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**INTERNATIONAL RENEWABLE ENERGY AGENCY**

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Note of the Director-General for Policy Discussion on  
**Accelerating Renewables Deployment in Developed Economies**  
The Role of IRENA

**Introduction**

1. Since IRENA's first Assembly in April 2011, the Agency has substantially strengthened its analytical and substantive capacities in successive work programmes guided by the vision of its Medium-term Strategy. Clear policy guidance from its intergovernmental bodies has enabled IRENA to deliver targeted and tangible products and outcomes that have had substantial impacts in the areas of knowledge, policy, innovation and technology, regional cooperation and capacity building. Important initiatives such as the Renewables Readiness Assessments, policy studies, technology briefs, costing, renewable energy employment, have added value directly to countries' efforts and to the global awareness of the business case for renewable energy. At the regional level, the islands work and the Africa Clean Energy Corridor have created new perspectives, and engagement in Asia and Latin America is growing.

2. As the Agency gains capacity and experience, it is becoming increasingly important to determine how best to contribute to the rapidly-evolving environment in advanced economies. Together, they account for over 40 percent of global energy consumption and a significant share of modern renewable energy deployment. Understanding of and adapting to rapidly changing market conditions, as well as varied country experiences with evolving policy frameworks and industrial strategies, will be crucial in developing a global picture and in providing valuable insights into optimal policy and strategic measures on a global scale.

**Drivers for Renewable Energy Deployment**

3. Many of the fundamental drivers for renewable energy deployment are similar worldwide. Countries strive for affordable, secure and environmentally sustainable energy supply to support economic growth and social well-being. Where high-quality renewable energy

resources are available and can be developed in a cost-effective fashion, they are an attractive option as they bring energy security and resilience, and offer climate-friendly solutions.

4. Enabling policies – auxiliary to the fundamental drivers – are arguably better developed in advanced economies than elsewhere. As a group, these economies are best positioned to support renewable energy research, development and demonstration by academia, government labs and businesses. More stable policy regimes are best placed to support renewable energy deployment through *financial mechanisms* such as feed-in tariffs and tax incentives and through *regulatory mechanisms* like binding renewable power targets. Developed economies are furthest along in *opening power markets* to competition from independent power producers. And they have the most experience in using environmental regulations, which internalize costs for fossil-fuelled and nuclear power plants that help improve the competitiveness of RE options.

- **Financial incentives** have played a key role in RE deployment in several developed economies, illustrated by a production tax credit of 2.3 cents per kilowatt-hour in the United States (around USD 7 billion over ten years for 10 GW wind installed per year) and the *Energiewende* in Germany, costing some 20 billion euros per annum (annual FIT payments). Financial incentives are often a complex issue, due to the impact on government budgets and consumer prices, and the fact that consumers - rightly or wrongly - associate renewables with higher consumer electricity rates. Prevalent public opinion is that deployment of renewable power will raise the price of electricity substantially, even though this is an outdated notion as evidenced by IRENA costing studies. Although costs of hydropower, geothermal, onshore wind and even photovoltaics (PV) are competitive today in large parts of the world, for emerging technologies support is needed in the transitional period in order to achieve the necessary learning effects that reduce cost. PV is a prime example for such development that could be repeated for other renewables technologies. Yet government support schemes could potentially have a market-distorting effect for some time, if long-term commitments are made at the time the cost are high. In response, policy-makers are seeking to make renewable power support schemes more efficient, effective and flexible. Long term, the industry must be able to compete without support schemes. It is therefore essential to continue reducing the costs of renewable energy to the point where the main options are cost-competitive in the majority of settings.
- **Regulatory mechanisms** such as renewable power *targets* have played a major role in RE deployment in diverse economies. For example, China built 58 GW of renewable generating capacity in 2013, half of world capacity additions. In addition, Europe is on track to meet a target of 20 percent renewable energy share by 2020, including 34 percent renewables in gross power generation. Finally, in the United States, half of the states (accounting for 75 percent of the US population) have renewable energy portfolio standards and power share for the US as a whole around 12% in 2012, with much higher

shares in some states. High RE shares, especially in the power sector, create new market and technical challenges that are harder to address given limited experience.

