energy, offering discussion forums on topics such as finance, policy, economics, education, careers, technology, and sustainability. Adapting to new communication needs, the IRENA Community offers an interactive way for the public to engage with IRENA, ask questions and share ideas. The Community also serves as a social media tool to showcase IRENA projects and activities.

70. As part of IRENA's Knowledge Management activities, IRELP has also developed an IRENA Webinar Series. This new communication product offers the opportunity to disseminate knowledge, initiatives and outcomes, and highlight important activities carried by IRENA, Member countries and other partners.

IRELP facts

- 125,000 unique users and 550,000 page views to date
- Top users by country: India, United States, Germany, Pakistan, United Kingdom
- Top demographic groups: 25-34 (33.5%), 18-24 (27.5%)
- 42% returning users
- 2,700 renewable energy courses and degree programmes representing 65,000 new renewable energy professionals per year
- To reach the REMAP 2030 objectives, more than ten times this amount must be trained annually
- 41% of recorded courses are in Europe, 34% in North America, 11% in Asia, and 10% in Africa and Latin America
- 5 webinars hosted, attracting over 700 attendees
- A social media network of more than 230,000 followers
- 2,000 profiles created on the IRENA Community and 58,000 page views in less than 6 months
- To reach the REMAP 2030 objectives, more than ten times this amount must be trained annually
- 40% of recorded courses are in Europe, 35% in North America, 11% in Asia, and 10% in Africa and Latin America

RE Policy and Best Practice: Status and Trends

71. IRENA is working in partnership with the IEA to reinforce and promote the Joint Global Renewable Energy Policies and Measures Database ("the Joint Database"). Through this joint effort, the latest policies for 112 countries are monitored and updated. The Joint Database holds around 1,800 policies from 116 countries and has been used by around 67,000 users since September 2013. The fourth biannual update of the Policies and Measures Database started in October and has thus far resulted in the addition of 50 and revision of 30 renewable energy policies. IRENA is entering into the necessary agreements with IEA to ensure that the Policies and Measures database is properly referenced through the Knowledge Gateway, Global Atlas and other relevant tools.

Renewables: The true costs

72. IRENA's costing analysis is attracting increasing interest and IRENA's Renewable Costing Alliance has already grown to 18 members since its launch in January 2014. Discussions are underway with approximately 50 private and public organisations who have expressed interest in joining the initiative.

73. IRENA's world-class database of real project costs of some 9,000 utility-scale projects, (additional 6,000 with partial cost data), over 750,000 small-scale solar PV systems, and cutting-edge analysis is supporting IRENA's work and has led to growing interest in utilising IRENA's data. As a result, IRENA is increasingly referenced as a source for authoritative cost data.

74. This interest has also led to IRENA being asked to work more closely with a wide variety of government and private sector organisations, providing data and analysis to support their communications, research and analysis, and policy and decision-making. Examples include the use of IRENA costing data in the development of the New Climate Economy report of The Global Commission on the Economy and Climate, the UN Secretary General's New and Renewable Energy report and the IPCC Working Group III Mitigation of Climate Change report. IRENA cost data and analysis input has also been provided to organisations such as the World Bank (RISE indicators); the SE4ALL process (Global Tracking Report); REN21 (Global Status Report); European Climate Foundation; the Political Economy Research Institute (PERI); the Australian Bureau of Resources and Energy Economics; the Climate Council of Australia; The Cadmus Group Inc.; IKEA Group; and CleanTechnica to name a few.

Cost analysis

- World-class database of costs for over 9 000 utility-scale projects and over 750 000 small-scale solar PV systems
- Extensively quoted in the latest IPCC Working Group III Mitigation of Climate Change report, New Climate Economy, World Bank RISE Indicators, REN21 Global Status Report, etc.
- 890,000 website visits with over some 1.4 million cost analysis documents downloaded since January 1, 2014. This is equivalent to approximately 3 downloads every minute.

"I'm thrilled to share with you the news that IRENA has launched a global renewable energy cost analysis program … I certainly learned something already from browsing around the site, and I'm sure I will utilize it regularly"

75. In 2014, IRENA has begun to shift the focus from data collection to more in-depth cost analysis that directly supports policy-making. This includes the release of the first of a quarterly series of IRENA PV Parity Indicators reports that track solar PV installed costs and the levelised cost of electricity from solar PV systems. Results for the United States will be released by end 2014 and Italy shortly after. Other countries will be analysed upon request. IRENA will also release in early 2015 its analysis of the learning curve for wind, based on the levelised cost of electricity.

76. In order to accelerate the deployment of solar photovoltaic technologies in the sunbelt where the best resources exist but where there is little deployment to date, IRENA is working with GIZ to identify current costs of solar photovoltaic in Africa and analyse how to balance of costs of solar photovoltaic systems to competitive levels. This work is supported by a Voluntary Contribution provided by the Government of Germany and will be released in 2015.

77. IRENA has pioneered a template for the initial analysis of the potential benefits of renewables in reducing electricity tariffs on small island states. The first report, *Renewable Power Generation's Contribution to Reducing Electricity Tariffs on Islands: The Potential in Tonga*, has been well received by stakeholders and requests for additional studies have been received.

78. IRENA's costing work has been strengthened through secondment of personnel from the Government of the UAE and voluntary contributions from the Government of Germany to start two new projects to examine the role of renewables in improving energy security and the cost reduction opportunities for solar PV, concentrating solar power, and onshore and offshore wind.

The case of Tonga

Tonga is almost exclusively dependent on high-cost diesel-fired electricity generation, but has ambitious plans to expand renewable power generation capacity. IRENA's analysis has highlighted the potential of renewable energy to economically replace diesel-fired electricity generation, insulate the Tongan economy from volatile diesel prices and provide tariff reductions to consumers.
Key analysis insights are:

- Renewables can drastically cut diesel consumption and imports, but electricity tariff reductions are likely to be modest given the high fixed costs of island utility systems.
- Low levels of penetration can typically be achieved without expensive grid integration costs, but beyond renewable energy penetration of 20-25% care needs to be taken to plan the expansion. Marginal cost savings decline for higher shares of renewable energy.
- IPP projects have significantly lower capital costs than development projects and models for islands are emerging, although care needs to be taken to manage the expansion and it is not a "one fits all" solution.

Global Investment Dynamics

79. The Global RE Investment Dynamics project is intended to provide a comprehensive resource of renewable energy investment information and financial flows, accessible to all, showcasing global investment dynamics and potential sources of financing. In 2014, an initial database of public investments in renewable energy projects was created, currently covering over 800 renewable energy projects with investments from public financing institutions (such as multilateral, regional and bilateral development financing institutions). Additional funds and funding options are being incorporated into the database and will serve as a basis for IRENA analyses and a platform to support policymakers. In the course of this work, IRENA has analysed the definitions and methodologies in use for reporting on renewable energy investment, with the view to increased consistency.

Coalition for Action on Public Support to RE

80. In January 2014, IRENA and 35 leading players in renewable energy from around the world established a Coalition for Action to bolster public support for renewable energy. The Coalition aims to consolidate existing efforts to communicate the latest facts about renewable energy to the public. It will provide authoritative information to respond to public concerns, strengthen social acceptance of technologies and engage with the public and decision makers. The Coalition is facilitated by IRENA and operates as an independent body, distinct from the decision-making organs of IRENA and from its governance structure. Currently the Coalition has 42 members, including IRENA, 17 members of civil society, 10 industry associations, 9 companies, 4 international entities and one public-private partnership.

81. In the course of 2014, IRENA has developed the operational structure of the Coalition. The light and output-oriented structure allows Coalition members to initiate time-limited Task Forces that can vary in scale and nature. IRENA expects to organise the second Coalition meeting by January 2015.

II. Enabling investment and growth

82. Over the past three years, activities conducted have focused on filling knowledge gaps to further encourage the investment in renewable energy and economic growth. Analysis in *Renewable Energy Jobs and Access* provides estimates of global job creation potential from renewable energy deployment in off-grid areas and provides a benchmark to conduct socio-economic impact studies. Analysis in *Socio-economic Impacts of Renewable Energy* encompasses the various dimensions of renewable energy employment and assesses the positive impacts on industrial value added, GDP and welfare.

83. Translating knowledge into action, IRENA is developing new knowledge that can enable informed decision-making. The increasing depth and scope of the work will more effectively guide the global policy discourse on renewable energy deployment. This demonstrates the institutional maturity and the expertise that has been developed to support Members in the ongoing transformation of the energy system.

Policy assessment

84. The study "Adapting Renewable Energy Policies to Dynamic Market Conditions" was launched during IRENA's 7th Council and outcomes of the analysis served as the basis for enriching discussions between Member states and experts. Discussions focused on the appropriate policies that can help adapt to the changing landscape of renewables cost competitiveness. In particular, recognising the fundamental shifts occurring in many advanced markets, delegates reaffirmed the importance of adopting a systems-level approach to renewable energy policy-making. The rising growth of decentralised renewable energy and dynamics in the profitability of conventional generation is impacting traditional business models of incumbents. Delegates emphasised the need for co-existence and synergies between different energy sources and technologies to ensure that opportunities emerging from the ongoing transformation are tapped into and the long-term reliability of the electricity system is maintained. In this context, IRENA is expanding on this body of work and focusing its current analysis on the increasing role of non-traditional players in the energy sector.

Adapting Renewable Energy Policies to Dynamic Market Conditions

IRENA's report "Adapting Renewable Energy Policies to Dynamic Market Conditions" analysed best practices and lessons learned from diverse country experiences in adopting measures to adapt to evolving market conditions. Policy makers need to put in place adequate policy adaptation mechanisms to address challenges and to ensure that support measures are able to meet the sector needs in an effective and efficient way. Challenges include:

- Keeping pace with rapidly falling renewable generation costs and calibrating public support policies accordingly;
- Preparing for approaching grid parity for renewable energy technologies and accounting for their impact on the traditional energy sector;
- Integrating increasing renewable generation into power markets while ensuring long term electricity system reliability.

85. As part of the policy assessment work, IRENA is finalizing its report on "Renewable Energy Target Setting", which provides insights and guiding principles for designing and setting renewable energy targets. Renewable energy targets have become increasingly used in recent years to guide public policies and send long-term signals to renewable energy investors and companies. The topic is highly relevant

with over 144 countries currently having renewable energy targets in place, as well as in the context of the global effort to accelerate action on climate mitigation. Preliminary findings from the study indicate that meaningful renewable energy targets are based on a sound knowledge base, which also considers decisive contextual factors such as political, institutional and economic aspects outside the direct scope of the renewable energy sector.

Regional Market Analysis

86. IRENA is undertaking regional market analyses for the Gulf Cooperation Council (GCC) and for Latin America. In the context of the regional market analysis for the GCC, IRENA collaborated with the Gulf Research Council and National Technical University of Athens under the umbrella of EU-GCC Clean Energy Network to produce a state-of-the-art study of renewable energy status and trends, supporting policy frameworks and the potential macro-economic benefits of deployment of renewable energy in the region. The findings of this study were disseminated in expert meetings and workshops held in Abu Dhabi, Stockholm and Dubai, garnering valuable feedback from the public and private sector to support ongoing regional market analysis. Currently, IRENA is conducting an overview of the national energy sectors in GCC countries in order to explore aspects such as the drivers for energy diversification and the institutional frameworks and associated decision-making processes. The overview will form the basis for regional market analysis work in 2015.

87. The Latin America region is well known for having one of the world's cleanest electricity mixes due to hydropower's historical role. Recent trends show a rapid uptake of non-hydropower renewable sources, in particular wind, solar and bioenergy. A distinct feature of the region is the important role of biofuels in the transport sector, representing more than 10% of the sector's total demand in 2012. Given the large untapped renewable energy resources and rapidly decreasing cost curves across all renewable technologies, the region presents significant potential for renewable energy deployment not only in the power sector, but also in the heating and transport sectors.

88. Accordingly, the Latin America regional market analysis started with a mapping of key stakeholders at the regional level and across all sectors, including: electric utilities, renewable energy manufacturers, independent power producers, oil and gas companies, biofuel companies, international financial institutions, and public and private banks. The mapping exercise considers large industrial consumers such as manufacturing, steel and mining, automotive, pulp and paper, and agro-processing, to name a few. IRENA has conducted a review of the latest available data and information from a wide range of sources and, in parallel, has initiated consultations with energy experts in the region to identify knowledge gaps. A series of meetings were also conducted on the occasion of the Nationally Appropriate Mitigation Actions (NAMA) workshop organised in Montevideo in July 2014, with the participation of Latin American countries as well as the Latin American Energy Organisation (OLADE) and the Comisión de Integración Energética Regional (CIER). Based on these elements, IRENA is examining the energy sectors at a macro-economic level to contextualise renewable energy developments in the region and in particular to identify key trends and underlying drivers. This work represents a first step in the scoping process of the regional market analysis.

REvalue: social, economic and environmental impacts

89. Through its work on the socio-economic benefits of renewable energy, IRENA has been analysing the opportunities for value creation along the different segments of the value chain, including project planning, manufacturing, installation, grid connection, operation and maintenance and decommissioning. Further opportunities for value creation are also identified in the supporting processes such as policy-making, financial services, education, research and development and consulting.

90. In 2014, IRENA published the report entitled "*The Socio-economic Benefits of Solar and Wind Energy: an econValue report*" which identified the potential for value creation along the different segments of the value chain for solar and wind technologies and the opportunities for value creation that can arise from supporting activities. The study also discussed the need for the right mix of cross-sectoral policies, covering deployment and industrial policies, required to fully benefit from the socio-economic impacts of renewable energy. The report was launched at the fifth meeting of the Clean Energy Ministerial in Seoul at the roundtable on Renewable Energy for Sustainable Growth and Employment.

91. IRENA is deepening analysis to identify the various activities, sub-activities and components needed for the deployment of selected renewable technologies. The study analyses opportunities for value creation in the manufacturing, procurement and assembling of components and in the provision of services, as well as the requirements to undertake these activities locally. Through this work, IRENA aims to assist policy makers in identifying areas of the value chain that can be undertaken locally in order to maximise value creation.

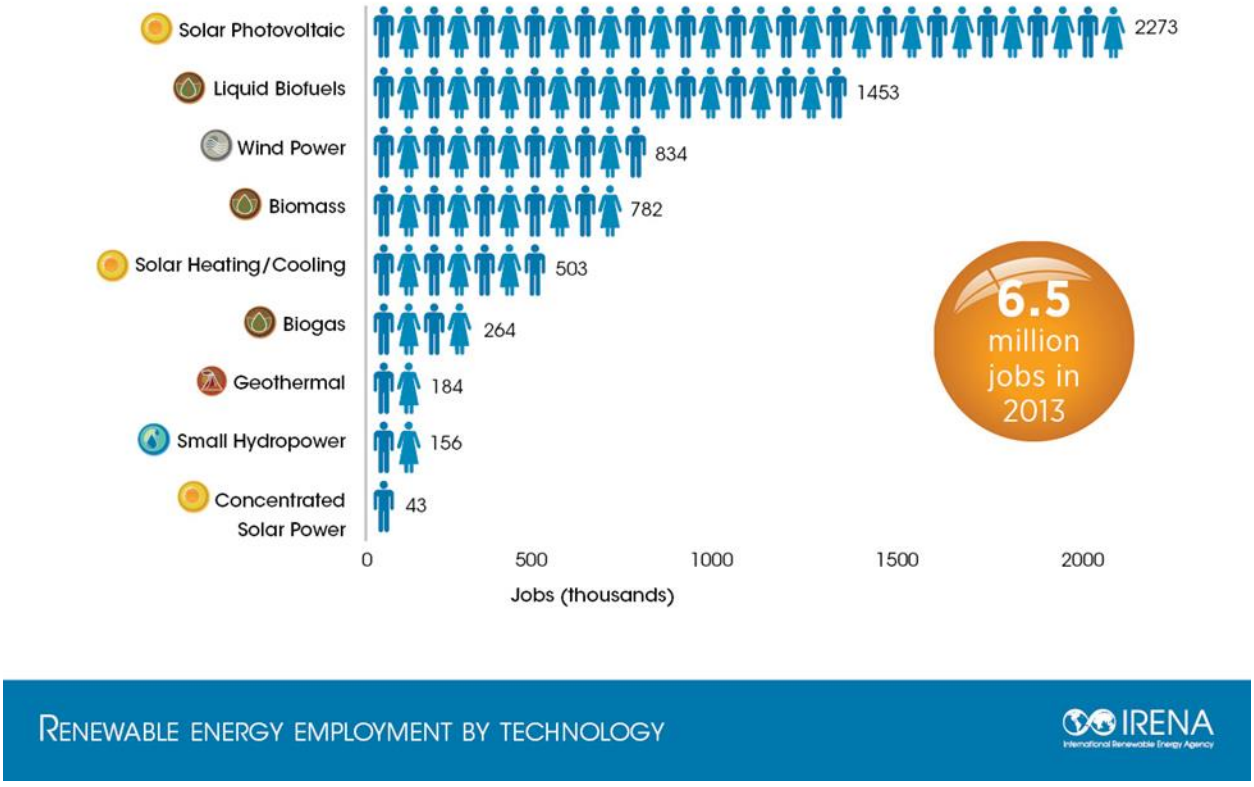
The Roundtable on Renewable Energy for Sustainable Growth and Employment

On the 12th of May, the Director-General attended the fifth meeting of the Clean Energy Ministerial which brought together energy leaders from the largest economies to discuss the next steps needed to accelerate the deployment of clean and efficient energy. On the margins of the meeting, the Director-General moderated the roundtable on "*Renewable Energy for Sustainable Growth and Employment*". The topic of the roundtable was a result of IRENA's econValue report, which analysed the socio-economic benefits of renewable energy deployment. The roundtable examined the barriers to creating growth and employment from renewable energy deployment and explored ways to stimulate social and economic growth through the renewable energy sector.

92. IRENA is expanding analysis on the potential value that can be created through the deployment of off-grid technologies in areas that lack access to energy, both in the renewable energy supply chain and in downstream enterprises. In rural areas of the developing world, considerable value creation can stem from activities enabled by renewable energy technology installations in the form of new local business start-ups. Moreover, productive uses of renewable energy in rural communities include water pumping and irrigation, heating (drying of foods products), and cooling (refrigeration of food products). The socio-economic impacts of introducing off-grid technologies to these communities are being analysed, supported by case studies from various regions that lack access to energy.

93. The project will also provide empirical evidence on the global socio-economic impacts of renewable energy deployment. Numerical evidence will be brought forward on issues such as the impact of renewable energy deployment on GDP and jobs, taking into consideration the economic interactions across all sectors. For this, IRENA is engaging with reputed institutions in order to use a state-of-the art analytical framework with a macro-economic perspective for variables such as trade balance, GDP and jobs. The results of this quantitative analysis will also feed into REmap.

94. IRENA is undertaking a number of analyses on the environmental impacts of the deployment of Renewable Energy Technologies (RET) throughout their life cycle, with an overview of the potential environmental impacts of solar energy technologies begin completed. IRENA has also started an analysis of the current end-of-life policies for recycling solar photovoltaic panels and avoiding e-waste from the solar industry, in particular in countries where the industry is growing rapidly, with limited capacities to recycle materials.



95. It is in this context that IRENA has been undertaking extensive work on job creation in the renewable energy sector, and has launched publications such as "*Renewable Energy and Jobs*" and "*Renewable Energy and Jobs – Annual Review 2014*" which provide insights on various facets of renewable energy employment and highlights that the sector has become a major employer, supporting around 6.5 million[2]

[2] Excluding large hydropower due to data limitations.

direct and indirect jobs in 2013. In the last year, these publications were disseminated in relevant regional and international meetings held in Beirut, Brussels, Dubai, Montevideo, New York Rabat, Rome and Seoul. This outreach has provided valuable feedback and data to support IRENA's ongoing work on the status and trends of renewable energy employment such as the upcoming update entitled "*Renewable Energy and Jobs – Annual Review 2015*". In this context, IRENA is also developing a database of employment factors to enable better estimates of renewable energy employment.

Energy Pricing

96. During the Middle East North Africa Renewable Energy Conference (MENAREC5) held in Marrakech, Morocco, on 15-16 May 2012, IRENA was invited to carry out a study evaluating the economic impacts of current energy policies in the context of renewable energy deployment. In response, work was initiated to explore the potential for renewable energy deployment in an energy pricing regime that rectifies market distortions by eliminating fossil fuel subsidies. A special focus was placed on five selected countries in the MENA region: Egypt, Jordan, Morocco, Oman and Tunisia. Featured case studies examine: (i) the structure of energy prices (ii) experiences with subsidy reform efforts; and (iii) the relationship between electricity pricing policies and renewable deployment.

97. IRENA has partnered with the International Institute for Sustainable Development (IISD) and engaged the Regional Center for Renewable Energy and Energy Efficiency (RCREEE) to conduct the study, and engaged independent consultants to carry out complementary analysis for the country case studies. A workshop with all project partners and the national experts was held in June in Al Gouna, Egypt, to discuss the national reports, which will be presented in a summary form together with a regional assessment. The study will be finalized in 2015.

