



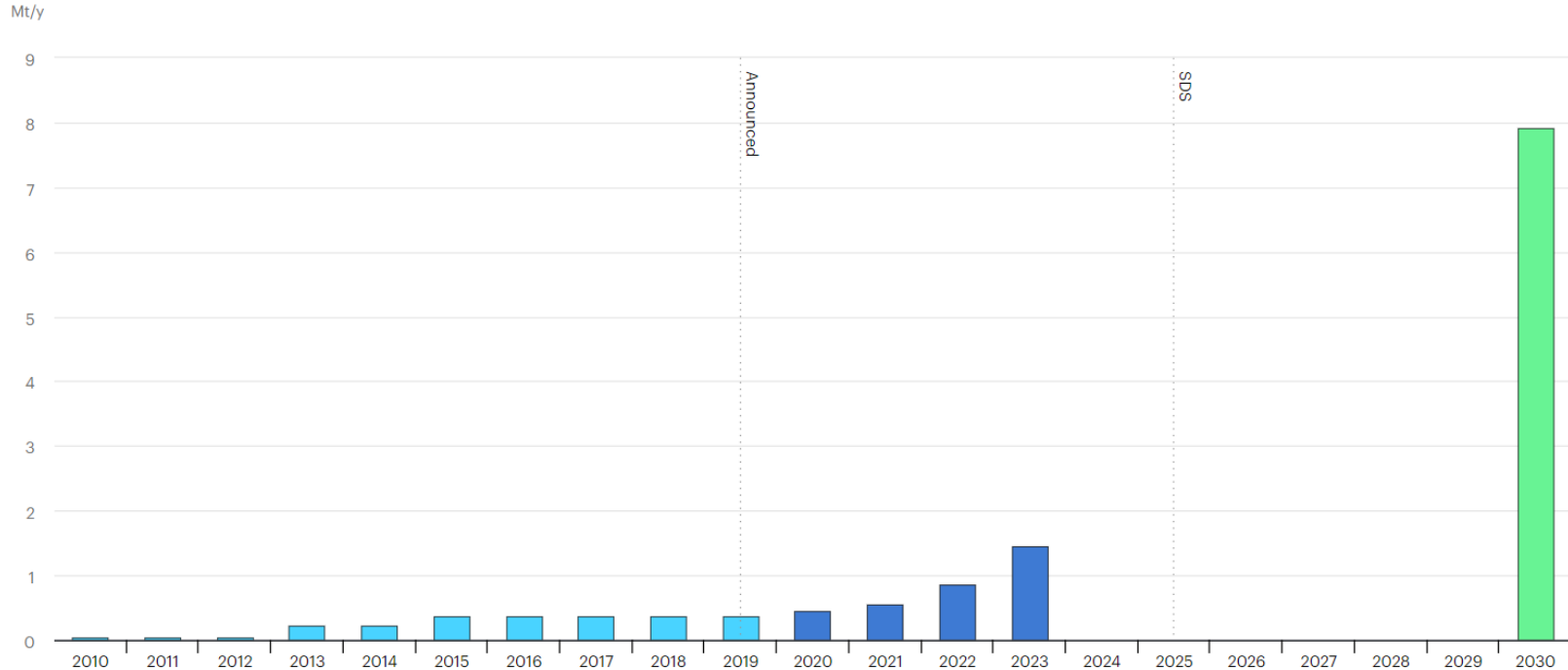
Overview of Hydrogen Policies in Latin America

Joerg Husar, Programme Manager, Latin America

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Global state of play in low-carbon hydrogen deployment



Low-carbon hydrogen is just beginning to take off

Key challenges and focus areas for hydrogen policy

Key challenges:

- Complexity: establishing high-tech value chains
- Costs: H₂ from fossil fuels still much cheaper than low-carbon
- Infrastructure: “hen and egg” problems
- Market readiness: differs a lot by application/sector
- Standards: in the process of being set at international level

→ Important role for the state in terms of **vision development / roadmapping**

Four focus areas for policy-making:

- Supporting demand creation
- Mitigating investment risks
- Promoting R&D, pilot projects
- Harmonising standards, removing barriers

