



Uruguay:

Opportunities in the
Renewable Energy Sector



Uruguay #1 in LAC



Democracy Index
(Economist Intelligence Unit, 2019)

#1



Rule of Law Index
(World Justice Project, 2020)

#1



Low corruption perception
(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

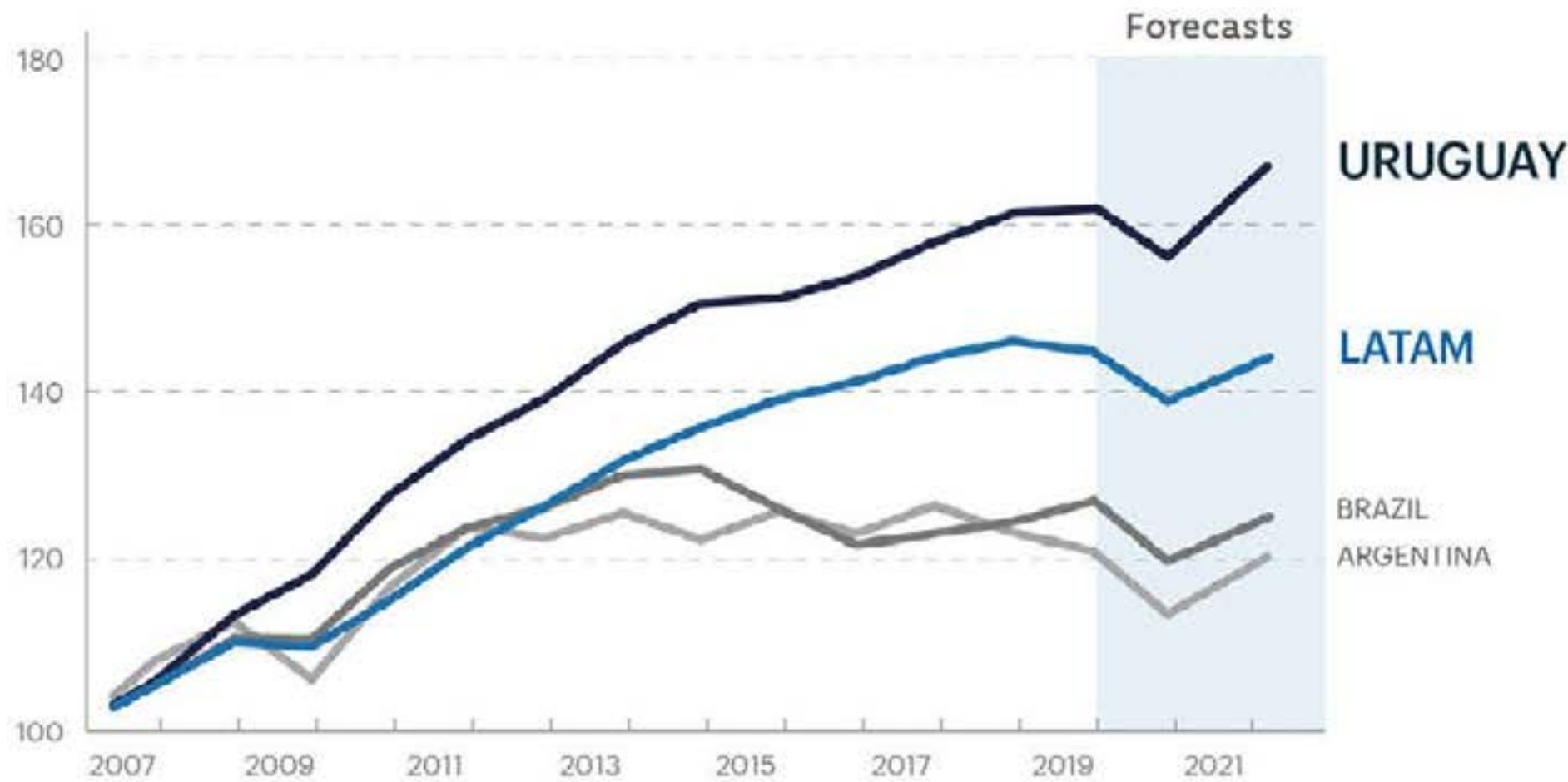
Global Freedom: 6th in the world

(Freedom House, 2020)



Steady & Stable growth

Accumulated real GDP growth
(Base index 100=2006)



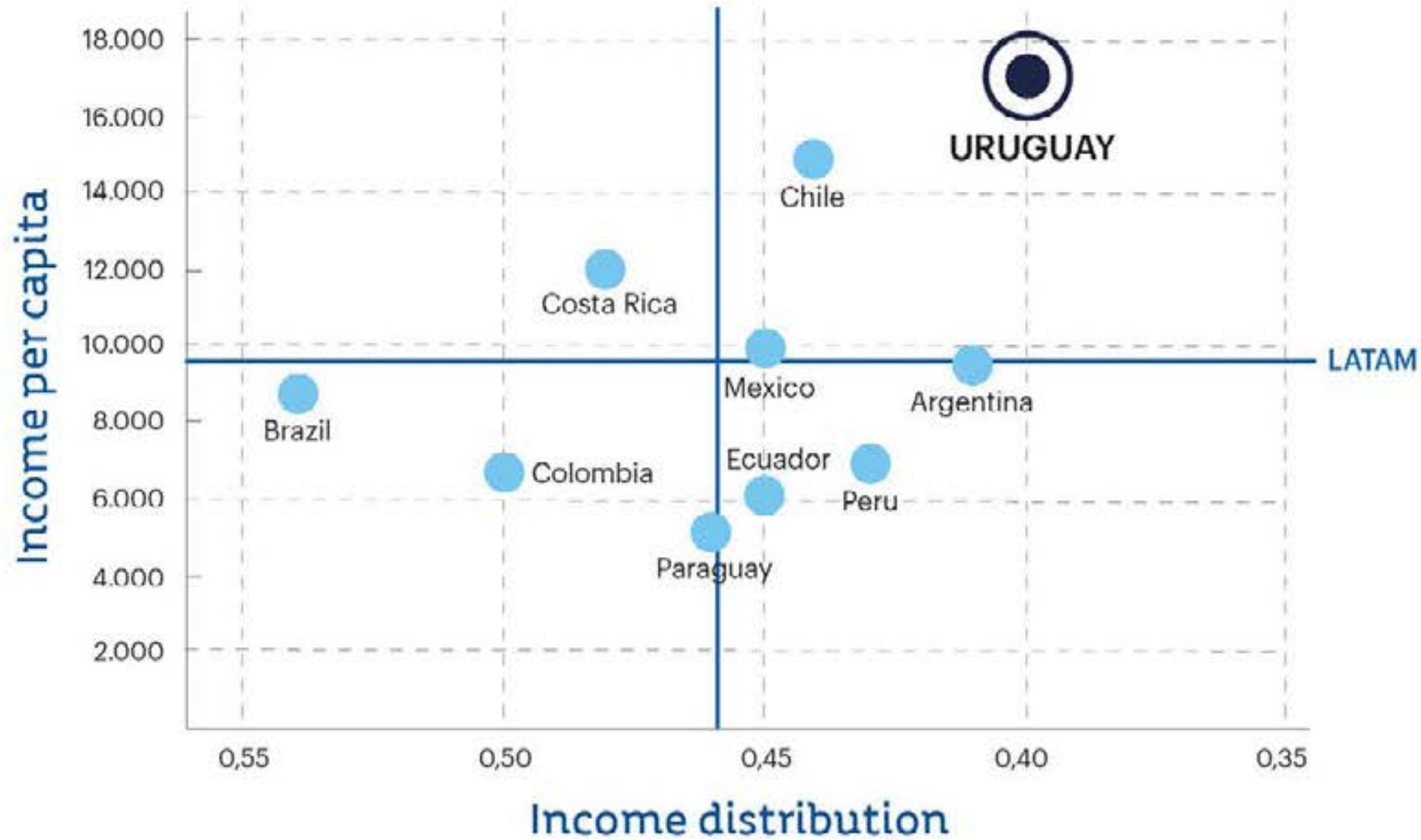
16 YEARS OF UNINTERRUPTED GROWTH

4.1% average

RESILIENCE TO EXTERNAL SHOCKS

Source: Uruguay XXI based on WEO, April 2020, IMF

Equitable growth



Investment grade



MOODY'S

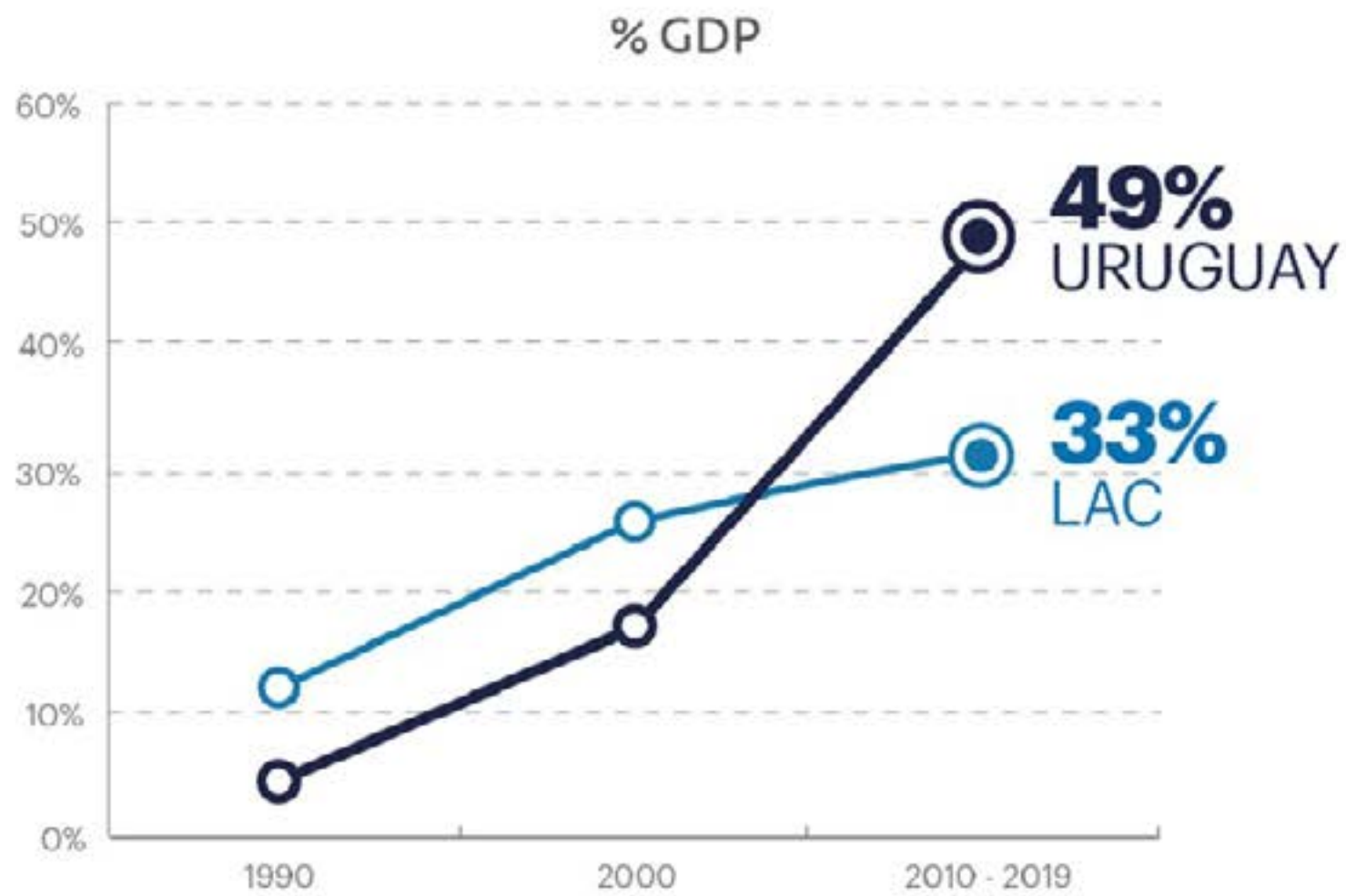
STANDARD
& POOR'S
The McGraw-Hill Companies

