

4th International Forum on Long-Term Scenarios for the Clean Energy Transition



Incorporating global hydrogen insights for national LTES narratives

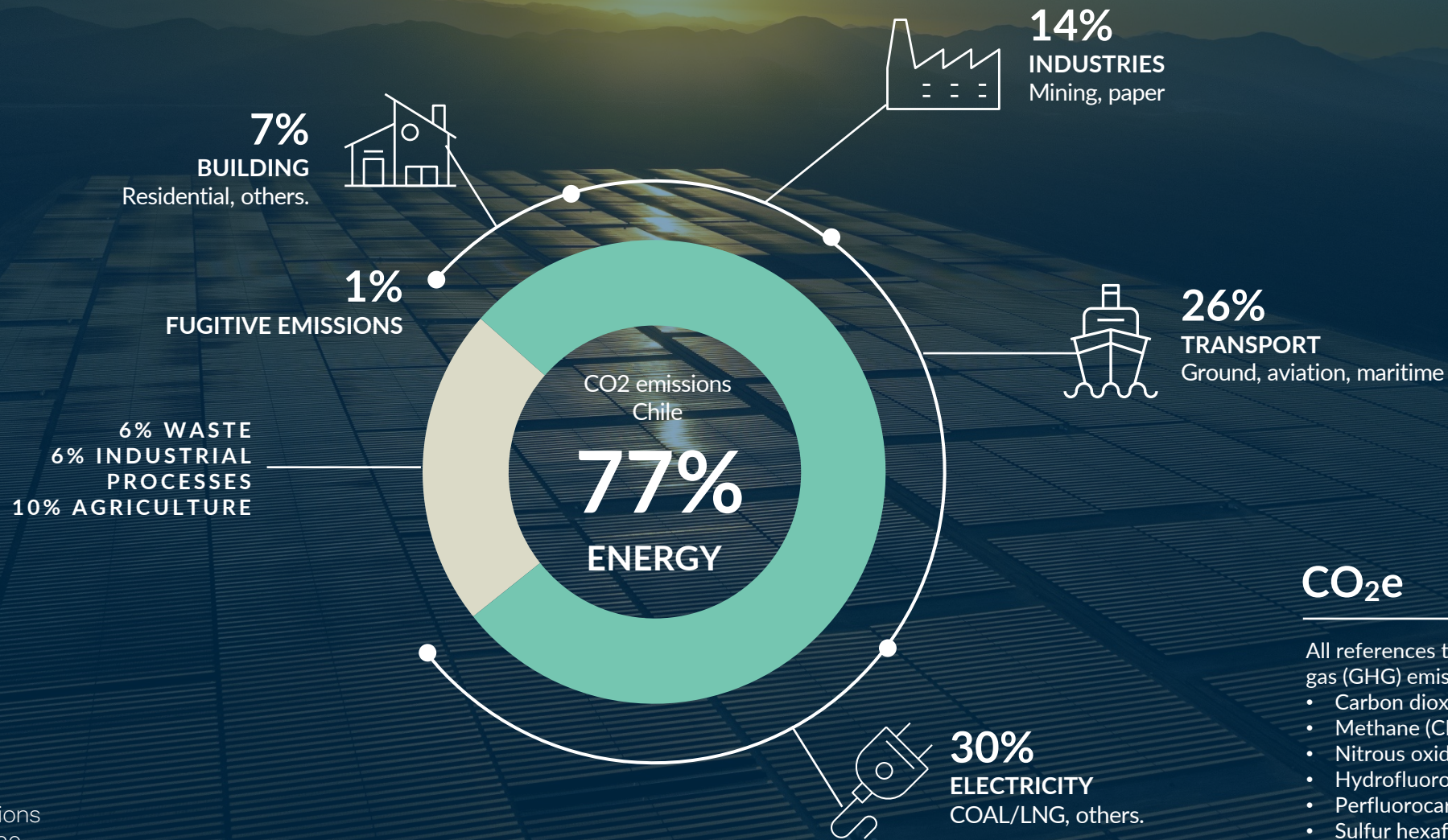
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Ministry of Energy

December 8th, 2022



Climate change and energy sector



CO₂e

All references to CO₂e refer to greenhouse gas (GHG) emissions as:

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF₆)

