IRENA
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Programmatic Discussion I: IRENA as the Global Hub for Renewable Energy

1. The Council's first programmatic discussion will address IRENA's key role as the global network hub for renewable energy and its participation in different initiatives to accelerate the increase of the renewables share in the global energy mix. This includes IRENA's designation as the Hub for Renewable Energy within the Sustainable Energy for All (SE4ALL) initiative; IRENA's global roadmap for doubling the share of renewables worldwide, REMAP 2030; and the Global Renewable Energy Islands Network (GREIN), IRENA's collaborative initiative to support accelerated renewable energy uptake on islands.

I. Renewable energy hub for Sustainable Energy for all

2. The United Nations General Assembly has declared 2014-2024 as the Decade of Sustainable Energy for All. The UN Secretary-General's Sustainable Energy for All (SE4ALL) initiative outlines three aspirational, interrelated goals for 2030: ensuring universal access to modern energy services; doubling the global rate of improvement in energy efficiency; and doubling the share of renewable energy in the global energy mix.

3. Several regional and thematic hubs are being established to advance SE4ALL activities and maintain relevant stakeholder networks. SE4ALL stakeholders and IRENA Members have designated the Agency as the Hub for Renewable Energy. This function, a natural extension of IRENA's mandate, also aligns with the strategic vision of IRENA as an authoritative global voice for renewable energy.

4. IRENA now needs to refine its plans for fulfilling the hub role, while ensuring the complementarity of SE4ALL activities with IRENA programmatic activities, broader global renewable energy efforts and the needs of IRENA Members. For further information on this subject for Council discussion, please refer to the "**Note on Renewable energy hub for Sustainable Energy for All**", circulated as C/5/CRP/1 on 27 May 2013 and also enclosed as Annex 1.

II. REMAP 2030

5. IRENA's global roadmap for renewable energy, REMAP 2030, is designed to demonstrate possible pathways and priority actions for meeting the aspirational target of doubling the share of renewables by 2030. It is the result of a collaborative process between IRENA, countries and other stakeholders. The REMAP process consists of two parallel tracks: 1) country-based analysis complemented with regional analysis to identify actions on technology deployment, investment and policies; and 2) sector-based technology roadmaps to identify the sector-specific opportunities across multiple countries and regions.

6. It is envisaged that REMAP would provide policy makers with recommendations for global action on technology deployment, and for investment streams and policies that can achieve the doubling of the renewable energy share by 2030. REMAP could also become a tool to help country leaders and policy makers understand the steps needed for a national energy transition in a global context. REMAP does not seek to set targets, but to highlight the possible paths, priority areas and possibilities for cooperation that would accelerate the deployment of renewables worldwide.

7. The Council may wish to provide feedback and suggestions on how REMAP could evolve to most effectively support individual Members and stimulate international cooperation. For further information on this subject for Council discussion, please refer to the "**Note on Global Renewable Energy Roadmap 2030 (REMAP 2030)**" enclosed as Annex 2.

III. Global Renewable Energy Islands Network

8. The Global Renewable Energy Islands Network (GREIN) was launched at IRENA's third Assembly in January 2013, following a call from Ministers and other officials from 48 countries at the "Renewables and Islands" high-level meeting in Malta in September 2012. GREIN provides a platform for pooling knowledge, sharing best practices and seeking innovative solutions to accelerate the uptake of clean and cost-effective renewable energy technologies on islands. GREIN will be the vehicle for contributing to the energy agenda of islands and island-related initiatives including the upcoming Small Island Developing States (SIDS) conference in Samoa in 2014.

9. GREIN is distinctive in three main ways. First, its scope is global rather than regional. Second, it is aimed not only at SIDS but also at other island countries, and at larger countries with islands or virtual islands far from transmission grids, which share the burden of high costs of energy (such as diesel fuel) that renewable energy could replace. Third, GREIN is focused on key thematic areas for renewable energy development.

10. GREIN will work through autonomous interest clusters, led by representatives from a range of relevant regional partners. A questionnaire distributed during the third Assembly elicited expressions of interest on the full range of proposed interest clusters from over 30 countries. Two clusters, on renewable energy roadmaps and grid integration, were activated in March 2013, and a third, on renewable energy for

tourism, is to be activated in late 2013. Several additional clusters are under consideration, pending identification of suitable leaders and funding sources to carry the work forward in a practical and efficient fashion. These include: renewable energy resource assessment, waste-to-energy systems and desalination systems.