FitchRatings

R&I

DBRS

FDI Stock



MAIN ORIGINS



Argentina



Spain



Finland



USA



Switzerland

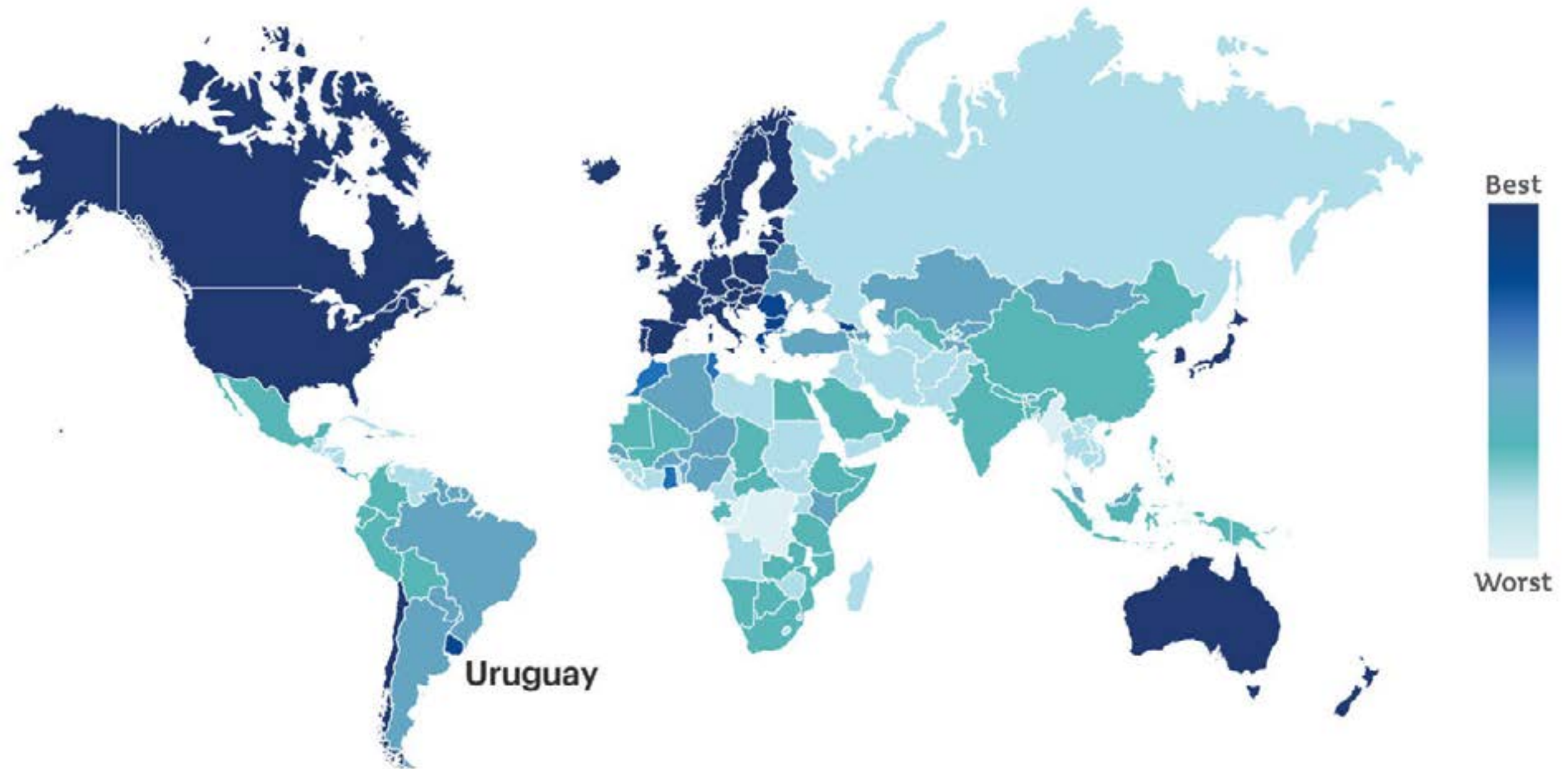


Chile

Source: Uruguay XXI based on UNCTAD and BCU (2019)

Highest performance in ESG factors

Environment · Social · Governance



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

Exports at a glance



Agribusiness and food

49%

Beef, Livestock,
Meat-by-products, Fish

Paper Pulp, Wood

Soy, Malt, Rice, Citrus

Dairy, Beverage concentrate

Wool, Leather, Textile

Global Services and Trading

21%

IT
Business
Trading
Financial
Creative
R&D

Tourism

13%

Tourism

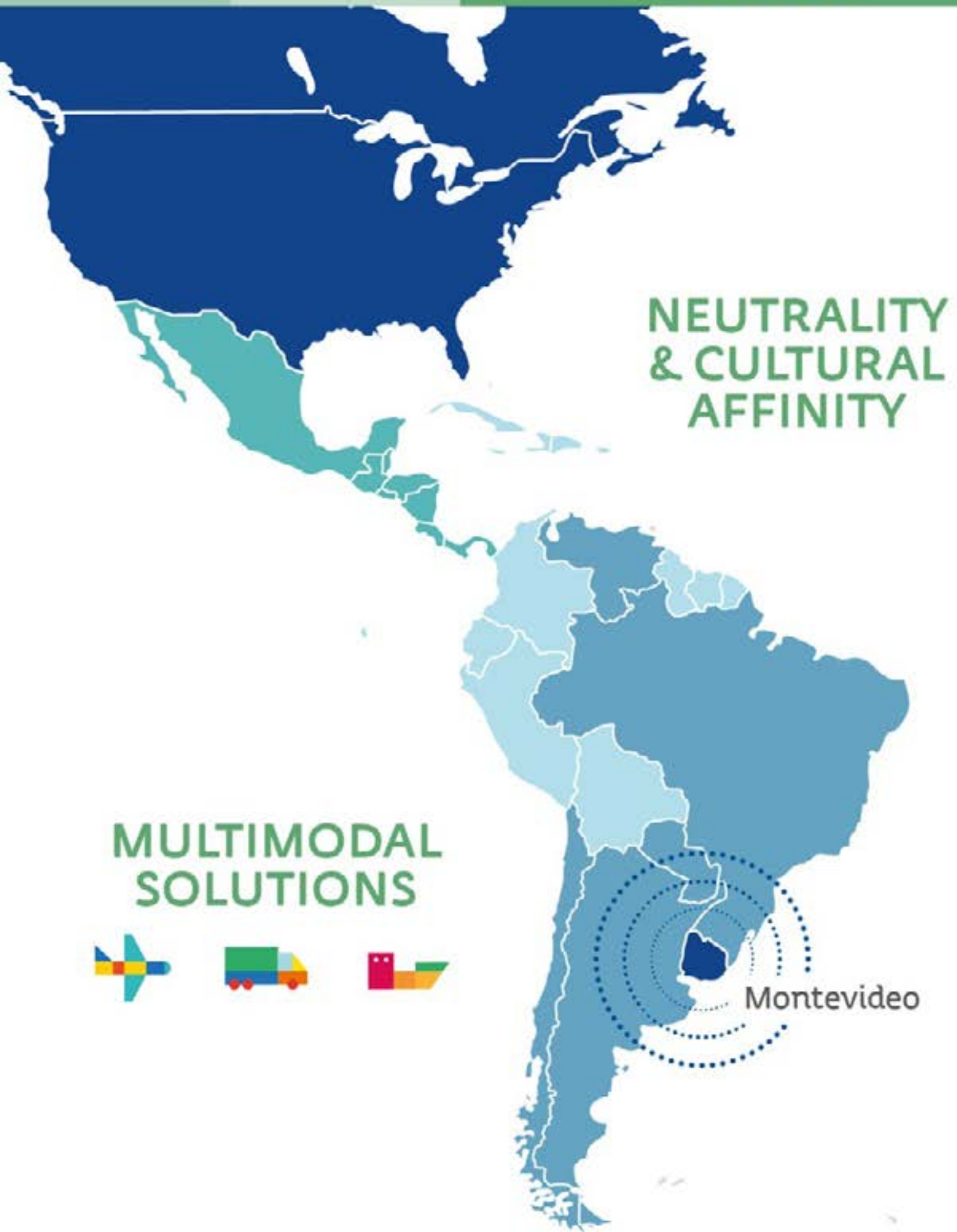
17%

Others

Autoparts

Easy for business





NEUTRALITY
& CULTURAL
AFFINITY

MULTIMODAL
SOLUTIONS



INTERMEDIATE
TIME ZONE



New York
GMT -4



Uruguay
GMT -3



London
GMT +1

TRADE AGREEMENTS
MERCOSUR
MEXICO
EUROPEAN UNION

DOUBLE TAXATION
& SERVICES
AGREEMENTS
NETWORK

Leader in communications

#1 in Latin America



Internet penetration
- fixed broadband
(International Telecommunication Union)

#1



% of homes connected
by optical fiber

#1



Adoption of IT
(World Economic Forum)

#1



% of companies
connected by optical fiber

#1



Digital Nations member
(World's leading digital
governments)

#1



E-Government
Development Index
(United Nations, 2020)

#1



#1

literacy rate in
Latin America: 98%

Free
access to
education
at all levels

225.000
technical and
university
students

17%
STEM
talent

60%
work and
study

56
educational
institutions
(technical and
university)

#1

The best quality of life in
Latin America
(Mercer, 2019)



Uruguay

LIVE THE
EXPERIENCE

liveinuruguay.uy



Health



Education









Commuting



Recreation

Investment Promotion Incentives

 <p>LOGISTICS & DISTRIBUTION Cross-docking Postponement</p>	 <p>COMMERCE & SERVICES Sales - Trading - Procurement Shared Serv. Cent. - Holding</p>	 <p>INNOVATION IT solutions / R&D</p>	 <p>PRODUCTION Manufacturing</p>
<p>FREE PORT & AIRPORT LAW Goods exempt from domestic taxes and Customs duties</p>	<p>TRADING CIT 0,75%</p> <p>SSC / CCR CIT 2-8%</p>	<p>SOFTWARE CIT 0%</p> <p>INNOVATION Tax credit up to 45% of the eligible R&D project costs</p>	<p>EXPORT TAX REFUND 3 - 6% of FOB value</p> <p>TEMPORARY ADMISSION VAT & Customs duties exempt</p>
<p>INVESTMENT PROMOTION LAW SCIENTIFIC & INDUSTRIAL PARKS LAW CIT exemption up to 100% of investment</p>		 <p>ELECTRIC VEHICLES</p>	 <p>BIOFUELS</p>
<p>FREE TRADE ZONE LAW 0% CIT and Customs duties · Special tax and pension regime for expats</p>			

