



URUGUAY

Estrategia País de
Hidrógeno Verde

Opening Event *Virtual Data Room*
H₂U Pilot Project
April 8, 2021



Ministerio
de Industria,
Energía y Minería



Ministerio
de Economía
y Finanzas




ANCAP

AGENDA



1. Why Hydrogen?
2. Why Uruguay?
3. Potential for local use and exports of H₂
4. Virtual Data Room: pilot project

The background of the image shows three wind turbines silhouetted against a sunset sky with orange and blue hues. A large white circle is centered over the image, containing the text '1 Why Hydrogen?'. To the right of the circle is a white icon of a hydrogen molecule (H2) inside a stylized circular shape with a small circle on the right side.

1 Why Hydrogen?



Global greenhouse gas emissions and warming scenarios



- Each pathway comes with uncertainty, marked by the shading from low to high emissions under each scenario.
- Warming refers to the expected global temperature rise by 2100, relative to pre-industrial temperatures.

Annual global greenhouse gas emissions
in gigatonnes of carbon dioxide-equivalents

150 Gt

100 Gt

50 Gt

*Greenhouse gas emissions
up to the present*

0

1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100

No climate policies

4.1 – 4.8 °C

→ expected emissions in a baseline scenario if countries had not implemented climate reduction policies.

Current policies

2.8 – 3.2 °C

→ emissions with current climate policies in place result in warming of 2.8 to 3.2°C by 2100.

Pledges & targets

2.5 – 2.8 °C

→ emissions if all countries delivered on reduction pledges result in warming of 2.5 to 2.8°C by 2100.

2°C pathways

1.5°C pathways

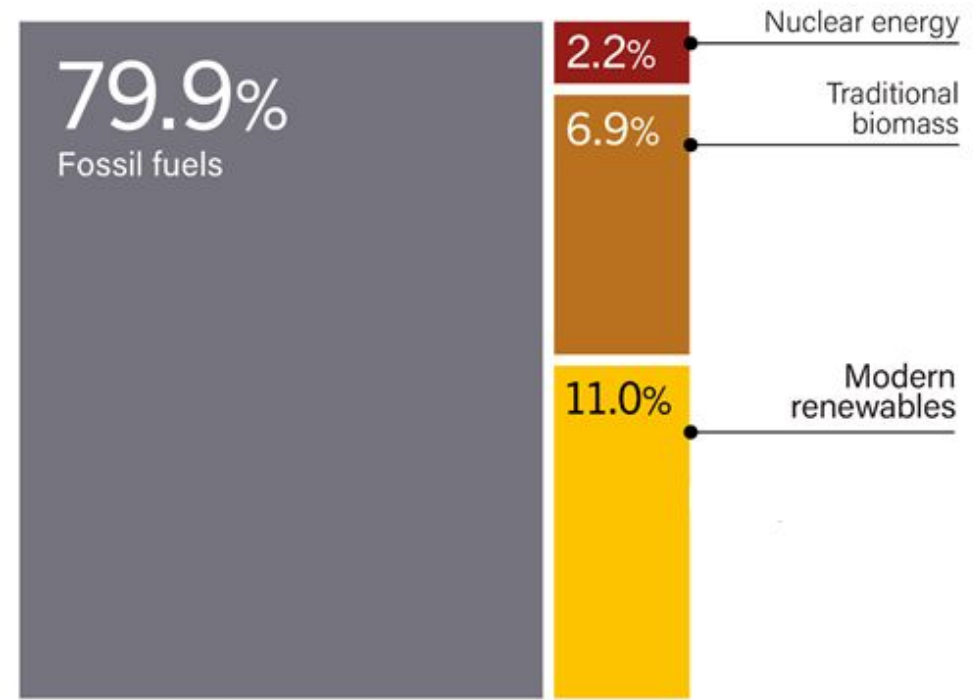
Population increase
+ economic growth



Source: Naciones Unidas

Today 80% of energy is produced with
fossil fuels

Estimated Renewable Share of Total Final Energy Consumption, 2018



Need for energy transition

- Commitment of **120 countries** to 0 emissions by 2050 (unfccc.int)
- Promotion of renewable energies, electrification of end uses, batteries, Hydrogen, etc.
- For example: decarbonization of transport (vehicles: BEV and FCEV; for air and maritime transport: ammonia and synthetic fuels made from Hydrogen, liquid Hydrogen and biofuels)

Global consensus: green hydrogen will be key in the decarbonization of the energy and raw materials sector.



2 Why Uruguay?



Uruguay #1 in LAC



Democracy Index
(Economist Intelligence Unit, 2019)

#1



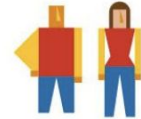
Rule of Law Index
(World Justice Project, 2020)

#1



Low corruption
(Transparency International, 2019)

#1



Social Mobility
(World Economic Forum, 2020)

#1



Civil Liberties Index
(Freedom House, 2020)

#1



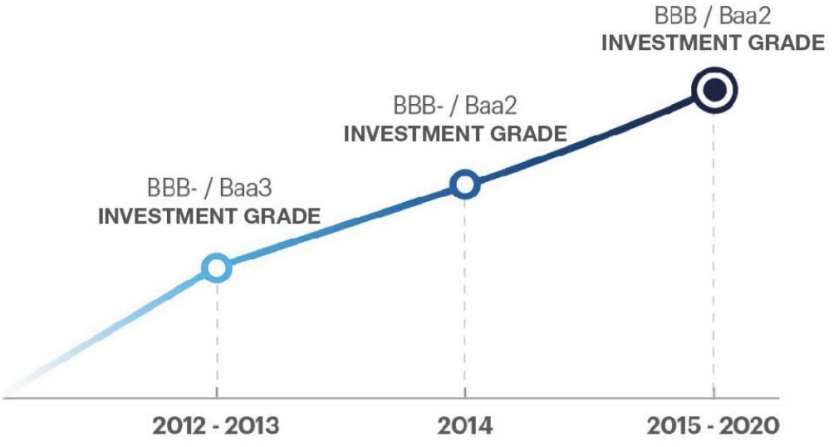
**E-Government
Development Index**
(United Nations, 2020)