Progress to date

11. The first three of GREIN's interest clusters are:

a. Grid Integration:

- Activated in March at the Pacific Energy Summit 2013 in Auckland, New Zealand, this cluster is intended to perform grid stability studies, each modelling an island power grid in cooperation with the national or local utility, to assess how much renewable power can be integrated into the grid while maintaining reliable service. The first of these studies was performed for Palau, culminating with an expert workshop and a study that showed that a 30 percent share of renewable generation could be accommodated on the island power grid with little adjustment to grid operations.

- Based on the potentially transformative effect of grid stability studies in promoting flows of private investment to renewable energy on islands, IRENA intends to perform such studies for interested island countries that are large enough to have a power grid, and small enough to benefit from the development of an island power grid model. These studies might begin with Pacific islands, leading up to the SIDS conference in Samoa in September 2014, and then continue on islands in other regions. Kiribati and St. Vincent and the Grenadines have already requested studies, and 22 countries have expressed interest in the GREIN grid integration cluster, which is led by the Pacific Power Association.

b. Roadmaps:

- This cluster, also activated in Auckland in March 2013, will help prepare renewable energy technology roadmaps, which would identify the most cost-effective mixes of renewable power options (biomass, geothermal, hydro, marine, solar, and wind) that could be introduced to each island given a short-, medium- or long-term planning horizon. Three such roadmaps are to be prepared by mid-2014, according to the outline currently being developed. The Roadmaps cluster is led by the Secretariat of the Pacific Community.

c. Tourism:

- This cluster will work with island hotel associations to build a business case for expanding the use of cost-effective renewable technologies, such as solar hot-water heaters or absorption chillers for air conditioning. Terms of reference have been prepared for a study to identify the main areas of focus for this cluster's activities. The Tourism cluster is planned to be activated in late 2013.

12. Partnerships with donors would further strengthen the implementation of GREIN cluster activities. Provided that suitable leaders and funding sources can be found for feasibility studies and pilot projects, the following additional interest clusters would also serve vital needs for islands:

a. Resource Assessment:

- Renewable energy projects on islands can only be financed, in many cases, following the allocation of funds for detailed resource measurements, which banks can then use to assess the likely energy output, revenue stream, profit and likelihood of payback. This cluster would work with islands to review their resource assessments, develop strategies to improve these assessments, and help identify financing for detailed measurements of selected resources at suitable sites. IRENA would also develop technical guidelines for resource measurement on islands.

b. Waste-to-Energy Systems:

- Dense population and limited land area create a need for waste-to-energy systems on islands. These systems represent a market opportunity for renewable energy, based on the cost savings from not having to ship waste off an island, which can substantially lower the net cost of electricity production. One promising area for action is the treatment of solid waste through a well-established gasification and pyrolysis process. This is cost-effective for islands where more than 500 kW can be generated from solid waste. Another possible area for action is the treatment of liquid waste, such as sewerage and runoff from distilleries and abattoirs, through anaerobic fermentation. This is generally cost-effective for islands with at least 500,000 people, but the process needs further development. This cluster would approach island communities and hotel associations to develop coordinated projects.

c. Desalination Systems:

- Desalination is an increasingly vital and urgent application for renewable energy, as many islands are experiencing extended drought. A key economic goal is to desalinate water at a cost of less than USD 1 per ton, which is difficult using conventional desalination systems that rely on imported diesel fuel. This cluster would foster the sharing of best practices on renewable desalination options among interested islands. It could also provide coordination of feasibility studies and joint proposals for pilot projects.

13. GREIN is fostering cooperation and partnerships with the organisations and entities who are involved in the islands-related work, which includes the SIDS-DOCK. The SIDS-DOCK is initiative among the Alliance of Small Island States (AOSIS) to provide SIDS with a platform for transforming their energy sectors as a catalyst for sustainable economic development. It has endorsed a partnership with GREIN to develop a Global Islands Virtual Knowledge (GIV Knowledge) Network. GIV Knowledge would enable IRENA to share best practices in grid integration, roadmaps, tourism, resource assessment, waste-to-energy systems, and desalination systems, among others. Its scope would include SIDS, all island countries and all interested countries with islands.