RE Finance

98. In keeping with its role as the central platform for international cooperation and a repository of financial knowledge on renewable energy, IRENA has been focusing on exploring risks and barriers to renewable energy investment and analysing the risk mitigation options. IRENA is systematically engaging financial institutions, project developers, think tanks, governments, and other international organisations through outreach events and meetings. Jointly organised with partners (Climate Policy Initiative, the IEA, Ministry of Foreign Affairs of the United Arab Emirates, Masdar, and REN21), these meetings explored ways to mitigate risks and overcome challenges in renewable energy investment with a focus on political, policy, and liquidity risk. Furthermore, at the Second High-Level Meeting of the Africa-EU Energy Partnership (AEEP), held in Ethiopia, IRENA co-organised a breakout session on financing renewable energy projects and discussed the potential of risk mitigation instruments for renewable energy projects in Africa.

99. This work has been taken forward through two studies focused on types of risks and barriers specific to renewable energy investment. These studies identified available financial options to address risks and barriers, and analysed the effectiveness of existing risk mitigation instruments based on a quantitative and qualitative survey of financial institutions. The focus has been placed on ways to better utilise existing risk mitigation instruments and structure deals more effectively to scale up private investment. Case studies and additional research activities are underway to supplement the findings and to map out how IRENA can practically play a facilitative role in de-risking renewable energy investments and supporting countries in dealing with key barriers. These studies will culminate in a comprehensive report that will highlight IRENA's approach to effective renewable energy risk mitigation and project facilitation.

100. As part of IRENA's commitment to assist project developers in accessing financing, IRENA has launched the IRENA Project Navigator. The Project Navigator is a tool designed to help project

developers in the development and implementation of renewable energy projects. The tool provides users with written and interactive guidelines on project development and access to information on funding. Technical guidelines, designed to guide users through the technological requirements of a specific technology, have been developed for on-shore wind and solar photovoltaics, with small hydro in progress. Technical guidelines for biomass, geothermal and off-grid and micro-grid applications will be developed in 2015.

101. With support from the UAE, the Project Navigator is used to strengthen project proposals submitted to the UAE Pacific Fund. Furthermore, in cooperation with the Carbon War Room, the Navigator will focus on the Caribbean to provide regional and local content such as regulation, technical environments and regional financing.

102. To facilitate access to financing, the Project Navigator currently provides information on 25 global and regional funds. Partnerships are being formed with regional and international institutions to expand access to this information through the Project Navigator. Discussions are currently underway with ECREEE, Caribbean Policy Research Institute (CaPRI) Renewable Energy Finance Database and the African Fund Finder.

Project Navigator Workshop, Cabo Verde

The first IRENA Project Navigator Workshop, organised in cooperation with the Ministry of Tourism, Energy and Industry of Cabo Verde and the ECOWAS Centre of Renewable Energy and Energy Efficiency (ECREEE), was held in Cabo Verde on September 2014. The workshop brought together 70 policy makers, funding institutions and project developers from around the world representing over 25 institutions and addressed issues on the renewable energy project development environment in Cabo Verde, renewable energy technology project development challenges, key success factors of realised renewable energy technology projects and lessons learnt from past experiences, renewable energy funds' functionality, structure and requirements.

The workshop also featured a one-day training session on renewable energy technology project development and the use of the Project Navigator tool, which gave IRENA the opportunity to receive feedback from users on the tool's functionality and better understand regional and national considerations to be incorporated into the Navigator.

The General Director of Energy in Cabo Verde, Antonio Baptista, on Project Navigator (translated from Portuguese):
"Since Cabo Verde is a very ambitious country in terms of renewable energy, the Navigator, as an on-line platform, will greatly help in the development of projects that could be financed and implemented."

Cooperation with the Abu Dhabi Fund for Development

103. IRENA's mission to scale up renewable energy globally is actively supported through the IRENA/Abu Dhabi Fund for Development (ADFD) project facility. Through this facility, USD 350 million in concessional loans have been allocated by ADFD to projects in developing countries recommended by IRENA. These funds are disbursed over seven cycles, leveraging the equivalent or more from other sources. The facility's focus is on innovative projects with transformative results that enhance learning, are easily replicated or scaled up and further the advanced deployment of energy.

104. The first cycle resulted in the allocation of USD 41 million in January 2014, leveraging an additional USD 42 million from other funding sources to six medium-sized renewable energy projects. These projects are to be implemented in Africa, Asia, Latin America and the Pacific. All six projects will have a direct positive impact on the livelihoods of 300,000 people bringing power, biodiesel for transport and drinking water to coastal fishermen, schools, tourism, health centers and small village businesses.

105. The second cycle is nearing completion with shortlisted projects recommended to ADFD for final selection. Project proposals have been scored and commented on by experts based on technical merit, commercial feasibility, socio-economic and environmental benefits as well as replicability/scalability, innovativeness, the transformative nature of the project, and scope to improve energy access and energy security. The projects constitute a diverse and promising mix of projects covering Asia, Africa, Latin America and Small Island Developing States and a broad range of technologies. The increased diversity and growth in requested loan amounts demonstrate progress for the future of the IRENA/ADFD project facility and its ability to reach a wide range of countries and promote the widespread use of renewable energy. The announcement of the selected projects will be made at IRENA's fifth Assembly in January 2015. The third cycle opened in November 2014 with a deadline for applications of 18 February 2015.

One of the projects is a Mauritanian 1 MW wind energy project for isolated coastal communities to help to improve the livelihoods of local fishermen who would then be able to store their catch.

106. The IRENA/ADFD project facility continues to benefit from the work of the Advisory Committee and its experts to improve the application and selection process and to set up a project feedback framework. Co-funding partners also continue to be invited to assist projects seeking finance in the process. A major announcement was made by ADFD in early November 2014 with the further softening of the loan terms applicable to the IRENA/ADFD facility with rates of 1% and 2%, and a 20-year term and 5-year grace period. These new terms are also applicable to projects approved under the first and second cycles.

Quality Assurance and Standardisation

107. Quality assurance and standardisation are key enablers for healthy and robust renewable energy markets. However, developing and implementing sound quality assurance mechanisms requires concerted effort and resources from different market actors. IRENA's analysis of the experiences in quality assurance for small wind turbines and solar water heaters from 39 countries resulted in structured guidance provided to a selection of countries to develop quality infrastructure.

108. The German Metrology Institute (PTB) requested IRENA to support the development of quality infrastructure for solar water heaters in Latin America and the Caribbean. IRENA is now a member of the Project Steering Committee (PSC) for the initiative, along with the Organisation of American States (OAS), the Pan American Standards Commission (COPANT), the Inter-American Accreditation Cooperation (IAAC), OLADE, and the Inter-American Metrology System (SIM).

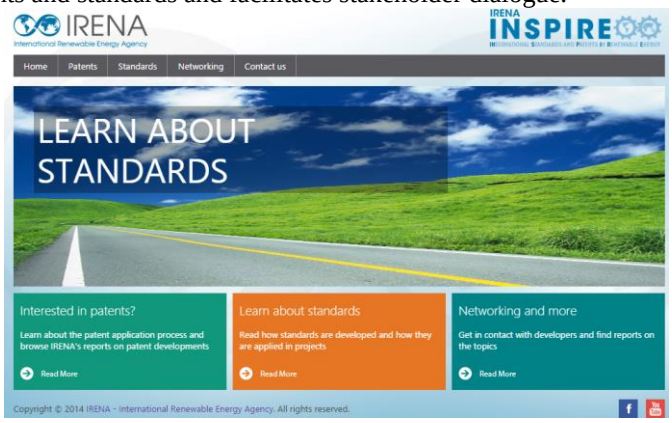
109. IRENA's engagement in West Africa has confirmed the shortage of qualified practitioners who can install, operate and maintain photovoltaic systems. In response, IRENA's Certification of Solar Photovoltaic Installers initiative was developed to assist countries from the ECOWAS region to implement a harmonised certification scheme for photovoltaic installers. This initiative leverages the ongoing IRENA project "Promoting a Sustainable Market for PV Systems in the ECOWAS Region" (ProSPER) project, focused on building entrepreneurial capacity. In April 2014, IRENA hosted meetings in Burkina Faso with the West African Economic and Monetary Union (UEMOA), where it was recognised that the Agency's initiative for regional certification of solar PV installers may increase regional employment opportunities. During 2015 a regional technical committee will be created to develop harmonized competency standards for solar PV installers at the regional level. IRENA also works with the East African Community (EAC) to support the operationalisation of standards for renewable energy technologies.

110. In support of the development and implementation of sound quality assurance mechanisms for renewable energy technologies, IRENA has released guidelines for solar water heaters (SWH) and small wind turbines (SWT) and has started work on guidelines for electricity grids. In cooperation with relevant partners, IRENA has also continued to provide advice on implementing quality assurance frameworks for SWH in Latin America and the Caribbean. The Asian Small Wind Turbine Test and Training Centre is a technology centre, currently under construction, based in China and jointly established by the Chinese Wind Energy Association (CWEA) and the Chinese Wind Energy Equipment Association (CWEEA). The Centre's purpose is testing, knowledge exchange, research and training. IRENA participates in the Centre's advisory board to develop, evaluate and guide its long term strategy of making its services and products relevant and of high-impact.

111. This regional support is being expanded in the field of standards and technical regulations for electricity grids by providing guidance on how to develop and implement grid codes that enable higher shares of variable renewable energy.

To encourage higher investor confidence, IRENA is launching an information platform on standards and patents to facilitate access to up-to-date information in support of technical regulations and renewable energy research and development efforts.

The Standards and Patents information platform provides users access to existing renewable energy patents and standards information, structured around existing patents and standards, learning, and networking, guiding users on how to apply for patents and standards and facilitates stakeholder dialogue.



Innovation and Research, Development and Demonstration (RD&D)

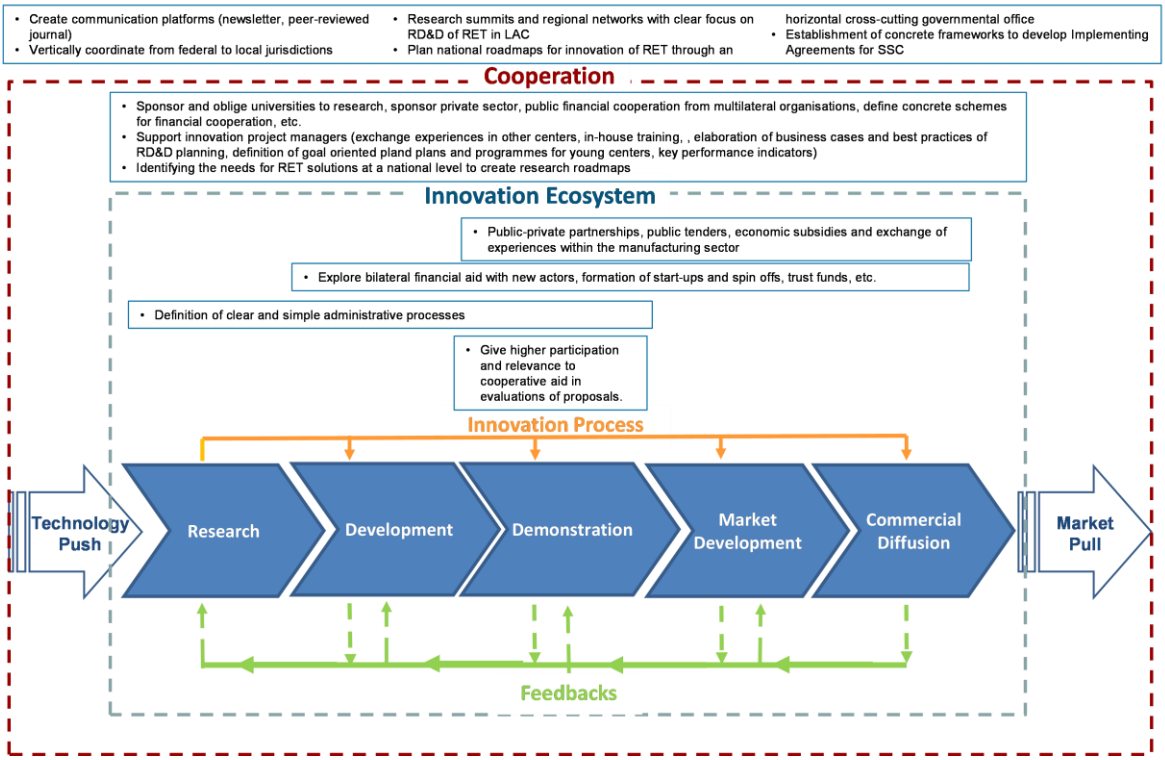
112. Innovation is essential to transition to a higher share of renewable energy technologies (RET). Designing and implementing appropriate mechanisms to boost innovation can be a challenging issue, however, international cooperation may advance RET development and encourage innovative solutions. In cooperation with Member countries and regional partners, IRENA has undertaken regional assessments for collaborative RD&D for renewable energy in Africa.

113. A study on how cooperation can support innovative RET solutions in the LAC region is also being finalised and will be released in 2015. Based on the assessment of regional initiatives and RD&D indicators, the report on RET solutions in LAC provides implementation recommendations for policy-makers in LAC on issues such as knowledge development and diffusion, promotion of entrepreneurial activities or market formation for new technologies, among others . Transforming recommendations into action, IRENA is working towards implementing report recommendations into priority areas such as smart micro-grids, advanced biofuels or coordination of technology centers in the LAC region.

114. IRENA has also initiated work on renewable energy resource technology outlooks for advanced biofuels and mini-grids. These studies analyze the current innovation status of such energy solutions, the developments that would be required to make them competitive in current markets and opportunities to achieving the commercialization phase.

IRENA Report: Recommendations and practical actions to innovation of RET in LAC

The recommendations are derived from interviews with main actors from the academia, private sector, NGOs, governmental and intergovernmental institutions. These recommendations are accompanied by suggestions on practical actions that could be taken.



III. Renewable energy access for sustainable livelihoods

115. With proven solutions, declining technology costs, successful business models and available financing, renewable energy may have an immediate and transformative impact on the quality of life of millions worldwide. IRENA is working to increase access to renewable energy through its IOREC platform, the work on mini-grid and off-grid applications, and capacity building.

IOREC platform

Solar PV electrification in a rural school

116. Off-grid renewable energy systems are now the most cost-effective solution for electrification in most rural areas. Tapping into this vast potential requires enabling effective policy and regulatory frameworks, tailored business and financing models and technologies adapted to the rural context. The International Off-grid Renewable Energy Conference (IOREC) convenes off-grid sector stakeholders to collectively identify pathways to scale-up off-grid renewable energy deployment. IOREC 2014, a joint effort by IRENA, the Asian Development Bank and the Alliance for Rural Electrification, was held in June in the Philippines, and convened over 400 key stakeholders from across the off-grid renewable energy value chain, including representatives from rural electrification agencies, ministries in charge of renewable energy development, the private sector, academia, financing institutions and international organisations.

117. Among the key messages that emerged from the two-day deliberations was the urgent need to change mindsets from a 'grant-driven' approach towards a 'marked-based' approach. This new thinking reflects the cost-competiveness of off-grid renewable energy technologies and the untapped market that energy-deprived off-grid communities represent. Attracting private sector participation requires dedicated policies, enabling regulations and a focus on the broader ecosystem that allows business models to be sustainable and scalable. Access to affordable financing is a critical element of that ecosystem whereby the international community needs to ensure that adequate financing for the sector is raised and that the financing is efficiently delivered to the enterprises and projects. Discussions also laid emphasis on engaging local communities in the design and implementation of rural electrification programmes and initiatives, and building local technical and managerial capacities to ensure the long-term sustainability of projects as well as local value retention.

118. Key findings from the conference and results of a stakeholder survey are summarised in the Conference outcome paper, available on the IOREC website. Moreover, deployment barriers identified during the IOREC discussions will guide IRENA's future activities on the topic.

IOREC: select key messages

- The target of universal electricity access by 2030 cannot be achieved unless a market-based approach to off-grid renewable energy deployment is adopted.
- There is a need to rethink delivery mechanisms through which financing can be made more accessible and be administered in a time bound and efficient manner.
- A paradigm shift is necessary from viewing electricity access as being limited to lighting alone towards delivering power that is compatible with the aspirations of the end-users.
- More comprehensive frameworks to bridge the information deficit on technology costs, socio-economic impacts, resource availability, etc. are needed to guide effective decision making.
- Capacity building efforts need to be directed at all stakeholders, including public agencies, financing institutions, entrepreneurs and regulators, for them to better understand the peculiarities of the off-grid sector.

Mini Grids

119. IRENA partnered with UNEP and SIEMENS to assess the economic and financial viability of hybridizing isolated diesel mini-grids with renewable energy. The objective is to show how adding renewable generation to a diesel-based mini-grid can reduce the levelised cost of electricity and earn good returns for public and private investors. The project started in 2013 with the identification of eight target locations across Asia, Africa and Latin America where real loads and cost data were sourced from isolated grids running on diesel and operated by public or private utilities to develop site specific business models. The full report and site-specific business plans will be released in 2015.

Mini-grid case study: Mauritania

Mauritania is a vast country characterised by low population density. Rural access to electricity is below 2%, and extending the grid to the entire population is therefore not likely to be economically feasible. Mauritania is therefore taking a decentralised approach to rural electrification through the development of clean energy mini-grids (wind solar diesel hybrid systems) to provide electricity access to unserved areas. Upscaling the deployment of clean energy mini-grids will involve designing sound policy and regulatory instruments to increase private sector participation. Through the RRA process, IRENA has facilitated the identification of key policy and regulatory gaps that need to be improved in order to attract and increase investment in the sector.

Off-grid for Niche Applications

120. IRENA and the United Nations High Commissioner for Refugees (UNHCR) have been discussing the possibility of addressing the energy needs of the Dollo Ado refugee camps in Ethiopia to improve the quality of life of refugees and host communities with the potential to replicate such strategies in other

camps. As a result of a field mission, a project proposal was prepared by IRENA and Masdar Institute outlining the need for energy solutions which include rechargeable solar lanterns; solar street lamps; and small scale solar powered systems for power and water applications. In November 2014, IRENA also performed a field mission to the Zaatari and Azraq refugee camps in Jordan to evaluate the energy situation and develop a roadmap for renewable energy deployment in cooperation with UNHCR, local government, and donor entities.

121. The proposal for the promotion of sustainable food preservation through the deployment of two pilot-scaled geothermal plant and one pilot-scaled solar food drying plant have been finalised. Detailed project deployment plans for both initiatives are subject to additional voluntary funding.

Capacity Building for Entrepreneurs

122. IRENA has engaged with entrepreneurs within the African region in an effort to build capacity and improve project bankability. In cooperation with ECREEE, IRENA organised training workshops for 25 entrepreneurs from West Africa and five regional financing institutions to help small and medium entrepreneurs assess the business potentials of renewable energy projects, develop business plans and loan requests, and increase financial institutions' confidence in renewable energy technologies. The training also contributed to ensuring sustainability of capacity building in entrepreneurship within the ECOWAS region by facilitating the participation of trainers from the ECOWAS-based incubation centre, 2iE Technopole. A follow up training was held in July, with participation of 17 regional commercial banks, development banks and micro finance institutions, to raise awareness of solar technology financing opportunities, associated risks and share best practices with the overall aim of increasing confidence of financial institutions in West Africa in financing solar energy projects.

123. IRENA is also in the process of setting up an Entrepreneur Technical Support Facility within ECOWAS which will become operational in 2015. The entrepreneur facility will support and encourage innovative ideas, provide expert and technical consultation and advisory services, and provide a basis for project review to increase project bankability. Considering the success of this model, IRENA will seek to identify opportunities for replication in other regions.

Mbolo skill training centre, The Gambia

124. In the Pacific, IRENA has been supporting capacity building activities to empower entrepreneurs from Vanuatu Island as part of an energy lending model managed by Village Infrastructure Angels (VIA), based on a combination of angel investment and crowd funding. The capacity building initiative is focused on market development and provides added value to existing development aid and grant funds. Through this series of training, it is expected that a more skillful workforce will ensure a long-term impact. By July 2014, 200 households in the outer island of Tanna benefited from the initiative and 20 entrepreneurs were trained on the technical and business development steps needed to start and grow a solar business.

125. IRENA also initiated a knowledge transfer initiative between South Asia and Sub Saharan Africa to support entrepreneurs in providing energy access through decentralised renewable energy technologies. IRENA is partnering with two of India's premium business incubators for energy access - the SELCO Incubation Centre and Centre for Innovation Incubation and Entrepreneurship (CIIE) based at the Indian Institute of Management Ahmedabad (IIMA), with additional support from UK Aid – Department for International Development (DFID) India's Knowledge Partnership Programme (KPP). Business incubators, entrepreneurs and national renewable energy association representatives from Asia and Africa

came together for the first workshop in Manila, as a pre-IOREC event, attended by 43 participants from 35 organisations. The workshop allowed participants to exchange knowledge and experience, as well as to identify gaps in knowledge and skills that prevent the creation and growth of enterprises. The workshop facilitated the formation of a network of incubation centres and renewable energy associations in South Asia and East Africa.

