

THE SOLAR HUB

A Hub for Everything Solar



Catalysing the Clean Energy Transition through Emerging Technologies

12 November 2025, 12:00-13:00 hrs (BRT)

Through its **Technology Roadmap and Policy pillar**, ISA is helping countries embrace emerging solar technologies through structured roadmaps, feasibility assessments, pilot demonstrations, and frameworks for policy, standardisation, and investment readiness.

This COP30 session will bring together policy leaders, innovators, researchers, and industry representatives to explore collaborative pathways for scaling the emerging technologies globally.

INTRODUCTION

COP30 comes at a critical juncture in the global effort to accelerate climate action and energy transition. With the world entering the decisive decade for implementation, innovation in solar technology will determine the pace and depth of decarbonisation across economies.

The International Solar Alliance (ISA) has emerged as a global platform uniting 125 member and signatory countries to advance solar deployment and strengthen energy access and security. Through its evolving vision, ISA is driving systemic change across the solar ecosystem, anchored around four strategic pillars: the Catalytic Finance Hub, Global Capability Centre and Digitisation, Regional and Country Level Engagement, and Technology Roadmap and Policy (TRP).

Under the Technology Roadmap and Policy pillar, ISA supports countries in identifying priority technologies, designing context-specific deployment pathways, and developing policy frameworks that are future-ready. At COP30, ISA will convene this high-level session to showcase how emerging solar technologies—ranging from Integrated PVs (AgriPV, BIPV, Floating PV), Perovskite Tandems, and Forecasting & Standards frameworks to Green Hydrogen and E-Mobility — can shape the next phase of global energy transition.

CONTEXT

The outcomes of COP30 will be defined by the world's ability to move beyond ambition toward scalable technology deployment that ensures affordability, reliability, and sustainability. Solar energy lies at the heart of this transformation, yet the next leap will come not from capacity addition alone but through technological integration across sectors and value chains.

Emerging solar technologies are redefining what the energy transition can achieve:

- **Integrated PV solutions** (AgriPV, BIPV, Floating PV) are unlocking dual-use potential for land, water, and urban infrastructure.
- **Perovskite Tandems and new materials** are expanding efficiency limits and reducing costs.
- **Green Hydrogen** is enabling decarbonisation of hard-to-abate sectors.
- **Solar-powered EV and Storage systems** are reshaping the mobility and grid landscape.

AGENDA

Time	Agenda Item	Speaker(s)
12:00 – 12:02 hrs	Welcome Address	Felipe Saliba, Chief, Knowledge Management and Institutional Development, ISA
12:02 – 12:07 hrs	Presentation on ISA's initiatives in the Technology Roadmap & Policy	Dr. Mridula Bharadwaj, Programme Lead – Green Hydrogen, Storage and Solar E-Mobility, (ISA-ADB TA)
12:07 – 12:08 hrs	Report Launch	ISA
12:08 – 12:10 hrs	<ul style="list-style-type: none"> ISA World Hydrogen Outlook - GHIC Annual Flagship Report Harvesting the Sun – Advancing Sustainable Mechanization through Solar 	Shakti Foundation
12:10 – 12:50 hrs	<p>Panel Discussion: "Emerging Solar Technologies for a Net-Zero Future"</p> <p>Key discussion points:</p> <ul style="list-style-type: none"> Integrated PVs (AgriPV, Floating PV) Perovskite Tandems and Next-Gen Materials Energy Storage technologies and green hydrogen Low Carbon Transport and Decarbonisation of Transport Sector <p>Moderator: Dr. Ajay Mathur, Professor of Practice, School of Public Policy, IIT Delhi</p>	<p>Dr. Ian Marius Peters, Group Lead- Forschungszentrum Jülich</p> <p>Julia Souder, CEO – LDES Council</p> <p>Stephanie Kodish, Senior Global Director, Drive to Zero, CALSTART</p> <p>Pawan Mulukutla, Executive Director for Transport, Clean Air and Clean Tech, WRI India</p> <p>Ramanshu Ganguly, Associate Director, Shakti Foundation</p> <p>Kate Hughes, Principal Climate Specialist, Asian Development Bank</p>
12:50 – 12:58 hrs	Audience Interaction	Moderator
12:58 – 13:00 hrs	Closing Remarks	ISA

Annexure: Pre-read

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 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 ^(1,2,3). ISA 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 ^(4,5).

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 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 ⁽⁶⁾. This initiative included global case studies showcasing success stories ⁽⁷⁾.

Programme on 'Solar for Green Hydrogen'

Green Hydrogen is a promising solution to decarbonise various hard to abate sectors, including transportation, refineries, fertilisers, and steel industry, etc. 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 skilled manpower and limited access to affordable financing. Recognizing the pivotal role of GH in achieving global climate goals, ISA launched a programme on '[Solar for Green Hydrogen](#)' in its Fourth Assembly held in October 2021. The objective of this programme is to accelerate GH production, utilization, and trade in ISA Member Countries.