Uruguay is largely compliant with OECD standards

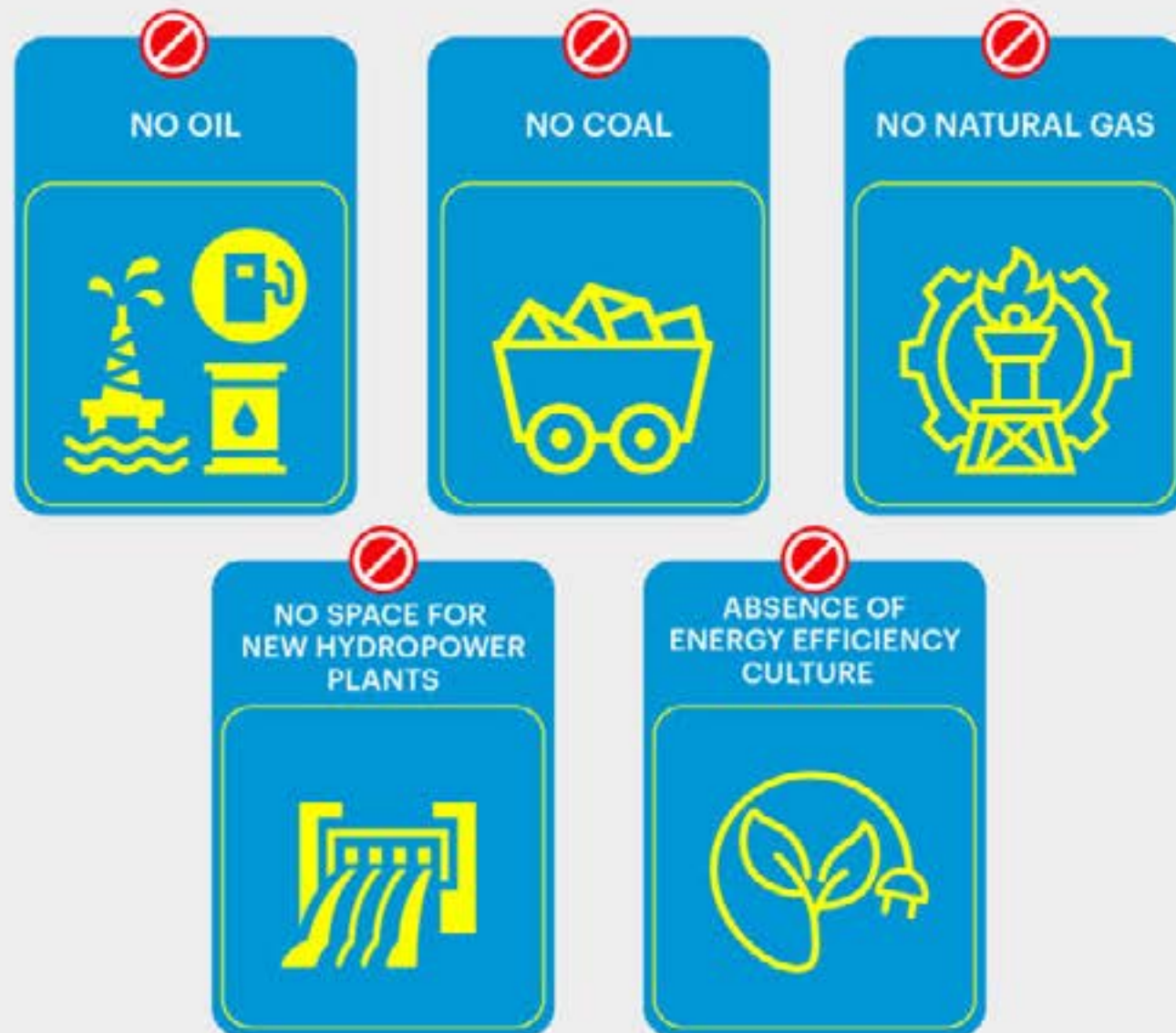


Energy framework and historical background



Energy Framework and Historical Background

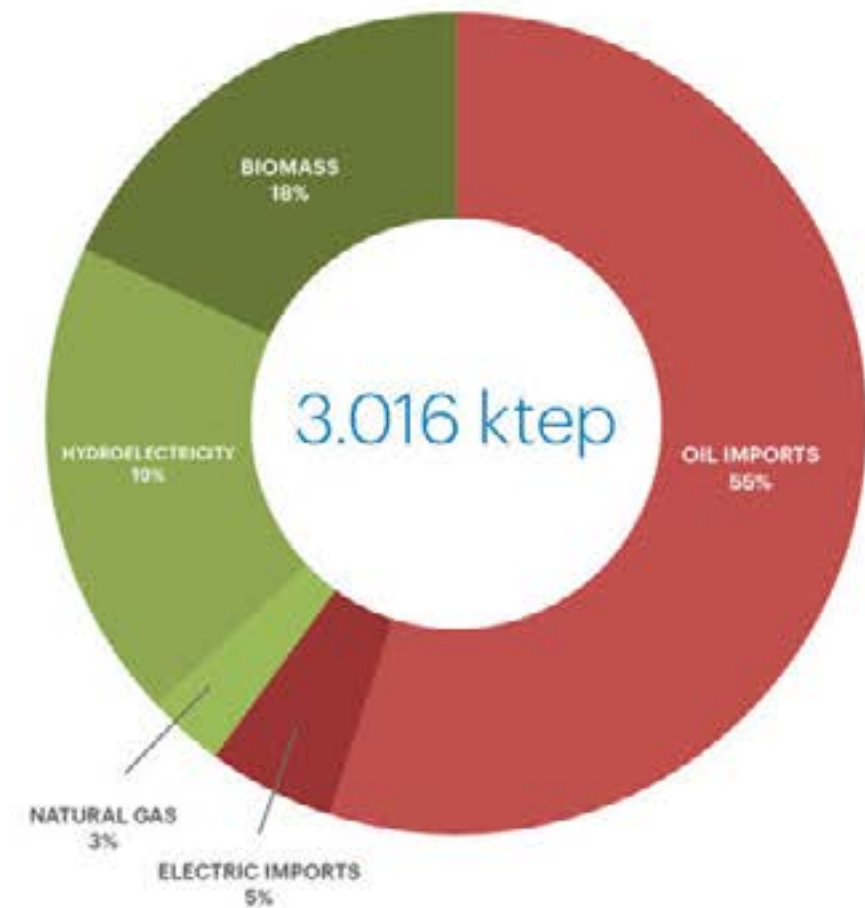
Energy sector in Uruguay



GENERAL INFORMATION:

MEAN ANNUAL POWER DEMAND:	1.100 MW
ELECTRIFICATION RATE:	99,8”%
PEAK POWER DEMAND:	2.088 MW (SUMMER 2020)
STRONGLY INTERCONNECTED:	ARGENTINA & BRASIL

2005



63% IMPORTED
37% LOCALLY GENERATED



Energy Policy “Uruguay 2030”

2008: New Energy Policy approved by the Government

2010: State Policy
Ratified by special committee including **all political parties in the Congress**

2020: State Policy adaptation & ratification
Multidimensional and integrated vision, including technological, economic, environmental, ethical and social issues .



Strategic Guidelines



INSTITUTIONAL:

Leading role of the state including regulated participation of private actors.



ENERGY SUPPLY:

Diversification of the energy mix in order to reduce the proportion of oil imports. Increasing domestic resources, promoting non-traditional renewable energy, building local capacity and maintaining a low carbon footprint.



ENERGY DEMAND:

Promotion of energy efficiency in all activities sectors.



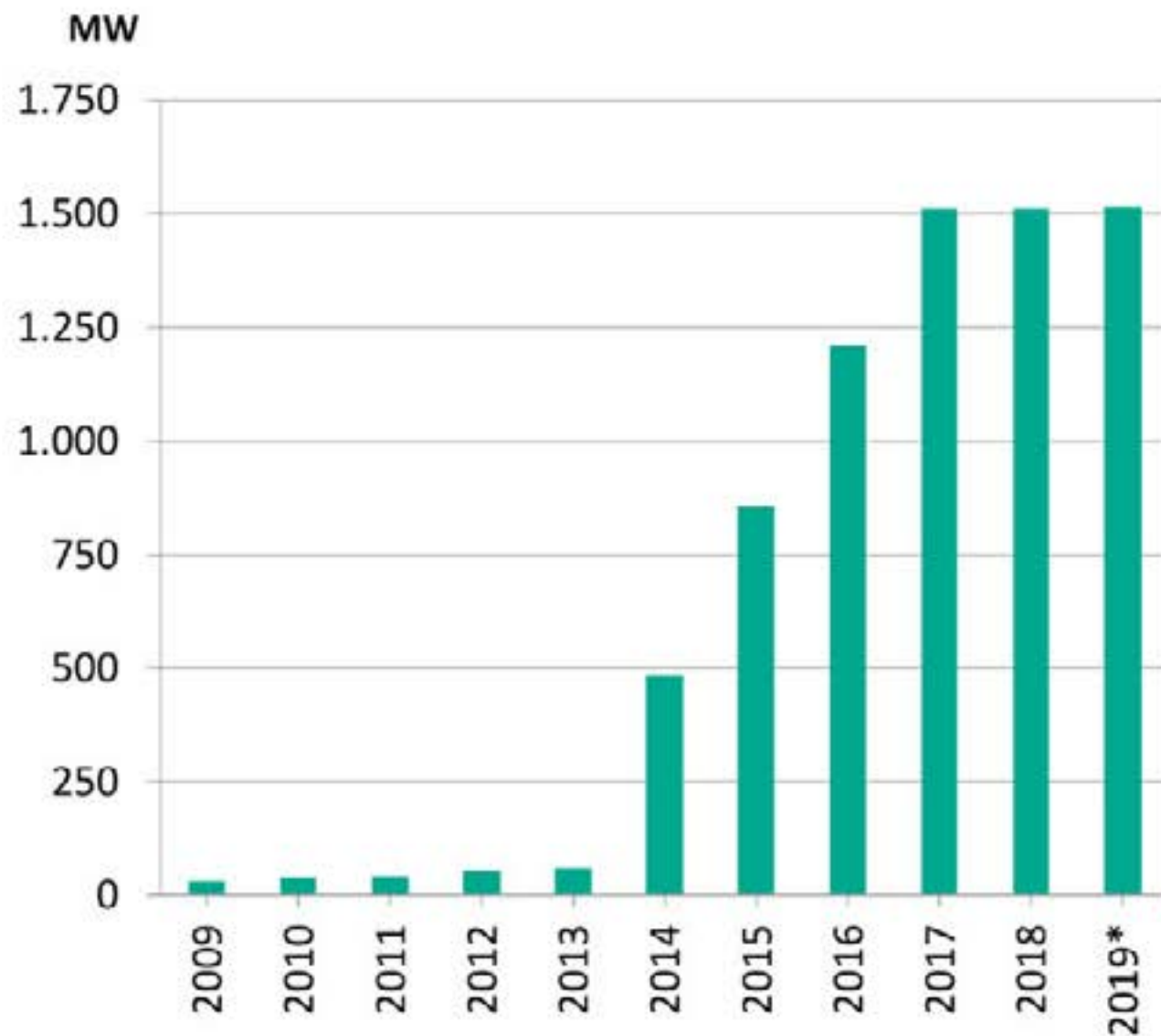
SOCIAL:

Adequate energy access to all citizens as a human right.



Wind Energy

Installed Wind Energy Power (MW)



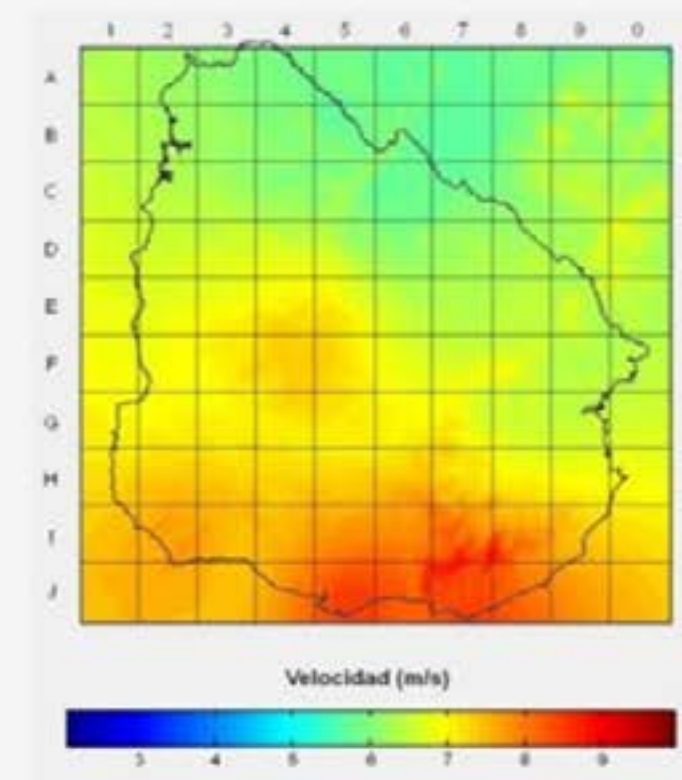
Source: DNE-BEN Preliminary 2019*

0 MW IN 2007 TO 1.514 MW IN 2019

- WIND POWER MAP, 2009
- COMPLEMENTARY WITH HYDRO
- TENDER PROCESS / PPA, 20 YEARS
- YEAR 2019: 1.514 MW (33,6% ELECTRICITY FROM WIND POWER)
- 20% - 44% LOCAL PARTICIPATION