Measured in units of CO₂ equivalent



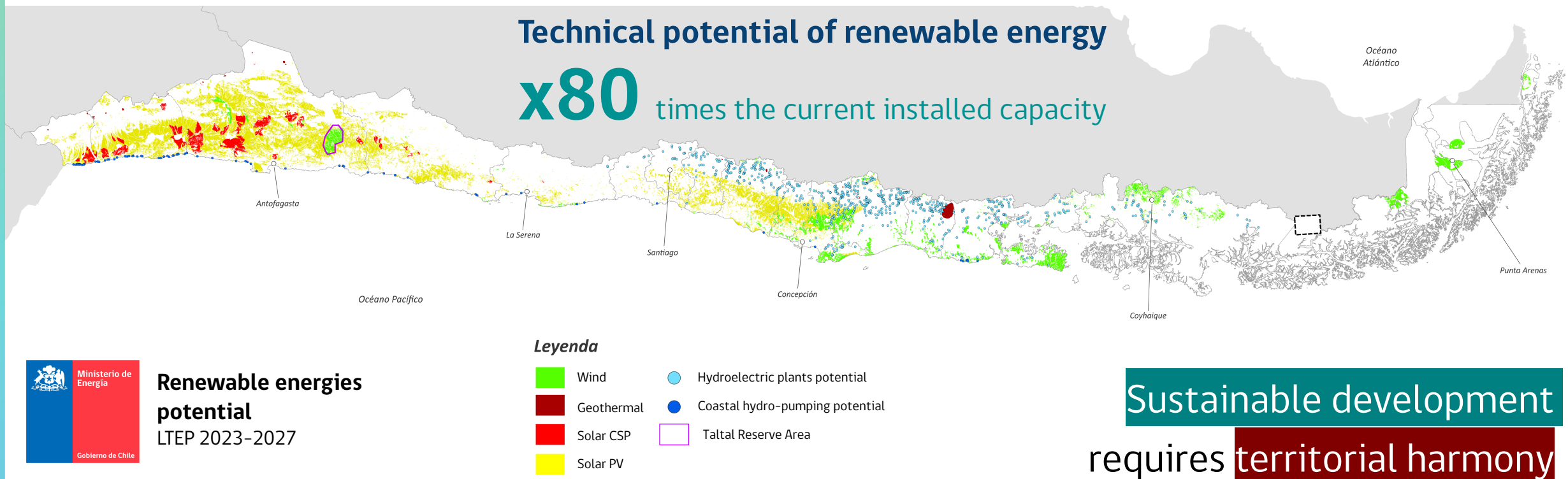
National GHG Emissions
Inventory Chile 2020
Ministry of Environment

Chile's energy context

- Very scarce fossil fuels, high availability of renewable energy resources
- Mainly private energy market with an articulating and regulating role of the State



Renewable potential
PELP 2023-2027



Climate Change Framework Law



Energy sector is responsible for almost 80% of the country's greenhouse gas emissions, so it has the challenge and responsibility to be the main sector in mitigation and adaptation to the climate crisis.

The enactment of Climate Change Framework Law defines and legally mandates Chile's commitment to be carbon neutral and climate resilient by 2050 at the latest.



But different public policy instruments have guided and oriented the decision to become a carbon neutral country by 2050

Chile's Energy Policy

National Energy Policy with a horizon to 2050 (first version in 2015, and updated in 2022)



