

INTERNATIONAL RENEWABLE ENERGY AGENCY

Eighth meeting of the Council

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**Note of the Director-General
IRENA's Approach to Regions**

1. The International Renewable Energy Agency (IRENA) has seen substantial growth in membership since its establishment in April 2011. Over the last three years the membership of the Agency has increased by two-fold to 135 Members with 34 states currently in the formal process of becoming Members.
2. The IRENA membership profile and early opportunities for engagement shaped the initial priorities for the work programme. In the first years of IRENA's operation, the membership base in Africa and Pacific experienced a fast growth. IRENA's wide membership base in these regions, as well as the high demand for IRENA's support, shaped a number of the Agency's regional initiatives (such as, the Africa Clean Energy Corridor and Small Island Developing States/SIDS Lighthouses). IRENA's work in these regions have matured over the past years with impacts on the ground becoming more visible.
3. In its engagement with Member Countries, IRENA aims at creating synergies and benefit from the complementarity of its activities implemented at global/thematic, region/sub-region, country and local levels. Regional initiatives are considered to the extent regional efforts can be translated into solutions for national issues.
4. *Renewables Readiness Assessments* (RRAs), one of the IRENA's country-specific tools, constitutes the backbone of IRENA's interventions at national level. The RRA offers a country-led multi-stakeholder process that provides a holistic assessment of the conditions for renewable energy deployment on the ground and recommends courses of actions to improve the readiness and overcome the key barriers impeding the deployment of renewables.
5. Such assessments are complemented by IRENA's various analytical, knowledge and enabling tools as well as technical support and policy guidance, such as, renewable energy technology and innovation, renewable cost and investment data, renewable energy statistics, best policy design and implementation practices, socio-economic impacts of deployment. As part of the renewable technology integration planning, *REmap 2030* country analyses provide operational roadmaps to support the aspirational target of doubling the renewables' share in the global energy mix by 2030, set by the UN Sustainable Energy for All. *Renewables Cost Database* initiative helps improve the quality of renewable cost data; the findings of the *Global Atlas for Renewable Energy* propound the most comprehensive instrument to assess renewables potentials at a global scale while the Project Navigator offers an online tool to assist project developers to prepare high quality project proposals.

6. As an on-the-ground support to renewables deployment, the *IRENA/ADFD Project Facility* extends financing to potentially transformative, innovative and replicable renewable energy projects in developing countries, disbursing up to a total of USD 50 million annually to co-finance medium-scale projects.

7. Such an approach helped IRENA identify opportunities to develop regional flagship initiatives, including, the concept of Clean Energy Corridors that promotes accelerated deployment and cross-border trade of clean, indigenous, and cost-effective renewable power in regions. The regional approach of IRENA has so far enabled the Agency to work closely with nearly 90 member countries on various activities and initiatives.

8. With gradually expanding constituency, a fast expanding set of opportunities have been presented to work with member countries to support their transition to a clean energy future. IRENA's engagement in Asia, Middle East, and Latin America has already been initiated through various country and regional initiatives; nevertheless, more needs to be done. Partnership with the OECD countries and institutions is also expanding to largely focus on the areas of technology and innovation, renewables statistics, and renewable energy policies and measures database.

9. Small and fragmented energy markets in South Eastern Europe are largely dependent on imported fossil fuels that make them vulnerable to interruptions in fuel supply. In this respect, efforts are ongoing towards creating a regional market, which will eventually be integrated with the European energy market. To contribute to both energy security and environmental goals of the region, IRENA has sought to collaborate with the European partners for an accelerated deployment of the substantial hydro, wind, biomass and solar resources in the region.

I. Regional Initiatives

10. IRENA's engagement at the regional level has become an important tool to set the stage for an accelerated deployment of renewable energy. Regional initiatives extend from the Clean Energy Corridors to those thematic programmes targeting a cluster of countries with similar power sector challenges and/or renewable energy technology potential.

11. Building capacities of various stakeholders – public, private and civil society, including consumers, are an important dimension to the regional work as during their transition to sustainable energy development, many countries and regions need assistance to build up momentum in framing appropriate policies and regulations, designing innovative financing mechanisms and skill enhancement. Capacity building activities, mainly through partnerships with regionally based organisations, are aligned with and integrated into IRENA's country and regional initiatives in order to fill the knowledge and skill enhancement gaps.

II. Customised Approach to Regions

12. Within the framework of its mandate and the ongoing work programme, IRENA is in the process of customising its strategic approach to each region to give a clearer operational guidance in streamlining current and future engagement in the regions – see Annex 1 for a regional presentation of the IRENA’s Work Programme 2014-15.

a. Asia:

13. Energy demand in Asia accounts for almost half of the world’s total energy demand and is expected to grow faster than in other regions. The challenge of energy security has been mounting in the region, making renewables an emerging opportunity for enhancing energy security, as well as developing a new economic pillar underpinning green growth that the region is pursuing.

14. Given the vast regional coverage and diverse economic development of the countries, IRENA takes a regional/sub-regional approach to provide assistance to those Members in relatively united sub-regions such as the Association of South East Asian Nations (ASEAN), or even at a smaller geographical scope like the Greater Mekong Sub-region, while also engaging with Members bilaterally, including Bangladesh, China, India, Japan, Korea, Mongolia, and Pakistan. The changing market dynamics per sub-region and country (such as, large and fast-growing renewables markets in China and India, renewables deployment largely concentrated on energy access in Bangladesh, an early stage of renewables development in Pakistan, largely untapped, vast renewables potential of Central Asia, etc.) will require IRENA to further customize its interventions in the region.

15. With the growing IRENA membership in Central Asia, IRENA pursues new opportunities of collaborative action, initially in the area of renewable energy knowledge and data frameworks that can be developed in partnership with specialised regionally active organisations.