EQUAL ANNUAL AVERAGE SPEED

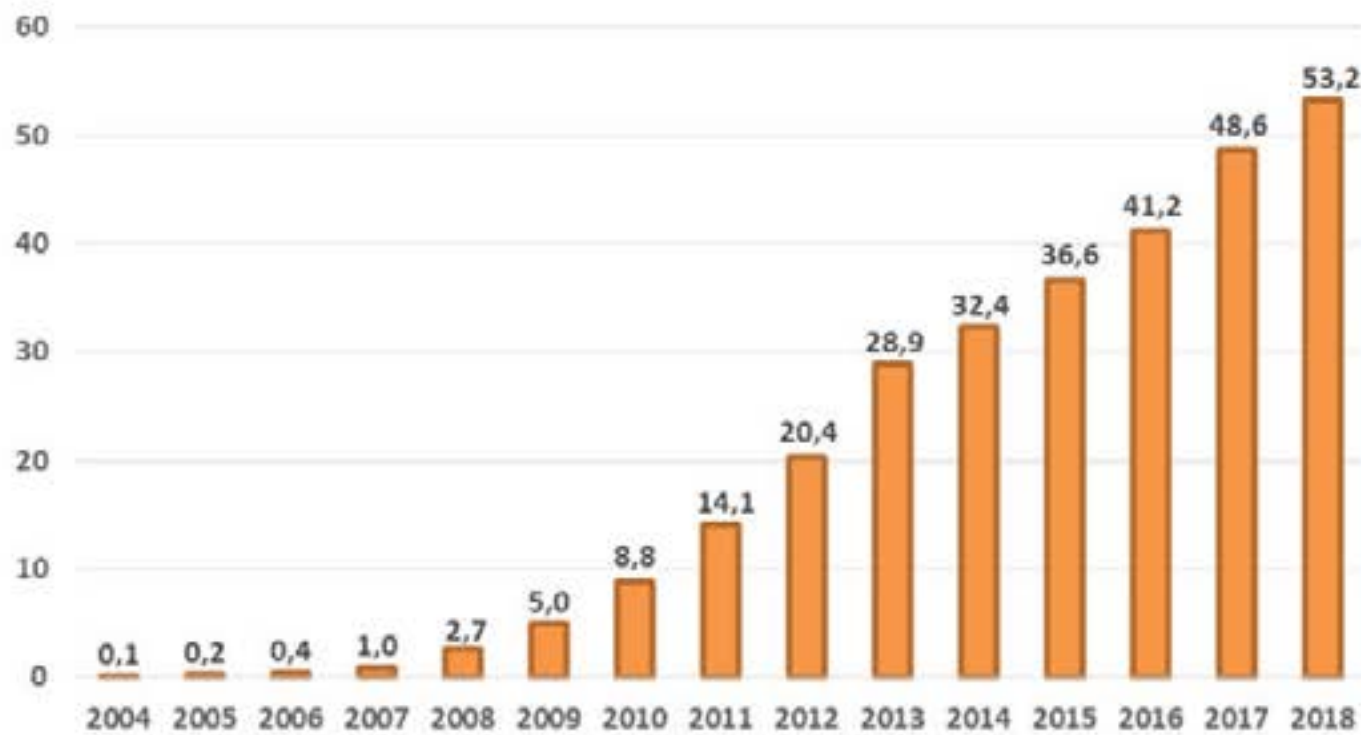
HEIGHT: 90 M



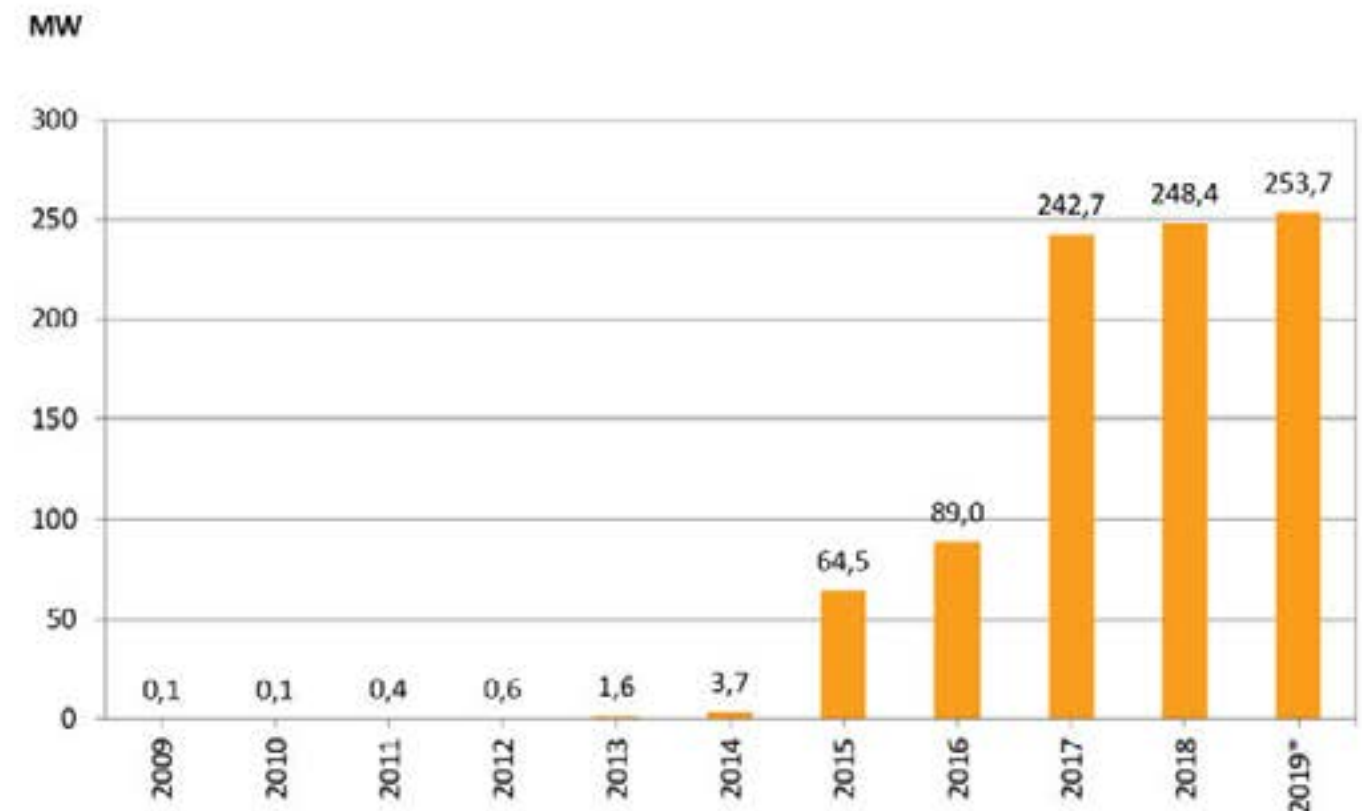
Solar Energy

Solar Thermal

Installed capacity of Solar Thermal Energy (MWth)



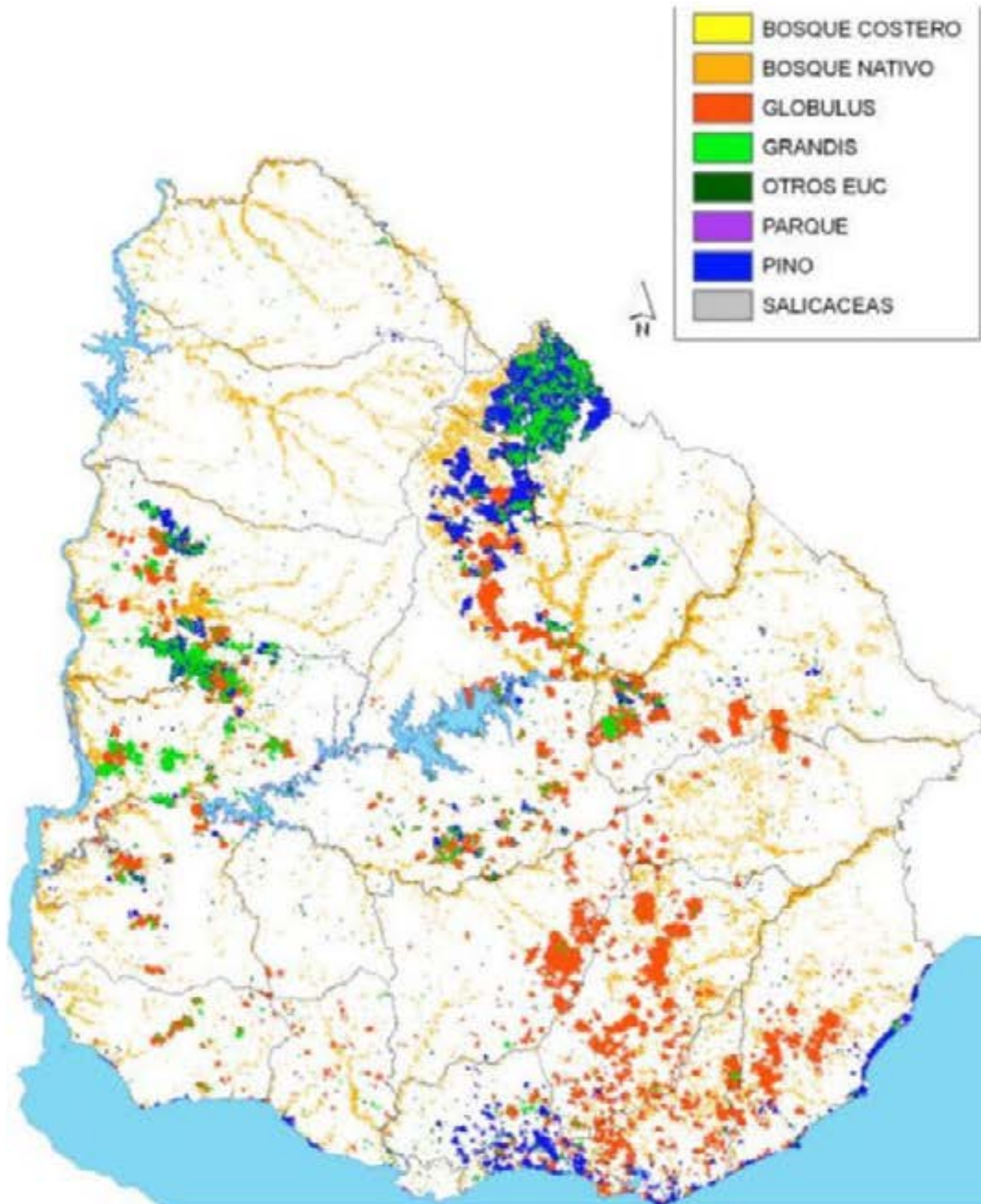
Installed Solar Power (MW)



Source: DNE-BEN Preliminary 2019*



Biomass



425 MW INSTALLED

- RAW MATERIALS: FORESTRY RESIDUES, RICE HUSKS, BAGASSE, BLACK LIQUOR
- 50% - 60% NATIONAL COMPONENT

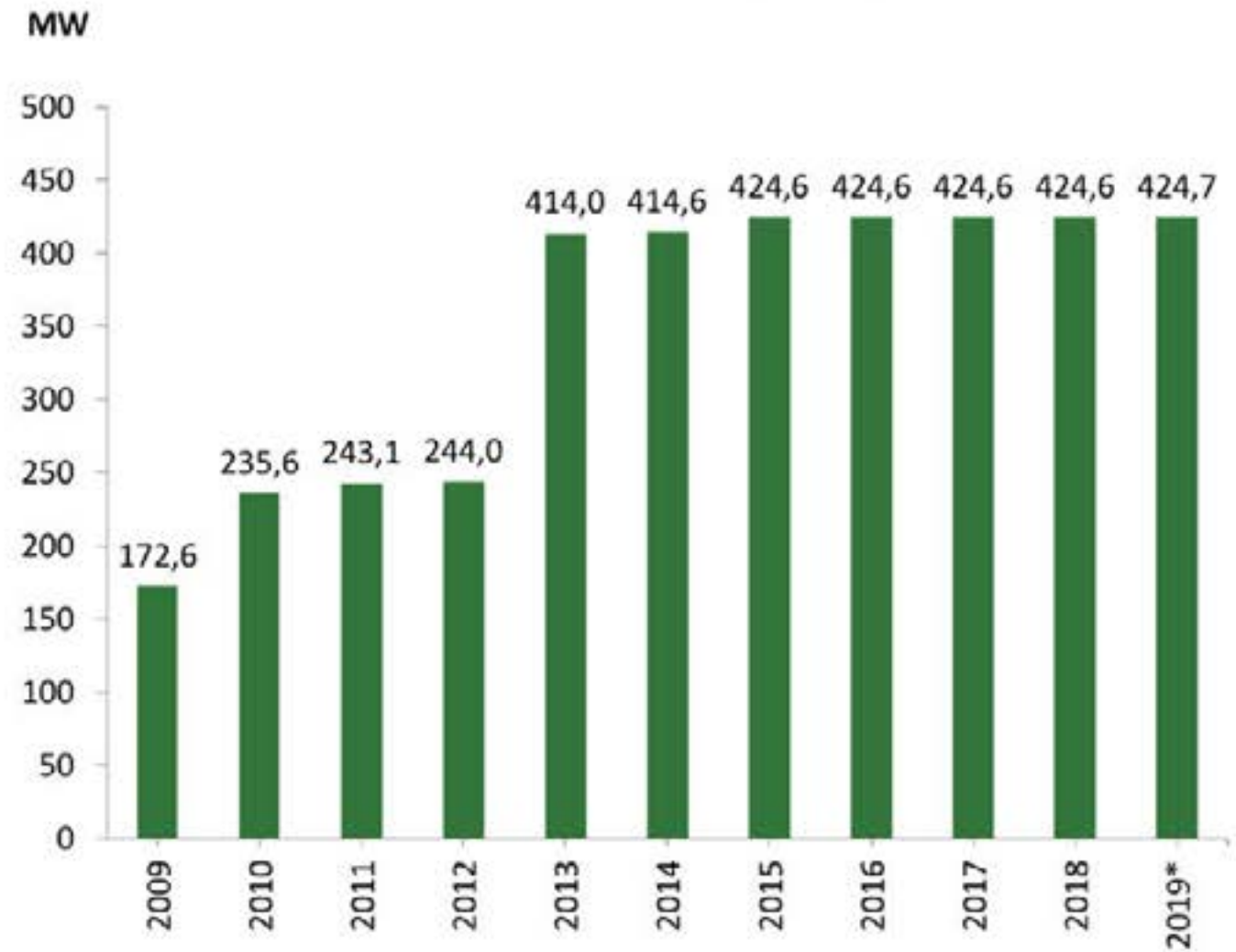


Biomass

Operating Biomass Plants



Installed power (MW)