Period 2015-2021

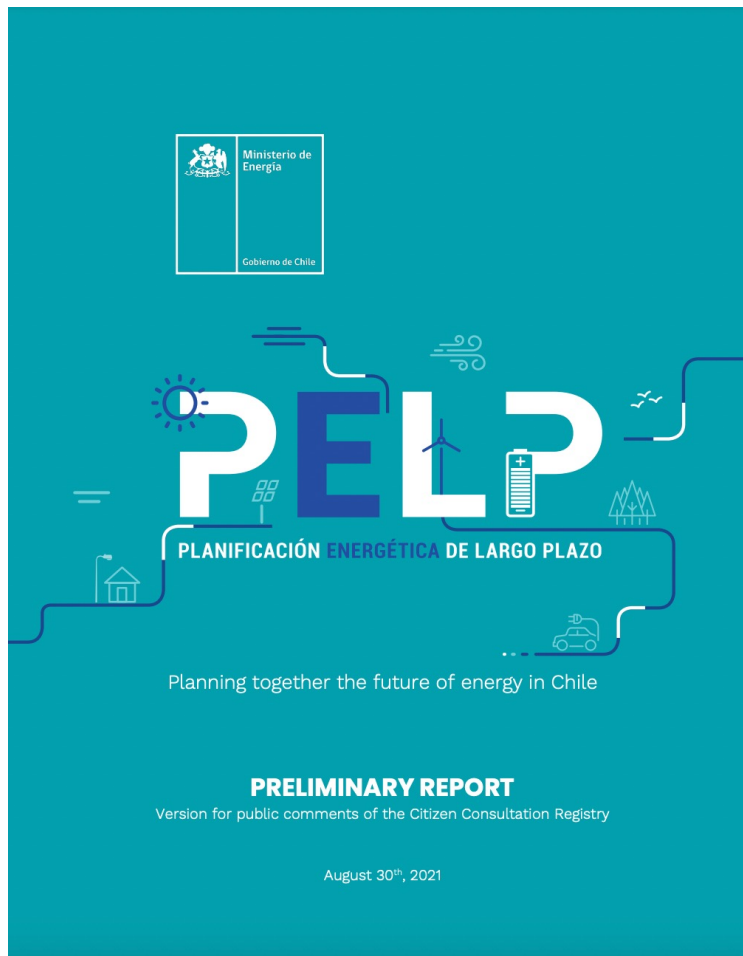


Updating 2022

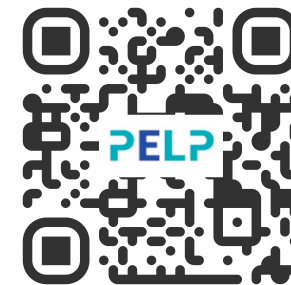
AGENDA DE
ENERGÍA
2022 - 2026

Long-term energy planning

The importance to have quantitative instruments with legitimacy



pelp.minenergia.cl