#1

Global Freedom: 6th in the world

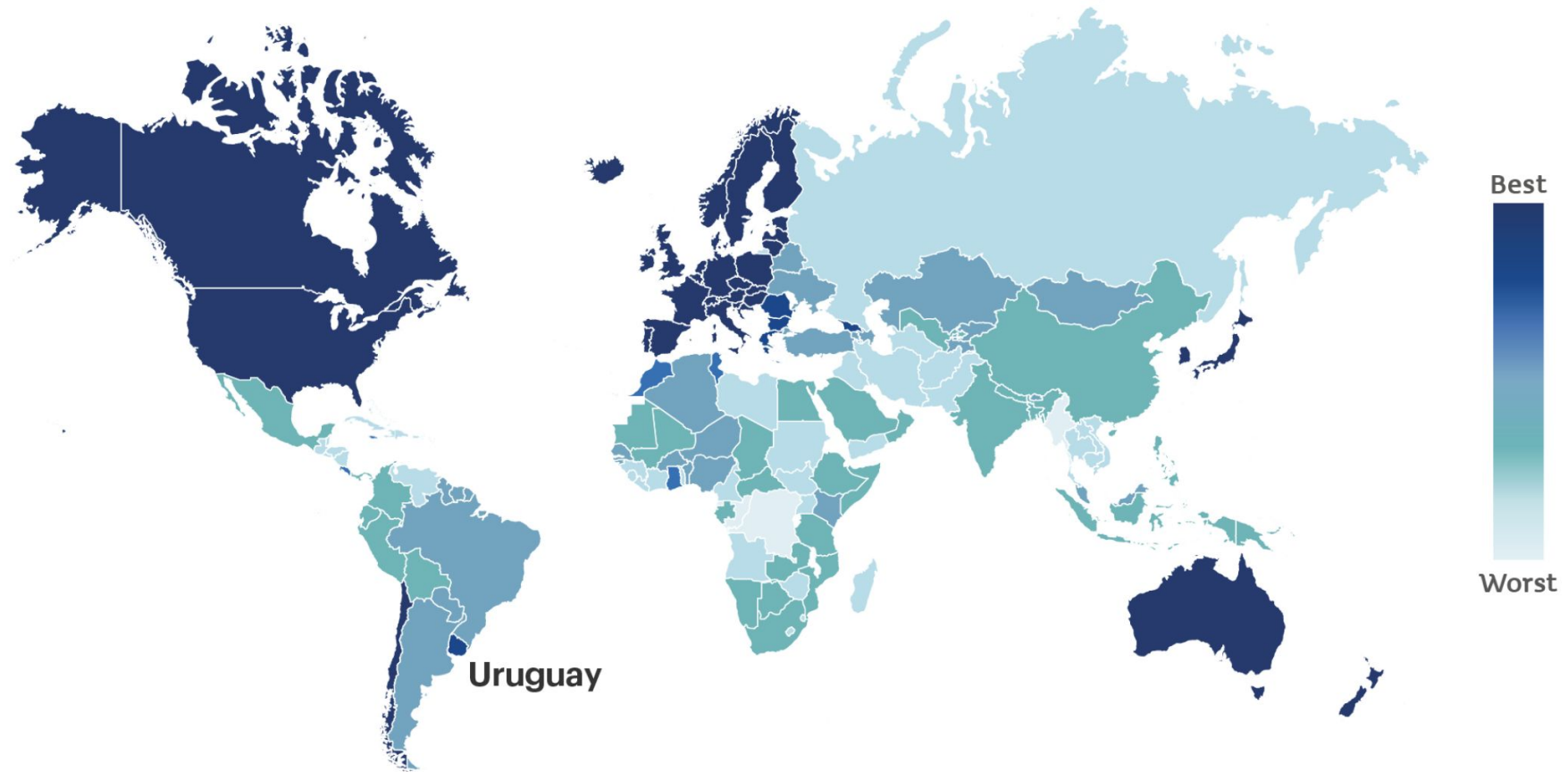
(Freedom House, 2020)

