

















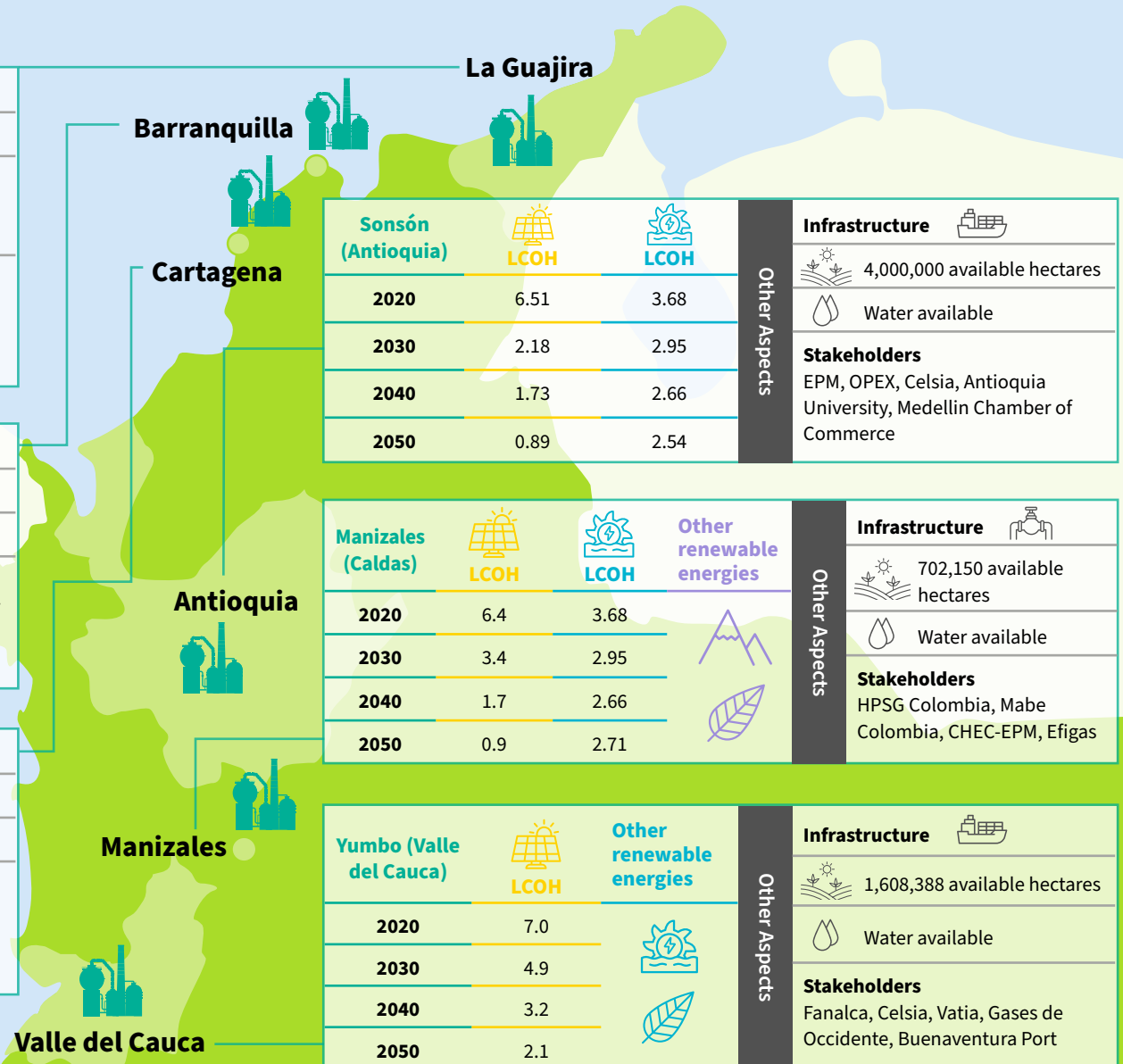


GREEN HYDROGEN HUBS IN COLOMBIA

Uribia (La Guajira)	 LCOH	 LCOH	Other Aspects	Infrastructure  
				 1,843,079 available hectares
2020	5.5	2.6		 Water scarcity (need for desalination projects and community involvement)
2030	2.9	1.9		Stakeholders La Guajira Chamber of Commerce, Promigas, TGI, Cerrejon, Ecopetrol, Hocol and Salinera del Caribe
2040	1.5	1.3		
2050	0.8	1.0		