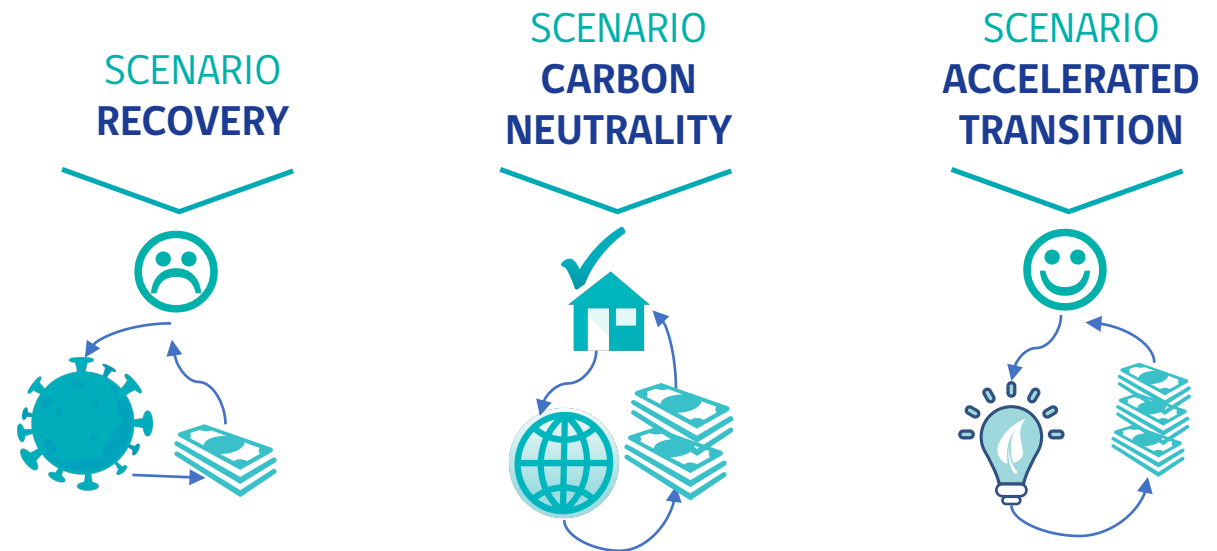
Informe Preliminar
PELP 2023-2027>

Long-term energy planning

The importance to have quantitative instruments with legitimacy

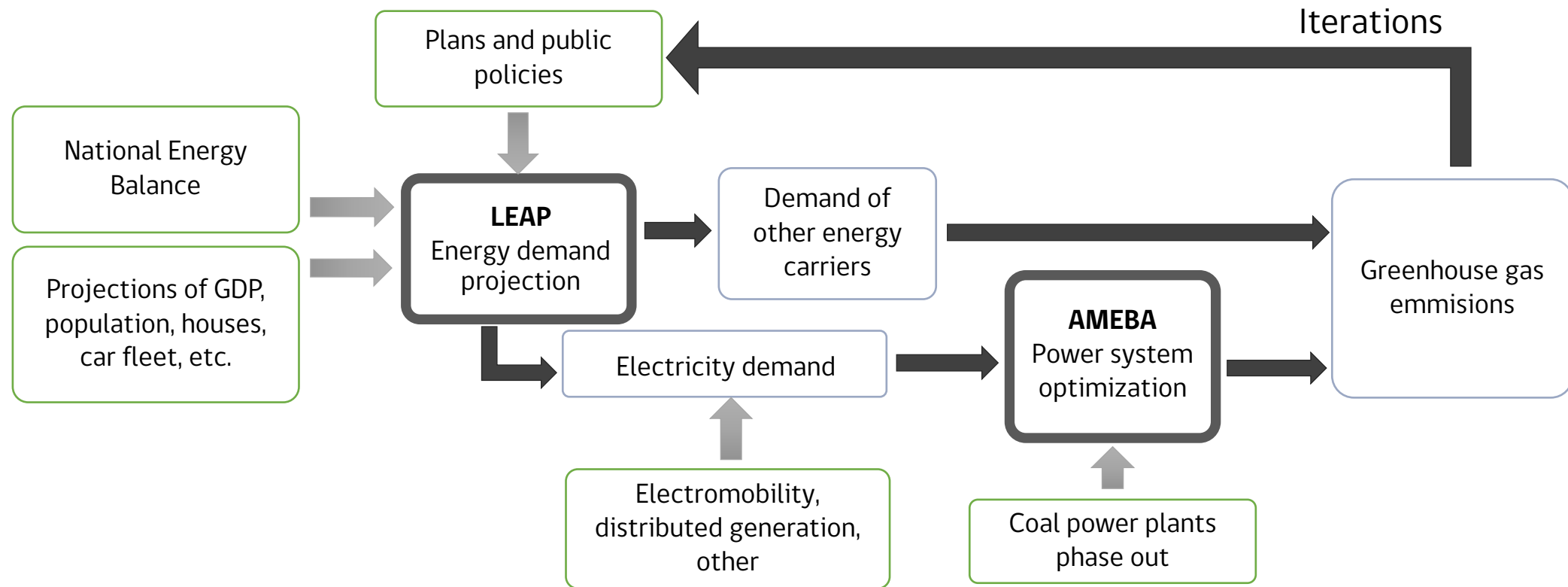


3 SCENARIOS



Determinating a carbon neutrality strategy