126. In November 2014, IRENA and the Climate Group India organized a knowledge-sharing workshop for South Asia to promote coordinated collective action among the Renewable Energy Associations and Clean Energy Networks in the region. There is a number of government and non-government led coalitions in these countries, including the Alternate Energy Promotion Centre of Nepal, Bangladesh Solar and Renewable Energy Association (BSREA), Renewable and Alternative Energy Association of Pakistan (REAP) and the recently-formed Clean Energy Access Network (CLEAN) in India. The joint outputs of these coalitions/networks could be significantly higher and various associations proposed to form a South Asia Network for Clean Energy (StANCE), formalization of which is underway.

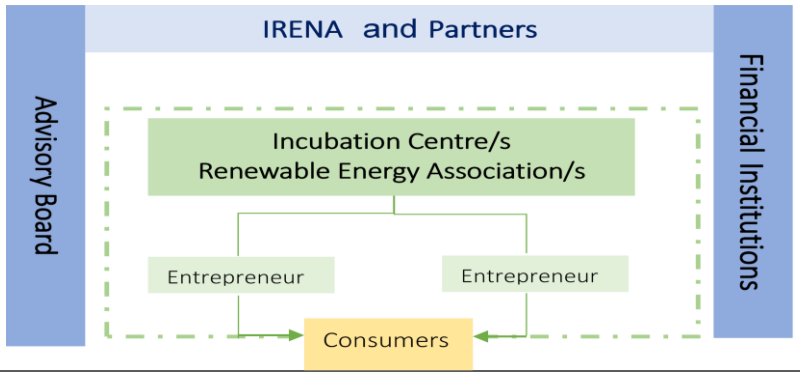
Supporting enterprise development for energy access

Renewable energy is playing an increasingly vital role in ongoing efforts to connect the nearly 1.3 billion people without access to electricity today. Approximately 60% of additional generation needed to achieve universal access to electricity by 2030 is estimated to derive from decentralised off-grid installations, either mini-grids or stand-alone, offering cost-effective sustainable solutions for off-grid populations.

Enterprise development is central to increasing electricity access but requires supportive systems and capacity building of stakeholders and institutions such as financial institutions, business incubators, and regional associations. Innovative approaches to the deployment of business models, increased investment and upgraded technical information on markets, technology and associated enabling environment are required.

To address these issues, IRENA is working to enhance financial flows through capacity building of financial institutions by establishing an Entrepreneurs Support Facility in partnership with ECREEE and 2iE, which includes technical and business advisory support for small entrepreneurs. IRENA is also accelerating knowledge transfer through training courses for business incubators and entrepreneurs from South Asia and Africa. Further, a mentoring system has been created to enhance success rate of entrepreneurs by 'twinning' incubation centers and entrepreneurs / incubatees enabling them to shadow each other's business and learn from the process. IRENA will also initiate the establishment of regional Advisory Boards to enable incubators, renewable energy associations and entrepreneurs to draw upon the knowledge of experts in the field – financiers, energy experts, and experienced entrepreneurs.

IRENA's approach to empowering entrepreneurs

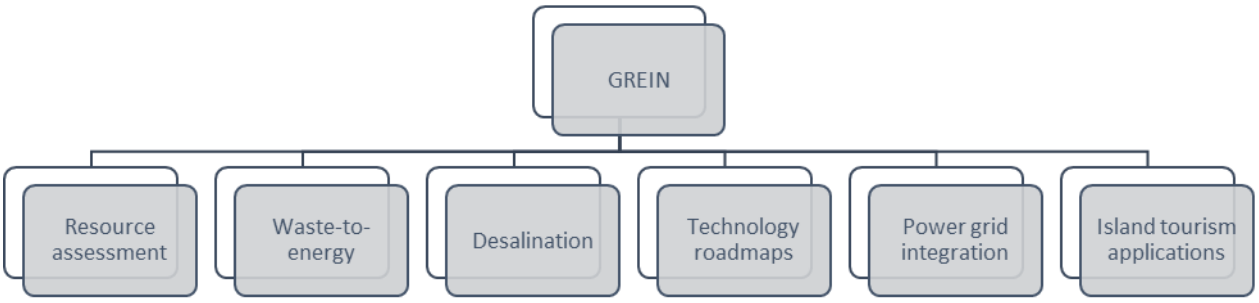


IV. Islands: lighthouses for renewable energy deployment

127. Islands represent a unique opportunity to showcase the transformative impact of renewable energy technologies and efficient use energy can have on energy security and social well-being. Within this context, IRENA is facilitating knowledge sharing, catalysing action, and developing island capacity to help island states realise their renewable energy potential and exceed their ambitious targets.

Global Renewable Energy Islands Network (GREIN)

128. To encourage knowledge sharing, IRENA has developed the GREIN web platform as a mechanism for sharing information and best practices on renewable energy deployment strategies, roadmaps, grid integration, tourism applications, resource assessment, desalination, and waste-to-energy systems. GREIN is a demand-driven platform and, with IRENA's help, islands are shaping the GREIN to serve its intended purpose. Exchanges and information sharing are spurring collaboration and a greater understanding of common problems and possible solutions. To foster the continued collaborative nature of the GREIN platform, IRENA is forming partnerships such as with the SIDS DOCK on the Global Islands Virtual (GIV) Knowledge Network, to widen its reach and maximise synergies.



Partnerships for Action in SIDS

129. In September 2014, IRENA participated in the Third International Conference on Small Island Developing States (SIDS) in Apia, Samoa. The conference addressed the theme of "The Sustainable Development of SIDS through Genuine and Durable Partnerships" and attracted twenty-one heads of state and government and 3,500 delegates, including representatives from private sector and civil society. Conference participants unanimously adopted the outcome document entitled '*SIDS Accelerated Modalities of Action (SAMOA) Pathway*' reaffirming commitment to the sustainable development of small island developing states. The outcome document has a strong focus on renewable energy and urges all stakeholders to join forces in supporting SIDS in the development and implementation of their national, regional and interregional sustainable energy plans and strategies. It also identifies IRENA as one of the key partners in this effort.

130. Prior to the Third International Conference on SIDS, Samoa, New Zealand and IRENA co-hosted a one-day Forum on Renewable Energy. The Forum, attended by some 300 participants, opened with a high-level dialogue with SIDS leaders and ministers who outlined the opportunities and challenges for the deployment of renewable energy. They conveyed the unified and strong message that renewables are key to the sustainable development of SIDS, and emphasised political commitment and the will to act, but also the challenge of implementation. In the ensuing discussions, Forum participants shared experiences and project insights, and echoed the belief that renewables contribute to economic prosperity and sustainable development, strengthen climate mitigation and resilience efforts and are key for the development of sustainable energy solutions for SIDS. Participants also stressed that access to financing and human and institutional capacity are essential underpinnings of required efforts.

Renewable Energy Forum, Apia Samoa

The Forum highlighted key issues spanning the national, regional and global context:

- "Many partners, one goal" approach is necessary to successfully transition to a sustainable energy future, as SIDS are too small for multiple approaches.
- SIDS need to be the lead in developing respective strategies, goals and roadmaps for renewable energy deployment, tailored to their individual circumstances, and with measurable targets to facilitate implementation.
- Enabling policy frameworks, as well as accountability and good governance, are required to incentivise stakeholders to invest in renewable energy solutions in SIDS.
- Regional exchanges and SIDS-to-SIDS cooperation focused on lessons learned and project insights will increase local skills, and provide guidance on best practice and innovative solutions.
- Opportunities for pooling human capacity at the regional level should be encouraged, wherever feasible.
- Partnerships that join political leadership, technical expertise, financing, and community involvement are paramount to the successful deployment of renewable energy technologies and transformation of the energy sector.
- Finding financial solutions that address limited economies of scale, high national debt, and high capital costs, and come at the necessary speed are essential to deployment of renewables in SIDS.
- Successful initiatives that bring together SIDS and a range of private and public stakeholders to make specific, measurable and time bound commitments to deployment of renewables should be encouraged.
- SIDS can provide invaluable lessons for integrating a greater share of renewables in electricity grids, or in providing innovative off-grid solutions, both of which can be deployed in non-SIDS settings.
- The time is right: declining technology costs, the need to decarbonise energy to address climate change, clear examples of success, better business models and available investment have created a momentum of opportunity that must be seized.

131. Consistent with the outcome of the Samoa Conference, IRENA launched the SIDS Lighthouses Initiative at the Climate Summit, in September 2014. The Initiative was introduced at the Abu Dhabi Ascent in May 2014 and launched at the Climate Summit, by which time it comprised 41 partners, including 27 SIDS. The initiative provides a framework for action for SIDS and partners, to move away from a piecemeal approach and transform their energy system through a structured, holistic and sustainable deployment of renewable energy, taking into account medium and long-term requirements and impacts.

132. The SIDS Lighthouses Initiative defines programmatic steps for accelerated deployment of renewables, and highlights opportunities for partnerships. The Initiative draws upon the GREIN work, which helped identify critical gaps and areas of interest, and serves as the bridge to catalysing partnerships and action around the areas of focus. Voluntary Contributions from Germany and Norway will enable IRENA to operationalise the SIDS Lighthouses in the coming months, with an immediate follow-up on the concrete requests received from Antigua and Barbuda, the Bahamas, and Barbados.

SIDS Lighthouse Initiative

The SIDS Lighthouses is a framework for action aimed at a programmatic deployment of renewables to enable their energy system transformation, by moving away from developing projects in isolation to a holistic approach that considers all relevant elements spanning from policy and market frameworks, through technology options to capacity building. Within the initial five (5) year timeframe, the SIDS Lighthouse initiative will focus on the power sector with the aim to achieving the following:

- Mobilise USD 500 million
- Deploy 100 MW of new solar PV
- Deploy 20 MW of new wind power
- Deploy significant quantities of small hydropower and geothermal energy and a number marine technology projects in progress
- Ensure all participating SIDS develop renewable energy roadmaps

IRENA will act as a hub for the SIDS Lighthouses, provide advice and support to SIDS as needed, and facilitate targeted engagement of stakeholders and mobilisation of funding.

SIDS partners will prioritise the deployment of renewables and, with support of IRENA as needed, lead the assessment of their plans, strengths and needs, to create an enabling environment for accelerated deployment of renewables. Development partners will provide technical, financial or other assistance, as needed. This support will target priority areas, which development partners will provide bilaterally or in partnership with other stakeholders.

Progress will be assessed on an annual basis in IRENA's regular meetings, and a high-level meeting would be organised in 2018 to assess progress and assess whether the initiative is on track to deliver its goals.

Analytical work in *support of island transitions*

133. Following the launch of the SIDS Lighthouses initiative in at the Climate Summit in September 2014, IRENA is consolidating its work with SIDS under the initiative's umbrella to facilitate the transition to a renewables based energy systems. The replacement of traditional generation plants with new variable renewable resources requires grid integration assessments to ensure continued electricity

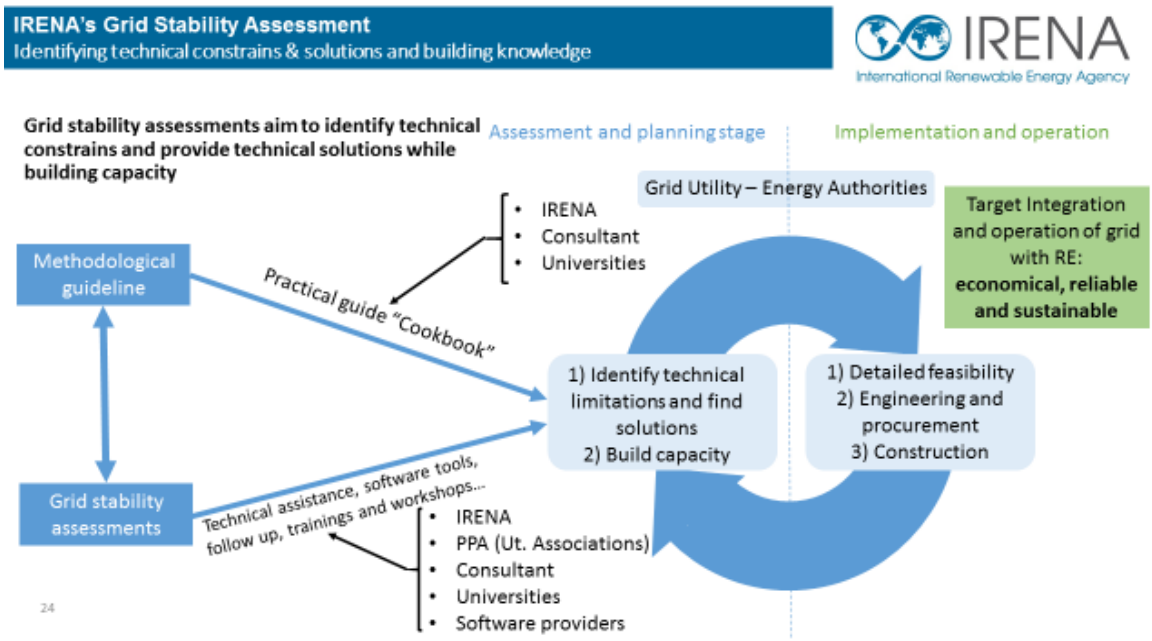
supply reliability. Through the coordination and execution of grid stability assessments, IRENA is supporting SIDS in the secure transition to higher shares of renewable energy. The task, successfully started with the pilot study for the island of Palau in 2013, is moving forward. Studies in Antigua and Barbuda, Barbados, the Cook Islands and Samoa are underway and will be released in 2015, with a number of others in the pipeline. As the sustainable transition to a secure high share of renewable energy requires the building of capacities among involved stakeholders, efforts are made to undertake these assessments in cooperation with local stakeholders. To support the strengthening of capacities and facilitate the conduction of studies by the member SIDS, IRENA has enabled the use of the highly specialized software tool for grid stability analysis PowerFactory. Public utilities and energy planning offices in the SIDS can have access to the software worldwide though the internet. Preparations are underway to support the PPA in conducting the study for Kiribati. This work area has been expanded through Voluntary Contribution of the Government of New Zealand, and will be accelerated in 2015 with the Voluntary Contributions provided by the Government of Germany and Government of Norway.

IRENA's Grid Stability Assessment Approach for Islands

IRENA's grid stability assessment approach to integrate high shares of renewable energies into island grids are based on the provision of a methodological guideline to self-coordinate and self-conduct grid stability studies and the coordination and execution of grid stability studies for Member countries with concrete plans for the integration of high shares of renewable energies.

Both activities aim to support the assessment of the technical feasibility of the island's renewable energy integration targets. This constitutes the first step in a sustainable, economical and reliable integration of renewable energies into the power grid; a process which the island continues with the funding, the implementation and finally the putting into operation of new generation resources. As the transformation of the electrical grids through the integration of renewable energies is in most cases not achieved in a single step, it is expected that the islands would need to conduct more than one grid stability study (i.e. cyclically assess the technical feasibility of new renewables into the grid). Therefore building knowledge is a key aspects for the success of the IRENA's approach.

Both components of IRENA's approach complement each other as the technical guideline development uses input and experience from the conducted studies and the conducted studies follow the developed methodology. The execution of the activities involves energy policy makers and power grid utilities of the member countries. It counts with the support from the industry and the academia.



134. IRENA organised an event on '*Renewable energy for island tourism'*, which took place in Cyprus on 29-30 May 2014. As a leader in deploying solar hot water heating systems for hotels and residential buildings and with the highest solar heating capacity installed per capita in the world, Cyprus was uniquely equipped to act as a host for this event. The event brought together participants from the energy and tourism sectors, government and academia, and created awareness and encouraged the exchange of best practices to accelerate renewable energy deployment in the tourism sector of islands worldwide.

135. A baseline report has been prepared on "*Renewable Energy Opportunities for Island Tourism*" to demonstrate the business case for the deployment of renewable energy in the tourism sector. As the first IRENA publication on the subject, its focus was on four cost-effective technologies suitable for hotels in islands: solar hot water, solar and sea water air conditioning and photovoltaic systems. The report shows that these options are good investments for hotels, with rapid payback and high returns, which also increase the attractiveness of the hotels, presenting them as responsible, green businesses that contribute to the improvement of the environmental quality of the island where they are located. The report also highlighted hotel cases that successfully deployed these technologies and emphasised the savings achieved. Efforts were made to document additional cases of cost-effective renewable applications in island hotels, in cooperation with the World Tourism Organisation (UNWTO) and its network of national tourism authorities. This work, enabled through a Voluntary Contibution of the Government of Germany, will be further advanced in 2015, including at the International Tourism Conference in March 2015.

136. Dialogue has commenced with the Indian Ocean Commission on energy efficiency and renewable energy auditing projects that could be undertaken for Indian Ocean islands. Capacity building for energy auditors will be provided in cooperation with a renewable energy hub established by France on the Indian Ocean island of La Réunion. A process is underway to assess capacities of energy service companies in the region to perform energy audits, with a view to providing necessary training and finding investment capital for renewable options which audits show to be cost-effective.

137. Wind measurement guidelines for islands have been completed. It is anticipated that donors might support measurement campaigns using these guidelines on selected islands for which the Global Atlas shows to have excellent, yet unexploited wind resources.

138. Island roadmaps define minimum cost pathways for islands to transition to renewable energy. Through a Voluntary Contribution of the Government of Germany, IRENA set up a program to assist Member countries in the development of island roadmaps. A first roadmap has been developed for Nauru in cooperation with other partner organisations (i.e. GIZ and SPC), and approved by cabinet during summer 2014. In the foreword of the roadmap, the Minister of Commerce, Industry and Environment states that, "the Nauru Energy Road Map realises the hopes and aspirations of Government and the People of Nauru for a better future, where reliance on fossil fuel is reduced, equitable access to energy supply and services is provided to all and energy supply becomes more secure and sustainable". The roadmap also shows the way for Nauru to contribute to the global initiatives in combating and mitigating the effects of climate change.

139. A roadmap for Cyprus been released in December 2014. The roadmap explored the key options for the evolution of the power generation mix, including interactions between renewable energy and natural gas and different pathways for the development of energy demand and investment implications. For each scenario, the roadmap defined an optimal pathway for Cyprus to develop its energy mix in compliance with its renewable energy targets, local pollutant limits, and energy security concerns. The roadmap provided key inputs for Cyprus' reporting obligations and set the baseline for the review of the national energy policy and the national renewable energy action plan. This work has been supported through a Voluntary Contribution of the Government of Germany.

140. The development of a third roadmap is ongoing for the Republic of the Maldives. The roadmap explores pathways for achieving the national objective of the Maldives to become the first carbon neutral country, and the implication of this policy for the development of the electricity sector. The roadmap focuses on the islands with larger electricity demand, and provides the required information for minimising the cost of the transition to renewable energy through an optimal mix of appropriate renewable energy technologies, electricity storage, electrical interconnection, and non-electric renewable energy technologies. The roadmap will provide the government of the Maldives with a set of clear

milestones for the transition of the national energy mix towards renewable energy, supported by recommendations on the necessary policies to enable this transition. This work has been supported through a Voluntary Contribution of the Government of Germany.

141. The development of a roadmap for Kiribati has been initiated in November 2014. The Kiribati Integrated Energy Roadmap (KIER), to be developed in partnership with SPC, and in close coordination with all the development partners active in the country, will be a government-led exercise that will look at the entire energy sector of the country, with a specific focus on shifting diesel grids towards RE, and providing energy access to the outer islands through RE. The first steering committee is planned in Tarawa for late January 2015.

142. A scope of work for roadmap for Barbados is at present under discussion. The roadmap will explore the minimum cost pathways towards the current target of 29% by 2029, as well as the implications of increasing this target. One of the key issues to be analyzed in detail will be the implications in terms of grid integration measures of large shares of variable RE like solar PV and wind. This is an issue of great relevance for the gradual transition of islands towards renewable energy, and this roadmap will constitute a unique exercise where long term energy planning will take into due account grid integration and grid stability issues, and look beyond current limits through the use of a portfolio of measures to increase the share of variable RE in island grids, including evaluating their cost effectiveness.

Building Capacity in Islands

143. IRENA's regional capacity building initiative is generating increasing momentum in the Pacific Islands due to its targeted approach and identification of country needs, leading to country ownership. Regional interventions have been focused on three areas: i) strengthening policy and regulatory frameworks; ii) building capacities of financing institutions to lower their perceived risk and increase their renewable energy portfolio; and iii) building a certified technical workforce for the design and installation of grid connected solar systems. In order to leverage resources and empower local regional organisations, all activities are implemented in close partnership with the Secretariat of the Pacific Community (SPC), the Sustainable Energy Industry Association of the Pacific Islands (SEIAPI), the Pacific Power Association (PPA), the Secretariat of Pacific Regional Environmental Programme (SPREP) and the International Union for Conservation of Nature Oceania (IUCN).

144. In August 2014, training was conducted in response to high priority needs, namely in areas of i) energy data and information; and ii) renewable energy targets and policy mechanisms to fulfil these targets. The training convened senior technical officials from energy departments, power utilities, and regulatory authorities from the Pacific SIDS. In the first segment of the training, IRENA built on the current efforts to establish a Pacific Regional Data Repository by introducing processes involved in defining, collecting and disseminating energy data to serve the national objective of countries. The second segment of the training built on the value of energy data in designing meaningful renewable energy targets as well as on relevant policy mechanisms. The training concluded with a confirmation of the capacity building needs for future IRENA interventions, among which was support for power regulators and assistance to develop a template for PPAs both of which were highlighted as a priority. IRENA and SPC are in discussions on how to streamline renewable energy data collection efforts.