Investment grade



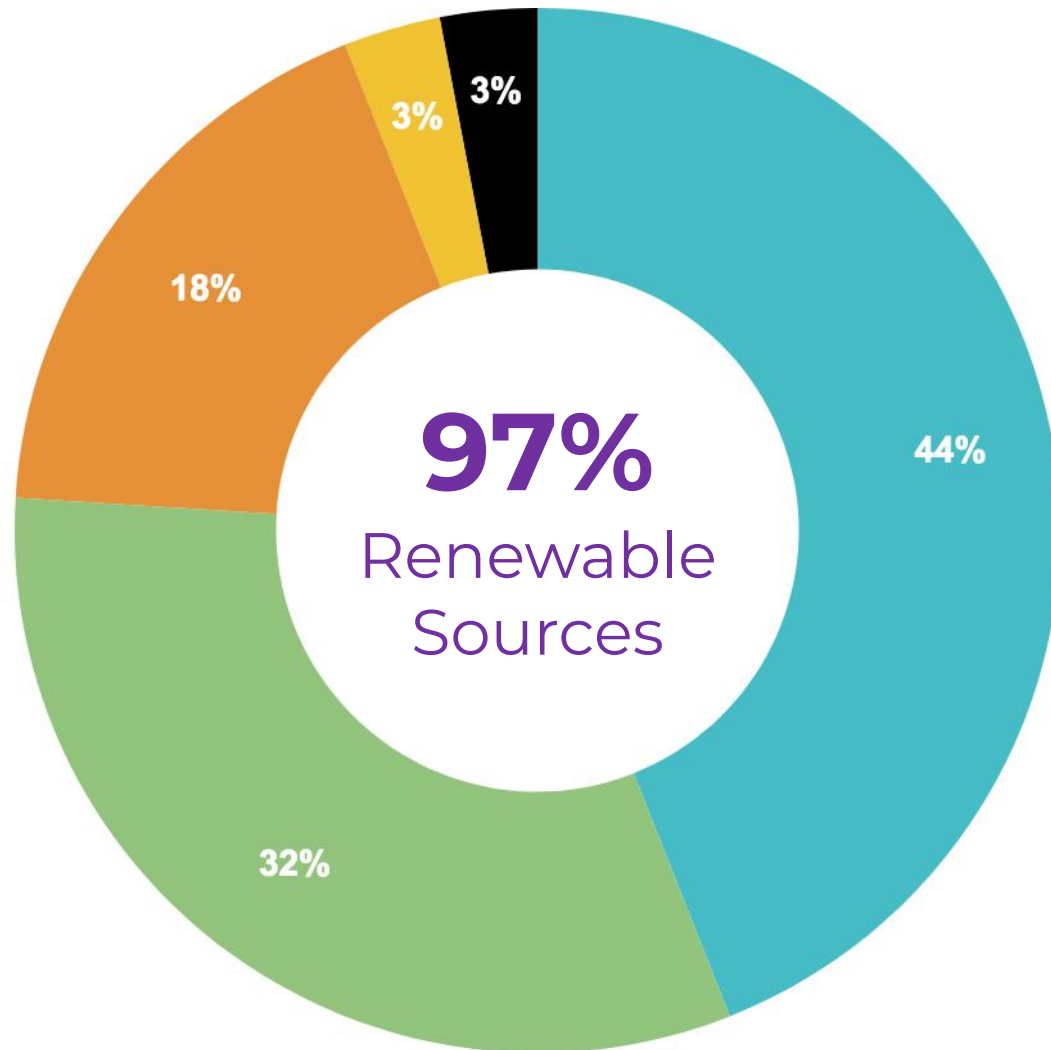
Highest performance in ESG factors

Environment · Social · Governance



Source: JP Morgan, Bluebay Asset Management – Verisk Maplecroft.