16. The REmap 2030 analysed the Asia region from both country-specific (China, India, Indonesia, Japan, Malaysia, and South Korea) and sub-regional (Southeast Asia and South Asia) perspectives. The countries analysed constitute some of the largest economies globally where the largest growth in energy demand is forecasted to come from. The analysis suggests that the renewable potential of all technology options in China, India and Indonesia alone would account for a substantial portion of the total global renewable energy use in 2030. This translates into a growth in their renewable energy shares in the energy mix by three to four times in 2030 compared to current levels. The findings of this analysis are instrumental to framing an effective engagement strategy for the region.

17. IRENA has organized the second edition of the International Off-Grid Renewable Energy Conference (IOREC) in South Eastern Asia (Manila, the Philippines), a region which faces the daunting challenge to alleviate energy poverty. Practitioners shared experience on how barriers to scale up off-grid renewable energy deployment in their country, were being addressed, and possibility of replicating successful solutions, in different regions, was actively explored.

18. Under the Repowering Cities initiative, IRENA is supporting local authorities in developing effective business models for renewables deployment in various cities, particularly in Asia.

b. Latin America:

19. While Latin American economies are growing at an average rate of nearly 3% per year, their energy needs are growing even faster. It is expected that by 2030 the energy demand across Latin America will double. Alongside the large hydropower projects that already provide much of the region’s power, Latin America is witnessing a surge of investor interest in biomass, geothermal, solar, small-hydropower and wind projects. The region has developed high expertise in the areas of hydropower and biofuels where experiences can be shared with other regions. Latin America is also witnessing fast growing wind and

solar markets, especially in Brazil, Chile, and Mexico while it is moving ahead with tapping the ample geothermal potential in the Andean region.

20. IRENA has been involved in a number of key initiatives in the region. In addition to RRA exercises completed in Peru and Nicaragua, IRENA is also engaged in initiatives to promote solutions based on deployment of the geothermal energy technology to address specific challenges common to a cluster of countries that have a high geothermal potential in the Andean region (i.e. Bolivia, Chile, Colombia, Ecuador, and Peru). The Geothermal Initiative in the Andes recognised the potential that a conducive regulatory and legal framework could have in promoting geothermal energy in the region and undertook a capacity needs assessment for the region based on a methodology developed with a specific reference to geothermal development to facilitate its development.

21. The REmap 2030 analysis in Latin America has so far covered some of the largest economies of the region that constitute 60% of the region's total final energy consumption: Brazil, Ecuador and Mexico. The analysis revealed Brazil's potential to expand the renewables shares in the energy mix up to 55%. In Ecuador and Mexico, significant upsurge in the renewables share is possible by 2030 (nearly tripling to 30% in Ecuador and reaching 25% in Mexico). The outcomes of this analysis will help IRENA tailor its engagement strategy for the region.

22. With further expansion of the IRENA membership in Latin America, the Agency's level of engagement in the region is expected to step up with interventions to be designed in close dialogue with the countries of the region in the areas of priority, such as, sustainable development of hydro resources, transition to modern use of biomass, grid integration, and renewables in the end-use sectors. Further engagement with countries and regional organisations is needed to shape specific interventions.

c. Middle East and North Africa:

23. Renewable energy deployment is considered as a viable alternative to cope with the fast-growing power demand (at an annual growth of 3-8%) across the region. Despite intensifying efforts to scale-up the renewables contribution in the energy mix, major challenges remain to be addressed, particularly, the creation of conducive environments for investment. IRENA targets initiatives to accelerate deployment of renewables not only in the countries with scarce conventional energy resources, but also in fossil fuel-rich economies where renewable energy is increasingly considered a viable alternative to reducing domestic consumption of fossil fuels, leaving larger reserves available for export.

24. In response to a request by the fifth Middle East North Africa Renewable Energy Conference (MENAREC5) held in 2012, IRENA carried out a study evaluating the economic impacts of current energy pricing policies in the context of RE deployment. The project had a special focus on five MENA countries (Egypt, Jordan, Libya, Morocco and Tunisia) and examined how energy pricing reform in the electricity sector can be successful in furthering energy policy while safeguarding socio-economic objectives.

25. Affiliation of a large number of Middle East and North Africa (MENA) countries with IRENA (18 out of 23 countries) has allowed the Agency to develop a strategic approach encompassing regional, sub regional and country level components. Creating synergies between countries and fostering regional integration for attracting investment at scale are among the key components of this approach. 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.

d. Sub-Saharan Africa:

26. Sub Saharan African (SSA) economies have grown at a rate of 5.3% per annum in the past decade with a dramatic increase in energy needs. The region has one of the lowest electricity consumption per capita estimated at 157 kilowatt-hour (kWh), while the population is growing rapidly and is expected to double by 2050. Access to electricity is less than 25%, falling below 10% in rural areas. With power outages happening at an average of 56 days a year, it has taken a toll on the economic growth of the region. Every time the power goes out, backup diesel generators must kick in to reduce economic losses for industry. The governments in the region have recognised the importance of other non-hydro renewables, especially solar, wind and geothermal in the energy supply mix, these now attract a growing number of investors.

27. IRENA has a fast-growing membership base in the region – 43 countries out of 48 countries in SSA are either IRENA Members or signatories. IRENA has already been and will continue to be extensively engaged with the countries of the region through a number of bilateral and multilateral initiatives. This includes, among others, RRAs completed or under processing in nine countries, the Africa Clean Energy Corridor along the Eastern and Southern African power pools, as well as various capacity building activities integrated into other instruments.

28. The initiative for Promoting a Sustainable Market for PV Systems in ECOWAS region (PRosPER) aims at strengthening local capacities to accelerate deployment of solar PV systems through promotion of incentive schemes and entrepreneurship as well as capacity building for financial institutions.

e. Small Island Developing States (SIDS):

29. Disconnected from mainland electricity grids, islands are especially vulnerable to price fluctuations for imported fossil fuels. But island states can overcome such challenges, as well as play their part in the global effort to mitigate climate change, through rapid renewable energy development. IRENA aims to support the islands' transition to greater use of renewable energy transformation through identifying efforts underway, pinpointing the gaps and barriers to renewables implementation, and ensuring crucial analytical data, information and resources are available to achieve a sustainable energy future.