Bioenergy: waste valorization



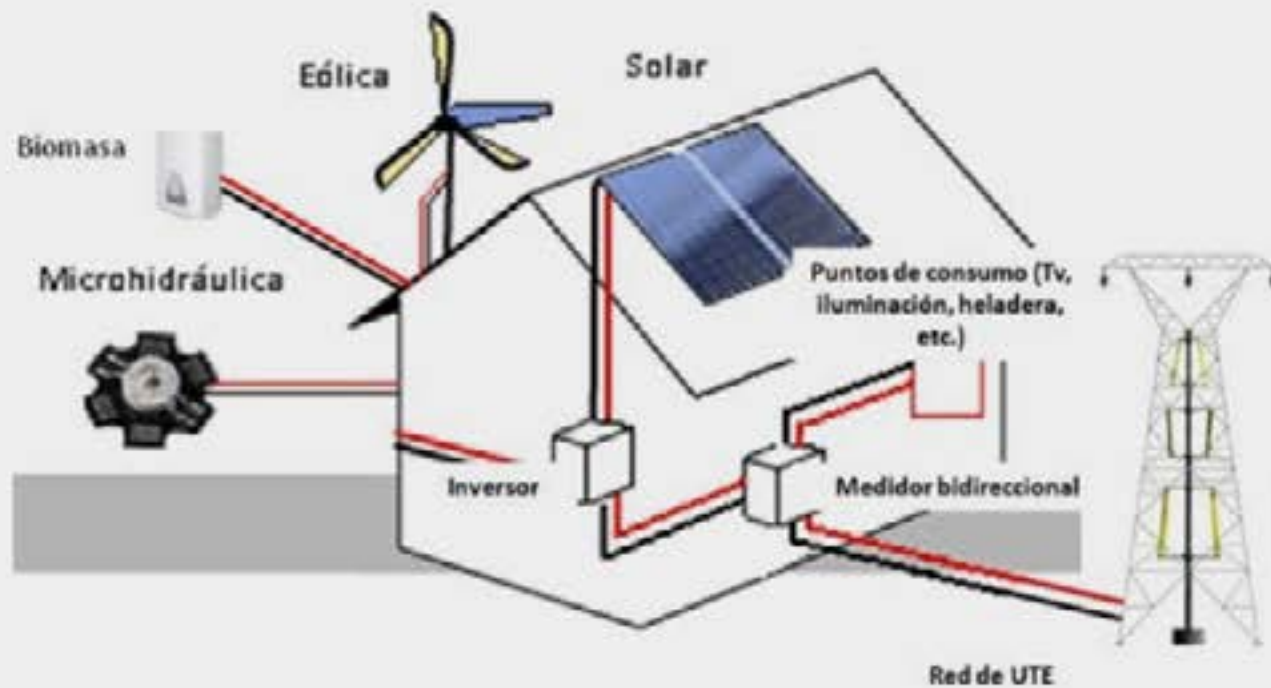
- COMPOSTING
- USE OF REFRIGERATOR WASTE
- ALTERNATIVE FUELS
- OTHER CIRCULAR ECONOMY INITIATIVES



Microgeneration

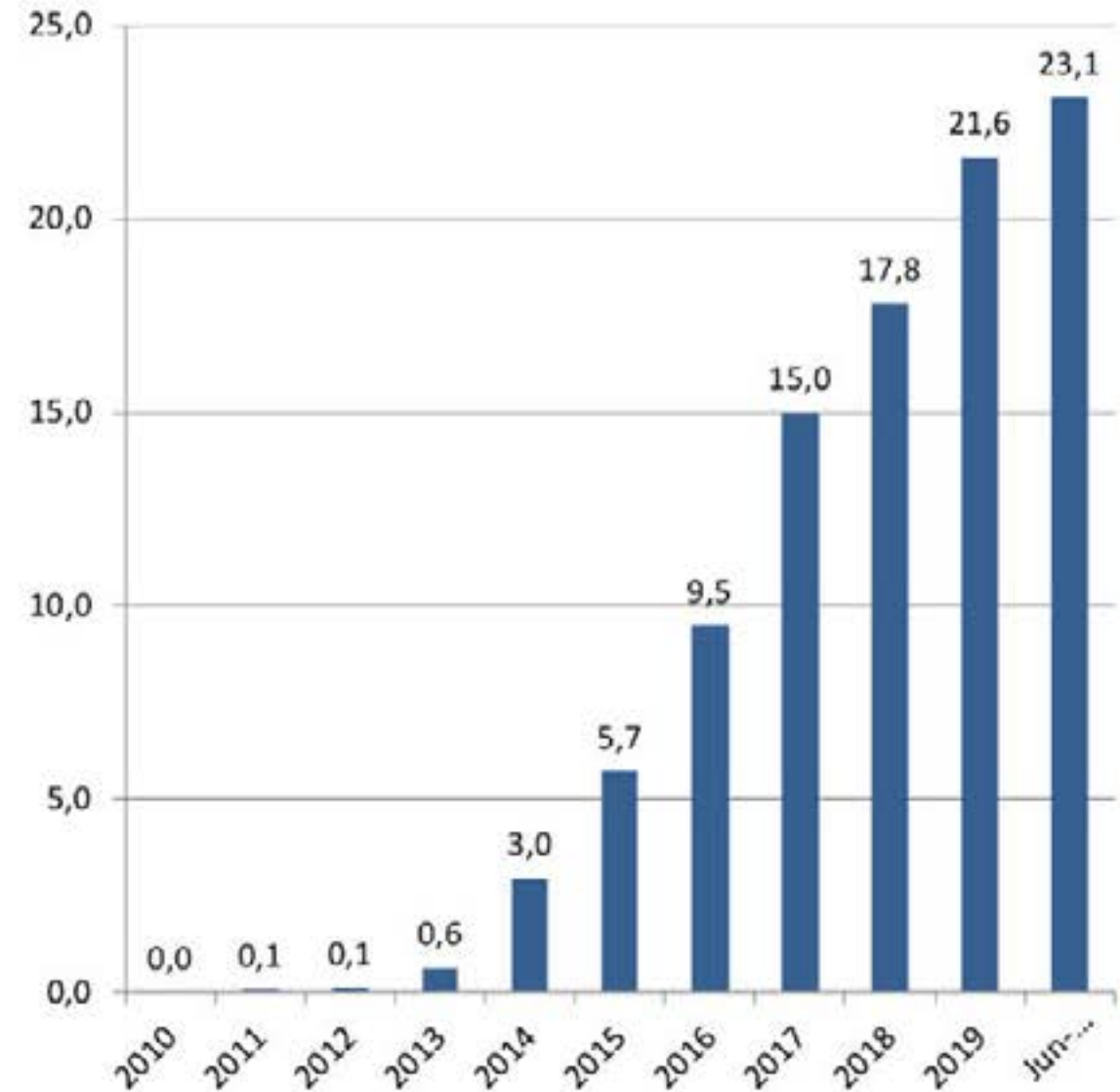
2010:

Uruguay enabled grid-connected renewable microgeneration.
(Net metering contract)



- MAXIMUM POWER 150 KW
- LOW TENSION CONECTION

Accumulated power (MWth)



Self-consumption

NEW REGULATORY FRAMEWORK OF THE NATIONAL ELECTRICITY SYSTEM

- PROSUMERS (GENERATES AND CONSUMES ELECTRICITY)
- NOT ALLOWED TO INJECT ELECTRICITY TO THE GRID (ONLY SELF CONSUMPTION)
- CUSTOMER REMAINS REGULATED
Decree 114/2014 and 27/2020





Impacts of Energy Policy



Energy sources: Uruguay: #2 in the world in renewable energies



Environmental
Performance Index

#3



Lowest greenhouse
gas emitter

#6

HYDRAULIC	50%
WIND	30%
BIOMASS	15%
PHOTOVOLTAIC	3%

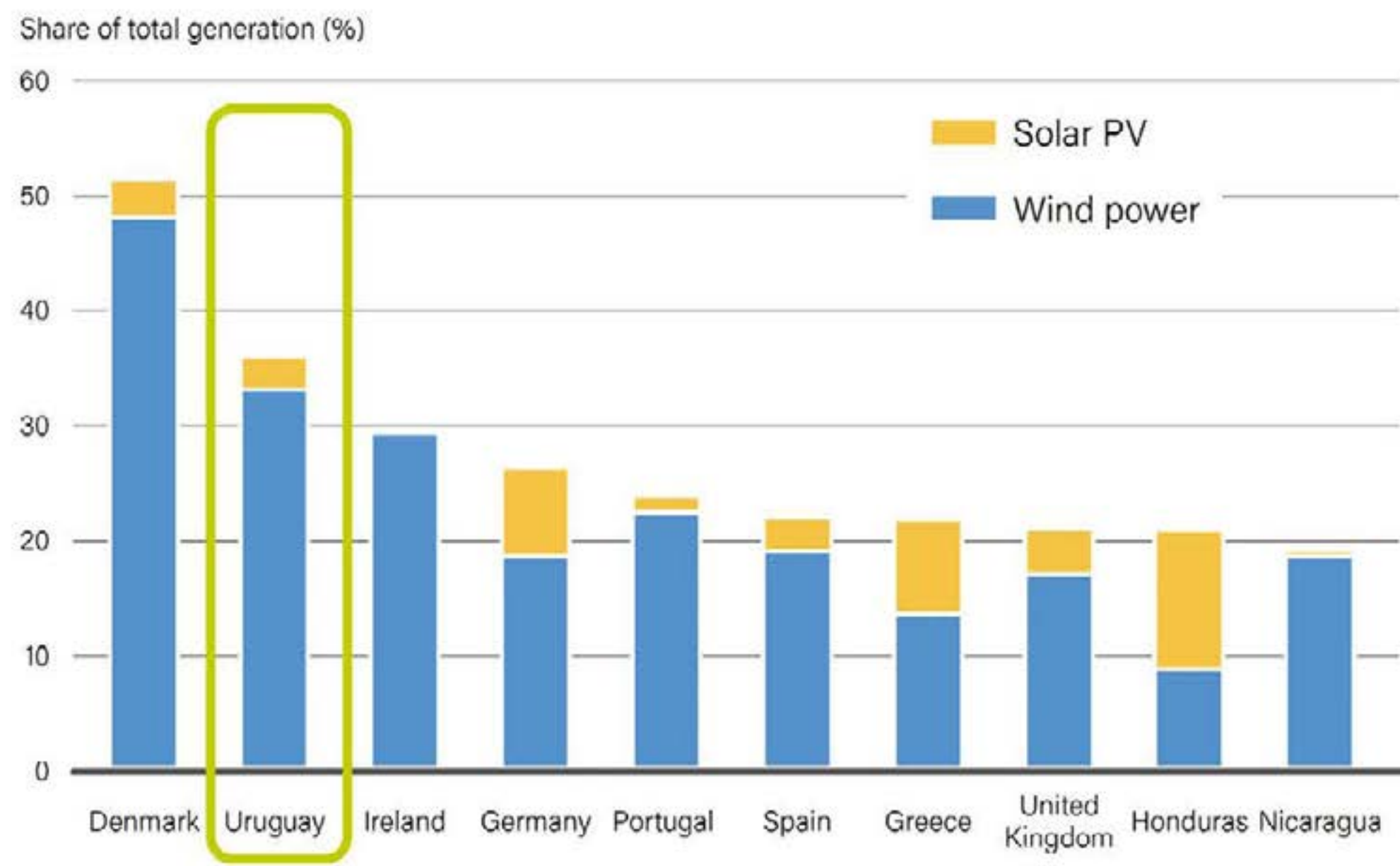
98%
renewable

TOTAL ENERGY PRODUCED IN 2019:

16.088 GWh

Uruguay in the international context

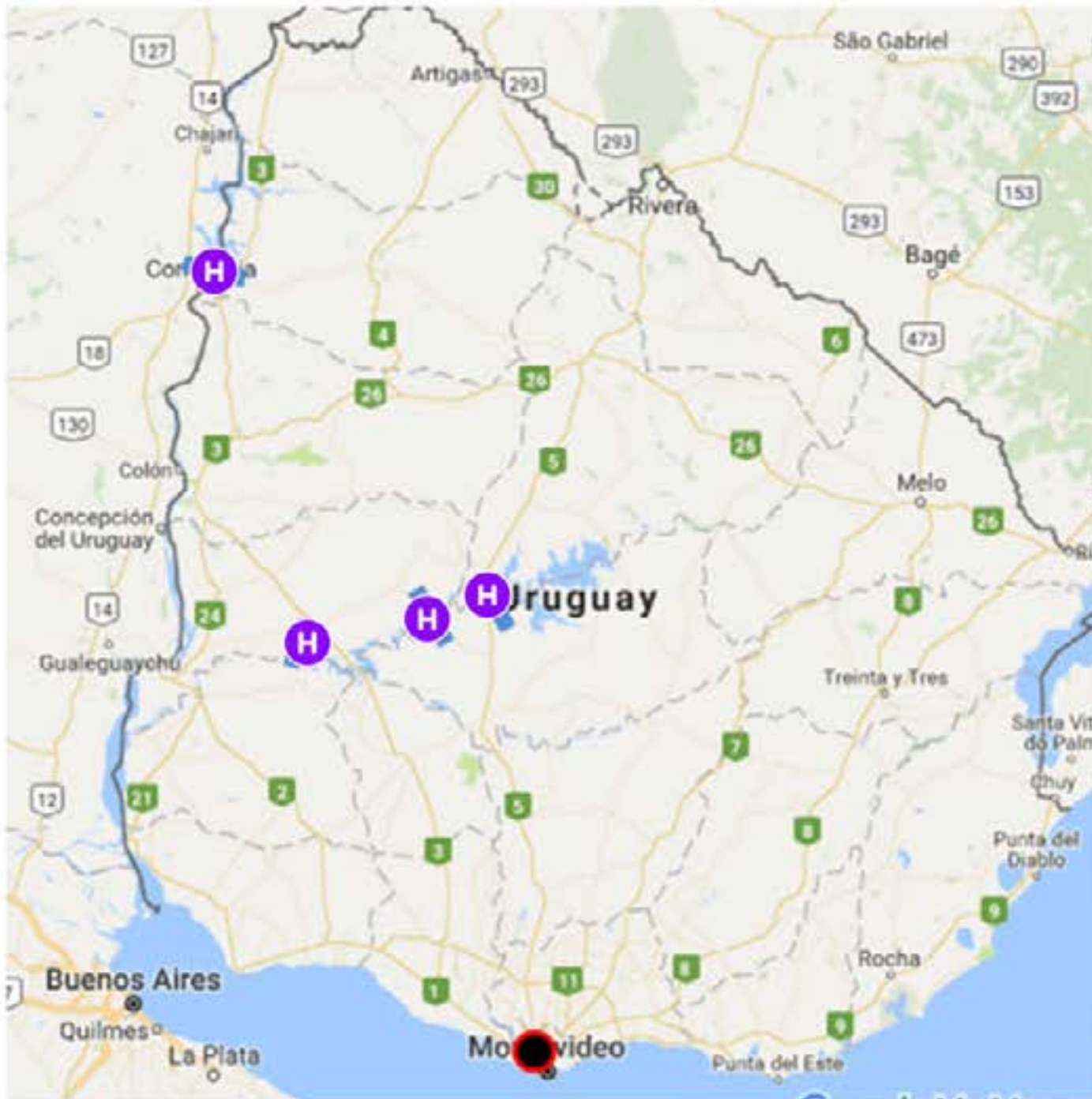
Share of Electricity Generation from Variable Renewable Energy
Top 10 Countries