Uruguay: Power Energy Mix 2017-2020



44% HYDRO

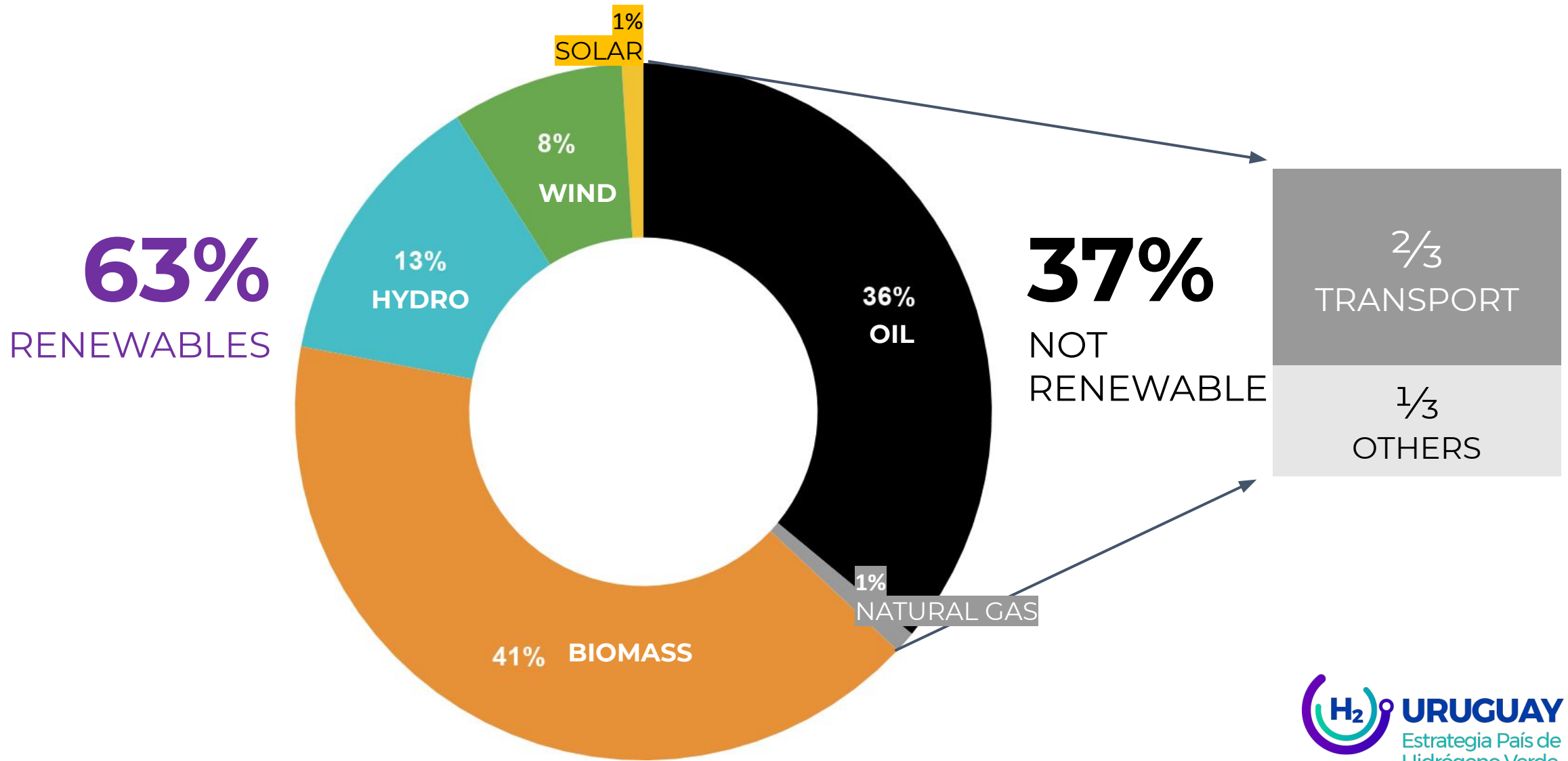
32% WIND

18% THERMAL BIOMASS

3% SOLAR

3% THERMAL FOSSIL

Uruguay: Energy Supply Matrix 2019



Weight
Tons

10,000+

1,000

100

10

1

0.1

10

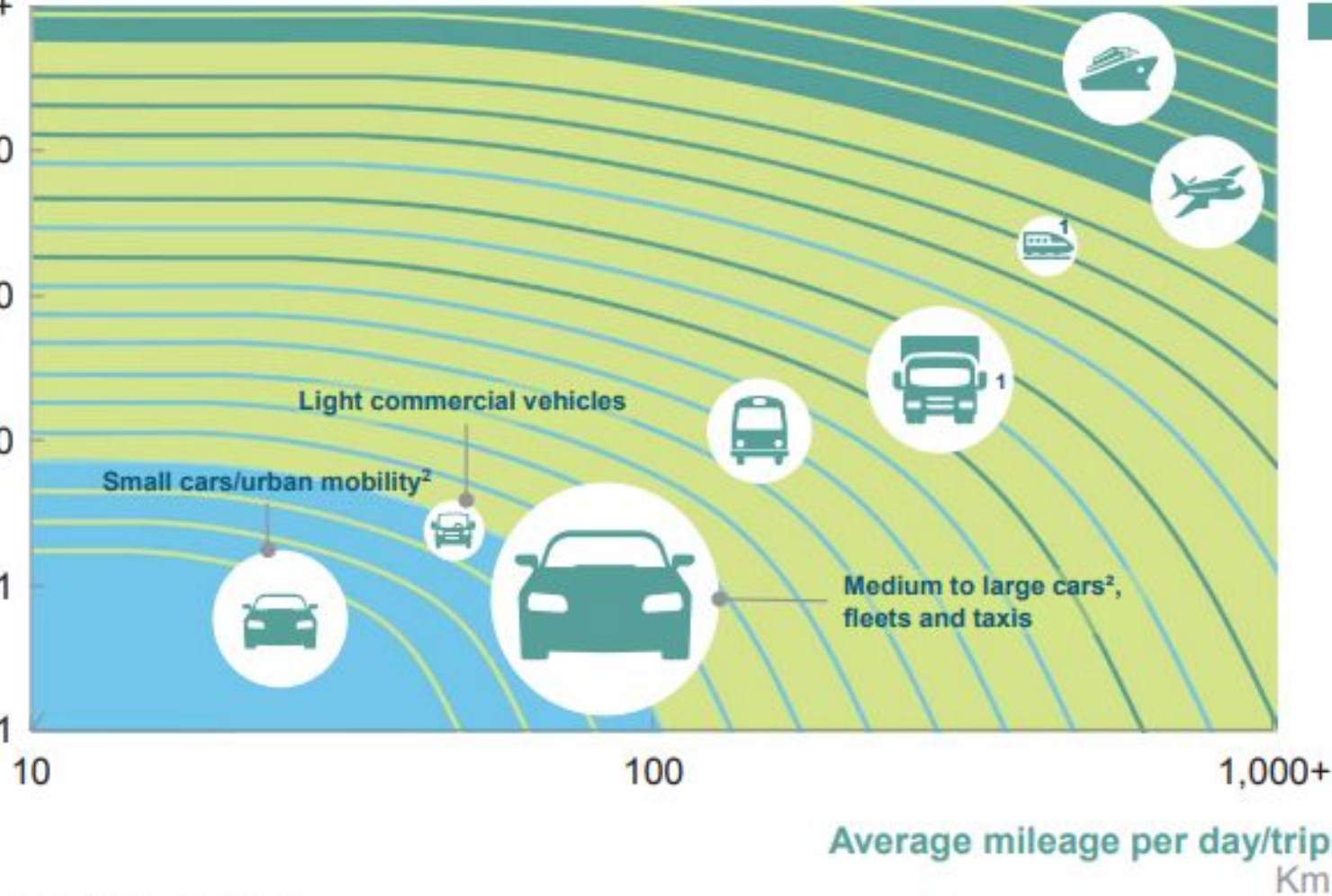


Bubble size representing the relative annual energy consumption of this vehicle type in 2013