145. Further, IRENA partnered with SPREP and IUCN Oceania to deliver training to financial institutions and other relevant institutions in the Marshall Islands, Tuvalu and Tonga. This training is aimed at improving the attractiveness of renewable energy projects by decreasing the perceived risk; building capacities; and, wherever possible, initiating consumer loans for renewable energy and energy efficiency projects at the local level.

146. Since late 2013, in partnership with SEIAPI and PPA, the regional industry-based certification programme for designing and installing grid-connected solar photovoltaic systems has gained momentum and more than 50 installers have been engaged in a series of theoretical and practical trainings that lead to certification. The participants come from six Pacific Islands namely: Fiji, Kiribati, Samoa, Tuvalu, Tonga and the Republic of the Marshall Islands, with the majority from the public power utilities. By August 2014, a total of 7 participants have been certified. A webinar sharing the experiences of IRENA and the building blocks of developing a certification framework in general was also delivered in July to over 40 participants.

V. Regional action agenda

147. IRENA is using its convening power and expertise to catalyse action by regional stakeholders and accelerate the introduction of renewable power options at the regional level, drawing upon the knowledge and experience of electric utilities, transmission companies, independent power producers, regulators, power pools, regional political and economic bodies, multilateral financial institutions and development partners.

Africa Clean Energy Corridor

148. The Africa Clean Energy Corridor (ACEC) is an IRENA initiative to promote a regional approach to the development and enabled deployment of renewable energy on the African continent beginning with those countries that make up the Eastern Africa Power Pool (EAPP) and Southern African Power Pool (SAPP). At the fourth IRENA Assembly in January 2014, an action agenda on the implementation of Africa Clean Energy Corridor was endorsed, through a ministerial communiqué, by the ministers of energy and heads of delegation of Angola, Botswana, Burundi, the Democratic Republic of Congo, Djibouti, Egypt, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, South Africa, Sudan, Swaziland, Uganda, the United Republic of Tanzania, Zambia and Zimbabwe.

149. The ACEC was one of the key initiatives launched at the Secretary-General's Climate Summit in September 2014. The importance of ACEC was emphasised by the Heads of African States, the AU Commissioner who presented it to the Summit, and the Secretary-General who stressed the ACEC's critical role in reducing carbon emissions and dependence on imported fossil fuels for a more sustainable and climate resilient economic growth. The process leading to the Climate Summit resulted in 14 additional government, private sector and other partners committing to the development of ACEC.

AU Commissioner, Mrs Zuma, launched the Africa Clean Energy Corridor at the Climate Summit 2014

150. As a part of the Climate Summit Impacts Task Team led by the UN Secretariat, IRENA quantified the impacts of the ACEC, using IRENA's regional SPLAT tools (see Section I Planning for Global Transition). IRENA's assessment shows that by creating a larger regional electricity market and building upon the strong political commitment of African leaders to strengthen regional institutions and

transmission infrastructure, the ACEC can attract investment to potentially meet 40-50% of power needs in the ACEC region by 2030. Combined efforts will also diversify resource availability, improve energy security, and foster investment opportunities and job growth. Such region-wide renewable energy deployment could cut the annual CO2 emission level in 2030 by 310 Megatonnes (Mt), translating into 2,500 Mt savings of cumulative CO2 emissions between 2010 and 2030, while increasing electricity supply 2.5 times.

151. The ACEC communiqué calls for five main actions: Zoning and Resource Assessment, Country and Regional Planning, Enabling Frameworks for Investment, Capacity Building, and Public Information. In support of the Africa Clean Energy Corridor, IRENA analysed the CO_2 mitigation impacts of the project using the SPLAT modelling framework. In addition, IRENA completed the, "*Analysis of Infrastructure for Renewable Power in Southern and Eastern Africa*", which outlined the state of the electricity sector, existing infrastructure and gaps that need to be addressed. As a result of the study, IRENA prioritised its activities in ACEC on zoning and resource assessment, enabling regulatory environments and capacity building.

152. The zoning methodology has been developed by IRENA and the Lawrence Berkeley National Laboratory (LBNL) and validated by stakeholders from utilities, government, regulatory bodies, power pools and academia from within the region. The methodology was used to identify developable, high resource potential renewable energy zones for solar and wind technologies, based on the input data from the EAPP and SAPP countries. Renewable energy zone ranks and zone supply curves will be presented to the stakeholders early in 2015. IRENA will further the zoning work in order to bring the results closer to implementation. This will include the identification of governance and technology solutions for enabling timely and efficient investment into zones.

153. IRENA has also developed a high-level strategy, the Regulatory Empowerment Project (REP), for the development and implementation of enabling regulatory environments. The REP has been developed in consultation with regulators and power pool operators in SAPP and EAPP with the aim to enable more private investment and help reduce associated risks. With the initial focus on SAPP, IRENA will work with local stakeholders to help develop and implement regulatory impact assessments; planning structures; tariff and support schemes; and system code structures.

154. A *Guide to Grid Integration of Variable Renewable Energy* was also published in 2014 and a first set of introductory capacity building workshops were delivered in Eastern and Southern Africa. In order to support the implementation of EREAP in Africa and also to expand activities on Enabling Regulatory Environments to potential clean energy corridors, IRENA is organising a set of capacity building activities for a targeted audience. Two training weeks on renewable power system regulations will be held early and late 2015 in Abu Dhabi. This activity is enabled though the Voluntary Contribution of the Government of Germany.

ACEC joint statement

Joint Statement

On the occasion of the United Nations Secretary General's Climate Summit, we the signatories of the IRENA Communiqué on the Africa Clean Energy Corridor (ACEC) issued in Abu Dhabi on 17 January 2014, together with partner governments, regional bodies, United Nations agencies, international financial institutions, private sector entities, and International Renewable Energy Agency, announce the Africa Clean Energy Corridor initiative to promote the accelerated deployment of renewable energy in the countries of Eastern and Southern Africa power pools.

The Africa Clean Energy Corridor initiative aims to substantially increase deployment of renewable energy in Africa, reducing carbon emissions and dependence on imported fossil fuels, leading to a more sustainable and climate resilient economic growth. Four-fifths of all electricity in Eastern and Southern Africa is currently generated from carbon-intensive fossil fuels such as natural gas, oil or coal. Regional demand for electricity is expected to more than double in the next quarter century. The Africa Clean Energy Corridor aims to meet half of total electricity demand from clean, indigenous, cost-effective renewable resources by 2030, thereby reducing carbon dioxide emissions to a more sustainable level.

Therefore, we the partners in the Africa Clean Energy Corridor initiative agree to support the implementation of the Action Agenda, as endorsed by Ministers representing 19 countries of the Eastern African and Southern African power pools in January 2014. The implementation of this Action Agenda will enable the ACEC countries to fully consider cost-effective renewable power options and develop enabling frameworks to attract investments, with a view to ensuring the accelerated and successful development of the proposed corridor.

Partners in the Africa Clean Energy Corridor Initiative:

Africa Clean Energy Corridor Countries: Angola, Botswana, Burundi, the Democratic Republic of Congo, Djibouti, Egypt, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, South Africa, Sudan, Swaziland, Uganda, the United Republic of Tanzania, Zambia, and Zimbabwe

Partner governments: France, Italy, New Zealand, the United Arab Emirates, the United States of America

Regional bodies: The African Union Commission, the East African Community, the New Partnership for Africa's Development, the Common Market for Eastern and Southern Africa

International financial institutions: The African Development Bank, Agence Française de Développement

United Nations agencies: The United Nations Development Programme, the United Nations Economic Commission for Africa

Private sector: Copperbelt Energy Cooperation, ENEL

Potential for a Central America Clean Energy Corridor

155. Subsequent to the informal consultation with stakeholders from Central America held in January 2014, a technical group from IRENA met with key regional actors including the National Energy Commission of El Salvador (CNE), USAID, the Regional Operator of the Electricity Grid (EOR), the Regional Electricity Interconnection Commission (CRIE), GIZ, the Integration System of Central America (SICA), among others. The meeting identified priority areas for regional intervention including building capacities to operate an electricity system with medium to high share of variable renewable energy (VRE); the identification of different scenarios for VRE penetration; and the assistance with the drafting of a cost-benefit analysis to quantify the costs and socio-economic benefits of the different penetration levels of VRE.

156. Following these meetings, a scoping and working session will be held in early 2015 to raise awareness on the main barriers and best practices on the operation of an electricity system with high shares of variable renewable energy in the Central American setting. This session will also reflect on climate change impacts and regulatory aspects to be considered in the overall grid system strategy.

Other Emerging Regional Clean Energy Corridors

157. IRENA teamed up with the League of Arab States (LAS) and other regional organisations to identify the actions needed to attract investments for larger deployment of clean and indigenous renewable energy resources in the Arab region. These actions are highlighted in a jointly-sponsored study of the "*Pan-Arab Renewable Energy Strategy 2030: Roadmap of Actions for Implementation*". The study proposes a clean energy initiative to integrate greater amounts of renewable electricity in the power systems of the Arab region. It recommends measures to streamline procedures to authorise renewable power plants, adopt regulations that support investment in such power plants, and facilitate coordination among national administrative bodies. It also points to measures to improve market access for renewable power and recommends tools to facilitate financing of renewable power investment and participation of the private sector in renewable power markets.

158. On the basis of this study, a new initiative on the Pan-Arab Clean Energy Corridor is under development to promote the exploitation of the region's abundant renewable energy potential and cross-border trade at the lowest environmental, social and economic cost. While the preliminary focus of the initiative is the Maghreb countries, the ultimate aim is to develop an integrated power grid covering the entire Arab region to allow for renewables-based power exchanges.

159. An inception meeting was held in January 2014 at IRENA Headquarters in Abu Dhabi to understand the views of various stakeholders, such as regional organisations, multilateral development organisations and power pools, on the actions that would be of greatest value for the Arab region. This was followed by the exploratory discussions in April with the Maghreb power pool (COMELEC). In addition, a consultative workshop was held in Tunis in June 2014 to inform key stakeholders of the opportunities for accelerating deployment of renewable power supply in the region.

160. Taking into account the structure and status of development of sub-regional power grids and the willingness of the key stakeholders identified, and in order to help frame an Action Plan in consultation with stakeholders, IRENA has initiated a situational analysis in the countries of the Maghreb region. This assessment will cover the current status of renewable power and associated infrastructure and supply chains, zoning and resource assessment capabilities, country and regional planning processes, market and financial frameworks for investment, human capacities and knowledge sharing.

161. In addition, IRENA is advancing the work on the integration of higher share of renewables in the ASEAN region. ASEAN countries are cooperating towards the development of a common ASEAN policy on power interconnection and trade, and ultimately towards the realisation of the ASEAN Power Grid (APG) to help ensure greater regional energy security and sustainability. The APG aims to lower the cost of electricity production and enhance the reliability and stability of the power supply by interconnecting the power grid systems with cross-border links. This will contribute in part to the growing ASEAN electricity demand which is estimated to nearly triple over the next two decades. IRENA will be implementing a "*Greening APG*" initiative with the goal to present strategic options for the region to maximise the use of renewable energy sources in tackling the intertwined challenges of energy security, environmental stresses and the need for creating new job opportunities. Taking a gradual approach, IRENA will first focus on Greater Mekong Sub-region.

Empowering through partnerships

162. To catalyse multilateral cooperation on renewable energy technologies, IRENA has partnered with the Latin America Energy Organisation (OLADE) and the International Geothermal Association (IGA) to support Andean countries in their status assessment through a detailed evaluation of the institutional, regulatory and legal landscape, the status of exploration of geothermal areas, and the status of incentives for investments, capacity-building needs and market structure. IRENA, together with the Andes Geothermal Centre of Excellence (Centro de Excelencia en Geotermia de los Andes – CEGA) and the Geothermal Institute (University of Auckland, New Zealand) organised a technical training workshop in Santiago, Chile, in May on geothermal environmental considerations and licensing and geothermal reservoir modelling, focused at the Andean region.

163. IRENA facilitated the participation of stakeholders from the Bolivia, Colombia, Ecuador, Nicaragua, Peru and Chile as well as expert presenters from the Geothermal Institute. The experts brought to the meeting important knowledge regarding geothermal environmental impact, monitoring and management, and geothermal reservoir modelling software. During the workshop participants discussed the status of geothermal development in each Andean country, challenges and capacity building needs. The workshop facilitated south-south cooperation as was demonstrated in the Memorandum of Understanding signed between CEGA (Chile) and National Institute for Energy Efficiency and Renewable Energy (Instituto Nacional de Eficiencia Energética y Energías Renovables or INER) from Ecuador to exchange information, staff, training, etc.

Global Geothermal Alliance

The Global Geothermal Alliance (GGA) was launched at the Climate Summit in September 2014. Initiated by Iceland at the Abu Dhabi Ascent and supported by IRENA, the Alliance brings together champions of geothermal energy deployment, including governments, financing institutions and the private sector. It aims to promote enabling frameworks for investment, innovative financial and institutional mechanisms for risk-sharing and build capacities for deployment of geothermal.

The founding members include Bolivia, Chile, Colombia, Fiji, Iceland, Kenya, Nicaragua, the Philippines, the Inter-American Development Bank, the World Bank Group and IRENA. Terms of Reference for the Alliance and a detailed Work Plan will be developed by January 2015, with a view to accelerate the work of the Alliance in the course of 2015.

164. IRENA has developed strategic partnerships with active centres of excellence and capacity building providers to deliver joint technical training programmes. As of November 2014, four partnerships were established and almost 60 professionals were trained. The first was the joint Japan-IRENA training on Designing and Implementing meaningful renewable energy targets. The training was conducted with the support of the Japanese Ministry of Foreign Affairs and the Ministry of Environment, based on the outcomes from the Renewables Readiness Assessment (RRA) that had been carried out in the countries of the participants. A total of 13 senior technical officials from energy departments, power utilities and regulatory bodies participated from Africa (The Gambia, Ghana, Mozambique, Niger, Senegal and Swaziland) and the Pacific Islands (Fiji, Kiribati, Marshall Islands, Samoa and Vanuatu). The workshop discussed topics such as the pre-requisites and methodology for designing a target and how to implement it by using sound policy mechanisms.

165. Feedback from the participants indicated several learning outcomes such as identifying gaps in the design of the targets and realising the added value of an analysis-based design approach; evaluating the appropriate policy mechanism or mix of policies (FiT, tenders, net-metering); understanding the impacts of high cost of diesel power generation on the design of net-metering in the case of islands; and realising a widely overlooked advantage of consumers that play an active role in the electricity market as producers. A follow up workshop for the Pacific Islands was delivered in August 2014, and preparations are underway for the follow-up in the Sub-Saharan Africa.

166. In partnership with The University of Oldenburg in Germany, IRENA facilitated the participation of experts from Bangladesh, Ecuador, Fiji, Jordan, Nepal, Rwanda and Samoa in the 8th International Biogas Compact Workshop on Mass Dissemination of Domestic Bio Digesters in Developing Countries. This specialised training focused on small scale biogas household applications for rural areas and large scale applications for urban areas with on-site demonstration of large biogas power plant operations.

167. IRENA continues to forge strategic partnerships to advance its capacity building efforts. In collaboration with the Kuwait Institute for Scientific Research (KISR), IRENA organized a joint technical training on solar resource assessments within the IRENA Global Atlas. The session was attended by 20 professionals from ten MENA countries. In addition to covering topics related to advanced solar resource assessment methods, the training addressed the prevalent gap between the efforts for solar resource potential assessment and the bankability of the resulting data leading to solar investments. Furthermore,

issues of reliability and variability of solar energy, currently at the forefront of the solar deployment agenda, were discussed with emphasis on solar radiation data quality control and uncertainty.

168. With the premier India Institute of Technology Alternate Hydro Energy Centre (AHEC), a technical training on small hydro power development was conducted in October 2014. The small hydro power (SHP) in particularly suitable for remote areas, due to its renewable, non-polluting nature, low operation and maintenance costs, high efficiency energy conversion rates, and fast response to demand variability. The training aimed to enhance the understanding of fundamentals across the engineering; economic and financing; and legal and policy development phases involved in designing, developing and operating a SHP. 15 professionals from IRENA Member countries with untapped hydro power potential and interest to exploit this resource participated in this training.

169. The third cohort of scholars of the Masdar Institute-IRENA Scholarship programme, representing thirteen different nationalities, successfully graduated resulting in a cumulative 60 alumni. The programme has been restructured to provide increased value to scholars as well as to the Masdar Institute. In this regard, this year the programme lectures were designed to bring renowned academic professionals from prominent research institutions and laboratories to Masdar Institute not only to apprise the students, but also to develop collaborative linkages with the Masdar and similar institutes. Additionally, new protocols have been developed to provide opportunities for internships and short assignments to all scholars associated with IRENA, including the recipients of the Masdar Institute-IRENA Scholarship. In this context, IRENA, the Masdar Institute faculty and students are developing long-term, mutually beneficial, research projects.

VI. Member Relations, Communications and Outreach

170. Member engagement is a vital component of IRENA's ability to maximise impact of its programmatic work. Based on clear communication and outreach, IRENA constantly seeks to engage the membership in innovative, user-friendly ways.

171. In 2014, IRENA has organised around 40 programmatic events and has released over 25 publications, a growing selection of which were released in multiple languages in 2014, in support of the objective of worldwide dissemination of knowledge to promote renewable energy.

172. IRENA Bulletins are issued regularly to enhance the communication and cooperation between the Secretariat and the membership, especially on programmatic matters and upcoming IRENA activities. Based on the feedback received, the Secretariat will disseminate these concise updates more frequently in the future. In addition, feature articles highlighting the value of renewable energy and IRENA's work for a wider external audience has been raised to a new level with the introduction of a redesigned newsletter, the IRENA Quarterly, as well as a growing array of website content and social media engagement.

173. In the context of the MTS, and empowered by the goal of becoming an authoritative global voice for renewable energy, IRENA took a number of steps to develop robust and resilient institutional messaging. Awareness about IRENA among key stakeholders and the general public is on the rise around the world, while the core message that renewables are viable and cost-effective has been actively disseminated through print, video, outdoor and other marketing and communications channels. The Agency has improved its ability to reach key stakeholders by expanding its targeted media lists and regularising communication with leading journalists and media outlets in the energy space. A well-received Financial Times – IRENA "*Question Time Debate*", was held for the third time at the fourth session of the IRENA Assembly, stimulating discussion among the high-level participants and the audience in attendance, and

also triggering robust online engagement. A fourth edition will take place during the fifth Assembly session.

174. To date, IRENA has also released numerous press releases which, coupled with outreach activities, attracted considerable media attention, resulting in international media outlets coverage including Al Jazeera, CNN, CNBC, ABC, Bloomberg, the Financial Times, Itar-Tass, Xinhua, Reuters, The Guardian (UK), Wall Street Journal, and Deutsche Welle, among others. IRENA also strengthened its presence in social media by establishing an active and well-regarded Twitter page; expanding the use of Facebook and LinkedIn for the Agency and some of its projects; and developing and publishing YouTube videos to promote and cover the Agency's major projects and events.

175. As IRENA's growing portfolio of products and activities gathers momentum, the Agency continued to develop its institutional communications capacity to match its growing need, including to strengthen and expand its position in media markets, develop and capitalise on synergies with like-minded organisations, and support Member communications efforts. Capacities and available resources have been directed towards priority requirements to carry out the Agency's communications strategy, both worldwide and in target markets for specific programmes and projects. This work is supported by the Voluntary Contribution from the UAE.