14. The Council may wish to discuss GREIN progress to date and provide feedback on the formation of partnerships and further cluster activation.

Annex 1

Note on Renewable energy hub for Sustainable Energy for All

1. The United Nations General Assembly declared the decade 2014-2024 as the Decade of Sustainable Energy for All. In order to catalyse action, the United Nations Secretary-General has launched the Sustainable Energy for All Initiative – SE4ALL - a global energy partnership and campaign aimed at achieving three inter-related goals by 2030:

- Ensuring universal access to modern energy services;
- Doubling the global rate of improvement in energy efficiency; and
- Doubling the share of renewable energy in the global energy mix.

2. The SE4ALL Initiative is envisaged to be an action-focused global network. It is guided by the SE4ALL Advisory Board and Executive Committee, which are supported by the Global Facilitation Team (GFT). The IRENA Director-General was invited to become a member of the Advisory Board.

3. A number of regional and thematic hubs are being established to form part of the Initiative's implementation structure. These hubs are intended to serve as platforms for advancing SE4ALL activities and for maintaining the Initiatives' stakeholder networks. It is envisaged that three regional hubs (Africa, Asia, and Latin/Central America) will be established to facilitate the implementation of the access goal, and two thematic hubs will be developed to facilitate the achievement of the energy efficiency and renewable energy goals. Denmark has been nominated to lead the thematic Hub on Energy Efficiency and the African Development Bank is leading the regional hub in Africa.

4. SE4ALL stakeholders and IRENA Members have designated the Agency as the Hub for Renewable Energy. This function is a natural extension of IRENA's mandate stipulated in its Statute, and is aligned with IRENA's strategic vision to become an authoritative global voice for renewable energy. IRENA has been contributing to SE4ALL activities, including the Global Tracking Report, High Impact Activities, and discussions on defining the processes and modalities for the Initiative. At this point, IRENA needs to refine its relationship with the Initiative and its responsibilities and plans for leading the SE4ALL Hub for Renewable Energy. The proposed function is defined along the following underlining principles:

- Facilitating complementarity of SE4ALL activities with broader global efforts on renewable energy, including with IRENA's programmatic activities;
- Responsiveness to the needs of IRENA's Members, in line with its mandate; and
- Close cooperation with the SE4ALL Global Facilitation Team in Vienna and New York, as well as the SE4ALL Regional Hubs for Energy Access, and Hub for Energy Efficiency.

Facilitating complementarity of SE4ALL activities with broader global efforts on renewable energy, including with IRENA's programmatic activities.

Enabling information sharing.

5. IRENA is well positioned to enhance the information flow between the SE4ALL Initiative and stakeholders, particularly to build broad country support for the SE4ALL activities. This will be done through existing structures, such as regular updates at IRENA assemblies, councils, conferences and workshops. Conversely, IRENA will feed information on its work into the SE4ALL structures to ensure that a broader audience is informed and involved in IRENA's work.

REMAP 2030.

6. REMAP is designed to demonstrate possible pathways and priority actions for meeting the aspirational target of doubling the share of renewables. It is a result of a collaborative process between IRENA, countries and other stakeholders. It is envisaged that REMAP will help guide IRENA's programmatic priorities, and can also be used to bring SE4ALL partners to contribute to the effort. Within REMAP, specific areas will be identified where SE4ALL constituency can make a contribution and accelerate the progress. In this context, IRENA will cooperate closely with the Regional Hubs on Access and the Hub on Energy Efficiency to both inform REMAP 2030, and to contribute to international collaboration and complementarity of action in the area of renewables.

7. To facilitate this collaboration, a REMAP/SE4ALL Renewables Taskforce will be established to inform REMAP of the activities that different stakeholders are undertaking, regional and thematic hubs in particular, and help ensure that it informs and engages other stakeholders. The Taskforce will seek to engage SE4ALL stakeholders from different constituencies, including countries, international and regional organizations, private sector and civil society. This is particularly important to complement IRENA's effort in not only working toward the SE4ALL goal of doubling the share of renewables, but also in meeting its mandate of accelerating the deployment of renewables worldwide. Based on the need and interest, SE4ALL thematic clusters could be established within the existing networks such as GREIN and the Business Forum.