BEV

FCEV

Bio- and (H₂-based)
synthetic fuels



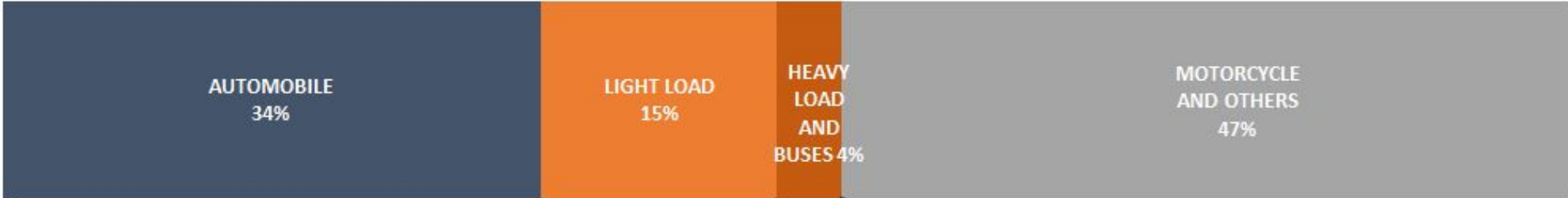
¹ Battery-hydrogen hybrid to ensure sufficient power

² Split in A- and B-segment LDVs (small cars) and C+-segment LDVs (medium to large cars) based on a 30% market share of A/B-segment cars and a 50% less energy demand

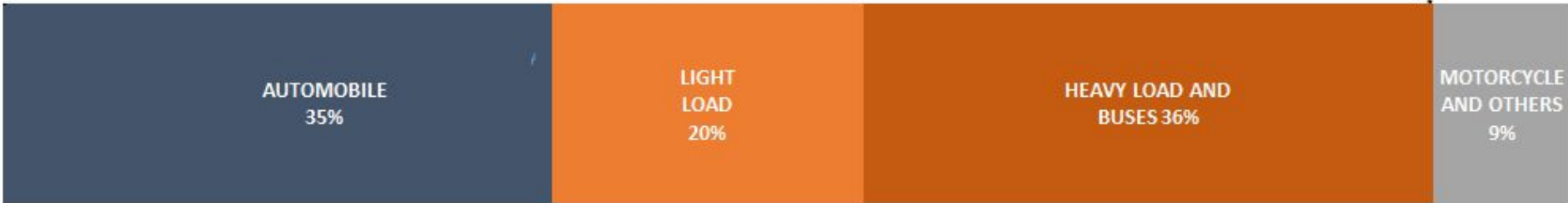
Source: Toyota, Hyundai, Daimler

Uruguay: Freight transport

Vehicle Fleet 2017: 1.421.476 units



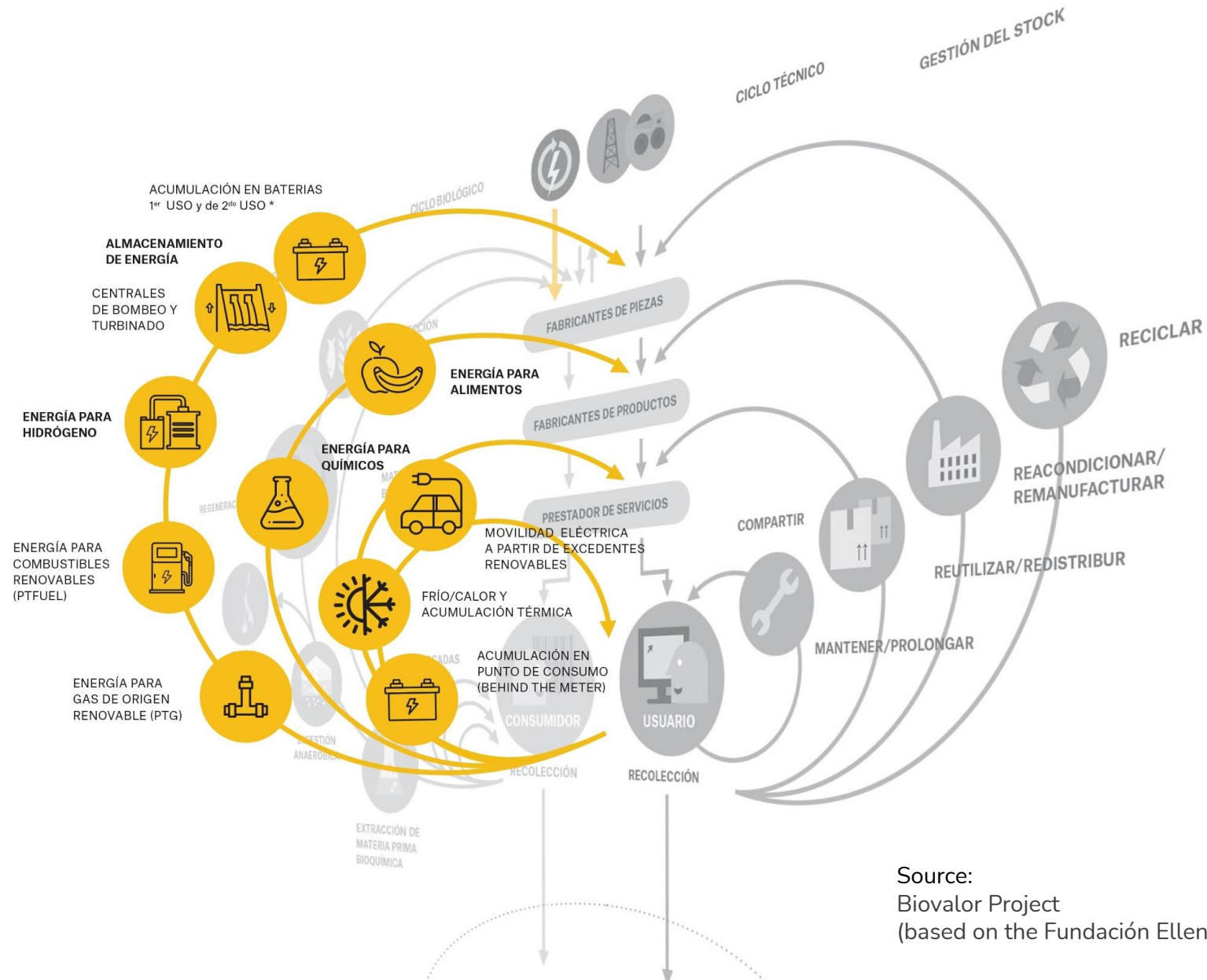
Road transport GHG emissions: 3710 Gg CO2 e



