Technology - Driven Pathways for Scaling Solar in the Evolving Energy Mix

17th July 2025, 12:30 hours – 14:00 hours (Sri Lanka Time)

ITC Ratnadipa, Colombo, Sri Lanka

21 Galle Face Center Rd, Colombo 00100, Sri Lanka

Registration link: https://isa.int/rcm_apac

The need to tackle climate change has prompted a global shift towards renewable energy sources such as solar and wind. While these sources are clean and abundant, their inherent variability presents significant challenges in maintaining a stable and reliable energy supply. This has necessitated the deployment of emerging technologies, among which energy storage, solar electric mobility, and green hydrogen stand out as critical enablers for a sustainable future.

Introduction

Solar energy adoption is a prominent global trend, and energy storage systems (ESS) enable expanded solar utilization. The intermittent nature of solar generation necessitates robust storage integration to ensure grid stability, enhance energy access, and optimize the use of renewable resources. To bridge the gap between fluctuating generation and demand, ESS have become increasingly important.

Electric Vehicles (EVs) offer an opportunity to rapidly reduce GHG emissions, especially when powered by renewable energy sources. The solar and electric mobility integration enables greater penetration of both clean technologies. Solar energy, with its rapidly falling costs and abundant availability, emerges as a viable and sustainable option for charging EVs.

The transition to a low-carbon future necessitates the rapid development and deployment of clean and sustainable energy sources. Green Hydrogen (GH), produced through the electrolysis of water using renewable electricity, emerges as a promising solution to decarbonize hard-to-abate sectors such as refinery, steel, cement, transportation, fertiliser, and power generation.

Context

Storage: Short- to medium- duration energy storage, such as advanced battery systems, flywheels and other technologies, offer promising solutions by shifting energy over seconds, minutes, or a few hours. Many of these can also deliver a wider array of services to power systems, such as ancillary and reserve services, ensuring system adequacy, and managing congestion in transmission and distribution networks. Long Duration Energy Storage (LDES) technologies, such as pumped storage, green hydrogen and thermal storage systems, enable the storage of solar energy for extended periods, ensuring a stable power supply. This is specifically beneficial for developing countries, particularly in regions like Sub-Saharan Africa, South Asia and Latin

America, which possess significant solar power potential. Solar and storage integration enhances energy security, grid stability, economic growth and environmental sustainability.

Solar E-Mobility: The integration of solar power into the e-mobility ecosystem not only enhances the environmental benefits of EVs but also ensures a more resilient and decentralized energy infrastructure. This transition is particularly crucial for Least Developed Countries (LDCs) and Small Island Developing States (SIDS), which are often more vulnerable to the impacts of climate change and face unique challenges such as limited infrastructure and financial constraints.

Green Hydrogen: GH accounts for less than one percent of global hydrogen production. However, the declining costs of renewable electricity and electrolysers indicate the investment readiness of GH sector. Although this emerging technology is gaining traction across industries, it faces certain challenges like high production and operational costs, underdeveloped infrastructure, absence of dedicated policy and standards, lack of knowledge, shortage of specialized manpower, and limited access to affordable financing. Recognizing the pivotal role of GH in achieving global climate goals, ISA launched a programme 'Solar for Green Hydrogen'. The objective of this programme is to accelerate GH production, utilization, and trade in ISA Member Countries. Building on the success of the SolarX, ISA has initiated the Global Green Hydrogen Start-up Challenge[14] project with ICF Consulting India Private Limited as the implementation partner. It aims to identify and support startups developing innovative, scalable, and commercially viable green hydrogen solutions, particularly within the steel and transport sectors.

Suggested Topics for Speakers

- **Invited Speakers**: Current and emerging technology and policy landscape in storage, solar e-mobility, and GH sectors; global best practices and case studies
- **Member Country**: Policy and regulatory frameworks to promote storage, solar EV and GH ecosystem; Demand creation
- **Industry**: Existing and emerging business models for large scale deployment of storage, solar EV and GH; Manufacturing and supply chain aspects; project risk assessment considerations

Expected Outcome

- Identify possible areas of collaboration between ISA and APAC region - Feasibility studies, Joint Pilots, Business Models, Technology Prioritisation, Country-specific Roadmaps
- Identify partnership opportunities with ISA's capacity building initiatives, e.g. STAR-C, Green Hydrogen Innovation Centre (www.isa-ghic.org), and joint training programmes.