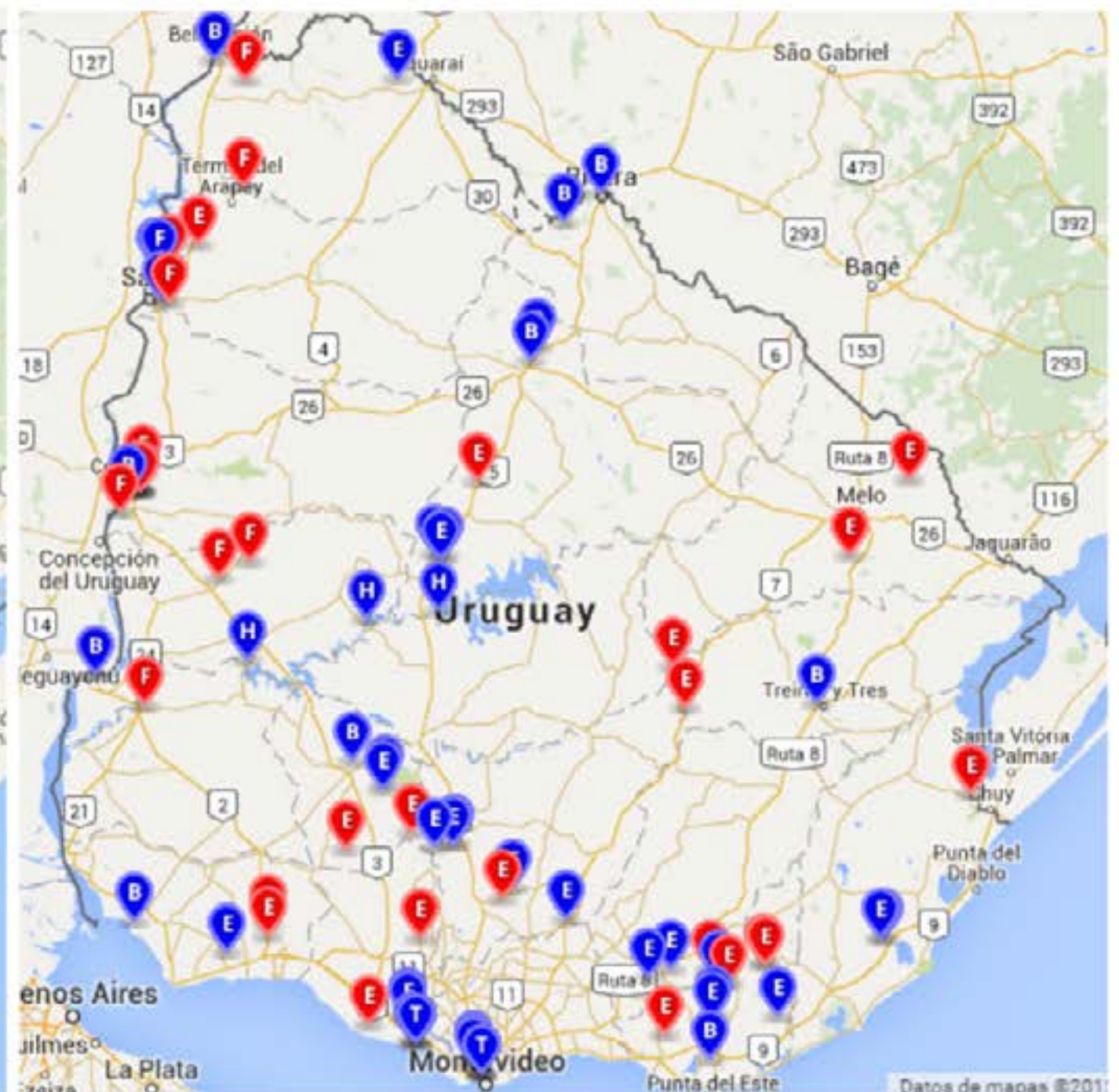
Note: This figure includes the top 10 countries according to the best available data known to REN21 at the time of publication.

Energy Supply

Power Generation
(before)



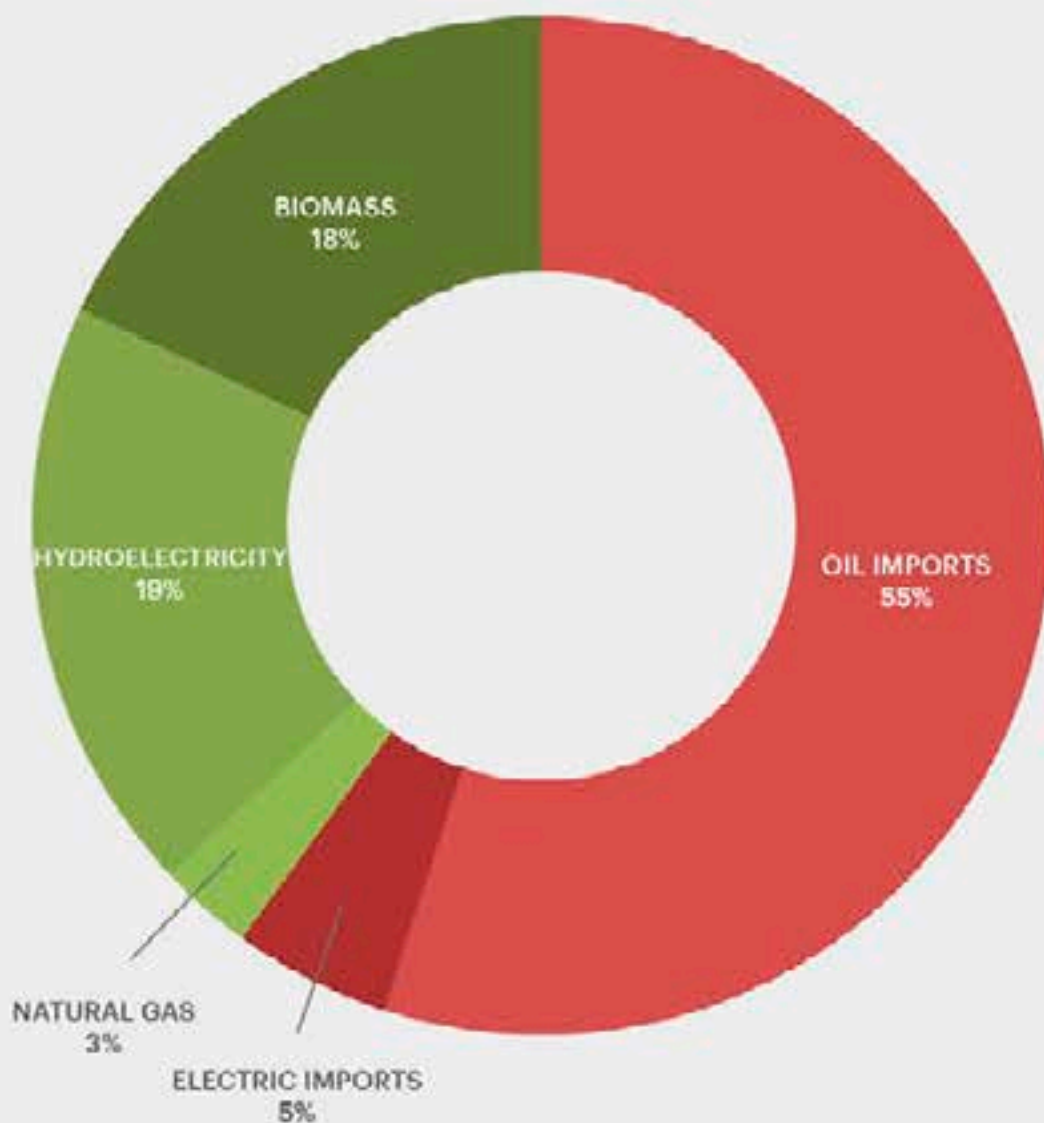
Distributed Power Generation
(now)



