

IDENTIFYING CHALLENGES FOR ACHIEVING 100% RENEWABLE POWER SYSTEMS BY MID-CENTURY

URUGUAY

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Montevideo, July 17th, 2019

OVERVIEW OF URUGUAY



Country name:	República Oriental del Uruguay
Capital city:	Montevideo
Land area:	176.215 sq.km
Population:	3,45 million inhabitants
Life expectancy:	76 years
Gross Domestic Product:	16.246 USD per capita



Energy sector

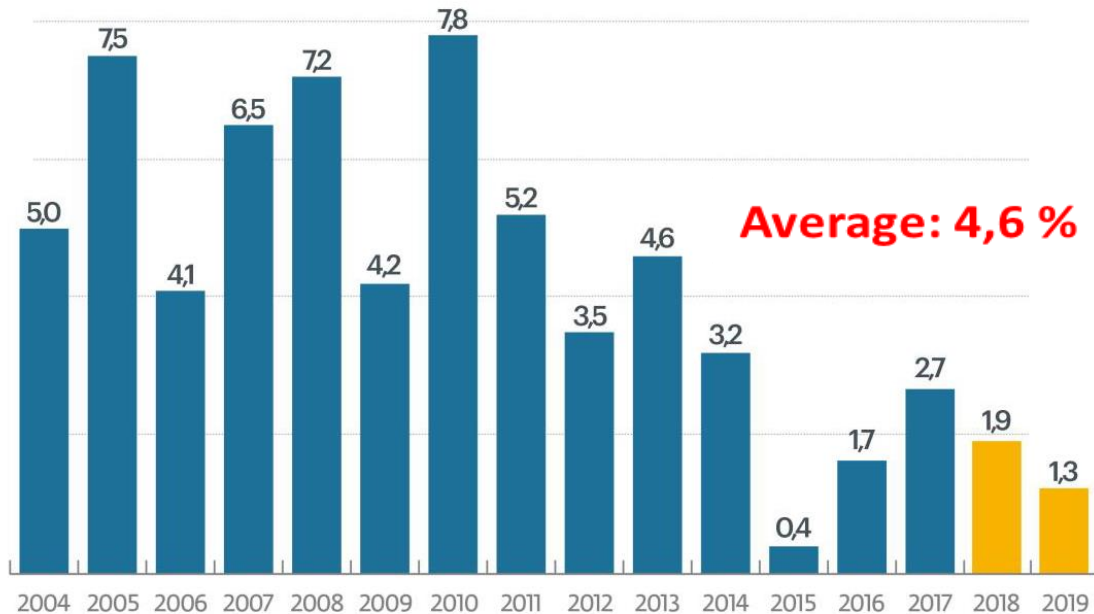
- No oil
- No coal
- No Natural Gas
- Strongly interconnected

Mean annual power demand:	1.200 MW
Electrification rate:	99,8 %
Peak power demand:	2.115 MW (summer 2019)