Over 200 simulations finding the most cost effective plan



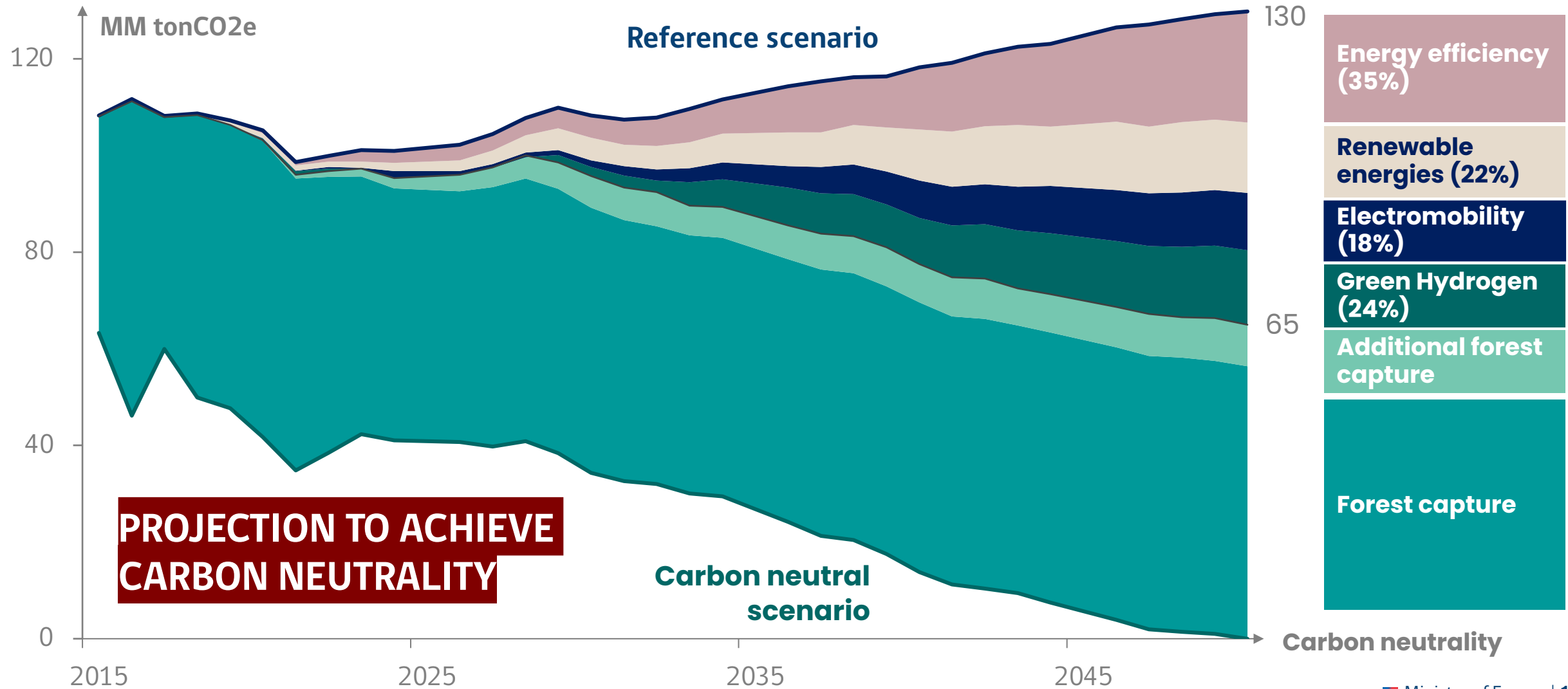
Data sources: INE (National Institute of Statistics), CASEN (National Socioeconomic Characterization Survey), Bloomberg, IEA, DOE (US), NREL, other