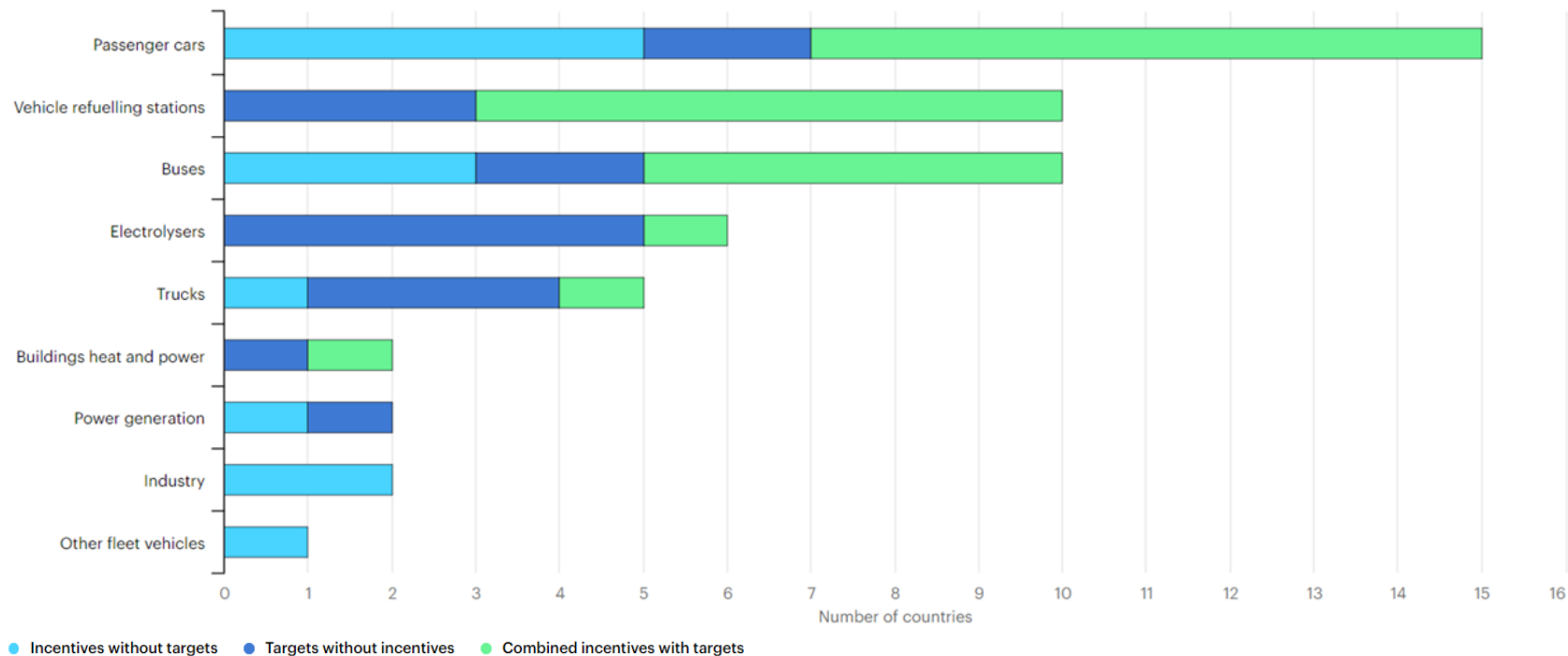
Policy developments worldwide

- **Hydrogen roadmaps – defining frameworks for action**

- Regional: EU (2020)
- National: Japan (2017), France (2018), Korea (2019), Australia (2019), Canada (2020), Germany (2020), Netherlands (2020)
- Subnational: France (Occitanie), South Australia, German Länder (North Rhine-Westphalia)