OVERVIEW OF URUGUAY

ECONOMICALLY SUSTAINABLE

Growth of GDP (%) Uruguay



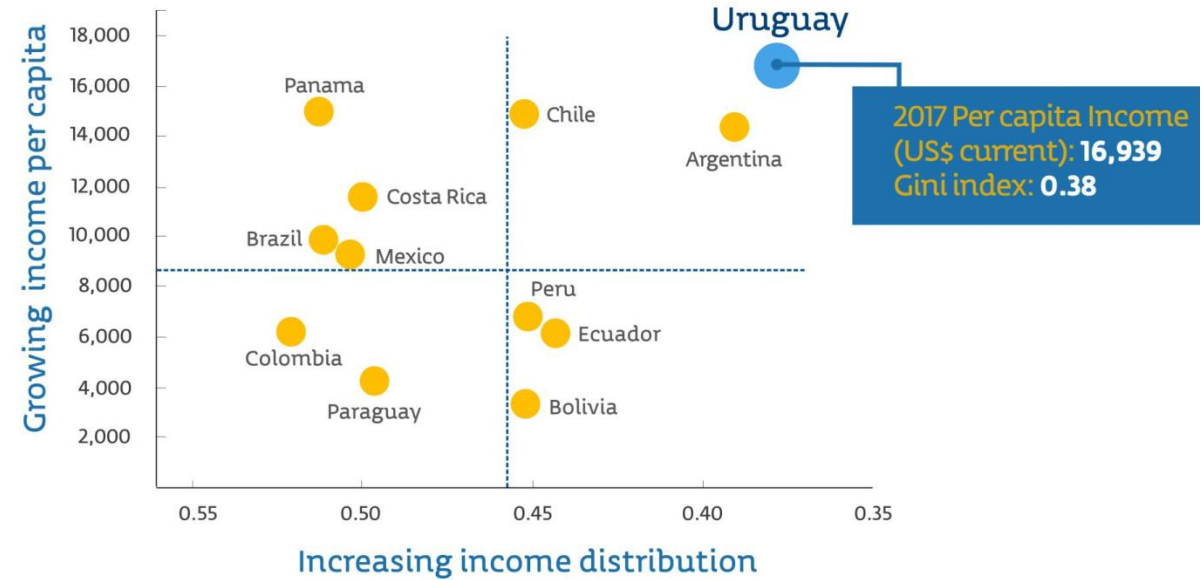
ENVIRONMENTALLY SUSTAINABLE



SOCIALLY SUSTAINABLE

Growth with equity

Income level and distribution in Latin America (US\$ per cápita and Gini index, 2017)

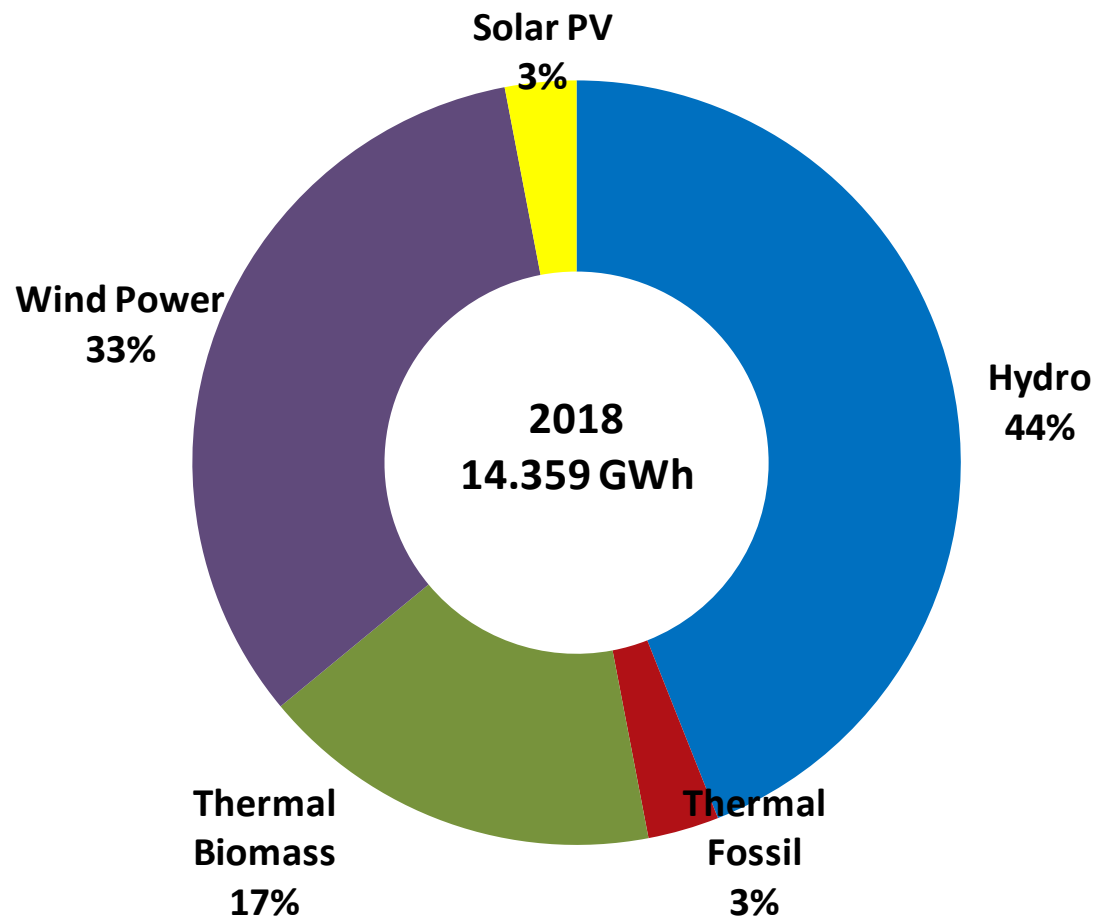


Political and social stability

URUGUAY #1 in LAC (2017)	Transparency #1 Low corruption perception Transparency International	Democracy #1 Democracy The Economist	Equity #1 Inclusive Development World Economic Forum
	Other indicators in Latin America #1 Control of corruption The World Bank	#1 Rule of Law World Justice Project #2 Press Freedom Reporters without borders	#1 Prosperity Legatum Institute #1 Quality of life Mercer