High-impact Opportunities.

8. IRENA will coordinate with the SE4ALL stakeholders who are undertaking renewables-related activities. Many entities have made specific commitments that could be complementary to IRENA's work, and would benefit from being connected to the broader renewables context. IRENA will engage those who have made specific commitment within the Initiative in the context of different High Impact Opportunities (HIO) which relate to IRENA's approved programmatic activities. These include the work on islands, cities, off-grid lighting and nexus. IRENA will also keep abreast of developments on the renewables-related HIOs which are not part of its work programme, such as the large scale renewables, to help ensure maximum impact and benefit for its Members.

Responsiveness to the needs of its Member constituency, in line with its mandate

SE4ALL Focal Points.

9. In line with its mandate to accelerate the global deployment of renewables, IRENA will seek to identify synergies and complementarities that would benefit its Members who are participating in the SE4ALL Initiative. At the outset, it will establish and maintain liaison with the SE4ALL country focal points to ensure coordination and avoid duplication of effort. This will also help disseminate information on IRENA's knowledge, policy, finance, and technology and innovation work.

IRENA regional initiatives.

10. In its Work Programme, IRENA has a number of regional and country initiatives aimed at accelerating deployment of renewable energy. The current work in the Pacific, and upcoming initiatives like the LAC geothermal and the Africa Clean Energy Corridor. In the upcoming biennium, the number of regional and country initiatives will gradually increase. IRENA will invite SE4ALL stakeholders to participate in and contribute to these efforts.

SE4ALL support at the country level.

11. To complement the work undertaken by SE4ALL in Member counties, IRENA will promote the use of its resources such as the Global Atlas, RRA methodology, Renewable Energy Policy Advisory Network, Project Navigator, and other tools. Conversely, it will profile the range of SE4ALL programmes and approaches to facilitate the transfer of best practice and raise awareness of the opportunities triggered by SE4ALL. IRENA will also seek to identify partners and financing opportunities within SE4ALL that can facilitate the opportunities highlighted through RRAs and other IRENA activities within countries and regions.

Close cooperation with the SE4ALL Global Facilitation Team in Vienna and New York, as well as the SE4ALL Regional Hubs for Energy Access and Hub for Energy Efficiency

12. IRENA will formalize its relationship with the GFT and the regional and thematic hubs to ensure information sharing and close cooperation. The IRENA office in New York will maintain close contact with the GFT office in New York to ensure IRENA's timely input and participation in SE4ALL activities. The GFT operational office is located in Vienna, which accelerates the need to complete arrangements for IRENA's Vienna based liaison office. In preliminary discussions with the Government of Austria, it was indicated that the colocation of the IRENA Liaison Office and the SE4ALL Operational Office would be possible.

13. While IRENA is specifically tasked with focusing on the Initiative's renewable energy goal, the Agency's work also spans a wide range of activities relevant to the regional Hubs for Access and the thematic Hub on Energy Efficiency. Therefore IRENA will establish working relationships with all SE4ALL hubs to contribute to the overall effort of the SE4ALL initiative, and to enable IRENA and its work to benefit from closer cooperation with these structures.

Immediate action

- Collaborative arrangements with already established hubs (African Development Bank, Denmark)
- Collaborative arrangements and plans of action with international and regional organizations participating in renewables-related SE4ALL activities (e.g. World Bank, IEA, UNDP, SIDS-DOCK, etc.)
- Collaborative arrangements with GFT Offices in New York and Vienna (yet to be established)
- Identification of country SE4ALL focal points and creation of RE-goal network
- Establishment of the SE4ALL Renewables Taskforce within REMAP
- Coordination of SE4ALL country assessments and RRAs, where appropriate
- Participation in the development of SE4ALL action plans for Member countries, upon request
- Facilitation of targeted donor contributions to renewables-related activities (e.g. post RRA actions, measurement campaigns, grid stability assessments, etc.) ; and
- Dissemination of information on financing modalities and instruments, as well as investment opportunities within the SE4ALL framework

Resources

14. IRENA will enhance its internal coherence to focus on its role as the SE4ALL Hub for Renewable Energy. The hub function is already being integrated into the existing IRENA structure, with responsibilities shared between different divisions. As the work of the Initiative progresses both in terms of operational and global coverage, dedicated resources will be necessary for SE4ALL-related tasks. These may include support for travel, meetings, expert input, and additional project posts.