4% OF VEHICLES ARE RESPONSIBLE FOR 36% OF GHG EMISSIONS FROM THE ROAD TRANSPORT SECTOR

Source:
Elaboration from the Office of Planning, Statistics and Balance DNE-MIEM
Prepared based on information from BCU, SUCIVE, BEN2017, INE, etc.

Circular Economy and Renewable Energies



Source:
Biovalor Project
(based on the Fundación Ellen MacArthur diagram)

CIRCULAR ECONOMY AND RENEWABLE ENERGIES

CIRCULARIZE THE AVAILABILITY OF RENEWABLE ELECTRICAL ENERGY that can be used in a first stage

Source: Biovalor about the image of the Fundación Ellen MacArthur.





3

Export and
local potential



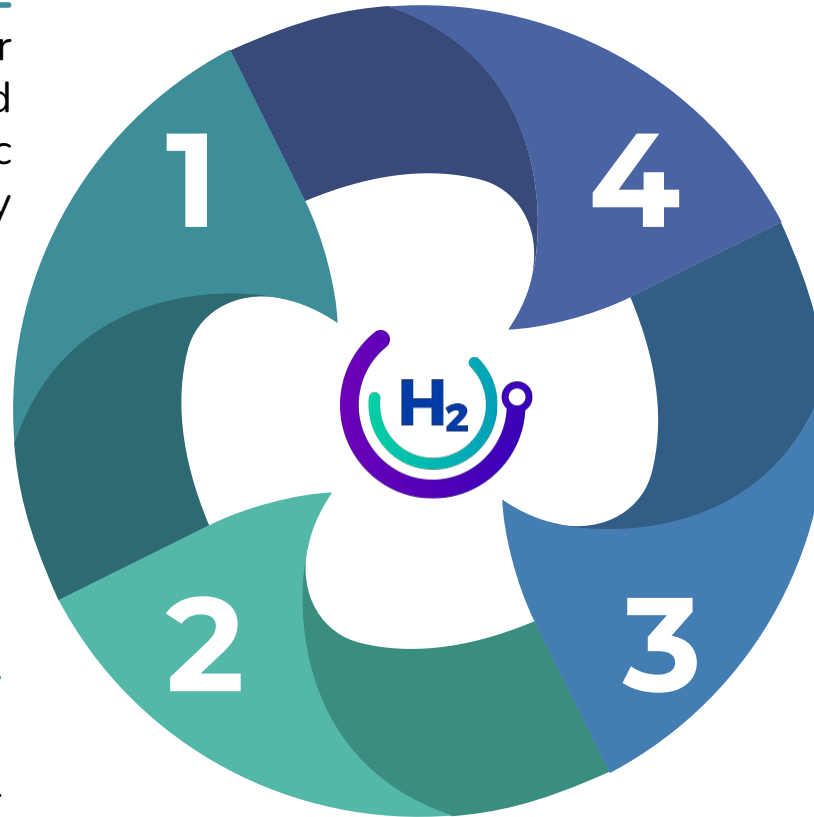
4 attributes to be a Hydrogen exporting country

POWER GENERATION POTENTIAL

Great potential for Power generation from combined wind and solar photovoltaic energy