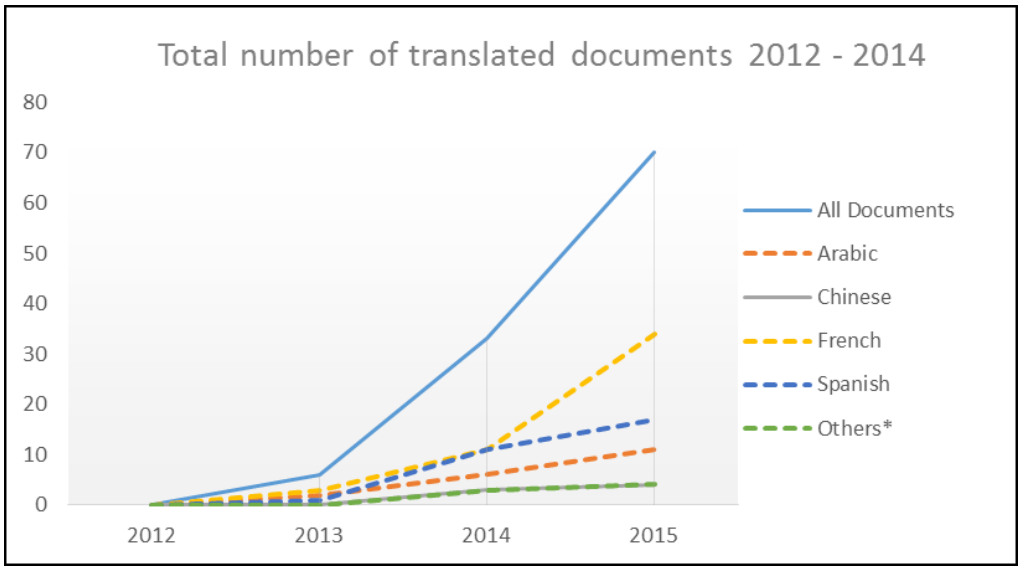
176. Since the Headquarters Agreement with the Agency's Host Country has entered into force, the number of appointed Permanent Representatives (PRs) to IRENA has been steadily growing, from two in January to 26 in December 2014. The Director-General hosted informal meetings in April and September 2014 to discuss IRENA's work and broader renewable energy issues with the PRs. As the PR community grows, the modalities for engagement will be further evolved to ensure regular and meaningful interaction and participation in the work of the Agency. IRENA's presence in New York provides an additional avenue for regular interaction with those Members who do not have a presence in Abu Dhabi. The Liaison Office played a critical role in the preparations for the major international meetings in 2014, including the Samoa Conference and the Climate Summit both in terms of facilitating interaction and IRENA's presence in relevant preparatory meetings, and in disseminating information to the membership. Furthermore, the Agreement on Privileges and Immunities for IRENA, the text of which was endorsed by the Assembly at its third session, has now been ratified by three Member States, namely, Germany, Egypt and Poland. The Secretariat continues engaging with Members to ensure that IRENA is granted the privileges and immunities it requires to conduct its work.

177. To further enhance communication and Member relations, the Secretariat is continuing its development of REmember, an e-platform that replaced the delegates' area on the IRENA website earlier this year. As of December 2014, REmember had some 500 users from 120 countries. REmember includes information developed in sync with the Agency's public communications platforms and a range of tools. For example, in response to Members' request to provide early information on IRENA events, REmember now contains the Events Calendar, comprising events hosted by IRENA as well as relevant events hosted by others, to assist Members in planning future participation in IRENA and other activities that may be of particular interest. REmember also includes sessional documents, a documents library, contact information for IRENA focal points, an inbox for Secretariat messages, latest announcements, and information on Permanent Representation to the Agency.

178. The Secretariat continues to provide substantive and technical support to the Assembly and Council and their subsidiary organs. Most recently, this support has included taking measures to "green" IRENA's meetings, making them more eco-friendly and sustainable. For example, IRENA is systematically reducing the amount of printed paper: the number of sessional documents printed for the second Assembly was reduced by almost 40% at the fourth Assembly. In addition, paper consumption in Council meetings decreased by 74% from the third to the eight Council meeting. Further, a meeting mobile

application will be launched at the fifth Assembly to facilitate delegates' participation and provide easy digital access to meeting documentation and information, and further reduce the carbon footprint of IRENA's meetings.

179. In order to engage with its expanding membership and to strengthen the reach of the Agency's work, IRENA has continued to seek possibilities for enhancing the use of different languages in the programmatic work of the Agency. Since the adoption of the decision on multilingualism at the third Assembly, a significant amount of programmatic work has been translated and more publications are planned to be translated in the second part of the biennium, as detailed in the figure below. When warranted by the programmatic needs, documents are translated in full[3], and where sufficient, only the executive summary of a report[4] is translated to ensure a wide reach, but at an affordable level. Efforts are being made to find practical and cost-efficient solutions for translating IRENA's web content, in order to facilitate online navigation and access to information on the Agency's platforms. As IRENA does not currently have resources to build and maintain in-house capacities for translation and interpretation, these services continue to be outsourced to external providers. In June, IRENA became a member of the International Annual Meeting on Language Arrangements, Documentation and Publications (IAMLADP), which will help gain information on cost-efficient best practices from other international organisations. IRENA is also seeking Member support to ensure quality delivery of translation. Members could provide financial support, assist with the translation of publications or provide support to proof-read translated publications.



180. The Fund for Developing Country Representatives (FDCR) was established at the second session of the Assembly to enable, subject to available funds, participation of delegates from Least Developed Countries (LDCs) and Small Island Developing States (SIDS) in the governing body meetings. Since the establishment of the Fund, contributions have been received from Armenia, Fiji, Finland, Germany, Iraq,

[3] Renewables Readiness Assessments (RRAs) , REmap country reports, and REthinking Energy (in progress)
[4] REmap 2030 summary findings, executive summaries of the Renewable Energy and Jobs Report and REthinking Energy publication

Madagascar, Sweden and the United Arab Emirates. At the end of 2014, Germany and the United Arab Emirates have pledged additional contributions to the FDCR.

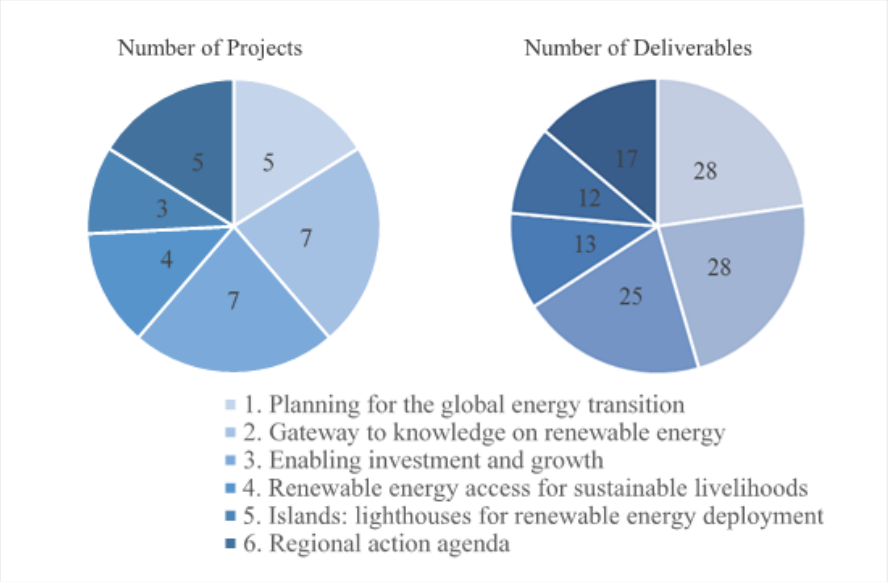
181. In the course of 2014, the FDCR supported participation of 75 delegates in the fourth session of the Assembly, the seventh and eighth Councils as well as the preceding committee meetings. In order to ensure a high level of inclusiveness and participation of all IRENA Members in the Agency's governing body meetings, it is essential that the Fund, which is exclusively based on voluntary contributions, continues to be replenished, emphasising that the fund frequently faces shortfalls which compromise broad participation of eligible delegates at governing body meetings of the Agency.

VII. Project Management Office

182. To ensure effective management and administration of the programmatic activities, the Work Programme has been structured along 31 projects, covering the 123 deliverables laid down in the Work Programme. Through the Project Management Office (PMO), project documentation has been standardised across divisions, so as to promote consistency and coordinated delivery of the Agency's products, ensure the most efficient use of resources, and introduce economies of repetition in the execution of projects.

183. In 2014, out of 123, deliverables, six have been completed ahead of schedule, eight have been or will be completed on schedule by the end of 2014, six have been delayed, and one has been adjusted due to changing needs. An important part of the PMO process is the monitoring and evaluation of the Agency's activities. Indications are that, with some four years of implementation, there are growing possibilities to evaluate the impact of different aspects of the Agency's work. Information in this respect will be consolidated and analysed at the end of the current programmatic cycle.

Projects and Deliverables by Thematic Area



184. The Work Programme and Budget 2014-2015 includes a range of programmatic activities that would strengthen the impact of IRENA's work, but would require additional voluntary contributions to be mobilised. A number of Members have already provided or pledged generous voluntary contributions that will enable the implementation of some of these deliverables.

VIII. Administration and Management Services

185. Over the course of 2014, the Administration and Management Services (AMS) Division continued to provide effective and efficient support services to all Agency divisions and activities. Services provided by the AMS Division included Human Resources, Finance, Information Communication Technology, Procurement and Travel. Through a collaborative effort throughout the Agency, AMS continues to develop and update policies, procedures and related processes required for the optimal support of the Agency's operations and project implementation. Different areas of AMS service sections were subject to external and internal audit during the year, resulting in several recommendations for improvement of service delivery. The update on the status of implementation of these recommendations can be found in the 'Report of the Director-General on the Status of the Implementation of Audit Recommendations' (Document A/5/13).

Human resources

186. Timely and effective recruitment of staff implementing a competitive and transparent process remains a priority. As of November 2014, out of 89 approved posts, 83 positions are either filled or under active recruitment and 6 are vacant. Staff represent 41 nationalities, 49% of which are female and 51% are male.

187. Over 7,000 applications were received in response to 29 vacancies announced during 2014, with the average number of applicants per vacancy continuing to increase compared to previous years, demonstrating increasing interest in employment with the Agency. To ensure a transparent process and selection of the best candidates for the vacant positions, candidates are being assessed through a standardised process involving a panel of staff members at appropriate levels. All recommendations are reviewed and approved by the Director-General before the final selection and appointments are made.

188. In addition to the Junior Professional Associate and Internship programmes that enable young professionals to gain renewable energy and administrative experience, seven individuals from three Members are serving the Agency under loan arrangements. One is provided by the Government of China and assigned to CSP in Abu Dhabi; two are supported by the Government of Japan and are working with SMED in Abu Dhabi and IITC Bonn; and four are loaned from the United Arab Emirates, working with the SMED, CSP, KPFC and AMS, all based in Abu Dhabi. Two loan arrangements relating to additional individuals loaned from the United Arab Emirates to be assigned in support of the IITC work in Bonn are currently underway.

Finance and Budget

189. For the year ended on 31 December 2013, the Agency's financial statements continued to be prepared in accordance with the International Public Sector Accounting Standards (IPSAS). These financial statements received a clean and unqualified audit opinion from the external auditors. The External Auditors made four recommendations, two of which have been fully implemented and the other two fully implemented by the fourth quarter of 2014 and the first quarter of 2015 respectively.

190. During 2014, a new Budget Planning Application, internally developed by the Agency's ICT services, was introduced in order to efficiently manage the process of issuing budgetary allotments and facilitate the process of monitoring commitments and utilisation. This application is intended as a bridging tool, pending the introduction of the new integrated Enterprise Resource Planning (ERP) system.

191. Following the Assembly approval of the revised Agency Financial Regulations in its decision A/4/DC/2, the Director-General issued an Agency directive promulgating the revised edition of the

Financial Regulations that govern the financial administration of the Agency. In the same directive, the Director-General, pursuant to Financial Regulation 13.1 (a), issued the promulgated Financial Procedures which follow the provisions of the corresponding Financial Regulations. The Financial Procedures provide further details as to the manner in which the Financial Regulations are implemented.

Procurement

192. During 2014, the Agency continued the implementation of its institutionalized procurement plan aiming to ensure the coordination and cost-effectiveness of its activities across all divisions. As of 30 November 2014, approximately 400 contracts - including 20 project agreements, and purchase orders were successfully processed for the amount of USD 5.4 million. To ensure transparency and competitiveness, procurement opportunities are being posted on IRENA's website and on the United Nations Global Marketplace (UNGM) and, where appropriate, Long-Term Agreements for various services are being entered into. As of September 2014, four Long Term Agreements had been concluded.

Information and Communications Technology

193. The Enterprise Resource Planning system (ERP) implementation efforts are advancing to automate the processes and procedures of Finance, Human Resources, Procurement and Travel, in support of smooth, efficient, transparent and auditable functioning of the administrative processes. User Acceptance Testing for Finance and Procurement have been completed and ways for data migration from legacy systems to new ERP systems are currently being explored. It is envisaged that Finance and Procurement modules would go live after data migration is successfully completed, with other modules to follow.

194. IRENA's Information and Communication Technology (ICT) Office provided a broad range of centralized solutions and services to IRENA offices, which operate in a single virtual office environment. To date, ICT has launched ten external portals and over fifteen in-house developed applications including the one used for managing budget, for recording personal international calls, for handling conferences and for managing correspondence system. To enhance service availability and resilience, IRENA has adopted Cloud based infrastructure and services IRENA's email system has been moved to cloud based Office 365 platform and the external information management portals were moved to Microsoft Azure Cloud Infrastructure. These two moves are expected to provide added benefits of improved performance & scalability along with centralized management. Additionally operational flexibility is enhanced with no major capital investments needed for ICT infrastructure on IRENA premises while contributing to significant reduction in cost. Using cloud infrastructure provides increased operational flexibility with no major capital investments needed for ICT infrastructure.

Travel and General Services

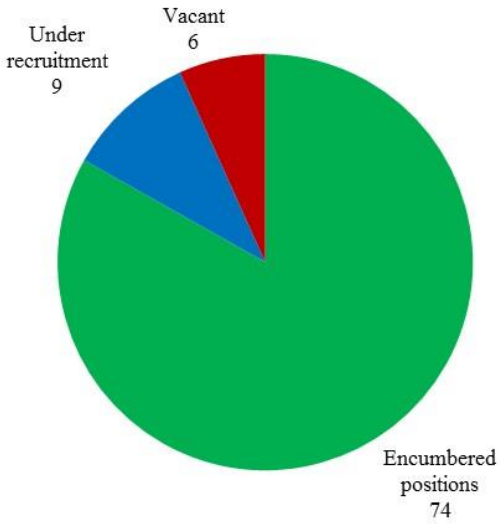
195. The Travel and General Services Office continued to facilitate staff, delegates, and conferences and workshops participants' worldwide travel through the Agency's Abu Dhabi and Bonn Offices. Approximately 1500 travel and accommodation arrangements have been made in 2014. Enhancement and review of premises safety and security plans are also regularly carried out.

196. The Agency's move to the permanent Headquarters offices provided by the host country at the new complex in Masdar City are in the final stages. Coordination meetings continue to take place with the UAE authorities addressing areas related to sustainability, energy targets, ICT requirements and interior design. The Headquarters committee, established to coordinate various operational requirements, continues to monitor progress, providing support activities as required.

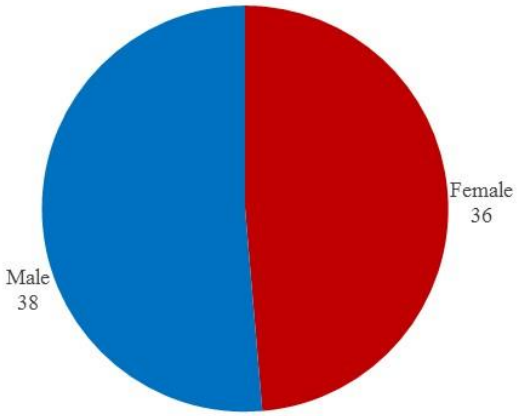
Approved and filled/under recruitment posts by level as of 30 November 2014

Level	Approved	Filled or Under Recruitment
ASG	**1**	**1**
D-2	**1**	**1**
D-1	**5**	**5**
P-5	**18**	**16**
P-4	**15**	**14**
P-3	**22**	**20**
P-2/1	**3**	**2**
Sub-total Professional and above	**65**	**59**
General Services	**24**	**24**
Total	**89**	**83**

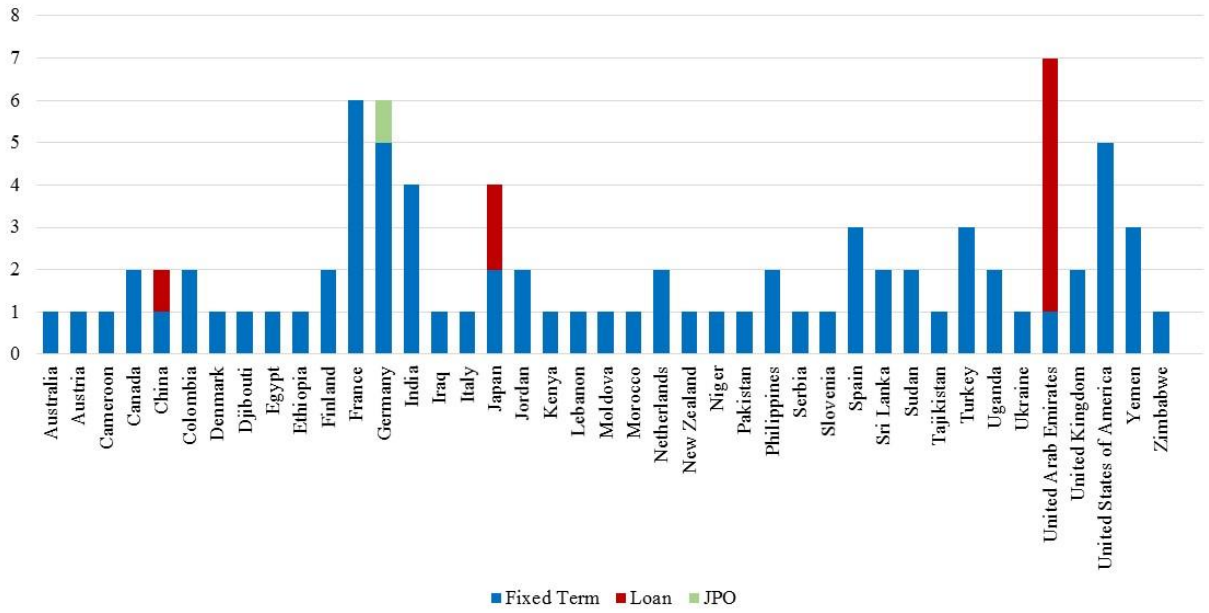
Staffing Status as of 30 November 2014



Gender Balance (based on filled posts) as of 30 November 2014



IRENA Staff Nationalities (based on filled posts) as of 30 November 2014



Note: IRENA Staff Members and related personnel (Fixed Term, On-loan and Junior Professional Officers) come from 41 different nationalities

Junior Professional Officers (JPO) and Loaned Staff

Division	Title	Loan from	JPO
SMED	Liaison and Protocol Officer	UAE	
SMED	Programme Officer - GSO	Japan	
IITC	Bioenergy Analyst	Japan	
IITC	Programme Officer	UAE	
IITC	Programme Officer	UAE	
AMS	Human Resources Officer	UAE	
CSP	Programme Officer	UAE	
CSP	Programme Officer	China	
KPFC	Programme Officer	UAE	
KPFC	Associate Programme Officer, Data and Information (JPO)		Germany

Table 1: 2014-2015 Biennium budget utilisation by funding sources (in USD thousands)

	2014-2015 Biennium Approved Budget	Utilisation as at 30 September 2014	
		Commitments and Expenses	Proportion of 2014-2015 Biennium Budget
Assessed Contributions (Core Budget)	**40,000**	**15,304.29**	**38%**
Voluntary Contributions from the:			
UAE:			
Operations	5,800	2,008.64	35%
Research	5,800	2,491.20	43%
Governing Body Meetings	3,200	1,076.00	34%
Sub-total UAE Contributions	**14,800**	**5,575.84**	**38%**
Voluntary Contributions from the:			
Germany:			
Innovation and Technology	9,200	3,519.02	38%
Sub-total Germany Contributions	**9,200**	**3,519.02**	**38%**
Total Voluntary Contributions	**24,000**	**9,094.86**	**38%**
Grand Total	**64,000**	**24,399.15**	**38%**

Table 2: 2014-2015 Biennium budget utilization by Thematic Areas (in USD thousands)

Division/Thematic Area	Combined Core and Voluntary Contributions		Budget Utilisation as at 30th September 2014	
	Amount (USD)	Proportion of Total	Amount (USD)	Propotional of Biennium Budget
A. Strategic Management and Executive Direction	12,270	19%	4,292	35%
Governing Body Meetings	3,200	5%	1,076	34%
Subtotal	**15,470**	**24%**	**5,368**	**35%**
B. Thematic Programme Area				
Planning for the global energy transition	10,816	17%	2,755	25%
Gateway to knowledge on renewable energy	7,624	12%	3,295	43%
Enabling investment and growth	8,252	13%	3,417	41%
Renewable energy access for sustainable livelihoods	3,393	5%	1,319	39%
Islands: lighthouses for renewable energy deployment	2,972	5%	1,159	39%
Regional action agenda	4,244	7%	2,491	59%
Subtotal	**37,301**	**59%**	**14,437**	**39%**
C. Administration and Management Services	**11,229**	**17%**	**4,594**	**41%**
Total Estimated Requirements	**64,000**	**100%**	**24,399**	**38%**

Voluntary Contributions Budgeted, Received and Pledged to date (as of 18 December 2014)

Voluntary Contributions in 2014

as of 18 December 2014, in USD

Budgeted Voluntary Contributions

	Voluntary Contributions Commitments	Received Contributions
GERMANY		
IRENA Innovation and Technology Centre	**4,500,000.00**	**4,500,000.00**
UAE		
Operations	2,900,000.00	2,900,000.00
Research	2,900,000.00	2,900,000.00
Governing Body Meetings	1,600,000.00	1,600,000.00
Subtotal UAE Contributions	**7,400,000.00**	**7,400,000.00**
Total Budgeted Voluntary Contributions	**11,900,000.00**	**11,900,000.00**