Annex 2

Note on Global Renewable Energy Roadmap 2030 (REMAP 2030)

1. IRENA's global roadmap for renewable energy, REMAP 2030, is designed to demonstrate possible pathways and priority actions for meeting the aspirational target articulated in the Sustainable Energy for All (SE4ALL) initiative of doubling the share of renewables in the global energy mix by 2030. It is the result of a collaborative process between IRENA, countries and other stakeholders.

2. REMAP 2030 is developed along two parallel tracks of work: 1) a country-based analysis complemented with regional analysis to identify actions on technology deployment, investment and policies, and 2) sector-based technology roadmaps to identify the sector-specific opportunities across multiple countries and regions required to achieve the doubling target.

3. Within the REMAP framework, specific areas will be identified where the SE4ALL constituency can make a contribution and accelerate the progress. In this context, IRENA will cooperate closely with the Regional Hubs on Access and the Hub on Energy Efficiency both to inform REMAP 2030 and to contribute to international collaboration and complementarity of action in the area of renewables. The relation between SE4ALL and REMAP is further elaborated in C/5/CRP/1.

4. Preliminary analysis of REMAP 2030 was presented at the third session of the IRENA Assembly, in January 2013. Initial results suggested that existing and future renewable energy expansion, as currently planned, will result in a 21 percent share of renewables globally. This leaves a nine percentage-point gap to achieve a 30 percent renewable energy target in 2030, or a 15 percentage-point gap to achieve the 36 percent target, as indicated in the SE4ALL Global Tracking Report. The paper also ascertains that technical potential exists to double the global renewable energy share, but the attainment depends on regional and country-level action.

5. REMAP 2030 is intended to assist policy makers in identifying attainable renewable energy options for the period up to 2030. It will provide a regional and global context, facilitate the sharing of experiences from a diverse range of countries and highlight possibilities for international cooperation. REMAP will specifically focus on the end-use sector, which remains largely underestimated for its role in accelerating the deployment of renewables. REMAP 2030 will thus be a useful tool for countries in the process of developing renewable energy plans tailored to their own needs and strategies.

Engaging IRENA Members and other key countries in REMAP analysis

6. At the outset, IRENA is analysing 25 countries, including the largest energy-consuming countries – accounting for around 70percent of global energy use – and a number of representative countries for different regional settings and different development levels (see Table 1).

Table 1. Countries in first stage of analysis

Australia	Brazil	Canada	China
Denmark	France	Germany	India
Indonesia	Italy	Japan	Malaysia
Mexico	Morocco	Nigeria	Russia
Saudi Arabia	South Africa	South Korea	Tonga
Turkey	United Arab Emirates	United Kingdom	United States

7. For each country, IRENA has assigned an internal coordinator who is responsible for communication between IRENA and national REMAP experts. Focusing on individual countries permits a better understanding of unique, country-specific conditions and facilitates the incorporation of in-depth knowledge from national energy planning departments or organisations.

8. The first step in IRENA's country-based analysis is an evaluation of existing plans and efforts to expand renewable energy deployment up to 2030. The analysis is based on a review of historical renewable energy deployment trends between 2005 and 2010, and existing national renewable energy plans and targets until 2030. The results of this analysis are verified by the national REMAP experts.

9. The second step in country-based analysis is the identification of additional renewable energy options within a given country. These additional options, called REMAP options, are based on national studies, accelerated renewable energy scenarios, an evaluation of national renewable energy potential based on IRENA's Global Atlas data, and considerations for lead times, manufacturing capacity and other national factors. These options are developed in cooperation with the national REMAP experts.

10. For every country, the REMAP options are combined in a cost-supply curve, which shows the potential and cost for each REMAP option. This approach does not contemplate country-specific renewable energy targets, as it is up to the country to determine which REMAP options are most appropriate for the country. The development of a country's cost-supply curve is supported by a dedicated REMAP tool, which allows national REMAP experts to pick and choose different renewable energy options to alter the national cost-supply curve. The national REMAP experts, in addition to having full access to all features of the tool, also provide final verification of the results prior to release. Hence, the analysis is fully dependant on the level of engagement and support from a country. Country analysis will be complemented by regional analysis to ascertain aggregate global conclusions in terms of technical and economic potential.