- **Until 2025/2030: shaping the basic conditions for growth**

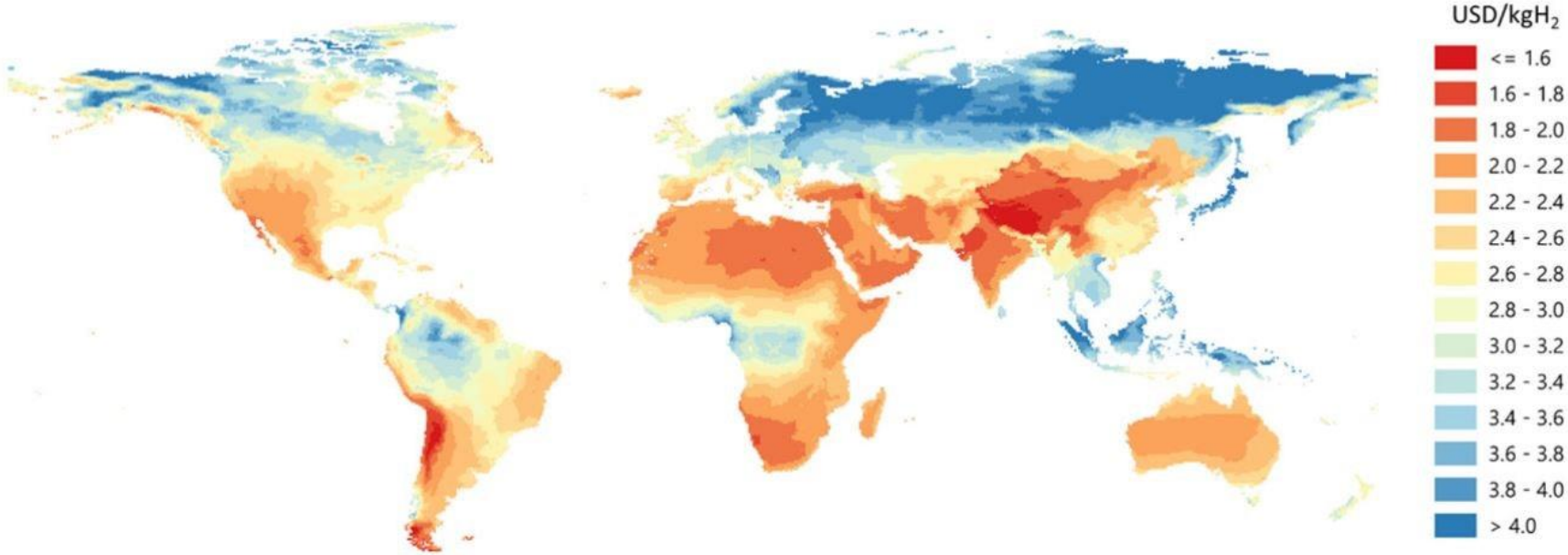
Hydrogen policies worldwide (2018)



Initial focus is placed on mobility, but buildings and industry are getting more attention.

Regional specificities: solar and wind potential

Hydrogen costs from hybrid solar PV and onshore wind systems in the long term



Four promising areas for near term deployment in Latin America

1. (Coastal) Industrial clusters

- Decarbonise ammonia and refining
- H2 from renewables: e.g. recent MoU on Hydrogen Hub in Port of Pecem (State of Ceará-Energix Energy)
- H2 from existing industrial clusters with CCUS, e.g. Trinidad and Tobago

2. Existing gas infrastructure

- Extensive gas distribution grids in Argentina and other countries, studies needed to assess tolerances for H2 mixing.

3. Fleets, freight, and corridors

- Individual transport
- Heavy-duty trucks, incl. mining sector
- Long range buses

4. The first shipping routes (Chile-Rotterdam, Chile-Singapore, Brazil-Rotterdam)

Policy frameworks / roadmaps

(Draft) Laws

- **Argentina:** Hydrogen Law 26.123 (2006) and National Hydrogen Plan (2014) – not implemented. Update of Hydrogen Law ongoing, interministerial working group.
- **Peru:** Draft law project on RE promotion includes H2 promotion (transport, industry and agriculture).

Existing roadmaps

- **Costa Rica: VII National Energy Plan 2015-2030;** Action plan on **H2 in the transport sector** (2018). Preparatory studies for H2 roadmap ongoing.
- **Chile: Green Hydrogen Roadmap (2020)** - Targets: 5 GW of electrolysis by 2025, 25 GW by 2030.

Roadmaps / policies in preparation

- **Brazil:** New hydrogen policy-making process to be launched very soon, studies ongoing.
- **Colombia:** preparatory study for roadmap ongoing. Includes H2 from fossils fuels with CCUS.
- **Mexico:** studies ongoing focusing on market potential, priority projects.
- **Paraguay:** roadmap in preparation, focus on transport sector and H2 from renewables.
- **Uruguay:** Preparatory studies on regulatory aspects, critical infrastructure, potential offtakers.

Creating local demand

- **Ad Astra transport pilot** (Costa Rica)
 - 4 fuel cell cars and one fuel cell bus operating with green hydrogen from solar PV energy.
- **HyEx project** (ENGIE-ENAEX, Chile)
 - Aiming to produce 700kt/y of green ammonia, 50% for Enaex's ammonium nitrate plant, 50% for fuels, fertilizer, export.
- **Aceleradora H2V** (Chile)
 - Support in pilot design (first stage) and cofinancing (second stage) for a total of ~400.000 USD
 - Aimed at end-use hydrogen projects (transport, industry, power generation, logistics, etc).