Strategy to select mitigation measures:

- Cost-efficient selection through iterative analysis of their individual and joint impact, along with an analysis of the economic and emission reduction effects.
- The entrance and weight of each measure, is decided according to its abatement cost (\$/tCO₂e reduced).

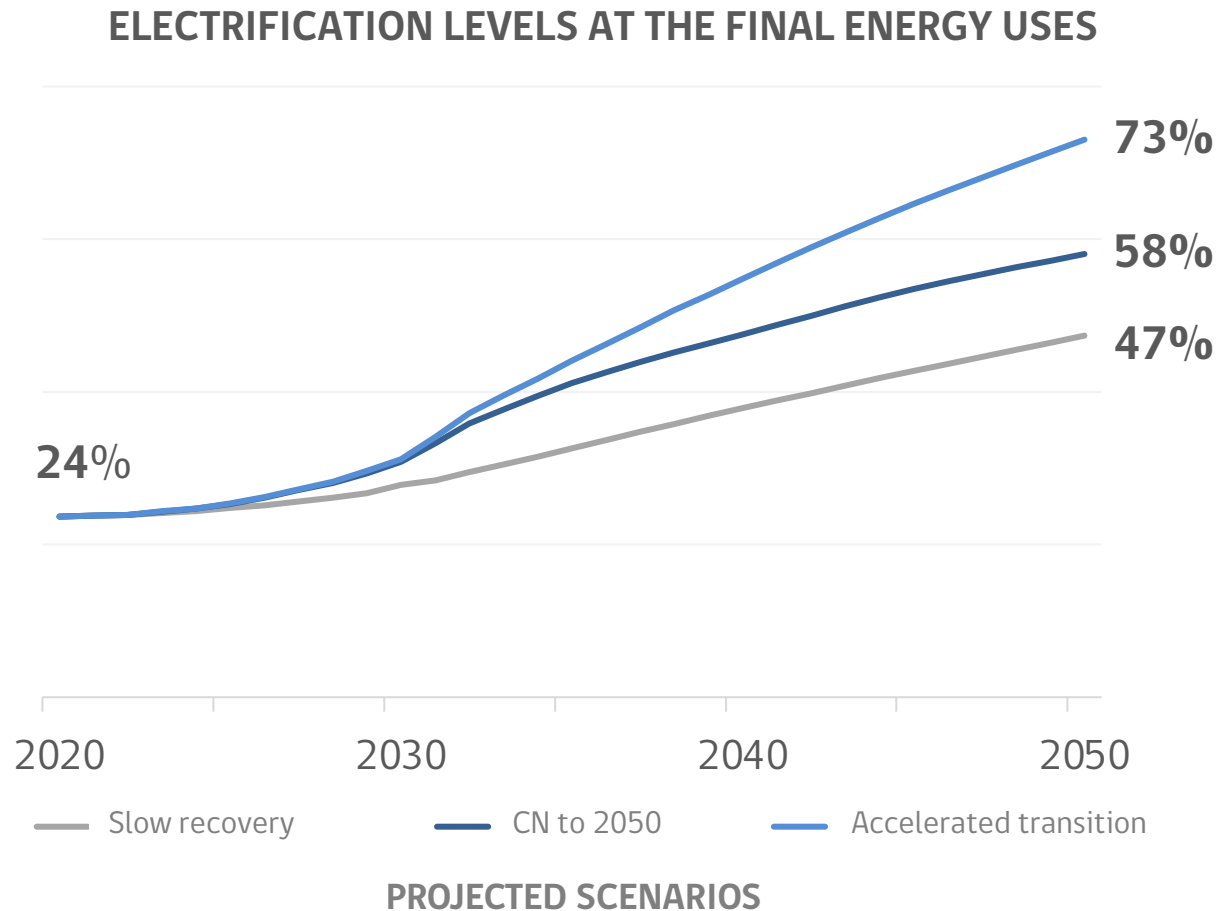
Future vision to face new challenges

Carbon neutrality commitment before 2050



Chile's Energy Production Composition

High dependence of fossil fuels produced in other countries

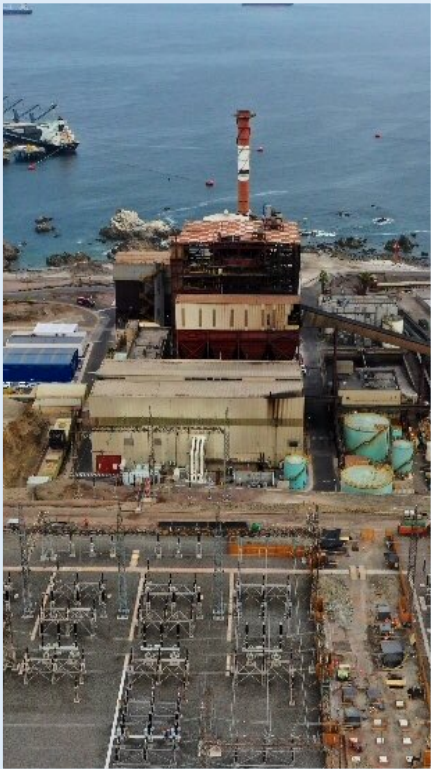


Electrification of different energy uses provided by fossil fuels today -as transport, climatization, industry and mining- **requires electrical grids not only reliables, but also resilient,** and a **strengthen of electricity quality of service.**

Those electrical grids -highly composed by renewable energy- will allow to produce **green hydrogen.**

Phase-out and reconversion of coal-fired power plants

TARAPACÁ



TOCOPILLA



MEJILLONES



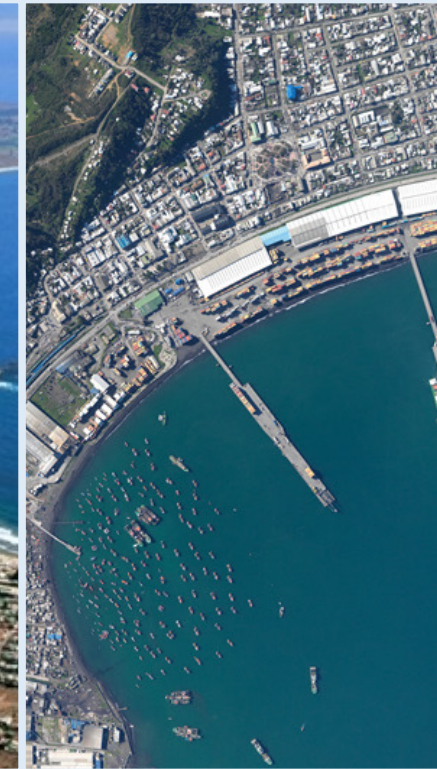
HUASCO



PUCHUNCAVÍ



CORONEL



We will promote a **just energy transition** that enables a **renewable future**, through **inclusive growth** that respect **communities**, the **environmental** and the **territory**