30. In the early days, IRENA's membership base within the Small Islands Developing States (SIDS) largely concentrated in the Pacific.¹ Since then, IRENA's activities in islands has further grown with the expanding coverage in the Caribbean as well as the Africa, Indian Ocean, Mediterranean and South China Sea (AIMS) regions. Following the recent Third International Conference on SIDS, the SAMOA Pathway, which urged all stakeholders to join forces in supporting SIDS in the development and implementation of their national, regional and inter-regional sustainable energy plans and strategies, IRENA has launched the SIDS Lighthouse initiative during the Climate Summit last September. 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 approach, taking into account medium and long-term requirements and impacts. Within the Lighthouses Initiative, the Global Renewable Energy Islands Network (GREIN) serves as a platform for sharing knowledge and best practices for islands worldwide, to create the predicate for investment in concrete projects by national and multilateral implementing agencies and public-private partnerships.

f. Clean Energy Corridors:

31. Sustained economic growth across the IRENA constituency is leading to steadily expanding demand for energy, with associated needs for new generating capacity to maintain economic momentum. With falling technology costs and rising prices for fossil fuels, renewable power

¹ Six Pacific islands were already IRENA members by the first Assembly in 2011.

technologies are increasingly competitive with fossil-fuelled power. Even key energy exporters are considering renewable energy options to reduce domestic fossil fuel consumption and allot larger oil and gas reserves for export. The deployment of renewable energy in a regional context can enhance access to reliable and affordable electricity supply through expanded grid infrastructure, improve security of supply through resource diversification, reduce carbon emissions and foster new investment opportunities and job growth.

32. IRENA's clean energy corridor concept aims at transforming the energy landscape in different regions by shifting away from yesterday's carbon-intensive technologies towards tomorrow's sustainable energy systems through promoting development and cross-border trade of clean, indigenous, cost-effective renewable power.

33. The concept is being implemented based on action plans customized to individual regional contexts. The overall aim of the concept is to support the implementation of enabling frameworks which attract timely and sufficient financial resources for identifying and developing cost-effective renewable power options, and encourage the reliable integration of higher shares of renewables into the electricity systems.

34. The implementation of the concept has been successfully started in countries of the Southern and Eastern Africa Power Pools, under the Africa Clean Energy Corridor (ACEC). The initiative calls for accelerated development of renewable energy resources and cross-border trade of renewable power in the Eastern African and Southern African power pools. 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 Corridor can attract investments to potentially meet 40% to 50% of the regional power needs by 2030. Such region-wide renewable energy deployment could cut the annual carbon dioxide (CO₂) emission level in 2030 by 310 Megatons (Mt), translating into 2,500 Mt savings of cumulative CO₂ emissions between 2010 and 2030 while increasing electricity supply by 2.5 times.

35. Since the Ministerial endorsement of the ACEC in January 2014, support has expanded to over 30 partners with the engagement of a number of regional organisations, development partners, financial institutions, and private sector. Work is in progress to identify zones for the development of renewable power plants in areas of high resource potential, to consider cost-effective renewable power options in long-term energy planning and to create enabling frameworks for investment by opening markets to independent renewable power producers, reducing the costs of renewable power financing, and facilitating renewable power trade.

36. The target for ASEAN of 15% renewable power in the supply mix by 2015 and enhanced cross-border electricity trade through integration of the national power grids can pave the way for the development of another clean energy corridor initiative in the South East Asian region (*i.e.*, Greening ASEAN Power Grid). In the preliminary phase, IRENA is examining the implementation of the Corridor concept in a relatively united sub-regional context of the Greater Mekong Sub-region that includes five ASEAN countries plus China (two provinces involved).

37. The interconnected electricity transmission system of Central America (SIEPAC) presents an opportunity to develop a clean energy corridor that will enable the regional market to operate with higher share of renewable energy. IRENA should closely coordinate with the Central American Integration System (SICA) in this initiative, where the Agency's preliminary strategy favours a systemic approach to the integration of renewable energy sources into the power system and a series of capacity building activities mainly targeting the regional operator and regulator.

38. The newly created Global Geothermal Alliance offers customised support in addressing key regulatory and commercial challenges to scale-up geothermal energy deployment in developing

countries, which will further strengthen the ongoing regional initiatives (including, the Geothermal in the Andes and the Clean Energy Corridors in Central America and Africa).

39. The Pan-Arab Clean Energy initiative aims at an accelerated deployment of renewable electricity in the power systems of the Arab countries with an initial focus on Maghreb countries (North Africa). The initiative is intended to promote and facilitate cross-border trade of renewable power in the region and with neighbouring regions.

40. Some engagement with the Central American, ASEAN and Maghreb countries has been initiated, with future work focusing on more detailed presentations of these proposals, and on building political support for them, engaging with national authorities and regional institutions, improving access to data, conducting regional resource assessments and planning, developing the enabling policy and regulatory environment for investment, and identifying power generation and transmission investment opportunities within the proposed corridors.

III. Guiding questions

41. The session will focus on the following questions:

- Given the experience of IRENA in regional engagement in its early phase, the growing demand and membership and demand for services, how can the Agency best engage with countries / regions to shape the next phase of growth in its regional activities?
- How should the Agency strengthen its collaboration with regional institutions and its outreach to countries? Would this include regional presence?
- What should be the appropriate level of ambition and which are the key priorities to be addressed? Would this have implications for future budgets?