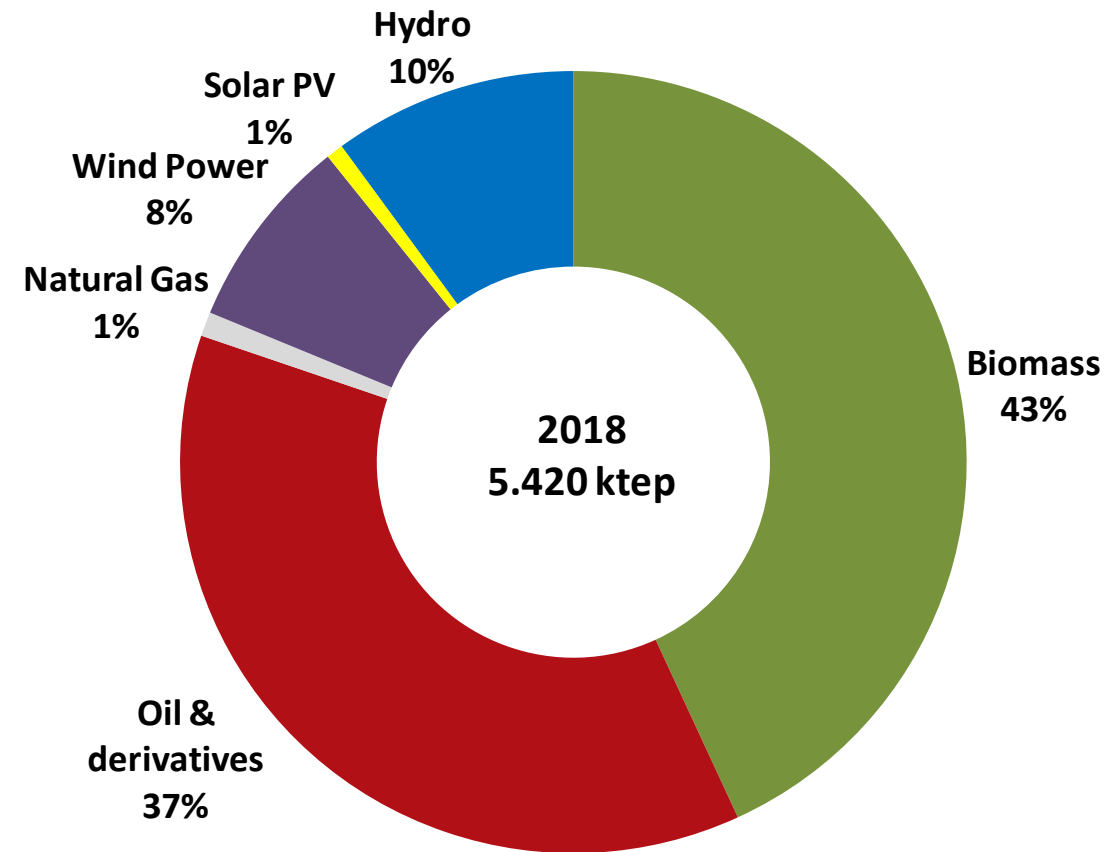
RE STATUS IN URUGUAY

ELECTRICITY GENERATION 2018



97 % - RENEWABLE SOURCES

ENERGY SUPPLY IN 2018

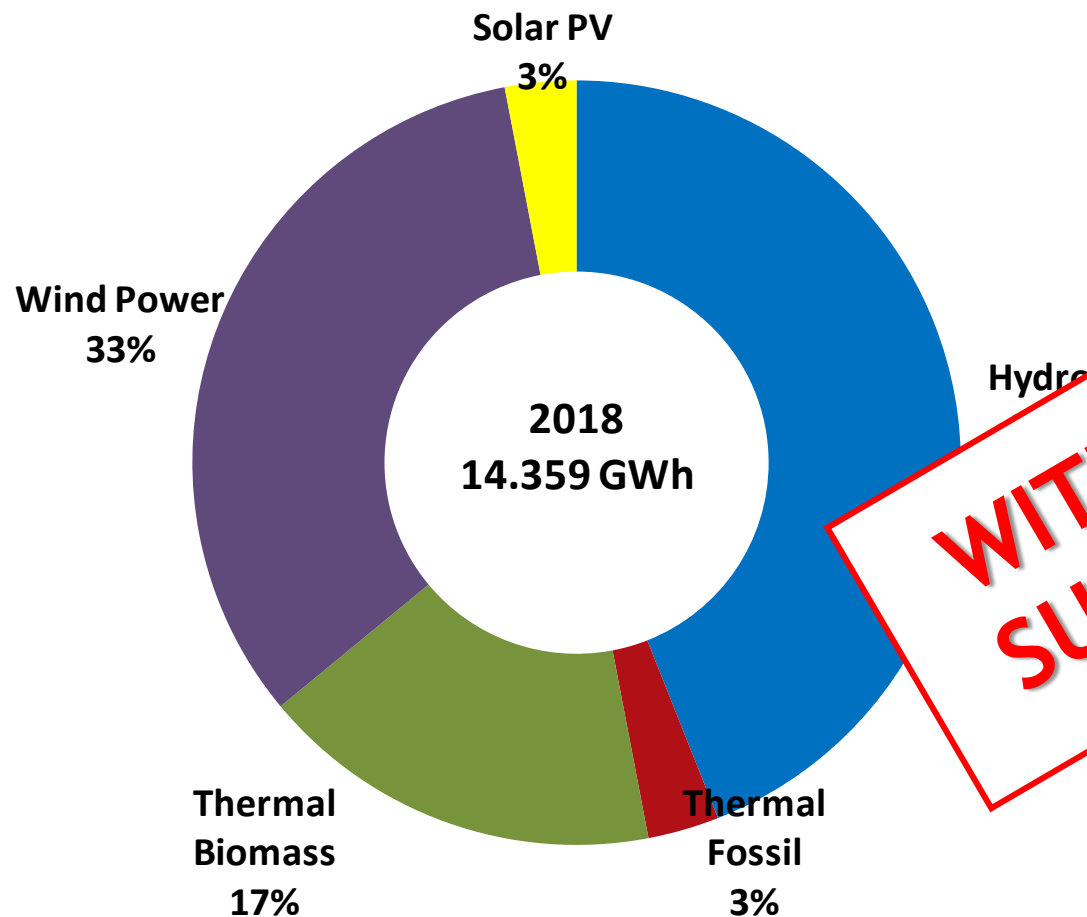