Coal phase-out enables a series of measures to reduce GHG

+ Reconversion of thermal power plants

Green hydrogen

Freight transport

Machine drive in mining
and heavy industry

Gas pipes

Reference
Scenario

Coal
Phase out

+ Machine drive
electrification

Industry

Mining

Copper mining

Retail

+ Electromobility

Private vehicles

Commercial vehicles

Urban public transport

Taxis

+ Power heating

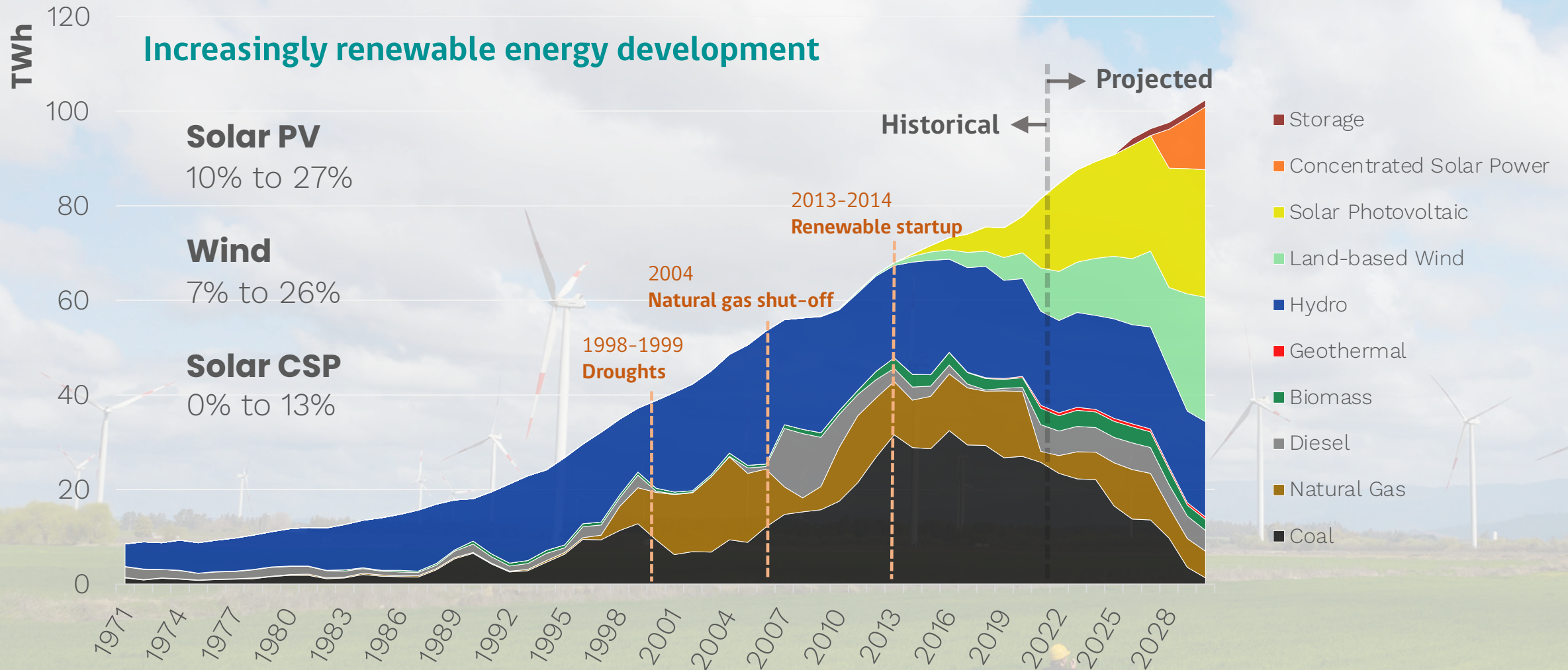
Housing

Retail

+ Energy efficiency

Carbon neutrality
scenario

Transition towards 24/7 renewable and clean energies



+20 GW

VRE generation

+1 GW

Concentrated solar power

+4 GW

Storage (batteries)

+Transmission

Kimal-Lo Aguirre / others

Green Hydrogen

GH2 Strategy 2020

Goals 2025

5
BUSD

Top 1
Investment
H2V in LATAM

5
GW

Electrolysis capacity
under construction
and operation

200
kton/año

Production in at
least two
Hydrogen valleys

During 2021, Chile consolidated its position in GH2

November
2020



Strategy
launch

January
2021



+10 projects in
Chile

December
2021



+60 projects in
Chile

Concurso M\$US 50
Aceleradora AgenciaSE (\$300.000)
Estudios AGCID (€300.000)