ANNEX:

IRENA'S ENGAGEMENT IN REGIONS

Overview of IRENA Activities in Regions

Region	Membership	IRENA Partners
<i>Asia</i> (33 countries)	Member: 17 Signatory: 3	Asian Development Bank (ADB), GIZ, UN Economic and Social Commission for Asia Pacific (UN ESCAP)
<i>Latin America</i> (22 countries)	Member: 9 Signatory: 6	Latin American Energy Organization (OLADE), Central American Integration System (SICA), CRIE (Central American Electricity Regulator), Central American Regional Market Operator (EOR),
<i>MENA</i> (23 countries)	Member: 18 Signatory: 4	Regional Center for Renewable Energy and Energy Efficiency (RCREEE), League of Arab States (LAS), Arab Union of Electricity, UNDP and UN ESCWA
<i>Sub-Saharan Africa</i> (48 countries)	Member: 29 Signatory: 14	African Union (AU), New Partnership for Africa's Development (NEPAD), African Development Bank (AfDB), Southern African Development Community (SADC), East African Community (EAC), Common market for Eastern and Southern Africa (COMESA), West African Economic and Monetary Union (WAEMU), Southern African Power Pool (SAPP), Eastern Africa Power Pool (EAPP), Independent Regulatory Body for EAPP (IRB), Regional Electricity Regulators Association of Southern Africa (RERA), ECOWAS Center for Renewable Energy and Energy Efficiency (ECREEE), International Institute for Water and Environmental Engineering (2iE), United Nations Economic Commission for Africa (UNECA)
<i>SIDS</i> (50 countries or territories)	<u>Pacific</u> Member: 11 Signatory: 1 <u>Caribbean</u> Member: 10 Signatory: 1	SPC and SPREP in the Pacific and Caribbean Community (CARICOM) in the Caribbean
<i>OECD</i> (30 countries – excl. 4 included in other regions)	Member: 26 Signatory: 2	Organization of Economic Cooperation and Development (OECD), International Energy Agency (IEA)
<i>Non-regional, non-OECD</i>	Members: 14	

Regional Presentation of Activities under Work Programme 2014-2015

An overview of IRENA's activities in different regions under implementation or being planned under the six thematic areas of IRENA's work programme 2014-2015 as follows:

Thematic Area 1. Planning for the Global Energy Transition

SE4ALL Hub: IRENA serves as the Renewable Energy (RE) Hub within the SE4ALL initiative. In that regards,

- **Sub-Saharan Africa:** IRENA contributed to the drafting of country SE4ALL action agenda template and investment prospectus through regional workshops for Western, Central, Eastern and Southern Africa in collaboration with the SE4All Regional Hub (the African Development Bank). Several concrete angles for IRENA support for SE4ALL country action agenda, notably through the Renewable Readiness Assessment (RRA) have been identified.

REmap 2030 is IRENA's roadmap for doubling the global RE share between 2010 and 2030. Through a continually expanding set of country, sector and technology report and analyses, REmap shows how the share of RE in the global energy mix can be doubled by 2030. In 2013, IRENA analysed 26 countries that account for three-quarters of the global total final energy consumption, while additional 11 countries are planned to be included in the scope in 2014, as follows:

- **Asia:** In 2013, China, India, Indonesia, Japan, Malaysia, and South Korea as well as the sub-regions of Southeast Asia and South Asia; planned for Kazakhstan in 2014.
- **Latin America:** In 2013, Brazil, Ecuador, and Mexico; planned/underway for Colombia and Uruguay in 2014.
- **MENA:** In 2013, Morocco, Saudi Arabia and the United Arab Emirates.
- **Sub-Saharan Africa:** In 2013, Nigeria and South Africa; planned/underway for Kenya and Ethiopia in 2014.
- **SIDS:** Planned for Dominican Republic in 2014.
- **OECD:** In 2013, Australia, Canada, Denmark, France, Germany, Italy, Japan, Mexico, Turkey, Ukraine, United Kingdom and the United States of America; planned/underway for Belgium, Egypt, Ethiopia, Poland and Sweden in 2014.

The **Renewables Readiness Assessment (RRA)** assists countries to develop effective enabling RE policy and regulatory frameworks and assess the potentials and regulatory options. RRA is a country-driven process that helps IRENA to engage with relevant national or regional stakeholders in a dialogue to pinpoint RE drivers, comparative advantages, enabling policies and measures.

- **Asia:** Mongolia and the Philippines, have undertaken the RRA process, with Mongolia's RRA report being under finalization. For the Philippines RRA, it is under implementation and the RRA workshop will be co-organized by the Department of Energy of the Philippines, IRENA and GIZ.
- **Latin America:** Peru and Nicaragua have undertaken the RRA process. While Peru RRA report has been completed, Nicaragua RRA report is under finalisation. In Nicaragua, the RRA process provided the opportunity to collaborate with SE4ALL by providing input for the RE component of the initiative. IRENA received a request from Antigua and Barbuda for an RRA with a component to support Barbuda for developing a pre-feasibility study and an initial plan

to achieve a high penetration of RE in the energy mix. Discussions with the country to plan ahead activities have been initiated.

- **MENA:** the first pilot RRA was conducted in Oman, where the government is trying to secure enough resources to meet the growing power demand by improving fuel efficiency; ensuring an appropriate balance between peak and base load power generation capacity; resource diversification through the introduction of alternative fuels; and potential implementation of RE projects. The RRA report is under review by the country focal point and will be finalised after this process. Two additional RRAs in the region for Mauritania and Tunisia are undergoing the in-country process. The RRA Mauritania, which is near completion, is implemented in collaboration with UNDP and presents a model for collaborative replication of the RRA process. In Tunisia, first discussions have started with the county focal point to plan ahead activities.
- **Sub-Saharan Africa:** Djibouti, Ghana, Mozambique, Niger, Senegal, Swaziland, the Gambia and Zambia have undertaken the RRA process. While Mozambique, Niger, Senegal, the Gambia and Zambia RRA reports have been completed, Djibouti, Ghana and Swaziland RRA reports are at an advance stage. The RRAs have triggered tangible changes in legislations and institutional set ups in Niger and Senegal and have led to concrete regional advisory services and initiatives in Western and Southern Africa. Furthermore, outcomes of the RRAs will provide input for the RE component of the country SE4ALL Action Agenda. The successful interventions have triggered more countries to request the RRA, incl. Rwanda and Tanzania.
- **SIDS:** In the Caribbean, Grenada, has undertaken the RRA process and RRA report has been completed. In the Pacific, while the report for Kiribati has already been published, Fiji, Vanuatu and Republic of Marshall Islands have been already engaged in the RRA process. All are in the finalization stage. The reports are expected to be published by the end of 2014 and present the opportunities of deploying renewable energies in those countries while at the same time provide recommendations that could help the countries foster a healthier enabling environment for private investors and developers to take part.

