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Note of the Director-General

The Changing Role of Hydropower in the Energy Sector Transformation

1. Hydropower is the largest source of renewable electricity in the world, supplying around 17% of the world's electricity and providing jobs for 18 million people globally. It is projected to remain one of the major sources of renewable electricity generation in the future, especially in countries which possess enormous untapped potential. However, many of these countries face difficulties in ensuring availability and reliability of hydropower systems. Constraints in strategic planning, adoption of new technologies, capacity building and management are considered major challenges.

2. In countries with installed hydropower capacity, hydropower is projected to continue to play a significant role in the era of energy sector transformation given its ubiquity in electricity networks. With the growing contribution of variable renewable energy (VRE) in the power system, new operation regimes and strategic planning for hydropower are essential to effectively cope with the generation intermittency of VRE. In the absence of systematic operation and maintenance (O&M) plans for hydropower plants, the energy sector transformation would lead to increasing performance losses, higher costs for rehabilitation, incrementing safety concerns, and accelerated degradation of components with the evolving demands for flexibility.

3. For the sustainable and efficient operation of hydropower plants, IRENA has undertaken analytical work and developed useful tools and data. The Agency has devoted attention to the changing role of hydropower in the energy sector transformation and explore how hydropower can affect the flexibility and efficiency of energy systems with higher shares of VRE in its recent report¹. In addition, the IRENA Project Navigator platform (www.irena.org/navigator) has provided project developers with a module and training opportunities on small-hydro project development to promote sustainable operating practices of small-scale hydropower aimed at minimising unintended consequences.

Objective

4. The session is organised to allow Members and experts to further discuss the role of hydropower in the era of energy sector transformation. Participants will be able to exchange their views on opportunities and challenges of hydropower O&M, share good practices to enhance the availability and reliability of hydropower, and identify solutions to support the accelerated adoption of modernised and innovative operation approaches of the hydropower fleet. Further topics to be covered include opportunities and challenges in strategic reinvestment and refurbishment for existing hydropower fleet, and approaches to accelerate adoption of modernized and innovative operation and O&M for the current and emerging hydropower fleet.

¹ IRENA (2017) Planning for the renewable future: Long-term modelling and tools to expand variable renewable power in emerging economies, Abu Dhabi, International Renewable Energy Agency

The World Bank and the International Hydropower Association (IHA) will introduce a new guidance tool for design and implementation of sustainable hydropower O&M. Case studies from diverse countries will present how to improve energy efficiency of existing plants and ensure an efficient operation regime in the energy transition with an adjusted role of hydropower. Finally, this event seeks to encourage participants to be actively involved in shaping solutions and in IRENA's work in this area.

Guiding questions

- What is the expected role of hydropower in the times of energy sector transformation?
- What are opportunities and challenges in adopting new O&M strategies for the sustainable operation of hydropower plants, and how can innovative and modernised operation of hydropower support the energy sector transformation?
- How can IRENA contribute to shaping solutions in this area?