Mitigating investment risks

- **Creation of promotion fund** (Argentina):
 - 2014 action plan foresaw creation of a *Fondo Nacional del Hidrógeno* (FONHIDRO)
 - Priorities: technology development, capacity building, industrial development.
- **Early H2 financing round of 50 MUSD** (Chile)
 - Aimed at competitive, early projects of production and use of green H2. Announced, not yet launched.
- **Role of multilateral development banks / IOs**
 - Interamerican Development Bank (IDB) support in Colombia, Costa Rica, Uruguay, etc.
 - UN SDG fund: 10 million USD grant to Uruguay's 'second energy transition' (transport and industry)

Promoting RD&D, pilot projects

RD&D

- Brazil: CNPE Resolution 21 defines hydrogen as one of the key priorities for energy R&D spending.
- Chile:
 - National R&D agency (ANID) promoting 'advanced human capital formation' to close skills gap
 - Development agency CORFO is supporting a project by Csiro, Engie and Mining3 aimed at reconditioning mining haul trucks to run with dual fuel (diesel-hydrogen)
- Colombia: Basic research on mixing H₂ into natural gas pipelines (Ecopetrol)

Pilots / consortia

- Argentina: HyChico green hydrogen plant (operating since 2008) / H₂AR consortium (40 companies)
- Costa Rica: *Alianza por el Hidrógeno* and *Asociación Costarricense de Hidrógeno*
- Peru: Peruvian Hydrogen Association (H₂ Peru)
- T&T: NewGen and Tringen MoU on green hydrogen for ammonia production
- Uruguay: Verne project – testing a hydrogen ecosystem in Uruguay

Harmonising standards, removing barriers

- **Adopting international standards**

- Costa Rica: e.g. INTE / ISO 14687: 2020 (H2 fuel quality) and INTE / ISO 22734: 2020 (electrolysers)
- Argentina: e.g. IRAM/ISO 15916 (safety)

- **Regulatory roadmap** (Chile)

- **Participation in international organizations**

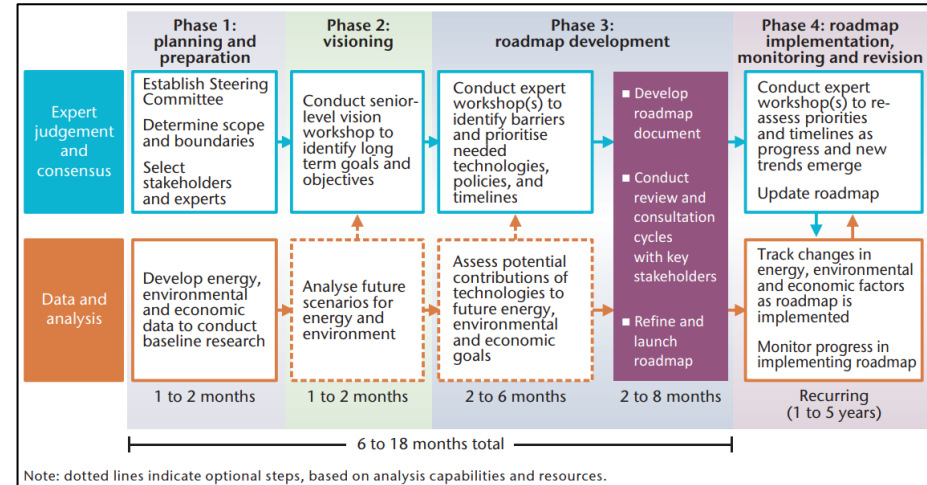
- **International Standards Organization** – hydrogen technologies subcommittee (TC 197)
 - Argentina (participating member) and Brazil (observer)
- **International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE)** – Working group on Regulations, Codes, Standards & Safety - Brazil, Chile, Costa Rica
- **IEA Hydrogen TCP** (Task groups on Safety, H2 for Export) – Argentina (Hychico)
- **Clean Energy Ministerial Initiative on H2** – Industry, Transport, domestic use – Brazil, Chile, Costa Rica

- **Role for regional organizations**

- H2 entering agenda of Central American Integration System (SICA)

From roadmaps to action

- Roadmapping processes can raise awareness and create alliances. But publishing a roadmap is only the beginning!
- Quantify potentials and costs
- Make strategic decision on initial focus areas
- Consider export, transit and import profiles
- Foster regional cooperation
 - Initial discussions in SICA
 - Panama ambition to become regional logistics hub
- Participate actively in global discussion on standards and certification



IEA (2014), *Energy Technology Roadmaps - A Guide to Development and Implementation*, Paris.

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