Planning with Renewables: IRENA help countries and regions to reflect the real potential of RE technologies in long-term regional and national energy master plans. The full assessment of the economic potential of RE requires that technologies are viewed as an integral element in analysing the relationship of renewable and non-renewable technologies, transmission and distribution, employment effects, carbon emissions and international trade.

- **Asia:** A workshop to discuss the regional/sub-regional power system development strategy with high share variable renewables in connection to the ASEAN power grid expansion and the interconnected Greater Mekong Sub-region will take place in 2015.
- **Latin America:** A regional workshop to disseminate the good RE planning practice guideline is planned other in Latin America in 2015.
- **MENA:** IRENA, in consultations with COMELEC and the utilities of the African Arab countries, is developing of long-term electricity sector planning models for the Arab countries in Africa, as a part of Africa System Planning Test (SPLAT). Energy planning training for the African Arab countries are being organized under the framework of the Technical Cooperation program of the International Atomic Energy Agency.
- **Sub-Saharan Africa:** IRENA has developed jointly with ECREEE, SAPP and WAPP two modelling tools (Renewable Energy Planning models for ECOWAS and for SADC) for power sector planning in ECOWAS and SADC regions. The tools allow analysts to simulate the electricity system for the WAPP and SAPP countries and can help to identify least-cost electricity supply configurations. Countries have been trained on how to use these tools and the

same activity is being conducted for CAPP and EAPP countries. Furthermore, IRENA is considering the possibility to provide support in the field of energy planning for the ECOWAS countries in the context of SE4ALL and National Renewable Action Plan development.

Advisory Services utilises IRENA's knowledge base and technical expertise, to provide in depth, targeted technical advisory services.

- **MENA**: IRENA, in collaboration with the League of Arab States, has recently produced a report on the *Roadmap of Actions for Implementation of the Arab Renewable Energy Strategy 2030*. The study identifies the gaps and barriers hindering the RE deployment, develops a detailed roadmap of national and regional actions to address the challenges, and provides concrete recommendations towards improving the investment climate, facilitating knowledge transfer, building local skills, etc. Furthermore, IRENA and European Investment Bank (EIB) have engaged in a joint study to evaluate RE manufacturing potential in three south Mediterranean countries, namely, Egypt, Morocco and Tunisia. The study will look into analysing and making a detailed presentation on the supply chains for RE manufacturing in the region, mapping the gap(s) identified for each selected South Mediterranean Country in terms of the development of local RE manufacturing capacity, Identifying concrete projects that could be implemented in the region and making recommendations to support the development of RE manufacturing in the region. The findings of the study is envisaged to be presented at the IRENA Assembly in 2015.
- **Sub-Saharan Africa**: IRENA has conducted a Small Hydro Power Planning for the RRA countries (Zambia, Swaziland, Mozambique and the Gambia), where RE resource has been identified as possible option for increasing energy access. The aim of that support service was to build countries capacities to assess their Small Hydro Power resource potential as well as to draft national strategies and action plans to develop the sector. The training was held in Zambia in May 2013
- **SIDS**: As part of Advisory Services in LAC the *Net Metering / Net Billing in the Caribbean* initiative aims to study strategies for implementing net metering / net billing schemes for solar PV in residential and commercial buildings in the Caribbean. First, a pilot study aims to identify the renewable power generation capacities that could be accommodated in a distribution network in particular each country or island without any grid upgrades, along with recommending actions on grid infrastructure and operation to facilitate future deployment based on net metering/net billing. The pilot study will also assess business models, existing regulatory framework, institutional set-up and the entrepreneurial and financial conditions for the implementation of such schemes. If appropriate, such work might be undertaken for other islands in the Caribbean or other regions.

Repowering Cities: IRENA organized with assistance from the European Commission, the International Council for Local Environmental Initiatives (ICLEI), the International Partnership for Energy Efficiency Cooperation (IPEEC), and the United Nations Human Settlement Programme (UN-HABITAT) a workshop in January 2014 aimed at exploring public private partnerships as an effective business model for RE deployment in cities. Attention was drawn to the lack of municipal financial resources for RE deployment in cities, which necessitates participation by the private sector through mutually beneficial public-private engagements. Mayors and officials have attended the workshop from the following countries:

- **Asia**: Pakistan, India, Afghanistan, Iran, Iraq, Sri Lanka and Nepal
- **Latin America**: Argentina
- **Middle East**: United Arab Emirates, Kuwait and Cyprus

- **Sub-Saharan Africa**: Burkina Faso, Cameroon, Ghana, Ethiopia, Egypt, Kenya, Mauritius, Nigeria, South Africa, Togo and Zimbabwe

The Water, Energy and Land Nexus: IRENA is conducting a study to analyse the benefits brought on by renewable energy in managing the water, energy and food nexus. In implementing this project, IRENA is collaborating with relevant stakeholders across the three sectors, including Qatar Foundation and Texas A&M University, and participating in the “Water, Energy and Food Nexus” High Impact Opportunity being led by FAO and GIZ within the SE4ALL Initiative. The study will serve as the foundation for carrying out select country-level analysis that will cover diverse regional contexts, including:

- **Asia, MENA and SIDS**

Thematic Area 2. Gateway to Knowledge on Renewable Energy

Renewables Statistics: IRENA is working to build the most complete, up-to-date and freely accessible global RE statistics database including the elaboration of a guidebook on practical approaches to RE accounting and reporting where case studies from different regions are included:

- **Latin America**: Uruguay, Ecuador
- **Sub-Sahara Africa**: Djibouti, Swaziland, Rwanda