Energy Supply Matrix

2005

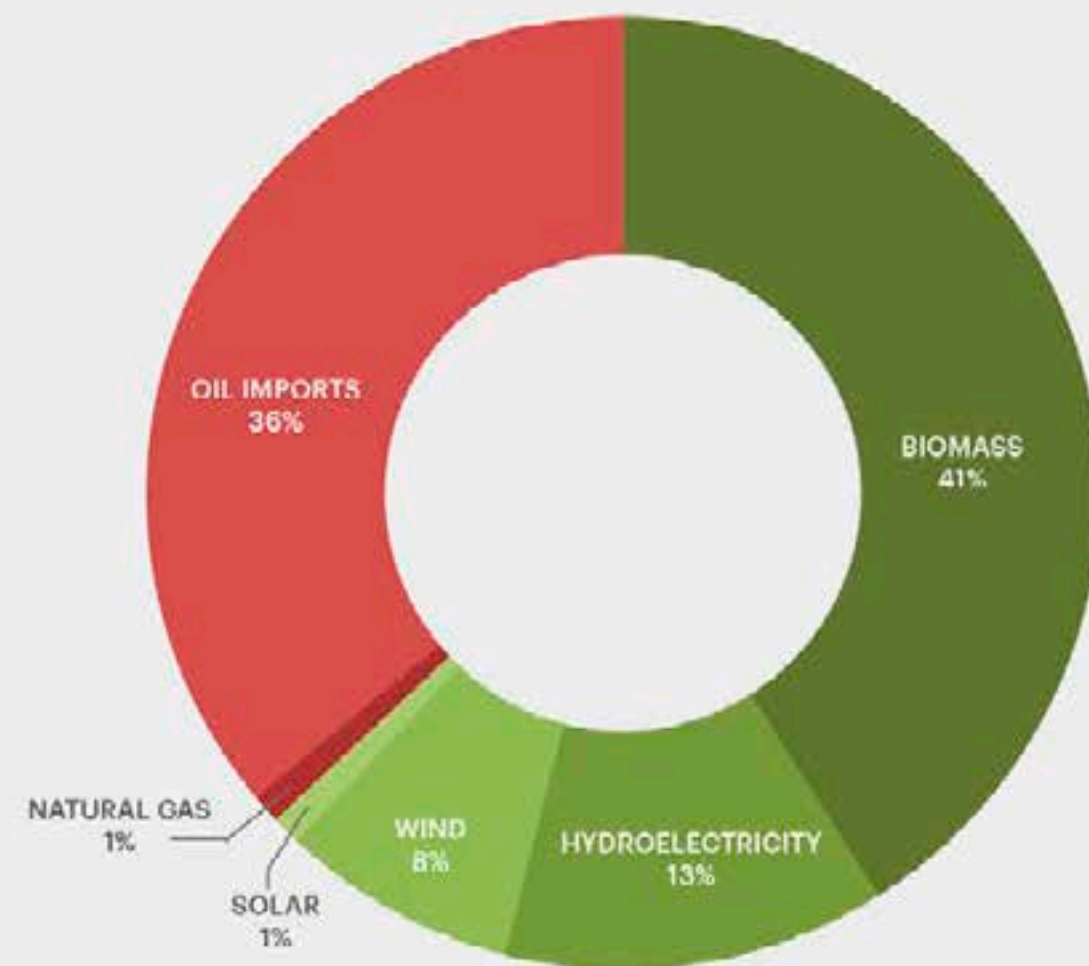
3.016 ktep



63% IMPORTED
37% LOCALLY GENERATED

2019

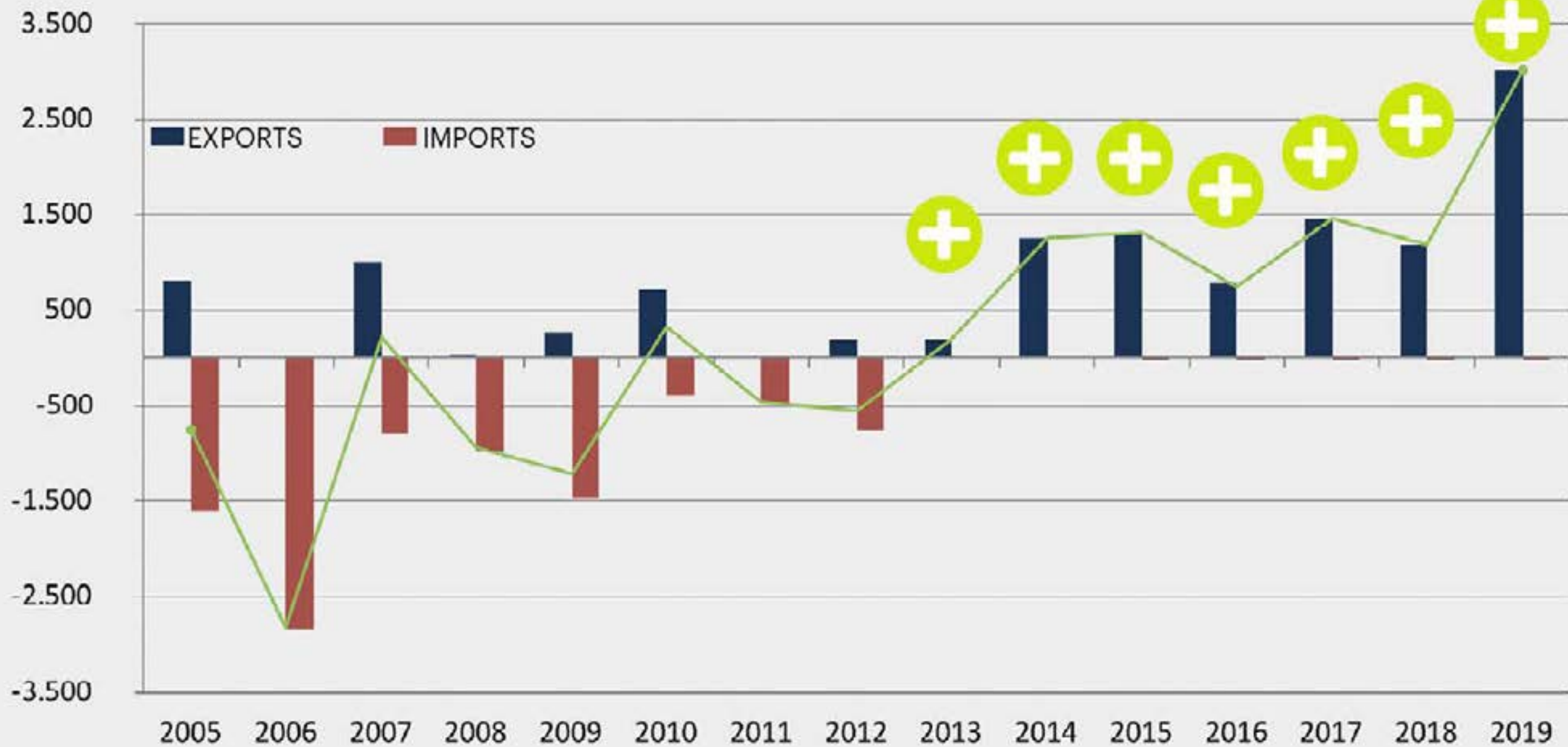
5.401 ktep



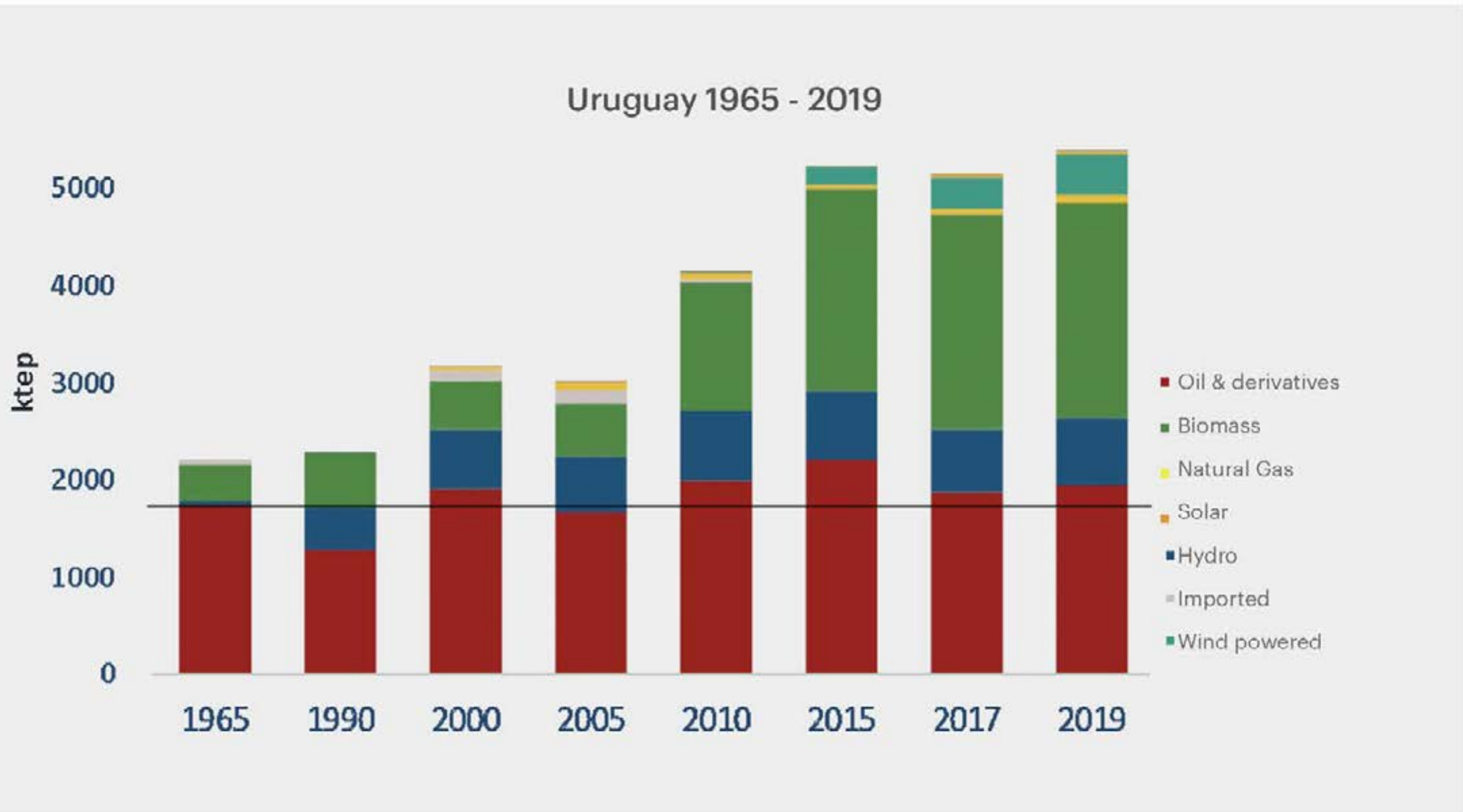
37% IMPORTED
63% LOCALLY GENERATED

Regional Energy Exporter

Electricity Exports and Imports (GWh)



The same oil consumption for the last 55 years





Commitment to energy efficiency



Government commitment



**Transport
Efficiency**



**Industry
Efficiency**

- Progressive electrification
- Energy efficiency law
- First national electric route



URUGUAY'S OPPORTUNITIES IN GREEN ENERGY

SUBSTANTIAL GROWTH IN THE RENEWABLE ELECTRIC MATRIX:

1. **Optimizing** complementarity in renewable energies
2. Better management of **energy demand and storage**
3. Use of **renewable energy surplus** in industry
4. Jump to the next level in the **export of green hydrogen**





Opportunity:

Uruguay as a Green H₂ exporter



Solar and Wind Resource

In Uruguay we have very good wind and solar combined resource.

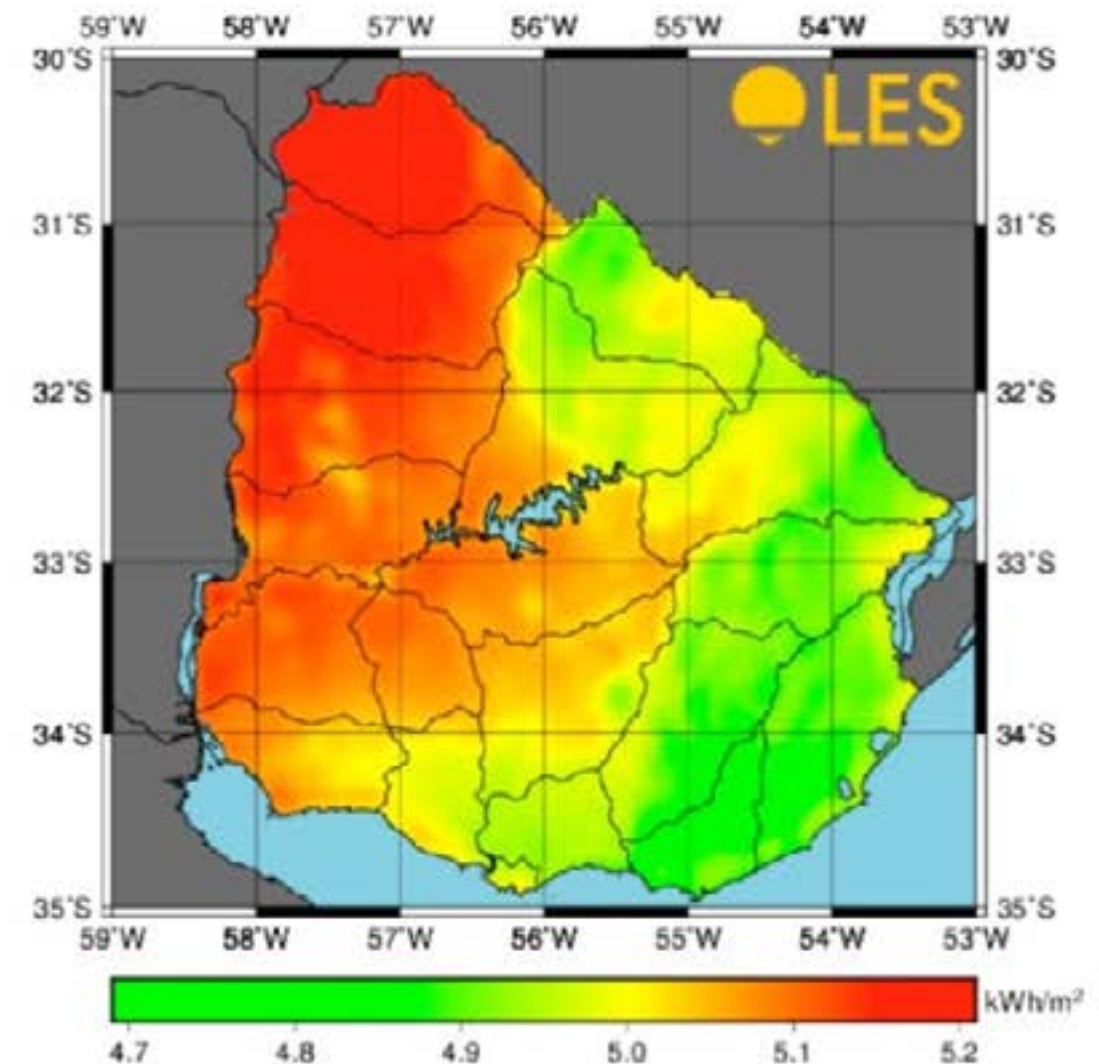
According to research carried out by the School of Engineering of the University of the Republic (Universidad de la República - UdelaR), there is a very good daily complementarity between wind and solar energy in Uruguay, achieving capacity factors close to 60% for combined wind/solar onshore plants.