Agenda

Time 90 mins	Speakers
Welcome Address (3 mins)	Mr Ashish Khanna, Director General, ISA
Opening Remarks (3 mins)	Dr Priyantha Wijayatunga, Senior Director, Energy, Asian Development Bank (ADB)
Presentation on ISA's initiatives in Technology roadmap & Policy (5 mins)	Dr Mridula Bharadwaj, Programme Lead – Solar E-Mobility, Storage, and Green Hydrogen, (ISA-ADB TA)
Roundtable Discussions • Energy Storage Systems • Solar E-mobility • Green Hydrogen **Moderator** Dr Mridula Bharadwaj, Programme Lead – Solar E-Mobility, Storage, and Green Hydrogen, (ISA-ADB TA) **Country Co-ordination** Sandeep K Singh (Programme Head- SIDS, ISA) Nar Bahadur Khatiwora (Regional Head- Asia, ISA) (65 mins)	**Participants** **Countries** **Bangladesh, Bhutan, Cambodia, Nepal, Sri Lanka** **Fiji** - Mr Mikaele Belena, Director Energy, Ministry of Public Works, Transport and Meteorological Services **Nauru** - Ms Phaedora Harris, Director Energy, Ministry of Climate Change and National Resilience **Papua New Guinea** - Ms Rensie Panda, Manager-International Affairs and Outreach, National Energy Authority **Solomon Islands -** Mr Gabriel Aimaea , Director Energy, Ministry of Mines, Energy and Rural Electrification **Vanuatu** - Mr Julius Mala, Ministry of Climate Change Adaptation, Meteorology and Geo-Hazards, Energy, Environment and National Disaster Management **Organisations** 1. Dr Amit Jain, Senior Energy Specialist, World Bank 2.Ashok Krishnan, Manager - Market Development, Sumitomo SFW 3. Gurpreet Chugh, VP and Managing Director, ICF 4. Sandith Thandasherry, CEO, Navalt 5. Dr Keiichi Komoto, Senior Manager, Mizuho Research & Technologies 6. Sturle H Pedersen, Chairman, Greenstat Asia 7. Mathieu Geze, Executive Director (Asia Pacific), HDF Energy 8. Anurag Mishra, Senior Energy Specialist, Green Climate Fund (GCF) 9. Dr Arvind Bodhankar, Chief Sustainability Officer, ArcelorMittal Nippon Steel 10. Matt Candy, CEO, Steamology
Audience interaction (12 mins)	Moderator
Closing Remarks and way forward (2 mins)	ISA representative

Annexure

ISA's initiatives

Programme on **'Scaling Solar E-Mobility & Storage'**

ISA supports member countries in developing policies and regulations to accelerate solar energy adoption through its 'Scaling Solar E-Mobility & Storage' programme. This initiative promotes diverse storage technologies like batteries, compressed air, gravity storage, and pumped hydro. ISA, in partnership with ADB, conducted a study titled 'Developing Prioritisation Framework for short to medium duration storage for Accelerating Solar Project Deployment in Least Developed Countries (LDCs) and Small Island Developing States (SIDS)'. The study is intended to serve as an assessment report for short to medium duration deployment in ISA member countries, particularly focusing on LDCs and SIDS [1,2]. ISA and ADB also conducted a study titled 'Scaling Solar integrated LDES Technologies: Developing Implementation Roadmap and Identification of project pipelines in Developing Nations'. This study explores the opportunities, challenges, and strategies for deploying LDES technologies[3].

To support large-scale e-vehicle deployment, ISA is actively fostering an enabling ecosystem focused on two approaches: (a) solar-powered vehicle and battery charging stations, and (b) Vehicle Integrated Photovoltaic technology. These approaches are designed to address the multifaceted challenges and opportunities associated with the large-scale deployment of solar-powered EVs. In this context, ISA, in partnership with ADB, conducted a study on "Readiness Assessment for Solar-Powered Electric Mobility: Developing an Implementation Framework for ISA's LDCs and SIDS." In this study, ISA prepared a detailed roadmap for transitioning to solar-powered electric mobility in LDCs and SIDS through the in-house developed Solar EV Ecosystem Readiness Assessment (SEERA) framework [4]. This initiative included global case studies showcasing success stories[5].

Programme on **'Solar for Green Hydrogen'**

Under this programme, ISA has carried out capacity building activities, analytics and advocacy, country insights and feasibility studies for its member countries [6-13]. ISA in partnership with ADB, under the G20, 2023 India Presidency has created a virtual 'Green Hydrogen Innovation Centre' (https://isa-ghic.org/). This Centre of Excellence will support the production, utilization, and trade of green hydrogen (GH), besides providing a platform for knowledge sharing and building competency across the GH value chain. The GHIC will also provide opportunities to incubate Start-Ups, provide certified training, and host Expert Working Groups to support the scale-up of the GH ecosystem in member countries. The platform was launched at the G20 Energy Transitions Ministerial Meeting (ETMM), and subsequently, was included in the G20 Leaders' Summit Delhi Declaration in September 2023. Building on these advancements, ISA introduced a new initiative—Global Green Hydrogen Start-up Challenge[14]. The objective of this initiative is to identify and support green hydrogen startups engaged in developing innovative, scalable and commercially viable solutions within the steel and transport sectors.

ISA Storage, Solar EV and Green Hydrogen Publication Links

1. Framework for Energy Storage Prioritization to Boost Solar Deployment in LDCs and SIDS
2. Summary report on Framework for Energy Storage Prioritization to Boost Solar Deployment in LDCs and SIDS
3. Summary report for Scaling Solar integrated LDES Technologies: Developing Implementation Roadmap and Identification of project pipelines in Developing Nations

4. Readiness Assessment for Solar-Powered Electric Mobility: Developing an Implementation Framework for ISA's LDCs and SIDS
5. Charging for Change: Solar Electric Mobility Global Learnings
6. Blueprint for Ecosystem Readiness Assessment for Green Hydrogen
7. Africa Solar Hydrogen Project (ASHyP)
8. A Roadmap for Developing and Scaling the Green Hydrogen Ecosystem
9. ISA-INAE Green Hydrogen Report for India
10. Green Hydrogen Innovation Centre
11. Readiness Assessment of Green Hydrogen in African Countries
12. Green Hydrogen Policy Accelerator Training Handbook
13. Ecosystem Readiness Assessment for Production and Utilisation of Green Hydrogen
14. Global Green Hydrogen Startup Challenge