Global Atlas: A wider-spectrum initiative of relevance is the Global Atlas for Renewable Energy, introduced and led by IRENA and supported by a high-profile international consortium. It also provides a web-based platform that includes homogeneous solar and wind data with global coverage, and enables users to overlay additional information on, for example, protected areas, roads or infrastructures. This enables users to highlight areas of opportunity for developing projects and also supports policy formulation, planning and stimulating investment in pre-feasibility studies for wind and solar projects. To date, IRENA has collaborated with a number of countries have joined the Global Atlas:

- **Asia**: India, Kazakhstan, Mongolia, and Philippines
- **Latin America**: Colombia, Honduras, Mexico, Nicaragua, Peru and Uruguay
- **MENA**: Egypt, Iran, Iraq, Israel, Kuwait, Mauritania, Morocco, Qatar, Saudi Arabia, Sudan, Tunisia, United Arab Emirates, and Yemen
- **Sub-Saharan Africa**: Ethiopia, Gambia, Mauritius, Mozambique, Namibia, Mali, Niger, Nigeria, Senegal, South Africa, Swaziland, Uganda, Tanzania and Zimbabwe, and the Central Africa power pool
- **SIDS**: Fiji, Grenada, Kiribati, Maldives, Mauritius, Seychelles, Tonga, Vanuatu.
- **OECD**: Australia, Belgium, Denmark, France, Germany, Greece, Israel, Italy, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Switzerland, Turkey, United Kingdom and the United States.

Thematic Area 3. Enabling Investment and Growth

Regional Market Analysis: The wealth of knowledge embedded in diverse regional markets needs to be captured, analysed and disseminated to share experiences and highlight transferable practices.

- **Latin America:** Based on the examination of the energy sectors from a regulatory, administrative, institutional and financial perspective, the regional assessment of status and trends in the LAC region will draw policy lessons, identify best practices and help leverage potential synergies.
- **MENA:** IRENA plans to conduct a market assessment in GCC and provide best practices on policy, regulatory and administrative frameworks that can facilitate the transition to clean energy systems of economies characterized by rapid industrialization, population growth and water scarcity.

Energy Pricing:

- **MENA:** IRENA initiated a study evaluating the economic impacts of current energy pricing in the MENA region in the context of RE deployment with a special focus on Egypt, Jordan, Libya, Morocco and Tunisia. Consultations with key stakeholders in the five countries have been conducted and the final report is expected to come out by the end of 2014.

Risk Mitigation:

- **MENA:** IRENA in collaboration with partners organised an executive-level meeting that focused on RE investment in the GCC region. The meeting reviewed the rapidly growing renewable energy market in the region, examined factors enabling successfully financed projects, and shared the private sector views on key barriers to scaling up financing in renewables.
- **Sub-Saharan Africa:** At the Second High-Level Meeting of the Africa-EU Energy Partnership (AEEP), IRENA co-organized a breakout session with the host on financing RE projects and discussed the potential of risk mitigation instruments for RE projects in Africa. Case studies and other research activities are being undertaken to document challenges and best practices of utilizing risk guarantee instruments for electric power plants and infrastructure projects in selected countries. The findings from the studies will feed into proposals for developing and facilitating effective de-risking instruments and mechanisms for potential implementation at the regional level.

Cooperation with the Abu Dhabi Fund for Development (ADFD): IRENA is cooperating with the ADFD in facilitating concessional loans focused on innovative projects that enhance learning and which may be easily replicated. The programme is implemented in seven cycles, where in the first cycle, the following projects have been selected:

- **Latin America:** A 3-MW small hydro project in Ecuador for a loan of USD 5 million.
- **MENA:** A 1-MW wind power project in Mauritania for a loan of USD 5 million.
- **Sub-Saharan Africa:** A 4-MW hybrid solar diesel mini-grids for 30 villages project in Mali for a loan of USD 9 million; a 6-MW grid connected solar PV project for expanding the grid coverage and improving its stability in Freetown area in Sierra Leone for a loan of USD 9 million.
- **SIDS:** A 2-MW waste to energy power plant project in the Maldives for a loan of USD 6 million and biomass gasification and biodiesel plants project in Samoa for a loan of USD 5 million.

For the second cycle over 70 projects were received out of which 22 were short listed. Currently full project proposals are being evaluated.

Quality and Standardisation for Renewable Energy Technologies:

- **Latin America:** IRENA supports the “quality label for solar water heaters in Latin America” initiative in collaboration with German Metrology Institute (PTB).

- **Sub-Saharan Africa:** IRENA is implementing a Certification Program for the Installation and Maintenance of Solar PV Systems, jointly with the West African Economic and Monetary Union (UEMOA), for eight West African countries (Benin, Burkina Faso, Cote d'Ivoire, Guinea Bissau, Mali, Niger, Senegal, and Togo). The initiative aims to set up a regionally harmonized, internationally recognized certification scheme, which would help overcoming the shortage of qualified practitioners for solar PV in the region. It offers the medium term potential of escalating the certification programme to the entire ECOWAS region, which would dramatically enhance the benefits of the initiative.

Valorisation of Biomass Residues as an Energy Source (Valo-BRES): The initiative aims at promoting innovation and investments in technology deployment for energy generation from biomass residues in Africa and the LAC region. This consists of the development of guidelines for optimum economically and environmentally viable pathways for RE generation from the various biomass residues arising from the core activities of the agriculture and forestry sectors as well as the development of a framework for supporting investments and technology adoption and deployment.

- **Sub-Saharan Africa:** Cameroon, Ghana, Nigeria, Senegal and Uganda
- **Latin America:** Ecuador and Costa Rica (in collaboration with OLADE)

Innovation and Research, Development and Demonstration (RD&D): IRENA developed a methodology for policy-makers to help define appropriate national, regional and international strategies and establish cooperative frameworks that spur innovation in RE technologies. It also assessed the possibilities for regional cooperation on RD&D and analysed future technology market trends.

