

**INTERNATIONAL RENEWABLE ENERGY AGENCY**

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**Note of the Director-General****Renewable Energy Deployment: Decreasing Costs - Increasing Benefits**

1. The recent Paris Climate Agreement signals a strong imperative for the world to transition to a sustainable energy future and provides a clear mandate to shift from negotiation to action. There has been much debate about the costs and benefits of this transition. IRENA analysis shows that a renewable energy-based system is technically feasible and economically viable. The falling cost of renewable energy technologies, notably solar and wind power, contributes considerably to the growing competitiveness of renewables vis-à-vis conventional fuels. Cost reductions coupled with effective enabling policies have meant that renewable energy capacity additions have continued to outpace those of nuclear and fossil fuels in the power sector since 2011.

2. As countries embark on the transformation of their energy systems, they have a unique opportunity to meet climate goals while fuelling economic growth and enhancing welfare. Scaling up renewable energy can generate new sources of growth, increase incomes, improve trade balances, create jobs and boost the health and wellbeing of millions. Quantifying the socio-economic benefits is gaining prominence in the global renewable energy debate. Assessing these benefits in the context of the dynamics of technology cost reductions is essential to better inform policy decisions, which can tip the balance in favour of low-carbon investments.

**Costs are decreasing and further reductions are expected**

3. Cost reduction dynamics are country-specific and depend on different renewable resource endowments, economic structures, local cost structures of renewable technologies and the state of global technology deployment and development. IRENA's analysis is increasingly being tailored to provide tools and results that address directly the challenges facing Members.

4. Cost reduction potentials for solar and wind technologies remain strong. In an era of low equipment costs, particularly for solar PV and, to a lesser extent, wind, balance of project, operations and maintenance, and financing costs can provide the largest cost reduction opportunities. At the same time, there remains a wide range of costs, both within countries and across countries. Understanding what represents best practice in different markets can help identify reasonable expectations for efficient cost levels in different markets at different stages of maturity.

5. It is vital to understand the underlying potential for continued cost reductions from technology improvements, economies of scale, market reform and learning effects. IRENA's analysis is identifying not only the magnitude of future cost reduction potentials, but also potential bottlenecks that need to be addressed by policy makers. This analysis will provide much needed clarity on the cost reduction potential for renewable energy technologies in a transparent way that highlights the sources of future cost reductions.

### **Renewable energy can improve the global economy**

6. To further strengthen the case for renewable energy investment, a growing number of countries are pursuing efforts to quantify the socio-economic benefits that can accrue to their economies from higher shares of renewable energy. However, specific analytical work and empirical evidence at the global level on this important subject remain relatively limited.

7. IRENA's report *Renewable Energy Benefits: Measuring the Economics* provides the first global quantification of the macroeconomic impacts of renewable energy deployment. The report builds on previous IRENA work on the socio-economic benefits of renewable energy and on REmap 2030, and aims to contribute to both work streams.

8. The report finds that doubling the share of renewables by 2030 has strong positive macroeconomic impacts including on GDP, welfare and employment. Employment in renewable energy, for instance, would surpass 24 million people in 2030, up from 9.2 million in 2014. The growth in renewable energy employment will be focused on bioenergy, hydropower and solar, the same technologies that account for a majority of the employment today.

9. A higher share of renewables will shift patterns of global trade and enhance energy security. There are substantial opportunities for countries to develop industries to produce and export renewable equipment. For large energy importers, renewable energy deployment presents a clear opportunity to reduce import dependence. For fossil fuel exporters, a renewable energy transition could help recast their economic structure and open new economic diversification strategies and export opportunities.

### **Guiding questions**

- How will renewable technology costs be affected by the rate of deployment of all countries?
- What are the bottlenecks to unlocking continued cost reductions and what is required of governments and industry?
- How can renewable energy deployment create new opportunities with much of the world facing an era of low economic growth?
- Following the Paris Climate Agreement, what are the immediate policy actions needed to massively scale up renewable energy deployment and realise the cost reductions and benefits from the transition?