Additional Voluntary Contributions

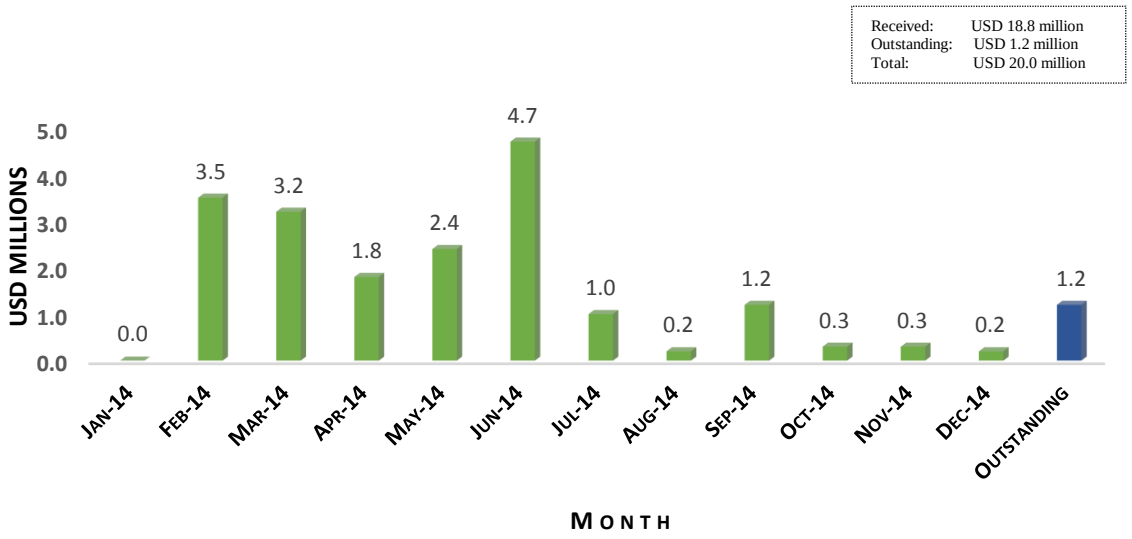
	Voluntary Contributions Commitments	Received Contributions
CONTRIBUTIONS TO PROJECTS		
Belgium/Flemish Government	103,448.25	103,448.25
France	359,355.64	189,970.00
Germany	1,820,064.48	1,437,784.43
Iceland	100,000.00	100,000.00
Japan	845,877.58	845,877.58
New Zealand	415,200.00	415,200.00
Norway	5,000,000.00	2,000,000.00
Switzerland *	200,000.00	-
Total Additional Voluntary Contributions	**8,843,945.95**	**5,092,280.26**

Fund for Developing Countries Representatives

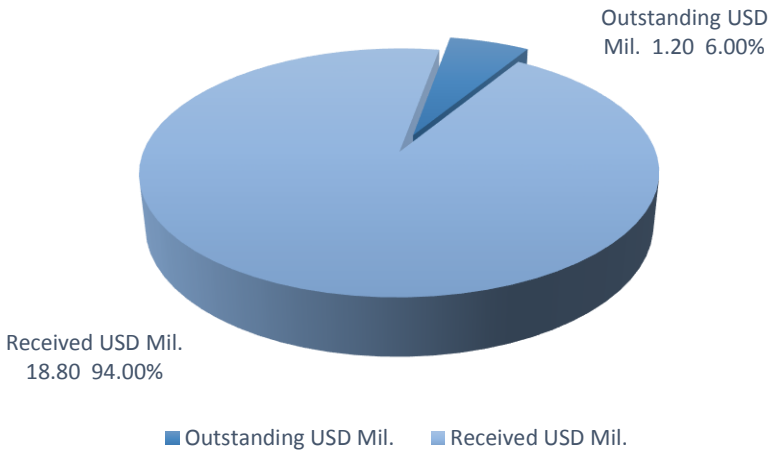
	Voluntary Contributions Commitments	Received Contributions
Germany *	68,835.80	-
UAE *	150,000.00	-
Total Additional Voluntary Contributions	**218,835.80**	**-**

* Members have informed the Secretariat that outstanding balances have been processed and should be shortly received by the Secretariat

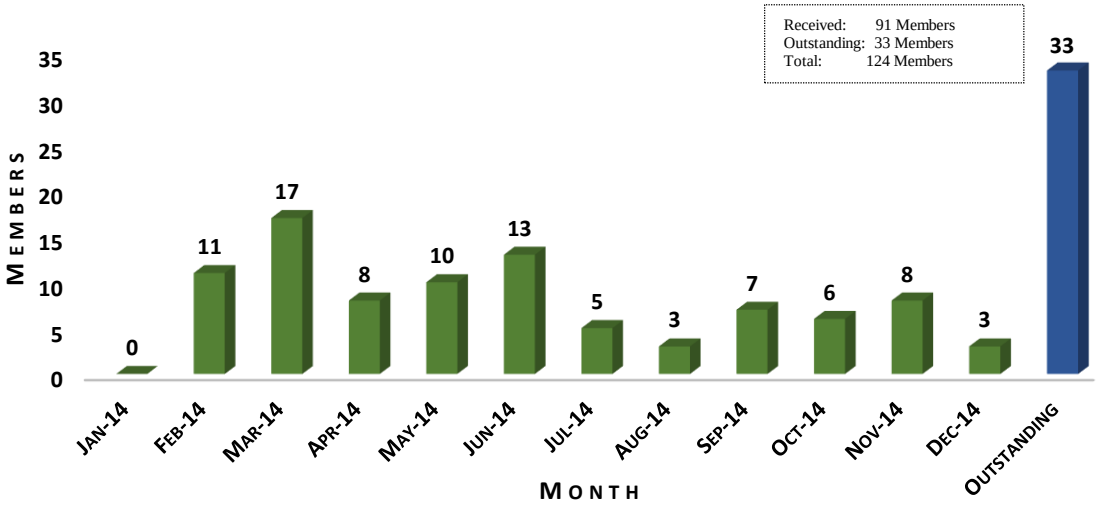
Received and outstanding assessed contributions for 2014 core budget
(as of 15 December 2014)



Status of contributions to the 2014 core budget **(as of 15 December 2014)**



Number of Members with received and outstanding contributions to the 2014 core budget
(as of 15 December 2014)



A/5/3

Thematic Programme Areas
Programmatic Activities

Thematic area: Planning for the global energy transition								
Objective: Mainstreaming renewable energy options and strategies in energy plans								
Resources: **10,816 (USD thousands)**								
Component	**Impact**	**Division**	**Activities**	**Deliverable (2014-2015)**	**Deliverable (subject to additional voluntary contributions)**	**Indicators of achievement[5]**	**Timeframe**	**Status**
SE4ALL Renewables Hub	Established platform for cooperation and concerted action by stakeholders to accelerate deployment of renewable energy	CSP IITC KPFC	Develop the hub function with the participation of all stakeholders, management of IRENA activities and development of a forward looking renewable energy reporting framework for 2030	Inclusive cooperation framework for all actors, and monitoring and reporting framework for 2030 renewable energy doubling target		- Operational framework agreed with SE4ALL stakeholders - Framework put into operation	Ongoing	- Inclusive cooperation framework for all actors **IN PROGRESS** - Monitoring and reporting framework for 2030 renewable energy doubling target **ONGOING WITHIN REMAP 2030 FRAMEWORK AND SE4ALL GLOBAL TRACKING FRAMEWORK**
			Support the hub function by developing analysis on the role of women in RE, RE for sustainable livelihoods, and the Nexus	- Develop an analytical approach on the role of women in RE and policy recommendations as input to the conference - Contribute to the SE4ALL Hub on issues related to RE for sustainable livelihood and the Nexus	International conference on the role of women in RE	- Enhanced global awareness on the role of women in improving livelihoods through RE	2014-2015	- Analytical approach on the role of women in RE and **p**olicy recommendations as input to the conference **IN PROGRESS, ON SCHEDULE** - Contribute to the SE4ALL Hub on issues related to RE for sustainable livelihood and the Nexus **SUBJECT TO VC, FUNDS NOT IDENTIFIED** - International conference on the role of women in RE **SUBJECT TO VC, FUNDS NOT IDENTIFIED**
			Develop policy recommendations and technical advisory services related to High Impact Opportunities (HIO)		White papers with concrete recommendations on:1) enabling legal and regulatory frameworks for scaling up mini-grids; 2) the role of renewable energy in managing peak demand in cities; 3) developing financing solutions for small-scale renewable energy in islands	Recommendations contribute to High Impact Opportunities activities in SE4ALL	2014-2015	- Three White papers with concrete recommendations **SUBJECT TO VC, FUNDS NOT IDENTIFIED**

[5] Indicators of achievement assume full funding from combined core budget and voluntary contributions from Germany and the United Arab Emirates, as well as additional voluntary contributions to be mobilised.

REMAP 2030	Comprehensive and acknowledged roadmap on options and action for doubling the share of renewable energy by 2030	IITC KPFC	Further develop the REMAP 2030 analytical framework and develop guidance on possible pathways, technology and policy options and international cooperation, as well as country and regional analysis, on doubling the share of RE by 2030	Comprehensive policy and technology roadmap -2nd edition		- REMAP2030 influences global debate and catalyses action - REMAP used to shape the IRENA work programme	Q4 2015	- Comprehensive policy and technology roadmap - 2nd edition **IN PROGRESS, ON SCHEDULE**
				2 workshops of national REMAP expert teams		- National experts engaged in the development of REMAP2030 - More and better quality country data feed the global debate - Global insights are increasingly used for national policy making	Q4 2014 (1 workshop) Q2 2015 (1 workshop)	- 2 workshops of national REMAP expert teams **IN PROGRESS, ON SCHEDULE.** *First workshop scheduled for 5 November.*
				Development of country action agendas		Implementation and application of REMAP technology options	Q3 2014 (1 meeting) Q1 2015 (1 meeting)	- Development of country action agendas **IN PROGRESS, ON SCHEDULE** *Three in-depth country reports completed (China, UAE, USA) and two in progress (India, Mexico)*
			Establish three REMAP action teams; two on substantive themes (transport, energy efficiency) and one to support the SE4ALL RE hub initiatives	REMAP - Transport and efficiency roadmap reports		- Reports' recommendations cited in RE global debate - New strategies identified that allow for higher RE shares	Q4 2015	- REMAP - Transport and efficiency roadmap reports **IN PROGRESS, ON SCHEDULE**
				REMAP/SE4ALL framework for cooperation amongst hubs		- Alignment in approaches with other SE4ALL hubs - New access, efficiency and RE nexus strategies identified that yield higher benefits and reduce cost - REMAP used to guide SE4ALL activities	Q3 2014 (1 meeting) Q3 2015 (1 meeting)	- REMAP/SE4ALL framework for cooperation amongst hubs**.** **IN PROGRESS, ON SCHEDULE** *Two meetings held with the Efficiency hub. A joint analysis of the benefits of combined efficiency and renewable energy strategies is under preparation.*
			Develop Technology Briefs with concise, policy-relevant and objective information on technology solutions	10 additional Technology Briefs for IRENA technology repository		Technology Briefs referenced as authoritative source on RE technology	Q2 2015	- 10 additional Technology Briefs for IRENA technology repository **IN PROGRESS, ON SCHEDULE** *4 technology briefs already published (ocean).*
			Assess the socio-economic impact of renewable energy deployment in REMAP 2030	Analysis of the impacts of the REMAP 2030 scenarios on employment, income, energy security, and trade balance		REMAP2030 reflects the broader macro-economic benefits of renewable energy deployment	Q4 2015	- Analysis of the impacts of the REMAP 2030 on employment, income, energy security, and trade balance **IN PROGRESS, ON SCHEDULE** *The quantitative assessment of socio-economic benefits (under the Thematic Area "Enabling Investment and Growth") will have a dedicated module on the macro-economic impacts of REmap 2030.*
REpowering Cities	Increased awareness, partnerships and technical support to local governments on	CSP KPFC	Address energy-related issues in cities by undertaking assessments to identify relevant RE deployment options to complement energy efficiency measures		Assessment methodology to help local governments prioritise energy efficiency and RE options	3 cities complete a RE assessment	2014-2015	- Assessment methodology **SUBJECT TO VC, FUNDS NOT IDENTIFIED,**

	renewable energy options in cities		Build a systematic approach for expertise and knowledge transfer in waste-to-energy, solar PV and solar thermal, and heating and cooling, through technical assistance and peer-to-peer learning		A systematic approach to transfer expertise and knowledge amongst cities in specific technology areas, designed and implemented	Concrete and focused technology cooperation between practitioners in 4 cities	2014-2015	- Build a systematic approach for expertise and knowledge transfer **SUBJECT TO VC, FUNDS NOT IDENTIFIED**
			Identify and promote successful renewable energy deployment business models in cities	A conference to showcase effective business models for deploying RE in cities in partnership with the Global Sustainable Cities Network and Masdar City		90 entrepreneurs, decision makers and other stakeholders attend the workshops	2014-2015	- Conference to showcase effective business models for deploying RE in cities **COMPLETED** *The Conference was organized at the World Future Energy Summit 2014.*
				Three workshops to build capacity of entrepreneurs, decision makers, and other key stakeholders in cooperation with Member States				- Three workshops to build capacity of entrepreneurs, decision makers, and other key stakeholders **IN PROGRESS, ON SCHEDULE**
			Analyse policies for the deployment of RE in Cities		Guidelines on policy measures needed to integrate RE at the local level	Outcomes and recommendations used by city decision makers	2014-2015	- Guidelines on policy measures **SUBJECT TO VC, FUNDS NOT IDENTIFIED**
Water, Energy and Land Nexus	Analytical and empirical framework for informed cross-sectoral policy and decision-making in resource-constrained environments	CSP KPFC	Develop an empirical policy framework and deploy an energy-centric tool that will allow policy-makers to empirically assess the impact of renewable energy in the water/energy/land Nexus in specific settings, and to bridge the existing knowledge gaps on the benefits of renewable energy deployment from a Nexus perspective	A comprehensive, analytical and empirical approach to inform policy-making in designing strategies that emphasise integrated resource management		Reference to the Nexus approach to resource management in the sustainable development energy debate	2015	- Comprehensive, analytical and empirical approach to inform policy-making **IN PROGRESS, ON SCHEDULE** *The findings from the study have been presented at the World Water Week 2015 in September 2014.*
				Tool for policy-makers to quantitatively assess the impact of RE in the nexus and country case studies to demonstrate it		Raised awareness on the role of RE in the Nexus for greater integration in decision-making	Q4 2015	- Tool for policy-makers **IN PROGRESS, ON SCHEDULE**
				Capacity building of the nexus tool		Trained country-level decision makers	Q4 2015	- Capacity building of the nexus tool **NOT STARTED** *This deliverable will start after the tool is completed early 2015.*
Transforming Power Grid Infrastructure	Comprehensive knowledge, resources and guidelines for grid and storage technologies for renewables deployment	IITC	Develop roadmaps on RE grid and electricity storage to facilitate RE integration in different settings	Two grids & storage technology related workshops to engage stakeholders in the development of roadmaps		- Roadmap recommendations agreed upon - Better understanding of Member countries how to cope with high shares of variable renewable power	Q4 2014	- Two grids & storage technology related workshops **IN PROGRESS, ON SCHEDULE** *A grids workshop was held on the side-lines of WFES in January. One storage workshop held in Düsseldorf (March), a further two scheduled for Tokyo (November) and New Delhi (December).*
				Report on consolidated grid & storage technology roadmaps		Report recommendations utilised by planners and decision makers at the national level	Q3 2015	- Report on consolidated grid & storage technology roadmaps - **IN PROGRESS, ON SCHEDULE**
			Refine IRENA grid-stability assessment methodology, and assistance to countries in the application to facilitate integration of renewables	Improved and extended IRENA grid-stability assessment methodology and country support in its application		- Methodology used by countries - Increased understanding and consensus how to plan for grid stability	2014-2015	- IRENA grid-stability assessment methodology - **IN PROGRESS, ON SCHEDULE.**

			Development of broad knowledge framework for grid, storage and management of variability	Technical guide(s) with latest developments in RE grid integration technologies, including solutions for storage, smart grids and mini-grids		- Reports' recommendations cited in RE integration debate - Member countries use IRENA information to plan grids and storage	2014-2015	- Technical guide(s) with latest developments in RE grid integration technologies **IN PROGRESS, ON SCHEDULE** *Smart grids technology report has been released in June. A number of invitations to present findings at international conferences (e.g. China, Germany, USA)*
				Analysis and recommendations on economic and technical feasibility of options of grid and storage technologies for integration of renewables		- Increased awareness among project developers and other stakeholders on RE grid integration technologies - Better understanding of market opportunities	Q4 2015	- Analysis and recommendations on economic and technical feasibility of options of grid and storage technologies **IN PROGRESS, ON SCHEDULE**
Planning With Renewables	Renewable energy mainstreamed in energy planning, with a focus on the power sector	IITC	Comprehensive overview and assessment of current planning methodologies for RE integration into energy systems	Report on effective planning methodologies and practices for RE integration into energy systems		- Report's recommendations cited in RE debate - Better understanding of energy supply and demand feedbacks results in more efficient and effective RE policies	Q4 2014	- Report on effective planning methodologies and practices for RE integration **IN PROGRESS, DELAYED TO Q1 2015**.
			Analyse the costs of RE integration into energy systems	Comprehensive policy-relevant knowledge framework on RE systems integration cost		Recommendations utilised by decision makers and cited in RE integration debate	Q4 2015	- Comprehensive policy-relevant knowledge framework on RE systems integration cost **IN PROGRESS, ON SCHEDULE**
			Facilitate regional exchanges on best practices in system planning	Two regional workshops on best practices in system planning with RE in LAC and Asia		- Active engagement of key regional stakeholders - Increased understanding of key planning framework components - Guidelines for its design accepted and deployed	Q4 2014 (1 workshop) Q4 2015 (1 workshop)	- Two regional workshops **IN PROGRESS, ON SCHEDULE** *The first Workshop in Asia was held in China in June 2014.*
			Inform the development of long-term global and regional energy outlook through engagement with energy modelling stakeholders	Cooperation with entities developing modelling scenarios		- Insights translated into policy-relevant information for Members - Better understanding of the planning uncertainties and how to deal with these in RE policy strategy development	Ongoing	-Cooperation with modelling entities **IN PROGRESS, ONGOING**

Renewables Readiness Assessment and Advisory Services	Countries equipped with knowledge and expertise to implement an enabling policy framework to upscale renewable energy deployment	CSP IITC	Facilitate RRAs, a country-driven process for assessing key policies, potentials and technologies for renewable energy deployment and the actions necessary to create an enabling policy and decision-making framework in Africa, Asia-Pacific, the Middle East and North Africa (MENA), and Latin America and the Caribbean (LAC)	- Facilitate the RRA process upon request in 10 member states. Five (5) RRA reports are published in 2014 and five (5) in 2015 - Design and operationalise an effective approach to utilise the expertise offered by Renewable Energy Policy Advisory Network (REPAN) in RRA and other IRENA programmes	- Facilitate the RRA process upon request in additional member states.	- Implementation of actions identified in the RRA country report - Collaboration with at least one international organisation as a partner for each RRA and follow up	2014-2015	- Facilitate the RRA process **IN PROGRESS, ON SCHEDULE** *Djibouti, Swaziland, Ghana, Oman, Nicaragua, Marshall Islands and Fiji RRA reports finalized in 2014. The RRA in Mauritania, Mongolia and Vanuatu have been completed and reports are under preparation. Initial discussion with Tunisia, Antigua and Barbuda for RRA are ongoing. The RRA workshop in Philippines is planned for last quarter of 2014.* - Design and operationalise an effective approach to utilise the expertise offered by Renewable Energy Policy Advisory Network (REPAN) in RRA and other IRENA programmes **IN PROGRESS, ON SCHEDULE** *The REPAN experts have been involved in providing specific expertise during the RRA process.* - Facilitate the RRA process upon request in additional member states **SUBJECT TO VC, IN PROGRESS** *Additional funding provided by the Government of Norway*
			Utilising IRENA's knowledge base and technical expertise, provide in depth, targeted technical advisory services upon request in resource assessments, legal and regulatory frameworks, implementation of standards and quality assurance mechanisms, structuring public-private partnerships, and RE technology deployment frameworks such as small hydro development in Latin America, biomass co-generation, solar and wind in Caribbean and Africa	- Advisory services on standards and quality assurance and enabling frameworks for deployment of renewables provided - Best practices in financing small hydro disseminated	- Advisory services on structuring public-private partnerships and resource assessments provided	- 15 countries are able to utilise the advisory services to design implementation pathways for accelerating RE deployment - Advisory services enable participating Member States to make informed decisions and drive actions - Improved frameworks for small hydro investment in 5 LAC Countries	2014-2015	– Advisory services **IN PROGRESS, ON SCHEDULE** – Best practices in financing small hydro disseminated in October 2014 – Advisory services on structuring public-private partnerships and resource assessments provided **SUBJECT TO VC, IN PROGRESS** *Additional funding provided by the Government of Norway*