- **Sub-Saharan Africa:** Planned to be implemented in 2014 to stimulate cooperation and strengthen RD&D efforts in the region.

Thematic Area 4. Renewable Energy Access for Sustainable Livelihoods

IOREC platform: IRENA organises the International Off-grid Renewable Energy Conference (IOREC) on a biennial basis to systematically engage public institutions responsible for rural electrification and practitioners, to identify key deployment barriers faced by off-grid renewable energy technologies and to collectively devise solutions to address them. The conference shifts regional focus with each edition while bringing together global expertise to facilitate best practices in design and implementation of rural electrification initiatives.

- **Sub-Saharan Africa:** The first edition of IOREC was co-organized with the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) and the Alliance for Rural Electrification (ARE) (Ghana, November 2012). The findings from the conference were published and have been widely disseminated across several regional platforms.
- **Asia:** The second edition of IOREC was held together with the Asian Development Bank (ADB) and ARE (the Philippines, June 2014). IOREC marked the beginning of the Asia Clean Energy Forum 2014, an annual gathering of regional stakeholders in the energy sector.

Mini-Grids: IRENA, in partnership with UNEP, SIEMENS and Frankfurt School, evaluates the potential of hybrid solutions for existing diesel-based mini-grids. Pilot sites of the study are situated in:

- **Latin America:** Colombia
- **Sub-Saharan Africa:** Kenya and the Gambia

- **SIDS:** Dominican Republic

IRENA partners with EUEI-PDF, who is developing a mini-grid policy toolkit, to jointly promote regulatory measures that will favour the upscale deployment of RE based mini-grids across Africa.

IRENA is also providing advisory services entrepreneurs in Mali and Burkina Faso to facilitate the uptake of biomass gasifiers for decentralised power generation through mini-grids.

Capacity Building for Entrepreneurs:

Promoting a Sustainable Market for PV Systems in ECOWAS region (PROsPER):

- **Sub-Saharan Africa:** The PROsPER initiative has been developed in the ECOWAS region jointly with the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) for strengthening local capacities of policymakers, regulators and utilities, branch managers of financial institutions, trainers from educational or research institutions, and RE entrepreneurs to accelerate RE and particularly solar PV systems' deployment. PROsPER has three components: (i) promotion of national RE and incentives scheme; (ii) promotion of RE entrepreneurship in PV technology; and (iii) capacity building for financial institutions. In 2014, IRENA and ECREEE are setting up a support and mentorship facility for entrepreneurs that will strengthen their innovative ideas and make them bankable as they scale up their RE businesses. The support will be provided to entrepreneurs through the International Institute for Water and Environmental Engineering (2iE) based in Ouagadougou – Burkina Faso.

Training programme for solar PV project planning and Engineering, procurement, construction (EPC) and operation and maintenance (O&M): IRENA, in partnership with the New Energy and Industrial Technology Development Organization (NEDO) of Japan, delivered this training in Sept-Oct 2013. A total of 40 trainees from 27 countries have benefited from this two-week intensive technical training in Japan:

- **Asia:** Bangladesh, India, Indonesia, Mongolia, Philippines, Thailand
- **Latin America:** Nicaragua, Uruguay
- **MENA:** Djibouti, Egypt, Iraq, Jordan, Morocco, Saudi Arabia, Sudan, Tunisia, United Arab Emirates, and Yemen
- **Sub-Saharan Africa:** The Gambia, Kenya, Niger, Senegal, Sierra Leone, Swaziland, Togo, Tunisia
- **SIDS:** Fiji, Samoa

Knowledge sharing for incubation of RE businesses in energy access: With the collaboration of the Center for Innovation, Incubation and Entrepreneurship (CIIE) supported by the Indian government, and SELCO Incubation Center, a training workshop is planned in September 2014 to facilitate experience sharing between business incubation centres across regions. Expected participation:

- **Asia:** India, Nepal, Bangladesh, Pakistan, Sri Lanka
- **Sub-Saharan Africa:** Kenya, Uganda and Tanzania, Burkina Faso
- **MENA:** Egypt

Resource assessment capacity building programme: To be implemented in collaboration with Asia and Pacific Centre for Transfer of Technology (APCTT) of UN-ESCAP.

- **Asia:** The first meeting indicated the gap in the region and the target to next step. Initial discussions with ASEAN Energy Market Integration Group has also started. With due

consideration to avoiding the duplication of existing activities in the region, further discussions for establishing effective and efficient capacity building programme in the region are expected.

Thematic Area 5. Islands: Lighthouses for Renewable Energy Deployment

- **Global Renewable Energy Islands Network (GREIN):** GREIN is a platform for pooling knowledge, sharing best practices and seeking innovative solutions for accelerated uptake of clean and cost-effective RE technologies on islands, reducing their needs for costly fossil fuel. GREIN's interest clusters include – on resource assessment, waste-to-energy and desalination- which will be discussed during a two-day event in Martinique. Participants in the event will include: governments from Caribbean Countries, companies and utilities involved in RE deployment, banks interested in financing RE investment, development partners, among others.
- **Capacity Building in Islands:** This aims to assist island states to create a pool of certified technicians and provide targeted technical assistance to SMEs in the Caribbean to deploy RE technologies. The initiative net metering / net billing in the Caribbean will help to identify potential business incubation centres in the region that could also include in their portfolio the distributed generation solar PV business sector.

Thematic Area 6. Regional Action Agenda

Asia

- **Greening Asian Power Grid (APG):** Greening APG is an initiative with the aim to increase the non-hydropower renewables in the future ASEAN Power Grid expansion an on-going initiative with the attempt to connecting all the major grids within ASEAN. The first phase will focus on the Greater Mekong Sub-region (GMS) including five ASEAN countries and two provinces of China, thanks to the advanced development of GMS compared to the rest of APG and the strong support from ADB in infrastructure development in GMS, particularly power grid interconnection. A MoU was signed between IRENA and ADB, offering a platform to partner with ADB on developing a collaborative initiative to scale up the integration of non-hydropower RE into the GMS power system.