- **Market opening** in many industrialised economies has assisted RE deployment. Renewable options can face barriers to entry in power markets. Entry is inhibited not only by restrictions on grid access, but also by poorly-developed capacity and reserve markets, and lack of ancillary service markets for grid support. Established electric utilities are struggling with the changing business paradigm and face huge value losses and an uncertain future. Independent Power Producers (IPPs) are aggressively expanding renewable power generation based on competitive pricing. Building owners – homeowners and small businesses – benefit from net metering arrangements when they connect PV systems to the grid, at the expense of utilities.

In the United States, IPPs have accounted for 83 percent of all wind power capacity installed. In Germany, half of all renewable power generation capacity is owned by communities and individuals, more than 70 municipal distribution utilities have been set up, and more than 200 concessions have been acquired by public operators from private groups. Naturally, utilities and policy-makers alike are wary of such momentous changes in a very strategic economic sector. Before the take-off of the renewable energy technologies, 85 percent of the generation capacities in Germany were property of four companies. Now more citizens, municipalities and smaller companies and developers are becoming shareholders of RE generation assets. An energy transition that includes a major share of renewables creates decentralized structures that require adjustments by all involved, notably the incumbents.

- **Technical Integration of RE on Grids:** High shares of variable renewables require more flexible power system design and operation. Vertical integration and monopolistic grid ownership structure still exist in many countries. Operational measures for greater flexibility include more dispatchable power plant operations, improved grid operations, balancing area cooperation and integration, better deployment of operating reserves, and better control and forecasting of variable renewable generation. Important long-term flexibility measures include capital investments in grid infrastructure, more dispatchable generation, electricity storage, and demand-side integration. The need for electricity storage and value-added of different smart grid designs is not yet fully integrated in planning or practice, and the prospects of centralized grids in a world with decentralized generation is yet to be determined.

### **How can IRENA help develop the case for renewables in advanced economies?**

5. IRENA's Work Programme for 2014-2015 addressed the issues related to developed economies in at least three thematic areas: energy transition planning, knowledge gateway, and enabling investment and growth. These include REmap 2030, transforming power grid

infrastructure, the Global Atlas, RE policy and best practice, costing studies, the Coalition of Action for Public Support, policy assessment, regional markets, REvalue, and innovation and RD&D, among others.

It is challenging to contribute substantively to the debate in advanced economies. First, national institutional frameworks are robust and face more nuanced challenges. Second, energy-related international frameworks already exist in which these countries meet and discuss renewable energy. Third, their shares of modern renewable energy are higher and the countries operate more closely to the innovation edge.

At the same time, combined, developed economies account for a large share of energy consumption globally. It is therefore important to seek additional avenues to support the deployment of renewables not only in the power, but also transport, and other end-use sectors.

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

**Topics for Discussion:**

- Should IRENA strengthen its work on transition pathway roadmaps for advanced countries and provide information, tools and advice on how policy makers can manage energy transmission in a cost efficient way?
- What are the key challenges to expansion of renewable energy in developed countries? Are there certain policy, cost, market and technology barriers and opportunities that deserve special attention?
- Should IRENA:
  - Engage more closely in the discussion on renewable energy as a solution for GHG emissions mitigation?
  - Work more on RE competitiveness, including opportunities for cost reduction?
  - Expand its activities in the area of biomass?
  - Work more on end use markets (thermal applications, liquids, electrification)
  - Strengthen its work on transition infrastructure for renewables integration?
  - Examine the issues of perceived cost of electricity to the consumer and its relation to renewables deployment in different markets?
- What can be IRENA's role in market design for electricity sector transformation?
- How should IRENA engage in the work on changing ownership structure, namely the utilities?