Thematic area: Gateway to knowledge on renewable energy								
Objective: Renewable energy knowledge accessible to all								
Resources: **7,624 (USD thousands)**								
Component	**Impact**	**Division**	**Activities**	**Deliverable (2014-2015)**	**Deliverable (subject to additional voluntary contributions)**	**Indicators of achievement**	**Timeframe**	**Status**
Knowledge Gateway	Authoritative, freely accessible global knowledge on renewable energy	KPFC	Design of the structure and launch of the Knowledge Gateway platform	Web-based Knowledge Gateway platform	2 outreach workshops to seek partnerships with other knowledge organisations	Establishment of the Knowledge Gateway as the single publicly available source of authoritative renewable energy information	Q4 2014 2014-2015	- Knowledge Gateway platform **IN PROGRESS, ON SCHEDULE** - 2 outreach workshops **SUBJECT TO VC, IN RPGRESS** *Additional funding provided by the Government of Norway*
			Integration of additional data and information from IRENA projects and external sources into the platform	Wider range of data and information available through the Knowledge Gateway	Introduction of the Open Link Data to include data from third parties	Diverse streams of data and information from the Knowledge Gateway used as the basis of analysis by different stakeholders	2015	– Integration of additional data and information from IRENA projects and external sources into the platform **IN PROGRESS, ON SCHEDULE** – Introduction of the Open Link Data **SUBJECT TO VC, IN PROGRESS** *Additional funding provided by the Government of Norway*
REthinking Energy (Institutional Publication)	Informed global debate on the transformative potential of renewable energy technologies to address rising global energy challenges	KPFC	Identify themes, research and produce two editions of the annual REthinking Energy publication	Second and third editions of REthinking Energy publication		Annual report becomes authoritative reference work for renewable energy developments	Q4 2014 Q4 2015	- Second edition of REthinking Energy publication **ADJUSTED** *First edition was launched in September 2014 in Abu Dhabi, Paris, New York and Tokyo in October.*
Renewables statistics	Solid foundations established for the most complete, up-to-date and freely accessible global renewable energy statistics database with high quality data	KPFC	Collection and standardisation of RE data from countries and secondary sources	Data collected from member countries and secondary sources, standardised, validated and posted online		IRENA renewable energy statistics database widely cited as data source in analytical reports	Ongoing	- Data collected from Member countries and secondary sources, standardised, validated and posted online **IN PROGRESS, ONGOING** *2014 data collection cycle (2013 data) – questionnaires sent to all countries.*
			Improvements to RE data accounting methodologies	Guidebook on practical approaches to RE accounting and reporting		Guidebook widely used by Members in their RE statistics reporting	Q4 2015	- Guidebook on practical approaches to RE accounting and reporting **IN PROGRESS, ON SCHEDULE** *First consultation held in June 2014.*
The Global Atlas	Enhanced global awareness of renewable resource potentials and policy-makers enabled to make	IITC KPFC	Expand the coverage of the Global Atlas to all 6 renewable energy sources (solar, wind, bioenergy, geothermal, hydropower, marine energy)	Global Atlas interface and data infrastructure upgraded to accommodate maps for five renewable energy sources	Global Atlas interface and data infrastructure includes maps for marine energy	The Global Atlas cited as the reference for resource assessment of all 6 renewable energy sources	Q4 2015	- Global Atlas interface and data infrastructure upgraded **IN PROGRESS, ON SCHEDULE** - Including marine energy maps **SUBJECT TO VC, FUNDING NOT IDENTIFIED,**

	informed planning decisions			Data quality framework (quality, validation and limit of use of the data) developed and implemented in the entire Atlas		Increased understanding by Global Atlas users of the limits of use of diverse datasets in the Atlas	Q4 2015	- Data quality framework developed and implemented **IN PROGRESS, ON SCHEDULE** *Data quality collection process started for all solar and wind providers. Demonstration for bringing the information to the user in Q1 2015. A country-by-country assessment of renewable resources in Africa was released.*
			Capacity building for energy planners and policy-makers on the use of spatial planning techniques for energy systems planning and policy making, as well as beginning the integration of the Atlas and Costing work		Develop a practical capacity building module targeted at energy planners and policy-makers	50 energy planners and policy-makers trained	2014-2015	- Develop a practical capacity building module targeted at energy planners and policy-makers **SUBJECT TO VC, IN PROGRESS** *Funding provided by the Government of Flanders (Belgium) and the Government of Germany.*
				Detailed guidebook on the methods used for mapping renewable energy potentials		Countries use the guidebook to assess their technical renewable energy potential	Q4 2015	- Guidebook on the methods used for mapping renewable energy potentials **IN PROGRESS, ON SCHEDULE**
			Facilitation of resource measurement campaigns	Upon countries request, scope the need for technical assistance and seek for possible resources and technical partnerships to initiate measurement campaigns		Address requests of 5 countries	Q4 2015	- Scope the need for technical assistance and seek for possible resources and technical partnerships to initiate measurement campaigns **IN PROGRESS, ON SCHEDULE**. *Working paper on Philippines to be released in October 2014.*
IRENA Renewable Energy Learning Partnership (IRELP)	Freely accessible renewable energy education and training database enriched with career opportunities and guidance, and best practices for long-term education strategies	KPFC	Establishment of an online forum to facilitate the development of renewable energy curricula by stakeholders	Launch of the online forum and establishment of an online community		Facilitation services used by 5 educational institutions for the development of renewable energy curricula	Q4 2014	- Launch an online forum and establish an online community **COMPLETED** *Online Community launched and operational.*
			Expansion of the renewable energy career centre	Develop and expand the career centre and provide information on RE job opportunities and links with employers and employment agencies		IRELP contains access to RE employment opportunities	Q4 2015	- Develop and expand the career centre I**N PROGRESS, ON SCHEDULE**
			Cooperation with partners to increase access to and awareness of renewable energy education and training	Joint promotion of renewable energy education, training and tools worldwide		Active participation of IRELP at global education fora	Q4 2014	- Promotion of renewable energy education, training and tools worldwide **IN PROGRESS, ON SCHEDULE** *MoU with UNESCO, joint event with UNESCO and JREF on education gaps to take place in Tokyo, Japan, in November 2014.*
RE Policy and Best Practice: Status and Trends	Global reference repository of renewable energy policies, regulations and best practice	KPFC	Analysis of policy status and trends based on standarised information on renewable energy policies and measures from Members	Contents of the policies and measures database updated on a biannual basis and expanded through cooperation with leading RE policy database providers		Double the number of new entries in the Policy Database from the 2013 call (68 new entries)	Q4 2015	- Policies and measures database updated on a biannual basis and expanded **IN PROGRESS, ON SCHEDULE** *The joint IRENA/IEA database holds around 1800 policies from 116 countries and was used by some 67,000 users since September 2013. In 2014, 50 new entries have already been added to the database.*
				Annual report on status and trends in renewable energy policy		Policy reports disseminated at 10 events	Q4 2014, Q4 2015	- Annual report on status and trends in renewable energy policy **IN PROGRESS, ON SCHEDULE**

			Systematise best practice and case studies on renewable energy deployment	Case studies and best practice information integrated in the Knowledge Gateway		Best practices utilised by countries for informed decision making	Q4 2015	- Case studies and best practice information integrated in the Knowledge Gateway **IN PROGRESS, ON SCHEDULE**
Renewables: The True Costs	Authoritative and comprehensive information and analysis of the true cost competitive-ness of renewables globally to help shape national and global debates, and global analysis of real cost issues and clear policy recommendations and tools to accelerate renewables deployment.	IITC	Renewable Costing Alliance and expansion of the IRENA Renewable Cost Database to become the most comprehensive resource on renewable energy costing	Launch and operation of the Alliance, substantially expanding the Cost Database and improving the quality of data available		- Increased membership of the Alliance adds data into the Cost Database - Alliance is the global network for cost issues on renewable energy technologies	Ongoing	- Launch and operation of the Alliance **IN PROGRESS, ON SCHEDULE** *18 new Alliance members. Discussions underway with 50 public and private organisations.*
			Up-to-date analysis of the improved cost competitiveness of solar PV compared to local retail electricity prices	Quarterly report on PV parity evolution for 10 countries		Informed decisions based on reliable information on PV parity	Ongoing	- Quarterly report on PV parity evolution for 10 countries. **IN PROGRESS, ON SCHEDULE** *Database of 200 000 small-scale solar PV systems developed.* *Parity indicator reporting is operational for the USA.*
			Expansion of IRENA Costing Reports to cover the entire spectrum of energy uses	Three RE cost reports: Updated power generation, marine/aviation/rail transport, grid integration technologies, RE integration systems costs		- Reports disseminated in 10 countries - IRENA costing data and analytical reports cited	Q4 2014 (1 report) Q4 2015 (2 reports)	- Three RE cost reports **IN PROGRESS, ON SCHEDULE**
Global investment dynamics	Solid global resource of RE investment information and financial flows, accessible to all, showcasing global investment dynamics and potential sources of financing	KPFC	Complementing information on renewable energy investment by developing standardised data on gaps identified, including small-scale renewable energy applications and a mapping of sources of possible financing for project developers	Collection of targeted investment data to support policy-makers and IRENA analyses	Analysis of renewable energy investment flows, highlighting investment trends and gaps and business models	Access to more comprehensive data on RE financial flows	2014-2015	- Collection of targeted investment data **IN PROGRESS, ON SCHEDULE** - Analysis of renewable energy investment flows **SUBJECT TO ADDITIONAL VC, IN PROGRESS.** *Additional funding provided by the Government of Norway*
				Methodological paper establishing a framework for comprehensive renewable energy investment flows data collection		Paper used by countries in their renewable energy investment flows reporting	Q4 2015	- Methodological paper **IN PROGRESS, ON SCHEDULE**
Coalition for Action on Public Support to RE	Global coalition effectively disseminating authoritative, consistent, and unified messages on RE	KPFC	Operationalise the Coalition for Action on Public Support to gather and disseminate effectively renewable energy facts and analysis in collaboration with major RE advocates in industry and civil society	Establishment of the structure, operational mode and strategy of the Coalition for Action		20 members join the Coalition and develop joint activities	Q2 2014	- Establishment of the structure, operational mode and strategy of the Coalition for Action **IN PROGRESS, DELAYED TO Q4** *35 members. Coalition structure and strategy being finalized.*
				Formation of a network of RE public information experts		50 communication officers and media outlets become part of the network and start working on improved messaging on RE benefits	Q4 2014	- Formation of a network of RE public information experts **DELAYED TO Q3 2015** *The network of communicators will be formed once the coalition structure is in place.*
				Development of innovative mechanisms for dissemination of information		RE facts better known and positively perceived by stakeholders through the innovative mechanism	Q2 2015	- Development of innovative mechanisms for dissemination of information **IN PROGRESS, ON SCHEDULE**

Thematic area: Enabling investment and growth								
Objective: Improving policy frameworks and enabling market conditions for accelerated deployment of renewable energy								
Resources: **8,252 (USD thousands)**								
Component	**Impact**	**Division**	**Activities**	**Deliverable (2014-2015)**	**Deliverable (subject to additional voluntary contributions)**	**Indicators of achievement**	**Timeframe**	**Status**
Policy assessment	Contribution to the global debate and increased awareness of policy options in a dynamic energy market	KPFC	Assess the key challenges faced by policy-makers in adapting to the structural changes in the energy sector (specifically changing ownership structures), analyse best practices in adopting effective measures and provide recommendations	Analysis of the impact of the changing market dynamics, including ownership structure, in the energy sector on RE deployment and policy adaptation measures		Increased understanding of timely policy adaptation measures required in dynamic market conditions	Q4 2014	- Analysis of the impact of the changing market dynamics **IN PROGRESS, DELAYED TO 2015**
Regional Market Analysis	Enhanced global knowledge of policy options for opening energy markets to renewable energy investment	KPFC	Analyse regional markets for the deployment of RE in two regions, identify best practices of several countries and formulate recommendations	Regional assessment of status and trends in the LAC region to draw policy lessons, identify best practices and help leverage potential synergies	Regional workshop and outreach to discuss and disseminate the results of the LAC assessment	Improved knowledge on opportunities in the RE sector	Q4 2015	- Regional assessment of status and trends in the LAC region **IN PROGRESS, ON SCHEDULE** *First expert workshop to be organized alongside the Assembly in January 2015.* - Regional workshop and outreach **SUBJECT TO VC, FUNDING NOT IDENTIFIED**
				Regional market assessment of policies and trends for RE in the GCC, including best practices on policy, regulatory and administrative frameworks facilitating the transition to clean energy systems	Regional workshop and outreach to discuss and disseminate the results of the GCC assessment	Improved knowledge on opportunities in the RE sector	Q4 2015	- Regional market assessment of policies and trends for RE in the GCC **IN PROGRESS, ON SCHEDULE** *First expert workshop to be organized alongside Council in November 2014.* - Regional workshop and outreach **SUBJECT TO VC, FUNDING NOT IDENTIFIED, NOT STARTED**
ireValue: Social, Economic and Environmental Impacts	Unique knowledge platform on socio-economic and environmental impacts empowers policy-makers and increases public awareness with	KPFC	Develop the knowledge framework on socio-economic impact of renewable energy deployment (income, trade balance, energy security) of RE deployment for solar, wind and off-grid applications. With partners, carry out studies that analyse experiences and best practices from different	Re Jobs - Comprehensive and authoritative analysis on the status and trends of renewable energy jobs drawing from the IRENA data collection on jobs		Annual analysis on renewable energy jobs referenced in the international debate	Q4 2014, Q4 2015	- Comprehensive and authoritative analysis on the status and trends of renewable energy jobs - 2014 edition **COMPLETED** *Renewable Energy and Jobs – Annual Review 2014 was launched in May and became the international benchmark on all discussions on the topic. Conclusions of the Review featured in more than 500 media and major reports.* - 2015 edition **IN PROGRESS, ON SCHEDULE**

	relevant analysis and information		countries and regions that will focus on the adoption of policies that maximise value creation and the dissemination of existing tools that allow policy-makers to empirically assess selected socio-economic impact	Report on the socio-economic impacts of large-scale as well as off-grid renewable energy technologies		Increased understanding of the business case for renewable energy among policy-makers, including local content	Q4 2014, Q4 2015	- Report on the socio-economic impacts of large-scale as well as off-grid renewable energy technologies - econValue report 2014 **COMPLETED** *The Socio-economic Benefits of Solar and Wind Energy launched during the fifth meeting of the Clean Energy Ministerial in Seoul in May 2014.* - econValue 2015 **IN PROGRESS, ON SCHEDULE**
					Quantitative assessment of the socio-economic benefits of renewable energy deployment	Numerical evidence of the impact of renewable energy deployment on GDP, jobs and other macroeconomic variables, taking into consideration the economic interactions across all sectors.	Q4 2015	- Quantitative assessment of the socio-economic benefits of renewable energy deployment **SUBJECT TO VC, NEW DELIVERABLE** *Voluntary Contribution from the Government of Germany*
					Dissemination of tools and methodologies to estimate the socio-economic impacts of renewable energy deployment	Developed national frameworks for the estimation of the socio economic impact of RE deployment	2014-2015	- Dissemination of tools and methodologies **SUBJECT TO VC, IN PROGRESS** *Funding from the Government of Germany Workshop in late November 2014 to disseminate the main findings of econValue, and showcase specific applications of tools.*
			Study environmental impact, including analysis of policies for end of life treatment of PV modules through a multi-stakeholder consultative process		Formulation and dissemination of best practices on end of life treatment of PV modules	Increased adoption of best practices by policy-makers and industry	2014-2015	- Formulation and dissemination of best practices **SUBJECT TO VC. IN PROGRESS** *Funding from the Government of Germany Release foreseen Q1 2015.*
Energy Pricing	Increasing investment in renewable energy by developing guidelines and approaches to optimal energy pricing frameworks and reforms required in current policies	KPFC	Analyse energy pricing frameworks under specific market conditions, with the objective of developing recommendations for economically, socially and environmentally optimal pricing that enables renewables technologies to be effectively integrated in decision-making	Contribution to MENAREC 6 in Libya in May 2014 through an analytical framework for North Africa		Outcomes and recommendations used by MENA countries decision makers	Q2 2014	- Contribution to MENAREC 6 in Libya in May 2014 **IN PROGRESS, DELAYED** *MENAREC6 has been postponed to 2015.*
				Report on the impact of energy pricing on renewable energy deployment in GCC countries		Informed policy making in GCC countries on the impact of energy pricing structures of renewable energy deployment	Q3 2014	- Report on the impact of energy pricing on renewable energy deployment in GCC countries **IN PROGRESS, DELAYED TO Q1 2015**
					Development of guidelines and approaches on energy pricing	Guide disseminated and substantiated by multi-stakeholder dialogue on reform	2014- 2015	- Development of guidelines and approaches on energy pricing **SUBJECT TO VC, FUNDING NOT IDENTIFIED, NOT STARTED.**
RE finance	Enhanced understanding of risks and innovative mitigation options and	IITC KPFC	Analyse risk and evaluate risk mitigation instruments in renewable energy investment	Report classifying the risks, identifying the gaps in risk mitigation and evaluating the performance of existing risk mitigation instruments		Report used as a reference in the renewable energy investment de-risking debate	Q2 2014	- Report classifying the risks, identifying the gaps in risk mitigation and evaluating the performance of existing risk mitigation instruments **IN PROGRESS, DELAYED** *Work has been consolidated. Report planned for Q1 2015, with expanded scope.*

	tools to develop bankable projects to facilitate renewable energy investment				High-level meeting about risk mitigation, including political and technology risks	Inform high-level decision makers of innovative risk mitigation options in renewable energy investment	2014-2015	- High-level meeting about risk mitigation, including political and technology risks **SUBJECT TO VC, FUNDING NOT IDENTIFIED, NOT STARTED.**
			Develop technology- and region-specific modules for the IRENA project development tool, the "Project Navigator"	Expansion of the navigator to in-clude additional technologies (Biomass, Concentrated Solar Power, Geothermal and Hydropower) and region-specific aspects (financial sources, regulatory, policy and technical aspects required for project development)		Expanded Project Navigator utilised by project developers in three regions to improve bankability of projects	2014-2015	- Expansion of the navigator **IN PROGRESS, ON SCHEDULE** *Module for islands has been developed, piloted in Cape Verde in September 2014*
			Validate and refine the Project Navigator tool by carrying out 7 pilot studies	Refined Navigator based on the results of 7 pilot projects in collaboration with partners (ADFD, Pacific Fund)		Improved bankability of the 7 projects	Q4 2014 (3 pilots) Q4 2015 (4 pilots)	- Refined Navigator based on the results of 7 pilot projects **IN PROGRESS, ON SCHEDULE** *Wind Farm Case Study, Yemen completed* *Piloting of IRENA/ ADFD and UAE Pacific fund projects in progress*
Cooperation with the Abu Dhabi Fund for Development	Investments in projects with replicable and/or innovative business models that promote energy access in developing countries	KPFC	Support the implementation of two project cycles of the IRENA/ADFD project facility	Annual award of approximately USD 50 million for projects under the IRENA/ADFD project facility		Disbursement of funds to selected projects	Ongoing	- Annual award of approximately USD 50 million for projects under the IRENA/ADFD project facility **IN PROGRESS, ON SCHEDULE** *USD 41 million allocated to projects for the first cycle, as announced in January 2014* *2nd cycle selection (2014) close to completion. 3rd cycle launch on schedule for November.*
Quality Assurance and Standardisation	Higher investor confidence through development of authoritative information and advice on standards and quality assurance	CSP IITC	Operationalise standards and quality assurance mechanisms tailored to the needs of IRENA Members	Technical advice to regional initiatives on quality assurance for RET - regional studies and workshops		Incorporation of IRENA's recommendation in regional initiatives for quality on RET	Q4 2014 (1 region) Q4 2015 (2 regions)	- Technical advice to regional initiatives on quality assurance for RET **IN PROGRESS, AHEAD OF SCHEDULE** *IRENA is part of the steering committee for the China SWT Quality Centre and the steering committee of a PTB project for SWH in LAC.*
			Develop best practices and recommendations on quality assurance for selected RE technologies	Report on development and implementation of quality assurance mechanisms for three renewable energy technologies, including solar domestic hot water and off-grid PV systems		- Report's recommendations cited in RE quality and markets debate - Deployment of IRENA recommendations results in higher quality and increased market confidence	Q4 2014 (2 reports) Q4 2015 (1 report)	- Report on development and implementation of quality assurance mechanisms for three renewable energy technologies **IN PROGRESS, AHEAD OF SCHEDULE**. *Three reports are close to completion (quality infrastructure guidelines, and applications for SWH and SWT)*
			Develop and operate a Standards and Patents information platform	Expansion and improvement of web platform for RE standards and patents		Up-to-date and improved web-based platform	Q4 2015	- Expansion and improvement of web platform for RE standards and patents **IN PROGRESS, AHEAD OF SCHEDULE.** Platform operational in December 2014