**SOLAR POTENTIAL IN 5% OF URUGUAY'S LAND
AREA: 450 GW**



**WIND POTENTIAL IN 5% OF URUGUAY'S LAND
AREA: 30 GW**



Off Shore Wind

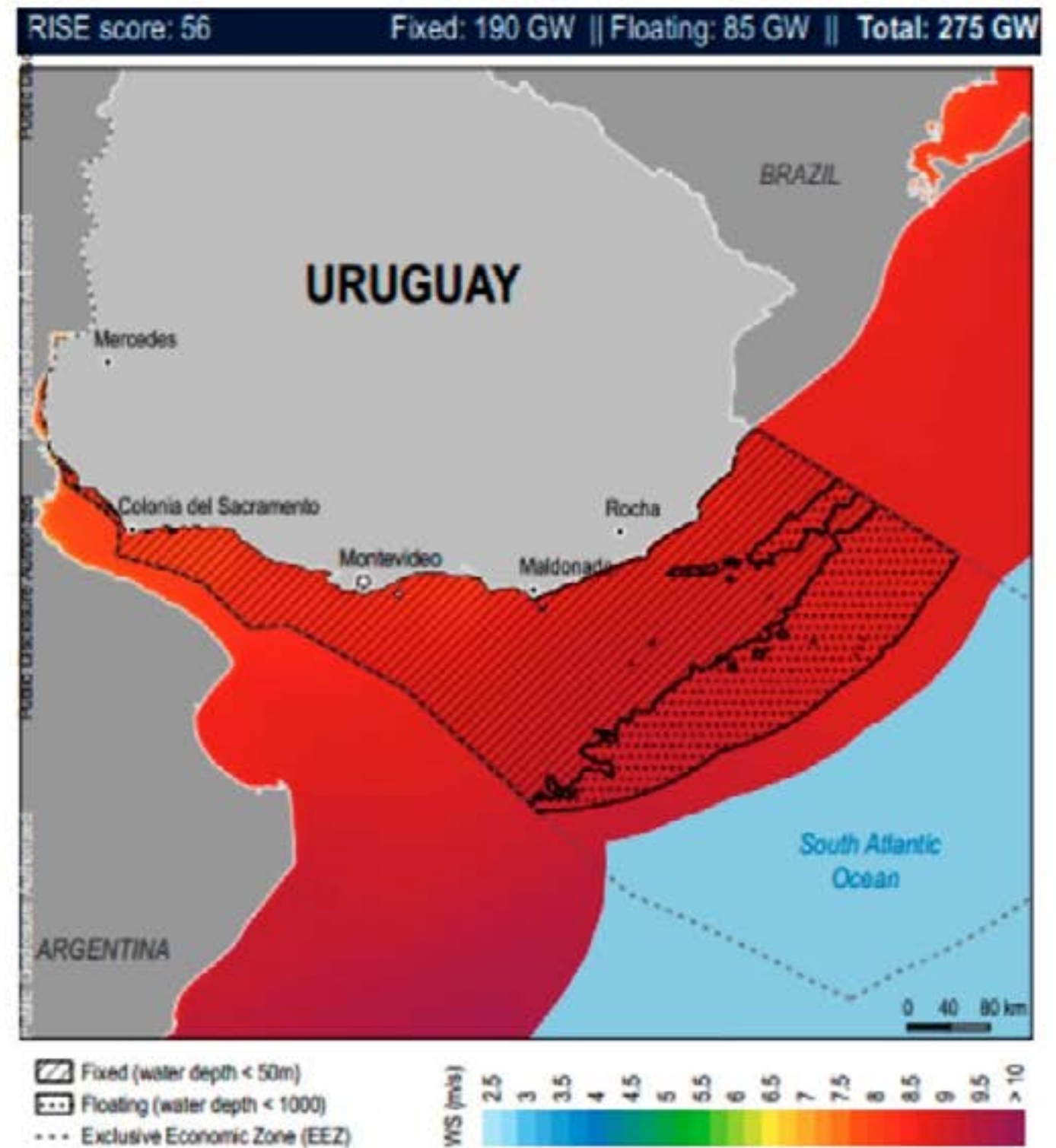
Uruguay has a Maritime area of 208.057 km²



POTENTIAL (ESMAP & WORLD BANK): 275 GW

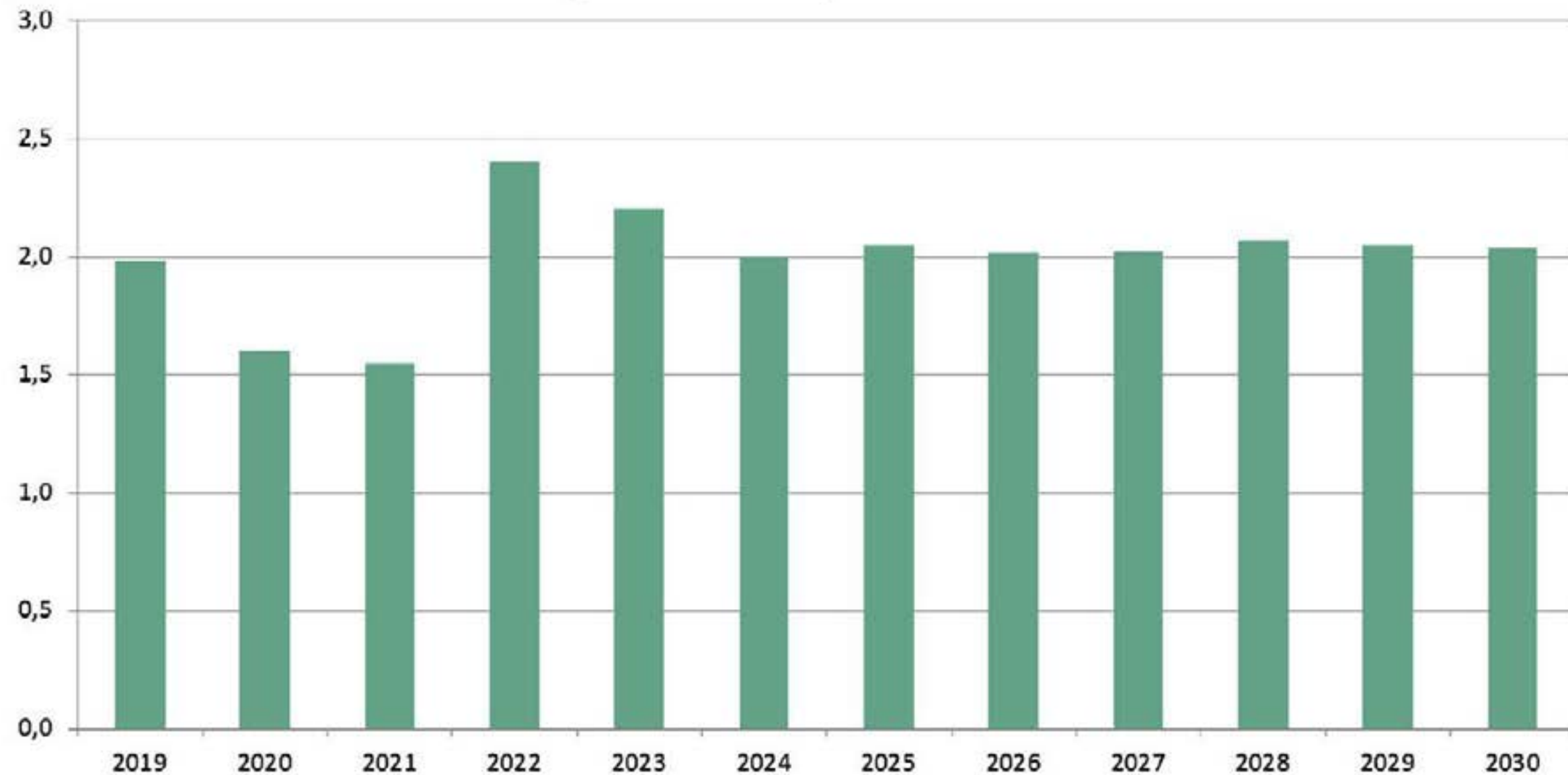
FACTOR CAPACITY APPROX.: 55%

WITH ONE QUARTER OF THE POTENTIAL: 69 GW WE CAN PRODUCE 5 MTPA OF HYDROGEN



Electricity surplus

Characterization of surpluses
Average annual surpluses in TWh



The Uruguayan electricity system will structurally generate 20% surplus energy (not taken by demand) by 2034.

Green hydrogen production for less than USD 2 per kilo

Green hydrogen can be produced from:

- I. The grid, because 98% of our electricity comes from renewables.
- II. The combination of wind and solar photovoltaic farms.

Cost of renewable hydrogen with varying LCOE and load factors
USD/kg H₂



Excellent conditions to export hydrogen

- Port on the Atlantic Ocean
- Absence of major climate events or social conflicts
- Slightly undulating plain land with access routes to the entire territory and Infrastructure for domestic transport
- Excellent wind and solar combined resources On Shore
- Expansion potential for Wind Energy on the Offshore Platform



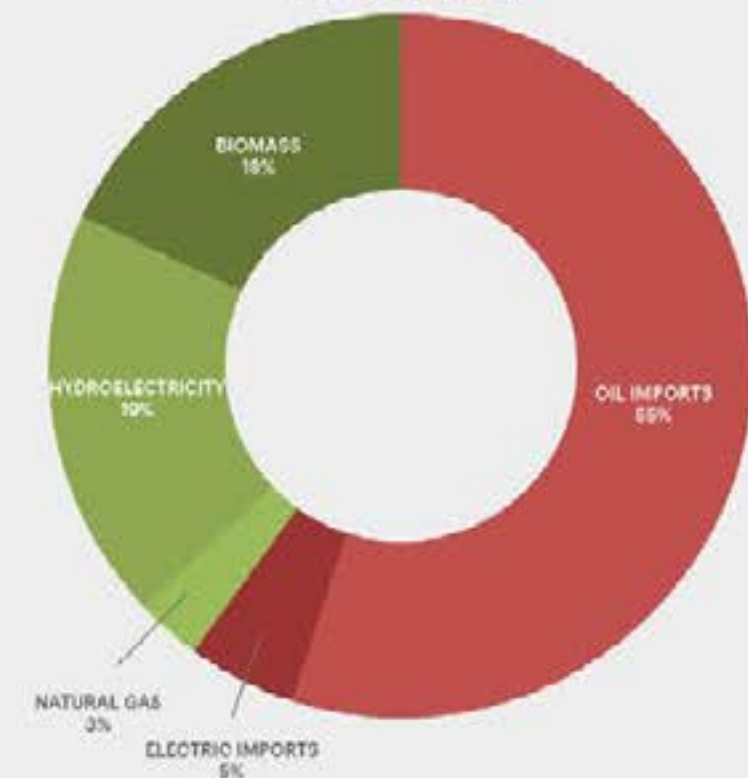
Uruguay as a pilot country

As the first energy transition has been completed by having decarbonized the electricity matrix; we are currently working on the second energy transition in Uruguay.

- Decarbonize the rest of the sectors (transport, industry)
- Develop green chemical industry
- Make the energy system in general more efficient
- International agreements:
 - Rotterdam Port agreement
 - Agreements for technical training in hydrogen production

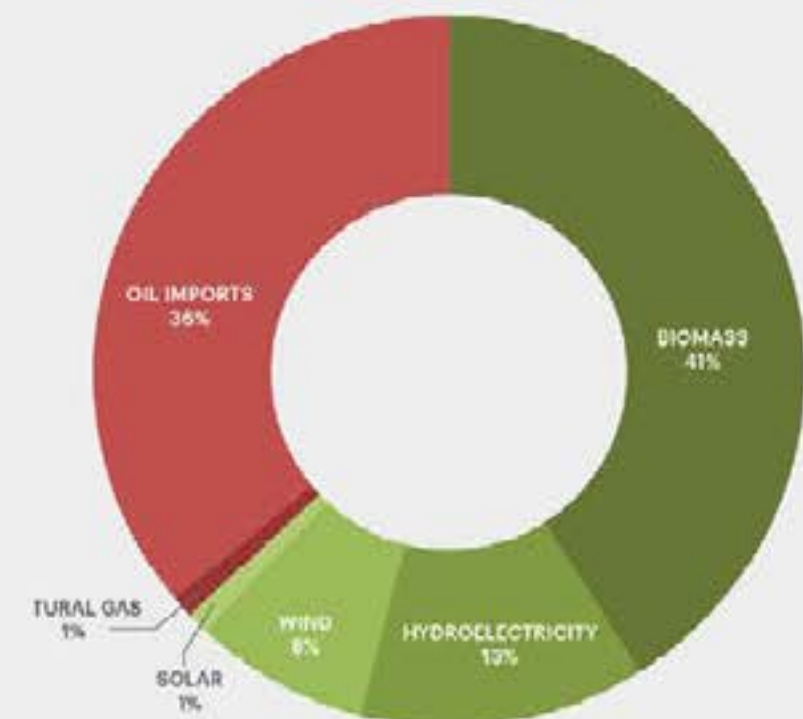
2005

3.016 ktep



2019

5.401 ktep



GREEN HYDROGEN



Why Uruguay?

- **Reliability**
- **Location**
- **Incentives**
- **Talent**
- **Lifestyle**

Reasons to produce H₂ in Uruguay

- **Renewable source**
 - Offshore wind power
 - Complementarity of wind and solar energy sources
- **Low cost production**
- **Supply chain continuity**
- **Test bed country**

THANK
YOU!



Ministry
**of Industry,
Energy and Mining**