Africa

- **Africa Clean Energy Corridor:** IRENA is developing the Africa Clean Energy Corridor initiative (ACEC) jointly with Eastern Africa Power Pool, Southern African Power Pool, countries, regional bodies (EAC, SADC), regulators, etc. 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.

Following a strategic group workshop held in June 2013 for laying out the ground for the way forward, in January 2014, an ACEC Action Agenda has been adopted through a Ministerial Communique. Currently, the work is in progress for the implementation of this Agenda through: (i) Resource Assessment and Zoning to identify zones for the development of renewable power plants in areas of high resource potential and routes for the efficient transmission of electricity to loads centres; (ii) Country and Regional Planning to consider cost-effective renewable power options for optimising investment in electricity generation and transmission infrastructure; (iii) Enabling Frameworks for Investment to open markets to independent renewable power producers, reduce the cost of renewable power financing, and facilitate renewable power trade; (iv) Capacity Building to develop skills required to build, plan, operate, maintain and government power grids and markets with higher shares of renewable electricity generation; and (v) Public Information to raise awareness of the ACEC and promote its benefits in providing secure, sustainable and affordable energy to meet rising energy demand. The ACEC was announced at the Climate Summit held in New York on 23 September 2014 as a collaborative action by related governments and partners through declaration of specific commitments. Since the Ministerial endorsement of the ACEC in January 2014, support has expanded to over 30 partners with the engagement of a number of regional organisations, development partners, financial institutions, and private sector.

- **Small Hydropower Development:** IRENA is organizing in partnership with the Alternate Hydro Energy Center (AHEC), India Institute of Technology in September 2014, a 12 technical training on Small Hydro Power (SHP) deployment. The training will provide participants with details on the global status of SHP, potential assessment, site selection, planning and design of civil works, selection of E&M equipment, tariff setting, on-grid and off-grid applications. A real time SHP plant simulator will be used during the training. 5 participants are expected from Eastern and Southern Africa regions.

Latin America

- **Central America Clean Energy Corridor:** Central America has rapidly growing power needs, estimated in around 7GW of new generation capacity by 2020. The region is rich in RE resources sufficient to meet all of its electricity needs. IRENA is working on a set of key actions to advance the integration of RE into the Central American Electrical Interconnection System (SIEPAC). After meeting relevant stakeholders in the region, IRENA defined a preliminary strategy which tries to tackle the most pressing needs without compromising, but favoring, a systemic approach to the integration of RE sources into the power system. IRENA is planning to support the regional operator and regulator (EOR and CRIE respectively) and other institutions, to identify the potential necessary upgrades or adaptations of the Energy Management System in the control room, to build capacities for the technical team aimed at power system operation with high shares of variable RE and to design grid codes for wind turbines connected to the regional grid. The way forward include a working session aimed at awareness raising on the main barriers and best practices as regards the operation of the system with high shares of variable RE and its integration into the electricity system, mainly focusing on wind energy. And how these barriers and best practices relate to the Central American landscape.
- **Geothermal Energy in the Andes** initiative was launched in 2012 together with the Latin America Energy Organization (OLADE) and the International Geothermal Association (IGA). It aims to support Andean countries – Bolivia, Chile, Colombia, Ecuador and Peru- to develop its geothermal sector. Three key areas of support identified are: i) legal frameworks to further develop enabling conditions for investments; ii) access to finance, dissemination of innovative

finance models, and risk mitigation mechanisms; and iii) capacity building. So far, three workshops has been organised as part of this initiative – Iceland, Peru and Chile. The most recent one on Geothermal Regulation, Environmental Licensing took place on May 2014 in Santiago, Chile. Participants from all the Andean countries plus Nicaragua participated in a technical training on Geothermal Regulation, Environmental Licensing and Reservoir Modelling was organised in collaboration with the Andean Geothermal Center of Excellence (CEGA) and the Geothermal Institute (University of Auckland, New Zealand). Discussions for the next steps include a workshop on geothermal finance and supporting Peru and Ecuador in the development of legal frameworks for Geothermal Energy.

MENA

- **Pan-Arab Clean Energy Initiative:** IRENA is working with the League of Arab States (LAS), the UN organizations, the Regional Centre for Renewable Energy and Energy Efficiency (RCREEE), the Arab Union for Electricity (AUE), and Arab power pools to identify the actions needed to attract investments for larger deployment of clean and indigenous renewable energy resources in the Arab region. In this context, IRENA and its partners are undertaking steps to launch the Pan-Arab Clean Energy (PACE) Initiative to integrate greater amounts of renewable electricity in the power systems in line with the 2030 target of the Pan-Arab Renewable Energy Strategy. IRENA has initiated a situational analysis in the countries of the Maghreb region to assess 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. 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.
- **Solar Resource Assessment:** IRENA is working with Kuwait Institute for Scientific Research to organize one week training on solar resource assessment in November 2014, with the aim to strengthen the technical skills of stakeholders, facilitate sharing best practices and latest technological advancements and help establish a network of resource assessment practitioners. Participants from East and North Africa are expected to join the training.

Africa and Asia

- **Designing and Implementing Meaningful Renewable Energy Targets:** IRENA co-organized with the Japanese government, AfDB, ADB, and Clean Energy Solution Centre (NREL) a capacity building workshop on how to set-up a RE target and implement it using the appropriate mix of policy mechanisms and incentive schemes. The workshop discussed topics of demand such as the pre-requisites and methodology for designing a target and how to implement it using policy mechanisms, for example, feed-in tariff, net-metering and tendering schemes. In addition, both the African Development Bank and the Asian Development Bank presented opportunities for funding RE projects in their respective regions. The training was attended by 13 people out of which 7 from SSA region namely from The Gambia, Ghana, Swaziland, Senegal, Niger, and Mozambique and the rest from the Pacific region (Fiji, Vanuatu, Kiribati, Samoa and RMI).