Under Phase 1 of this [programme](#), the ISA in partnership with Asian Development Bank (ADB), developed a report on GH ecosystem readiness assessment across a few shortlisted ISA member countries. In this report – '[Blueprint for Ecosystem Readiness Assessment for Green Hydrogen](#)'⁽⁸⁾, a high-level roadmap for development of a hydrogen ecosystem in select ISA member countries is presented. The study provides a synopsis of methodology to assess ecosystem readiness in a country to adopt GH as an energy vector – based on the potential to produce and cost of production of GH, ability to consume GH, and the infrastructure needed to produce GH viably.

Similarly, ISA-European Investment Bank-African Union published a report on '[Africa Solar Hydrogen Project \(ASHyP\)](#)'⁽⁹⁾. The study analysed investment opportunities focusing on three hubs: Western Africa (Mauritania, Morocco), Southern Africa (South Africa and Namibia), and Northern Africa (Egypt)

with a roadmap of technical, economic, environmental and financial solutions to unlock commercial development. The reports were launched at COP27, 2022 in Egypt.

ISA, with ADB and New Energy and Industrial Technology Development Organization (NEDO), Japan, published '[A Roadmap for Developing and Scaling the Green Hydrogen Ecosystem](#)'⁽¹⁰⁾ to facilitate building GH value-chain, especially for hard-to-abate sectors. The roadmap outlines technological advancements in electrolyzers; Regulations, Codes and Standards for GH Production and Use including country deep dive analysis for Brazil, Chile, and India.

ISA in partnership with Ministry of New and Renewable Energy, Government of India, and ADB, under the G20 2023 India Presidency has created a virtual 'Green Hydrogen Innovation Centre' [[GHIC](#)]⁽¹²⁾. This Centre of Excellence will support the production, utilization, and trade of GH, besides providing a platform for knowledge sharing and building competency across the GH value chain. The GHIC provides opportunities to incubate [Start-Ups](#) ⁽¹⁶⁾, provide certified training, and host Expert Working Groups to support the scale-up of the GH ecosystem in member countries. The GHIC platform was launched at the Energy Transitions Ministerial Meeting (ETMM), and subsequently, was included in the G20 Leaders' Summit Delhi Declaration 2023. Under the ISA - Denmark Partnership, a green hydrogen readiness assessment study has been conducted for four African countries (Egypt, Morocco, Namibia, and Ethiopia) that have strong developing trends and significant potential to become major GH hubs [[Link](#)]⁽¹³⁾.

The ISA and Green Hydrogen Organisation, Geneva organised the Green Hydrogen Policy Accelerator Training (GHPAT) Programme in 2024. The programme successfully conducted two training workshops that took place in Cairo and New Delhi, with 80 government representatives from 27 member countries, reflecting a global commitment to advancing the green hydrogen sector. This training aimed to enhance the skills and knowledge of government officials in the green hydrogen sector through comprehensive training and field trips. ISA has launched the training handbook titled '[Green Hydrogen Policy Accelerator Training Course](#)'⁽¹⁴⁾ at COP 29, 2024. The GHPAT workshops were preceded by a hydrogen safety training course conducted in partnership with Greenstat Norway, for South Asian member countries in Sri Lanka.

ISA, along with ADB, recently conducted a study '**Ecosystem Readiness Assessment for Production and Utilisation of Green Hydrogen**' for [ten countries](#) ⁽¹⁵⁾. This included a Commercial Framework for the development of GH Hubs. It provides an overview of the global infrastructure readiness for GH production highlighting the importance of [green hydrogen hubs](#). Four specialised GH tools have been designed to assist countries in assessing [project risks](#), [evaluating readiness](#), [estimating costs](#), and [hydrogen carbon accounting](#). These tools are available on GHIC portal. A [stakeholder consultation workshop](#) was conducted as part of the study with the identified ten countries - Nepal, Bhutan, Sri Lanka, Fiji, Papua New Guinea, Ghana, Tunisia, Peru, Argentina, and Trinidad and Tobago.

ISA Solar Compass Report

- [Solar Compass – Integrated PV Applications](#)

ISA Solar EV, Energy Storage 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. [Framework for Energy Storage \(Short and Medium Duration\) Prioritisation to Boost Deployment in LDCs and SIDS](#)
5. [Scaling Solar integrated LDES Technologies: Developing Implementation Roadmap and Identification of project pipelines in Developing Nations](#)
6. [Readiness Assessment for Solar-Powered Electric Mobility: Developing an Implementation Framework for ISA's LDCs and SIDS](#)
7. [Charging for Change: Solar Electric Mobility Global Learnings](#)

ISA Green Hydrogen Publication Links

8. [Blueprint for Ecosystem Readiness Assessment for Green Hydrogen](#)
9. [Africa Solar Hydrogen Project \(ASHyP\)](#)
10. [A Roadmap for Developing and Scaling the Green Hydrogen Ecosystem](#)
11. [ISA-INAEE Green Hydrogen Report for India](#)
12. [Green Hydrogen Innovation Centre](#)
13. [Readiness Assessment of Green Hydrogen in African Countries](#)
14. [Green Hydrogen Policy Accelerator Training Handbook](#)
15. [Ecosystem Readiness Assessment for Production and Utilisation of Green Hydrogen](#)
16. [Global Green Hydrogen Startup Challenge](#)