LOGISTICS

Port with access to the Atlantic Ocean and access routes to the entire country



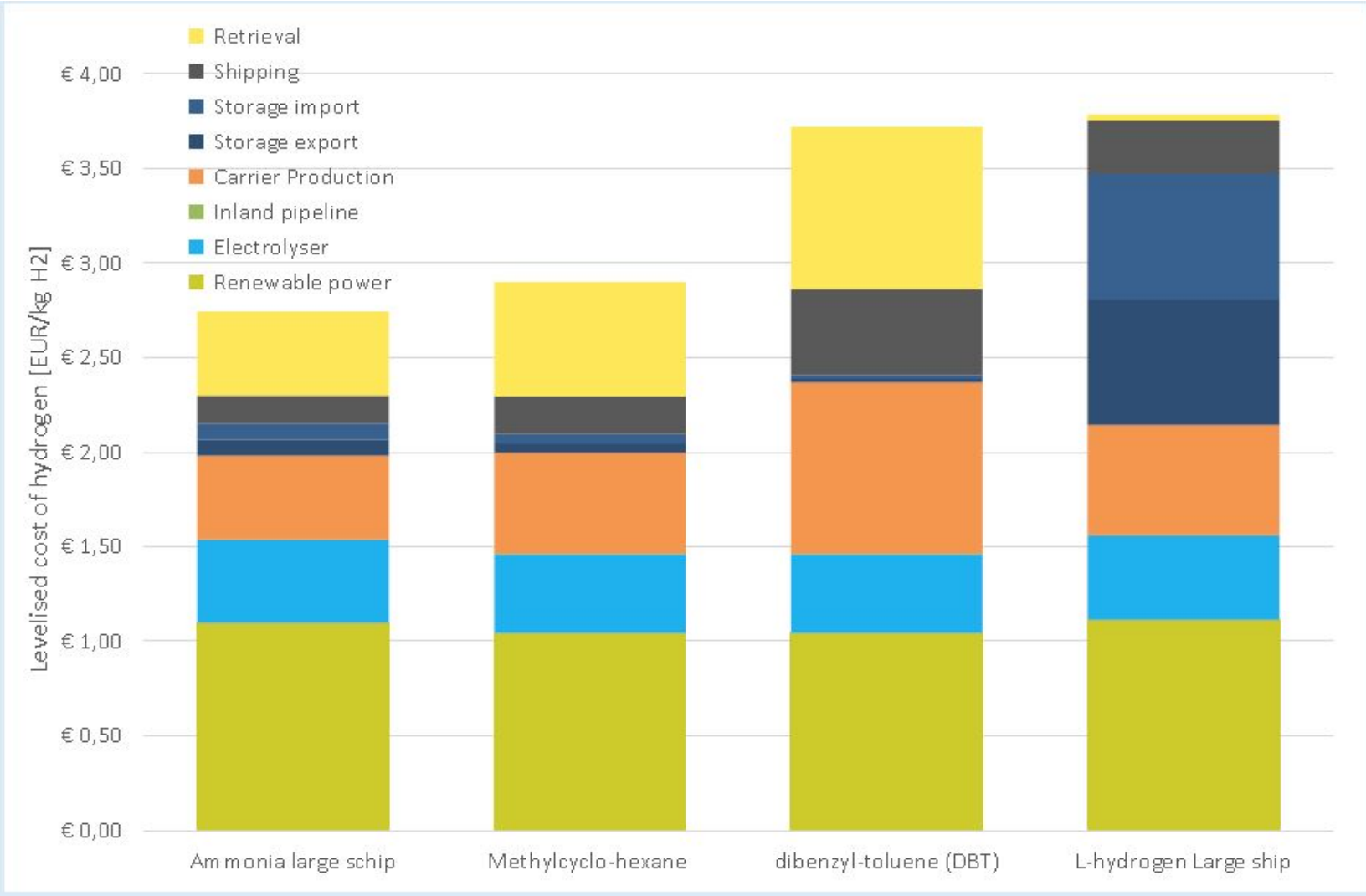
SOURCE COMPLEMENTARITY

High capacity factors (approx. 60%) due to Wind and Solar complementarity. Possibility of *offshore* expansion.

AVAILABILITY OF RENEWABLES

High availability of renewable power energy that can be used in an initial process

Pre Feasibility study 2030: MIEM - Port of Rotterdam



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Port of
Rotterdam

Local H2 Utilisation: Existing and new hydrogen applications

1

Uruguay H₂ transport project

Pilot project tender in 2021 for:

- Green hydrogen production by electrolyser
- Starting with 10 heavy vehicles: road trucks and buses with a range of ~ 400 km

Potential diesel demand of 670.000 m³/year for heavy duty transport for 2025 (equivalent to 150 kTon of Hydrogen per year)



estimaciones preliminares MIEM-ANCAP (transporte) y MIEM (fertilizantes).

2

Ammonia to fertilizer

- Uruguay Agricultural sector, produce food for 28 million people (3,4 million inhabitants)
- 100 kton of hydrogen per year as substitution of local fertilizer consumption

3

Other potential local uses of H₂:

- Natural Gas substitution
- Ammonia as vessel fuel


In future:

- Hydrogen train link from pulp plant
- Green Methanol production
- Green diesel (HVO)
- Synthetic fuels
- Green steel



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4 Virtual Data Room
H₂U Pilot



