IRENA
International Renewable Energy Agency

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Note of the Director-General for Programmatic Discussion on **Regional Clean Energy Corridors**

1. Developing countries have experienced rapid economic growth and a corresponding increase in electric power demand, which can lead to growing dependence on costly fossil fuels unless renewable power options are developed. While world GDP growth averaged 2.4% in 2013, Latin America and the Caribbean averaged 2.9%, Sub-Saharan Africa 4.3%, South Asia 4.9%, and East Asia and Pacific 7.5%. In the next quarter-century, the demand for electricity is expected to quadruple in East Africa, triple in both Southern Africa and South East Asia, and double in Latin America. In developing regions, there is heavy reliance on fossil-fuelled generation and large-scale hydropower which is likely to continue unless measures are taken on a regional basis to favour the development of clean, indigenous, cost-effective renewable energy instead. This is the premise for the various regional clean energy corridor initiatives in IRENA's Work Programme for 2014-2015.

2. IRENA's work on regional clean energy corridors seeks to attain consensus and momentum amongst IRENA Members, building upon existing work and regional initiatives:

- The Africa Clean Energy Corridor builds upon existing regional initiatives and agreed cooperative frameworks including work undertaken in the African Union, the Eastern Africa Power Pool and the Southern Africa Power Pool.
- The Central America Clean Energy Corridor seeks to build on the Central American Electrical Interconnection System (SIEPAC) established under the auspices of the broader Central American Integration System (SICA).
- The Pan-Arab Clean Energy (PACE) initiative seeks to build on the CENELEC power grid of Northern Africa and the power grid operated by the Gulf Cooperation Council Interconnection Authority (GCCIA).
- A clean energy corridor initiative in South East Asia could add a wind and solar power overlay to the ASEAN Power Grid developed by the Association of South East Asian Nations (ASEAN).

3. Geographically- and economically-integrated clean energy corridors can support sustainable economic growth by providing the electricity that growing economies need in a cost-effective and environmentally-friendly way. Cost savings can come from an increase in the share of renewables in the energy mix for electricity generation as the costs of renewable generation decline and the costs of fossil fuels increase. Regional planning can reduce costs through systematic ranking of renewable and other generating options for countries with high costs of generation. Savings can also come from importing electricity from countries with lower supply cost. For countries with a lower cost of power supply, exports would enhance national income. Strong transmission corridors can facilitate both import and export trade, while smoothing out locally variable output over a larger region. With greater predictability, a larger share of renewables can reliably be included in the electricity supply mix, enhancing security of supply in fossil-fuel-dependent economies. With larger, more integrated markets, investments in renewable power infrastructure will become more attractive so the economic, environmental and energy security benefits can be realised.

Challenges and Actions for Renewable Power Deployment in Regional Corridors:

4. Expansion of renewable power in developing countries requires taking a number of aspects into account. These include data on renewable resources, systematic planning processes, ease of market entry for independent power producers, lowering costs of financing for renewable power investment, and human capacity building for operating power grids with high shares of variable renewable generation. Clean energy corridor initiatives aim to address each of these aspects through a common set of approaches adapted to specific regional circumstances.

- **Development Zoning:** In most developing economies, despite abundant renewable energy potential, there is a general lack of detailed data on renewable energy resources at specific sites. Without such detailed, site-specific data, revenues from prospective renewable power plants cannot be projected and the construction of these plants cannot be financed. IRENA can work with partners to help countries develop detailed data, using the Global Atlas to identify promising geographical areas for renewable power development, and then perform an integrated assessment of zones within these areas that could be developed in a more economically feasible manner, with minimum combined costs of power plants and transmission to load centers.

- **Resource Planning:** Regions are facing electricity supply deficits while transmission constraints limit electricity trading. Solar and wind power plants, which take less time to build than hydro or thermal power plants, can rapidly reduce such supply deficits. Systematic planning processes and regulatory incentives can help integrate more renewables on the supply side and relieve transmission constraints. IRENA is working with countries and Power Pools to put in place planning processes that fully consider renewable power options with analytical tools for determining which renewable power options are most cost-effective.

- **Market Opening:** Although country and regional power markets are fast evolving, they are still largely dominated by vertically integrated single-buyer utilities which often have a vested interest in continued operation of large-scale fossil-fuelled generating plants with a minimal competition. IRENA's work with regulatory agencies to implement market frameworks can encourage competition by independent power producers (IPPs) and building owners, which are often the entities most favourably disposed to renewable power investment.

- **Enabling Finance:** Renewable power projects in developing regions face a number of real and perceived risks that often make such projects costly to finance. IRENA can benchmark the financing mechanisms used for high-priority infrastructure projects to identify best practices for financing such projects at affordable capital costs. IRENA can also investigate risk mitigation measures such as credit guarantees to lower the costs of capital for renewable power plants and associated transmission lines. When cost-effective renewable power investment options are identified through regional zoning and planning initiatives, best practices in financing and risk mitigation can be applied to these options so investment comes forward.

- **Capacity Building:** In all developing regions, there are limited material resources and skills to plan and operate power grids with a higher share of variable renewable generation. IRENA can help government regulatory agencies develop the skills they need to implement national and regional planning processes that systematically consider renewable power options. IRENA is also developing a practitioner's guide for grid integration of renewable power to help utilities plan, integrate and operate grids with an increased share of renewable generation.

Countries are invited to comment on the findings and proposed prioritization of activities.

Topics for Discussion:

- Does the clean energy corridor concept provide a compelling organising framework for upscaling deployment of renewable energy at regional level?
- Are the five key challenges/actions identified the correct ones? Can the approach be further strengthened?
- What can IRENA do to mobilize support for infrastructure investment in clean energy corridors through public-private partnerships, credit risk guarantees and other innovative mechanisms?
- What level of commitment should IRENA undertake and what are the implications for the structure and resourcing of the programme?