			Develop competency standards for trainings to certify installers in renewable energy technologies through a consortium of technical institutions, industry associations and forums of leading practitioners	- Establish a global collaboration for a 79 recognized certification scheme of renewable energy technology installers – starting with solar PV - Preliminary competency standards developed for solar PV installers certification training		Provide qualified skilled technical force to support deployment of renewable energy projects in the country	2014-2015	- Establish a global collaboration for a 79 recognized certification scheme of renewable energy technology installers - **IN PROGRESS, ON SCHEDULE** - Preliminary competency standards developed for solar PV installers certification training **IN PROGRESS, ON SCHEDULE**
			Assist countries in adopting and implementing certification of renewable energy technology installers through national and regional technical institutes		Dissemination of the certification scheme for solar PV installation and operation	6 countries adopt a recognised certification scheme for solar PV installation and operation	2014-2015	- Dissemination of the certification scheme for solar PV installation and operation **SUBJECT TO VC, FUNDING NOT IDENTIFIED, NOT STARTED**
Innovation and Research, Development and Demonstra-tion (RD&D)	Enhanced innovation through international cooperation and streamlined national RD&D plans	IITC	Analyse the policy framework for optimal technology deployment and provide advice for successful diffusion of modern RE technologies in developing countries	Assessment of options for modern biomass in Africa and advanced biofuels in Asia		Results of the studies used in policy making and planning for deployment	Q4 2014 (1 region) Q4 2015 (2 regions)	- Assessment of options for modern biomass in Africa **IN PROGRESS, ON SCHEDULE** - Assessment of options for advanced biofuels in Asia **IN PROGRESS, ON SCHEDULE**
			Map and analyse the gaps for and benefits of collaborative RD&D on RE technologies in regions and RD&D planning	- Regional assessments on collaborative RD&D for RE in Africa, Eastern Europe and Central Asia - Advice on national RD&D programming upon request		Recommendations used in regional RE innovation and market strategies	Q4 2014 (2 reports) Q4 2015 (1 report)	- Regional assessments on collaborative RD&D for RE in Africa, Eastern Europe and Central Asia **IN PROGRESS, ON SCHEDULE, ADJUSTED**. *Considering consultations on Eastern Europe within UNECE framework, emphasis has been shifted to the LAC region to avoid duplication.* - Advice on national RD&D programming upon request
			Analysis of future technologies and potential for deployment in markets to match new energy needs with innovative and cost-effective RE solutions	Studies on innovative RE technologies, including advanced biofuels, new electricity storage, mini-grid, floating off-shore wind		Study contributes to national perspectives for expanding technology options	Q4 2015	- Studies on innovative RE technologies **IN PROGRESS, ON SCHEDULE**

Thematic area: Renewable energy access for sustainable livelihoods								
Objective: Contributing to sustainable livelihoods through access to renewable energy								
Resources: **3,393 (USD thousands)**								
Component	**Impact**	**Division**	**Activities**	**Deliverable (2014-2015)**	**Deliverable (subject to additional voluntary contributions)**	**Indicators of achievement**	**Timeframe**	**Status**
IOREC platform	Scaling up off-grid renewable energy deployment by providing the platform for stakeholder engagement on a global level	KPFC	Support enabling frameworks for off-grid renewable energy deployment	Second International Off-grid Renewable Energy Conference and Exhibition and associated activities within the IOREC platform		Policies for mainstreaming RE in off-grid energy supply	Q4 2014	- Second International Off-grid Renewable Energy Conference and Exhibition **COMPLETED, AHEAD OF SCHEDULE** *The IOREC II conference took place on 16-17 June 2014 in Manila, Philippines, convening over 400 participants*
				Regional workshop with practitioners and public institutions responsible for rural electrification on barriers and solutions			Q4 2015	- Regional workshop with practitioners and public institutions **IN PROGRESS, ON SCHEDULE**
Mini-Grids	Enabling conditions for renewable energy-based mini-grid deployment to shift the paradigm for universal energy access	CSP KPFC	Facilitate a consultative process and develop an analytical framework to increase RE mini-grid deployment	Recommendations on policies and regulatory measures to support renewable energy-based mini-grid deployment		Improved policies for the deployment of RE mini-grids	Q4 2015	- Recommendations on policies and regulatory measures to support renewable energy-based mini-grid deployment **IN PROGRESS, ON SCHEDULE**
			Build a public-private partnership to promote hybrid mini-grids	Preparation of site-specific business models for 6 sites, including recommendations on financial mechanisms, local stakeholder base and key steps required for implementation of demonstration projects		Financial closure of at least 3 hybrid/RE grids projects	Q4 2015	- Preparation of site-specific business models for 6 sites **IN PROGRESS, ON SCHEDULE**
			Build a cross-cutting mini-grid initiative focusing on policy, regulatory, finance and business models in collaboration with well-established implementing and financing institutions including the private sector	Four analytical country studies focusing on the policy and regulatory frameworks necessary to promote investments in mini-grids, including follow up for designing implementation strategies		10 mini grids projects initiated in countries	2014-2015	- Four analytical country studies **IN PROGRESS, ON SCHEDULE**
			Build capacity of policy-makers and entrepreneurs to deploy renewable energy mini-grid at scale	Capacity needs assessment in one regions and two training workshops on enabling frameworks and business model delivery	Capacity needs assessment and training workshops on enabling frameworks and business model delivery in additional regions	80 policy-makers and entrepreneurs trained	2014-2015	- Capacity needs assessment in one regions and two training workshops **IN PROGRESS, ON SCHEDULE** - Capacity needs assessment in additional regions **SUBJECT TO VC, FUNDING NOT IDENTIFIED,**
Off-grid for Niche Applications	Accelerated deployment of off-grid renewable	CSP	Assist countries, upon request, in developing deployment strategies and facilitate knowledge exchange	Expert training workshops conducted for off-grid applications for productive use (e.g. solar pumping and micro-		40 people trained in 2 workshops on RE applications	2014-2015	- Expert training workshops - **IN PROGRESS, ON SCHEDULE**

	energy solutions in isolated communities and urban areas		on off-grid renewable energy technologies in rural and remote settings	hydro)				
			Partner with private sector actors with regional or global presence to design and implement a plan to showcase renewables technologies for off-grid applications in urban and peri-urban areas		Implementation strategies for off grid designed with private sector players	Partnerships with 3 private sector players to showcase renewable energy off grid application	2014-2015	- Implementation strategies for off grid designed with private sector players - **SUBJECT TO VC, FUNDING NOT IDENTIFIED**
Capacity Building for Entrepreneurs	Increased renewable energy deployment through greater financial and technical assistance to SMEs	CSP	Support SMEs by creating expert groups to provide guidance to RE entrepreneurs on identifying business opportunities	Expert groups established		- 20 experts commit to mentor entrepreneurs through advisory boards - 4 existing business incubation centres will support energy entrepreneurs - 10 financial institutions trained on financing RE projects	2014-2015	- Expert groups established **IN PROGRESS, ON SCHEDULE** *The advisory facility will be operational in Q4.*
			Support business incubation centres and facilitate sharing of experience among similar institutions across regions	Facilitate experience sharing between business incubation centres and similar institutions across regions				- Facilitate experience sharing between business incubation centres and similar institutions across regions **IN PROGRESS, ON SCHEDULE** *Partnerships with 8 Business incubation centers to train energy entrepreneurs in Africa and Asia.*
			Build capacity of financing institutions to assess technology risks in developing countries	Two webinars to build the capacity of public service officials for developing proposal for funding	Two training workshops for financing institutions to build capacity to assess technology risks and provide best practices to structure lending to RE project			- Two webinars **IN PROGRESS, ON SCHEDULE** *Training on accessing solar PV technology risk provided to 17 financial institutions in ECOWAS countries.* - Training workshops **SUBJECT TO VC, FUNDING NOT IDENTIFIED,**

Thematic area: Islands: lighthouses for renewable energy deployment								
Objective: Island energy systems transformed through renewable energy								
Resources: **2,972 (USD thousands)**								
Component	**Impact**	**Division**	**Activities**	**Deliverable (2014-2015)**	**Deliverable (subject to additional voluntary contributions)**	**Indicators of achievement**	**Timeframe**	**Status**
GREIN	Improved knowledge of solutions and conditions for investment in renewable energy applications on islands	CSP IITC	Establish and support of 6 GREIN clusters	- Clusters on resource assessment, waste-to-energy, desalination, roadmaps, grids and tourism established and operational - Report on settings for success in implementing renewables on islands		Work plans implemented by clusters	Q4 2015	- Clusters on resource assessment, waste-to-energy, desalination, roadmaps, grids and tourism established and operational **COMPLETED, ONGOING** *All of the six clusters have been launched support ongoing.* - Report on settings for success in implementing renewables on islands COMPELTED
			Assist islands in the development of their Renewable Energy Roadmaps	Technical assistance provided for island roadmaps		Recommendations of the roadmaps integrated in planning processes of islands	Q4 2015	- Technical assistance for island roadmaps **IN PROGRESS, ON SCHEDULE**
			Analyse islands' grid stability for the integration of a higher share of renewable energy upon request	Advice to island utilities on how to maintain grid stability with high shares of variable renewables results in accelerated deployment		Higher share of renewables integrated in island grids	Q4 2015	- Advice to island utilities on how to maintain grid stability **IN PROGRESS, ON SCHEDULE**
			Demonstrate the business case for investments in renewable energy in the tourism sector	RE audits completed in 9 islands		- 9 hotels embark on renewable energy audits - 2 hotel associations adopt a renewable energy agenda	Q4 2014	- RE audits completed in 9 islands **IN PROGRESS, DELAYED** *Capacity Needs Assessment for Energy Efficiency and Renewable Energy Audits in six islands in the Indian Ocean underway. Considering alternative approaches in addition to audits.*
			Demonstrate the business case for waste-to-energy and desalination systems	Cost/benefit analysis for waste-to-energy and desalination systems on islands with projected payback periods		Islands undertake solar desalination and waste-to-energy projects	2014-2015	- Cost/benefit analysis for waste-to-energy and desalination systems on islands with projected payback periods **IN PROGRESS, ON SCHEDULE**
			Assist islands to develop renewable energy resource assessment strategies	Guidebook for detailed wind resource measurement on islands		Islands use the guidebook to help produce bankable data for wind projects	Q3 2014	- Guidebook for detailed wind resource measurement on islands **COMPLETED**
Partnerships for Action in SIDS	Strengthened partnerships to advance renewable energy deployment in SIDS	IITC	Showcase opportunities for RE deployment through IRENA activities on islands as a contribution to the SIDS Conference in Samoa	Contribution to the Conference and building partnerships for action with islands and development partners	Follow-up on renewable energy-related outcomes of the Conference	Inclusion of renewable energy in the post-conference action agenda	2014-2015	- Contribution to Samoa Conference **COMPLETED** *RE prominent in the post-conference action agenda.* - Follow- up **SUBJECT TO VC, IN PROGRESS** - *Funding provided by Government of Germany and Government of Norway*

Building Capacity in Islands	Improved capacities to meet national renewable energy targets and attract investments in SIDS	CSP	Implement the on-going IRENA capacity building initiatives in Pacific SIDS	- 2 training workshops on policy and regulatory frameworks - 3 training workshops and follow-up technical assistance for financing institutions		Lessons learnt from Pacific SIDS replicated in other Islands through GREIN - Pacific Islands gradually transition to promoting renewable energy projects with commercial financing - 5 SMEs deploy renewable energy technologies for meeting their energy needs	2014-2015	- 2 training workshops on policy and regulatory frameworks - 3 training workshops and follow-up technical assistance for financing institutions IN PROGRESS, ON SCHEDULE *Additional capacity building activities will be undertaken under the Lighthouses Initiative*
			Assist island States to create a pool of certified technicians	One training workshop to certify renewable energy engineers and technicians	Additional training workshops to certify renewable energy engineers and technicians			- Pool of certified technicians **COMPLETED, ON SCHEDULE** *About 50 people have received training by August 2014, and 7 participants have been certified. 2 companies in Fiji have also received certification.* - Additional workshop **SUBJECT TO VC, to be undertaken within the Lighthouses Initiative**
			Provide targeted technical assistance to SMEs in the Caribbean to deploy renewable energy technologies	Training workshops for SMEs in Caribbean and AIMS islands				- Targeted technical assistance to SMEs **IN PROGRESS, ON SCHEDULE**

Thematic area: Regional action agenda								
Objective: Regional integration with increased shares of renewables to meet energy needs								
Resources: **4,244 (USD thousands)**								
Component	**Impact**	**Division**	**Activities**	**Deliverable (2014-2015)**	**Deliverable (subject to additional voluntary contributions)**	**Indicators of achievement**	**Timeframe**	**Status**
Africa Clean Energy Corridor	Growing renewable power deployment and investment in Eastern and Southern Africa strengthens economic growth, job creation and energy access	CSP IITC KPFC	Implement the action agenda for the Clean Energy Corridor formulated in close consultation with regional and national stakeholders	Identification and analysis of renewable power development zones and associated transmission corridors in Eastern and Southern Africa Power Pool countries	Workshops and outreach activities to strengthen the engagement of the donor community and the private sector in the Africa Clean Energy Corridor	- Ministerial endorsement of an action agenda - 2 renewable power development zones identified - 40 participants from Eastern and Southern Africa Power Pool countries are trained in RE zoning and system planning - Increased investments in renewable power	2014-2015	- Identification and analysis of renewable power development zones **IN PROGRESS, ON SCHEDULE**
			Support country and regional planning processes and identify potential renewable power development zones	Workshops to promote integrated resource planning of generation and transmission facilities in the Eastern and Southern African Power Pool countries				- Workshops to promote integrated resource planning of generation and transmission facilities in the EAPP and SAPP countries **IN PROGRESS, ON SCHEDULE**
			Forge regional consensus on long-term needs for new generation and transmission capacity needed to harness renewable energy	Agreement reached on long-term needs for generation and transmission capacity				- Agreement reached on long-term needs for generation and transmission capacity **IN PROGRESS, ON SCHEDULE**
			Assist countries and regional entities to develop enabling regulatory frameworks	- Recommendations for harmonised regulatory frameworks to promote renewable power investment and trade - Workshops on market and regulatory frameworks to encourage the market entry of renewable power sources in Africa				- Recommendations for harmonised regulatory frameworks to promote renewable power investment and trade **IN PROGRESS, ON SCHEDULE** - Workshops on market and regulatory frameworks to encourage the market entry of renewable power sources in Africa **IN PROGRESS, ON SCHEDULE**
			Build the capacity of policy-makers, utilities, grid operators to incorporate increased shares of variable renewable power	- Capacity building workshops to help power pools in Africa assess the options for renewable power development zones - Capacity building workshops to help transmission utilities in Eastern and Southern Africa Power Pools operate power grids with a diversified mix of renewable power plants				- Capacity building workshops to help power pools in Africa assess the options for renewable power development zones **IN PROGRESS, ON SCHEDULE** *Capacity building workshops for regulators scheduled for Q1 2015.* - Capacity building workshops to help transmission utilities in Eastern and Southern Africa Power Pools operate power grids with a diversified mix of renewable power plants **IN PROGRESS, ON SCHEDULE** *Two capacity building workshops for renewable energy integration in grids in EAPP and SAPP conducted.* - Workshops and outreach activities to

								strengthen the engagement of the donor community and the private sector in the Africa Clean Energy Corridor **SUBJECT TO VC, FUNDING NOT IDENTIFIED,**
			Assess financial models and mechanisms for lowering the cost of capital	- Recommendations on implementable mechanisms to lower the cost of finance - Dissemination of strategies for reducing costs of capital for renewable power options in Africa through workshops		At least 2 financial institutions actively considering mechanisms to lower the cost of finance	2014-2015	- Recommendations on implementable mechanisms to lower the cost of finance **IN PROGRESS, ON SCHEDULE** - Dissemination of strategies for reducing costs of capital for renewable power options in Africa through workshops **IN PROGRESS, ON SCHEDULE**
Central America Clean Energy Corridor	Integrated power market for renewables in Central America taking advantage of regional scale economies	CSP KPFC	Identify opportunities for accelerated renewable power development in SIEPAC with a focus on transmission infrastructure and regulations	- Report on gaps and opportunities for renewable power development, including gaps in financing - Convene stakeholders to discuss key actions for zoning, planning & enabling markets and finance that could help overcome the barriers - Assessment of regulatory frameworks to promote investments, trade & long-term contracts	Workshops and outreach activities to strengthen the engagement of the donor community and the private sector in the Central America Clean Energy Corridor	- Increased uptake of RE in the regional grid - Improved regulatory frameworks at the regional level to upscale RE generation and transmission in the region - Capacities developed in key areas to facilitate the intake of RE in the System - Regional planning processes include higher share of renewable power options	2014-2015	- Report on gaps and opportunities for renewable power development, including gaps in financing **IN PROGRESS, ON SCHEDULE** - Convene stakeholders to discuss key actions for zoning, planning, and enabling markets and finance that could help overcome the barriers **COMPLETED** - Assessment of regulatory frameworks to promote investments, trade and long-term contracts **IN PROGRESS, ON SCHEDULE**
			Identify potential zones for concentrated renewable power development and links with the SIEPAC transmission corridor	- Identification and analysis of renewable power development zones and associated transmission corridors - Workshops to promote integrated resource planning of generation and transmission facilities in the Central American Electrical Interconnection				- Identification and analysis of renewable power development zones and associated transmission corridors **IN PROGRESS, ON SCHEDULE** - Workshops to promote integrated resource planning of generation and transmission facilities in the Central American Electrical Interconnection **IN PROGRESS, ON SCHEDULE**
			Build the capacity of power pools, utilities and regulators to plan and operate grids with a diversified mix of renewable power	- Capacity building workshops to help power pools assess the options for renewable power development zones - Capacity building workshops to help transmission utilities in Central America operate power grids with a diversified mix of renewable power plants				- Capacity building workshops to help power pools assess the options for renewable power development zones **IN PROGRESS, ON SCHEDULE** Capacity building workshops to help transmission utilities in Central America operate power grids with a diversified mix of renewable power plants **IN PROGRESS, ON SCHEDULE** - Workshops and outreach activities to strengthen the engagement of the donor community and the private sector in the Central America Clean Energy Corridor **SUBJECT TO VC, FUNDING NOT IDENTIFIED**

Emerging Regional Clean Energy Corridors	Effective regional frameworks of cooperation to increase the share of renewables in power grids	CSP KPFC	Support Southeast Asian countries to exploit renewable resources in the region through the on-going integration of the ASEAN Power Grid Launch a MENA Solar Bridge Initiative to focus on the wind and solar opportunities in the region and their effective integration in regional power grids Support countries in South East Europe to investigate opportunities to develop renewable power options more efficiently through better planning and zoning Assist countries in Central Asia to develop renewable electricity generation	- Reports on gaps and opportunities for renewable power development in Southeast Asia, Middle East and North Africa, and Central Asia - Three regional workshops to develop work plans to support the integration of renewable energy options into the grid, with power pools, utilities, regulators and other stakeholders	- Workshops and outreach activities to strengthen the engagement in the Emerging Regional Clean Energy Corridors	- Endorsement of the Clean Energy Corridor Concept by countries and related regional entities - Regional planning processes and national integrated resource plans includes higher share of renewable power options	2014-2015	- Reports on gaps and opportunities for renewable power development in Southeast Asia, Middle East and North Africa, and Central Asia **IN PROGRESS, ON SCHEDULE** - Three regional workshops to develop work plans to support the integration of renewable energy options into the grid, with power pools, utilities, regulators and other stakeholders **IN PROGRESS, ON SCHEDULE** - Additional workshops and outreach **SUBJECT TO VC, FUNDING NOT IDENTIFIED**
Empowering through partnerships	Enhanced knowledge and skills to design and implement renewable energy policies and projects	CSP	Build an active interface, in different renewable energy technologies, between countries, to share experiences and know-how to overcome barriers and attract investments Solicit expertise from its Member States, training institutions and development partners to provide training programmes responding to needs identified through RRAs, and regional initiatives	- Identification of 2 training institutions/organisations in Member countries to deliver targeted trainings in partnership with IRENA - 2 practical training sessions for technicians for early stages of the supply chain	- Identification of additional training institutions/organisations in member countries to deliver targeted trainings in partnership with IRENA - Additional practical training sessions for technicians for early stages of the supply chain	- 150 participants trained in various aspects of RE development - policy, finance, technical - 2 Research or University institutions develop courses or curriculum in geothermal - 30 trainees for technical geothermal complete training	2014-2015	- Identification of 2 training institutions/orgs in Member countries to deliver targeted trainings in partnership with IRENA **COMPLETED** - 2 practical training sessions for technicians for early stages of the supply chain **IN PROGRESS, ON SCHEDULE** *Technical training workshop 26-30 May in Santiago, workshop on Mass Dissemination of Domestic Bio Digesters in Developing Countries was conducted in Germany with the University of Oldenburg.* - Identification of additional training institutions/organisations and additional training sessions **SUBJECT TO VC, FUNDING NOT IDENTIFIED**
			Develop capacities of key stakeholders to design and implement legal and regulatory frameworks for geothermal deployment	Technical assistance in geothermal law and regulations in Latin America and Caribbean, Asia and Africa				- Technical assistance in geothermal law and regulations **IN PROGRESS, ON SCHEDULE**
			Form a global IRENA Resource Network that supports various renewable energy projects in their countries		Enhancement of curriculum for renewable energy in collaboration with expert institutions			- Enhancement of curriculum for renewable energy in collaboration with expert institutions **SUBJECT TO VC, FUNDING NOT IDENTIFIED**