Barranquilla (Atlantico)	 LCOH	 LCOH	Other Aspects	Infrastructure  
				 291,016 available hectares
2020	6.5	3.3		 Water available
2030	3.4	2.4		Stakeholders Monomeros, Barranquilla Chamber of Commerce, Electricaribe, Barranquilla Port
2040	1.7	1.8		
2050	0.9	1.3		

Cartagena (Bolívar)	 LCOH	 LCOH	Other Aspects	Infrastructure  
				 2,205,332 available hectares
2020	7.0	4.7		 Water available
2030	4.7	3.4		Stakeholders Ecopetrol, Yara, Promigas, Cartagena Chamber of Commerce, Ports of Cartagena and Mamonal
2040	1.9	2.5		
2050	1.0	1.8		



Additional comments on the identified green hydrogen hubs

The **Cartagena Hub** in the Mamonal industrial area can meet the relevant demand for hydrogen from companies such as Ecopetrol (90,000 t/year) and for ammonia from companies such as Yara (136,000 t/year).

The **Barranquilla Hub** can supply the current consumption by Monmeros (50.000 t/y) for fertiliser.

The **Valle del Cauca Hub** in Yumbo, an important industrial zone, has adequate infrastructure for green hydrogen. It further has the potential to increase local demand for green hydrogen and Power-to-X (PtX) products such as methanol.

The **Medellin Hub** around and south of Antioquia can cover the national demand for renewable solar, hydro and biomass energy. Companies active and interested in the development of green hydrogen production and consumption projects are, among others, OPEX, EPM, Celsia.

The **Manizales hub** intends to cover a limited local demand and make use of available renewable resources, including residual biomass. There is a good regional infrastructure (Caldas, Risaralda and Quindío) of land routes for the distribution of PtX products.

The conditioned **La Guajira hub** seeks to make use of the region's excellent wind and solar energy potentials that allow for very competitive production costs. It could be positioned as an ammonia export hub thanks to its available port infrastructure. The focus here should be on achieving regional social development through the establishment of these hubs. This requires close cooperation with the communities to find solutions that allow them to benefit from the projects.

Meeting the sustainability criteria in La Guajira would mean the possibility of realising the Hydrogen Valley of the Colombian Caribbean: Cartagena, Barranquilla and La Guajira.

Barriers to Hub implementation

ECONOMIC

- Investment
- Macroeconomic
- Exchange rates

TECHNOLOGY

- Know-how
- Deployment
- Integration in the process

REGULATORY

- Value chain regulation
- Technical standards

ENVIRONMENTAL

- Licenses
- Prior consultation of communities

SOCIAL

- Symmetric information
- Working with communities

POLITICS

- Development and investment
- Energy policy

Electrolysis capacity required to meet potential hydrogen demand

CAPACIDAD	UNIT	2030	2040	2050
National Demand	GW	3	25	69
International Demand	GW	1	5	19
Total	GW	4	30	88

A target of **1% of the total hydrogen import demand by 2030 for Germany, South Korea and Japan** is set to be covered:

- Total demand to be exported: 60,000 tons of hydrogen per year.
- The required hydrogen production will be a maximum of 90,000 tons per year for which an electrolysis capacity of 1 GW will be required.



Scan the QR code to read the full Executive Summary (in Spanish) including detailed information on LCOH, intercontinental transport and policy.