Mission-orientes
policy



Efficient route to a
zero-emission
country



Driver of local
development



International
openness



Clean export
economy



Balanced use of
resources and
territory

Pillars

Green Hydrogen

GH2 Action Plan 2023-2030

GH2 Strategy

Action Plan 2020-2023

2024

Validation and updating of assumptions
Every 2 years and 6 months

2026

Strategy update
Every 5 years

GH2: Action Plan 2023-2030

Roadmap towards a sustainable development of green hydrogen in Chile

INVESTMENT AND INSTITUTIONAL FRAMEWORK

SUSTAINABLE AND LOCAL VALUE

INFRASTRUCTURE AND TERRITORY

GH2 Projects

Main figures

**41 projects
registered in
8 regions**

Antofagasta: 15

Atacama: 1

Coquimbo: 1

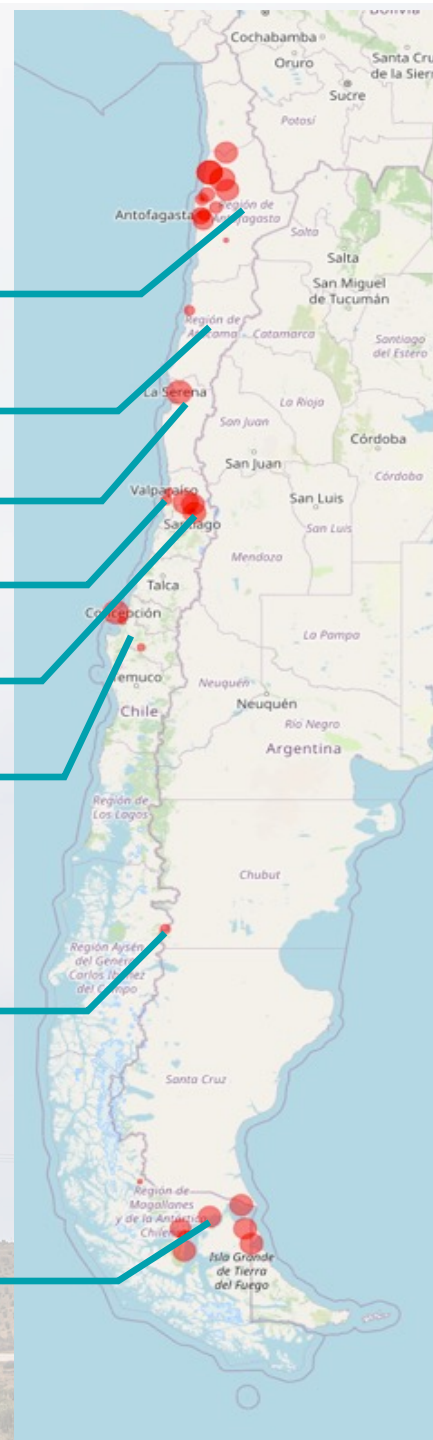
Valparaíso: 3

Metropolitana: 3

Biobío: 3

Aysén: 1

Magallanes: 12



Construction: **4**

Feasibility: **15**

Pre-feasibility: **18**

In conceptual stage: **4**

Total GH2 production: **2.7 Mton/año**

RE generation capacity: **41 GW**

Electrolysis capacity: **28 GW**

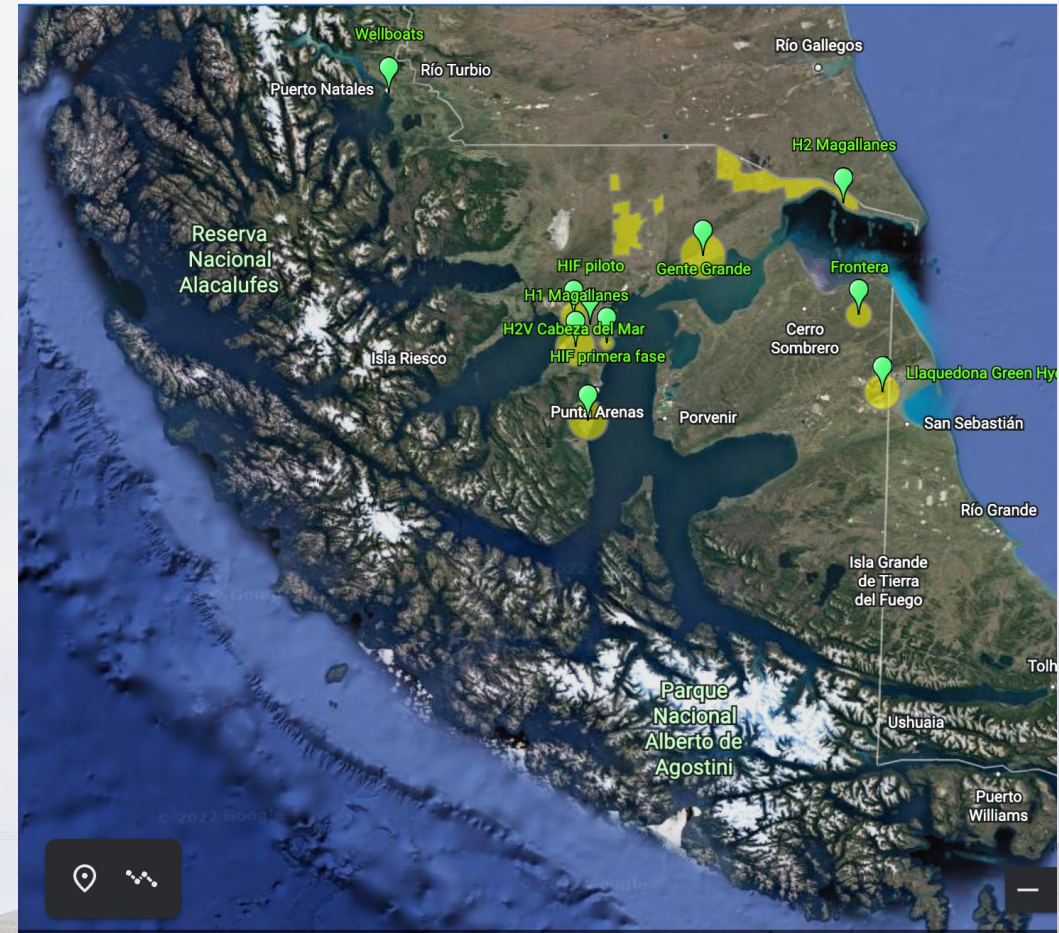
Investment: **56 BUSD**

GH2 Projects

Regions with the highest number of projects announced



Antofagasta
15 GW



Magallanes
25 GW



**Ministerio de
Energía**

Gobierno de Chile