11. Following a call by the Director-General on 31 January 2013, national REMAP experts have been nominated by 29 countries to engage in country or regional analysis. In the period between January and June 2013, IRENA has completed 15 draft reports on countries accounting for around 60 percent of projected global energy demand in 2030. The reports and tools are shared with the respective national REMAP experts in each country. On 13 June, IRENA organised a webinar to update the national REMAP experts on the progress to date and the next steps for country engagement.

Identifying cross-country opportunities for renewable energy deployment in end-use sectors

12. Country analysis is complemented and enriched by sectoral technology roadmaps. These roadmaps are based on a techno-economic analysis of renewable energy potential combined with a number of regional and/or topical stakeholder workshops to identify and prioritise action items. IRENA is developing four sectoral technology roadmaps: the manufacturing sector; cities; electricity storage; and renewable energy grid integration.

13. The sectoral technology roadmap for the manufacturing sector suggests that there is sufficient techno-economic potential to increase the share of renewables from 8 percent today to 25 percent in 2030. Carbon pricing and the availability of cheap and sustainable biomass supply are key factors for renewables deployment in the manufacturing sector.

14. The final Renewables in Cities workshop was conducted on 3 June in Bonn, and the results of this workshop are now being used to develop IRENA's roadmap to be presented at the 6th Council. Initial results suggest that renewables programmes should be combined with energy-efficient building programmes, and that renewables-based electrification of the building and transport sectors is key to increasing the renewable energy share. Heating, cooling and the provision of sustainable biomass sources for cooking are other areas to increase the renewable energy share.

15. Several activities are being undertaken to strengthen the sectoral analysis of the power sector. IRENA's costing studies on renewable power generation are providing up-to-date data on economic potential, while sectoral technology roadmaps on electricity storage and renewable energy integration are under development. A background report on technical options to support an increase in the renewable power share will be released during the 5th Council session.

16. For the transport sector, a separate cost study has been conducted to identify renewable solutions. The results of this costing study, to be released in July 2013, also feed into sector analyses for REMAP 2030.

Next steps for REMAP 2030

17. IRENA will be completing the full set of country-based analyses and will undertake consultation with REMAP country experts in the coming months. In addition, IRENA will incorporate reviews of the benefits of increasing the share of renewable energy into REMAP analysis, taking macro-economic factors into account. For the current year, IRENA will focus on the impact on employment. A draft roadmap will be presented to the 6th Council, and REMAP 2030 will be presented to the Assembly in January 2014.

For Council discussion

18. For the biennium 2014-2015, IRENA envisions REMAP to continue to map possible paths to doubling the share of renewable energy in the global energy mix by 2030, and to identify opportunities

for the use of renewables in end-use sectors. In the following years, the analysis can be expanded, with the potential areas for expansion including: more countries; more technology/country detail; interaction with efficiency and access; 2050 outlook; nexus issues; and identification of concrete projects and policies.

19. REMAP will be used in the broader context of IRENA's mandate of renewable energy deployment, with the view to sustainable development and responding to climate change, rather than the more limited focus of the SE4ALL initiative. In this context, REMAP can provide policy makers with recommendations for global action on technology deployment, and for investment streams and policies that can achieve the doubling of the renewable energy share by 2030.

20. REMAP is also envisioned to become a tool to help country leaders and policy makers understand the steps needed for the transition. It will equip IRENA Members with a unique platform to evaluate their national activities within the global context and provide a vehicle for interested Members and stakeholders to create coalitions along specific action items. Countries are both participants in REMAP's development and beneficiaries of its recommendations.

21. Internally, REMAP will contribute to the determination of IRENA's future Work Programme activities and provide a sound analytical basis for IRENA's strategic planning until 2020. REMAP will remain a live document that will be revised regularly to reflect changes and new developments. In the following years the analysis can be expanded, for example for identification of concrete projects and policies.

22. The Council is invited to provide feedback and suggestions on how REMAP can evolve in the future to most effectively support individual Members and stimulate international cooperation.