1. Defined pilot project of Fuel Cell Heavy Duty Vehicles
2. Open pilot projects for other uses



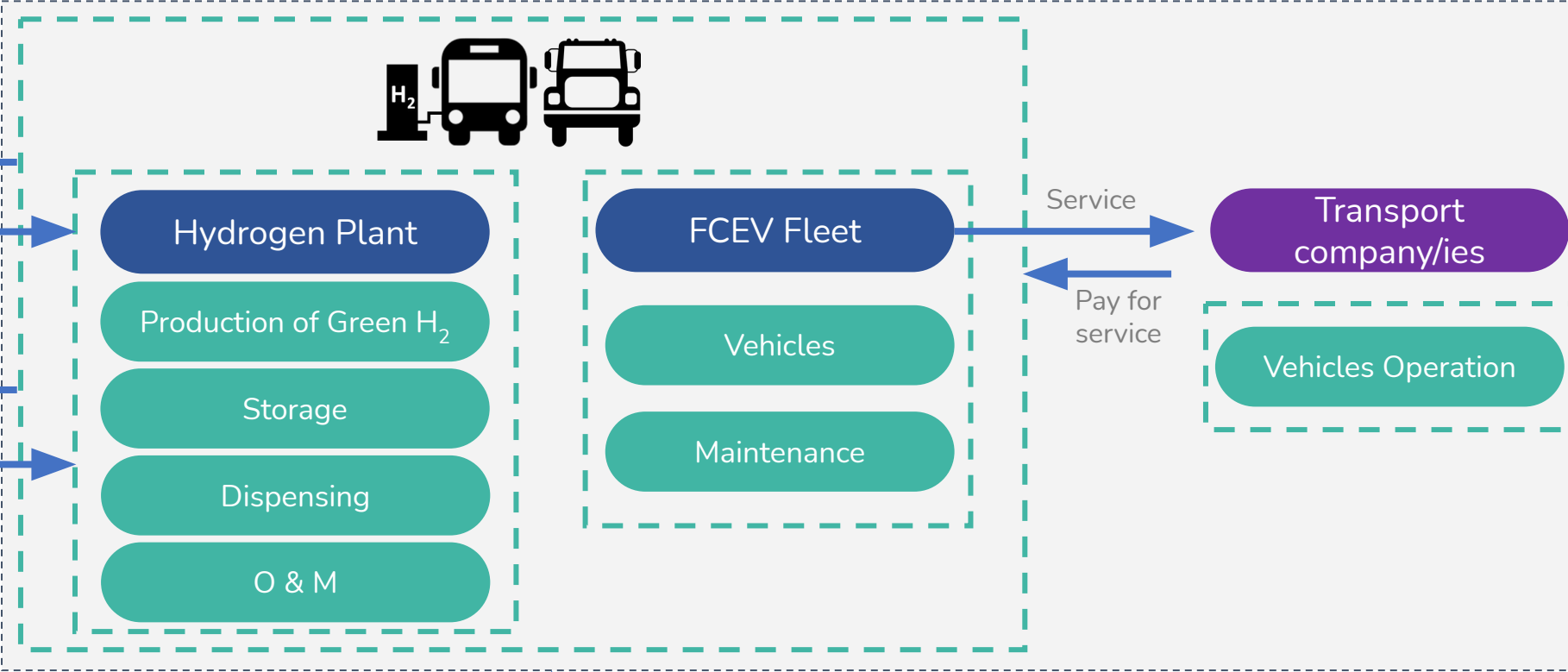
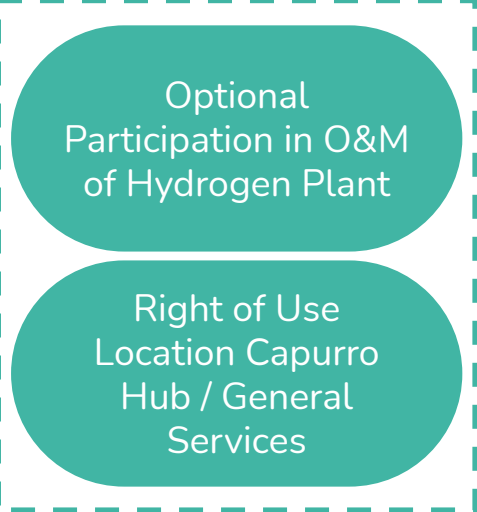
H₂ URUGUAY
zero emission



Initial business model H₂U Pilot - Defined



Offerer (Investment, Equipment Provision, Construction, Operation and Maintenance)



Tax benefits and additional public support



Transport Pilot: Participation scheme

- Guarantees of maintenance of the offer and commitment to fulfillment of the contract will be established
- Minimum experience will be requested from participating companies in electrolyzers, HRS, FCEV (fuel cells electric vehicles)
- Project duration: 10 years
- **Government and state owned companies will provide a series of benefits:**
 - Tax exemptions
 - Special energy price
 - Availability of site and services
 - Additional targeted supports

Transport Pilot: Electric Power price menu

★ UTE

	Diaria Continua						Diaria discontinua						Semanal discontinua					
	7	8	9	10	11	12	7	8	9	10	11	12	7	8	9	10	11	12
2022																		
2023																		
2024																		
2025																		
2026																		
2027																		
2028																		
2029																		
2030																		
2031																		
2032																		
2033																		

- Up to 5 MW
- Only on this site
- For transportation use only
- Additional demand

Transport Pilot: Benefits

★ **ANCAP (optional)**

1 - Right of use at the Capurro Hub to install the hydrogen production, storage and dispensing plant(*)

- Environmental Viability of Location in process (IDB Cooperation)
- Industrial zone
- Good area for loading trucks/buses

2 - Specialized operators, technicians and maintenance workshops as well as other services


(*) Rambla Baltasar Brum s/n
esquina Doroteo Enciso, Montevideo, Uruguay

Transport Pilot: Participation scheme

- The additional focused incentive may be granted through a trust or similar enabling legal figure, which allows the Awardee to benefit from the additional support under the conditions established (e.g. minimum mileage and periodic reports, unrestricted access to plant).
- The Offerers will compete for the technical conditions of their project and the minimum focused incentive required to develop the Project, in accordance with the terms and conditions of the competitive process.

Transport Pilot: Technical characteristics

- ★ **Type of vehicles:** At least 10 trucks and/or buses with the following minimum characteristics:
 - Trucks: 17 tons, Gross Weight (GW)
 - Buses: 9 meters long
- ★ Minimum distance of travel: annual average of 3,500 Km per day between all trucks/buses
- ★ Hydrogen production by electrolysis with power energy from the grid
- ★ **Plant capacity:** minimum of 1.5 MW of total nominal power of electrolysers
- ★ National and international environmental and safety requirements must be met when applying

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Other possible
projects
H₂U Pilot



Other possible H₂U pilot projects

- We are open to receive the interest of companies to include in the call the development of other pilot projects, such as Production of Ammonia / Green Fertilizers or other applications of Green Hydrogen
- A menu of specific electricity prices for other projects will be analyzed, which may include high availability of renewable electricity if the proposed project allows it at the required grid connection point



01

SCHEDULE

Request meeting, sending confidentiality agreement and notary certificate regarding the company and its representatives

20
APRIL

Virtual individual meetings
AM de UY (GMT - 3)

14
MAY

03

COMPETITIVE PROCESS

Second semester 2021, preparation of the call for proposals, regulatory adjustments, opening

02

PRIVATE INTERVIEWS

Exchange period and adjustments of framework and project concepts



Book agenda by writing to hidrogeno@miem.gub.uy





URUGUAY

Green Hydrogen
Country Strategy

we are ready
to drive the
**hydrogen
economy**



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Time for questions
and exchanges





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THANK YOU

H₂UPilot Project
April 8, 2021



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