62 % - RENEWABLE SOURCES

BIOMASS > OIL & NATURAL GAS

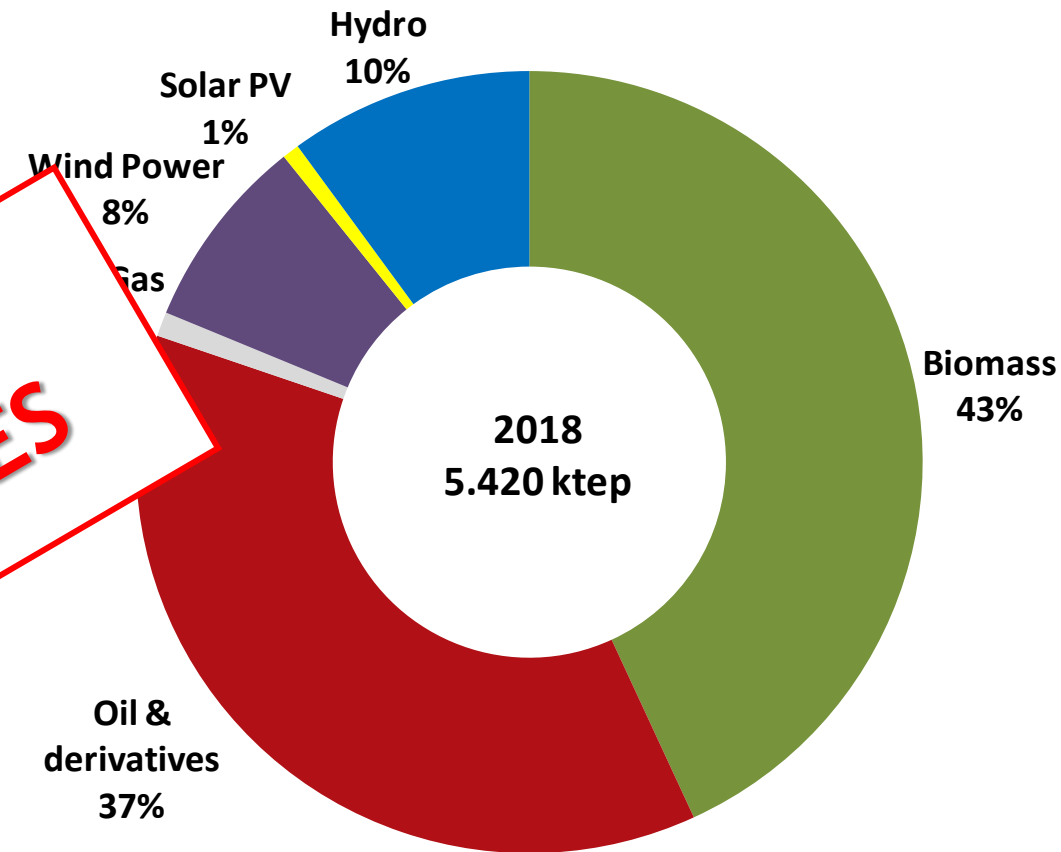
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ENABLING MEASURES



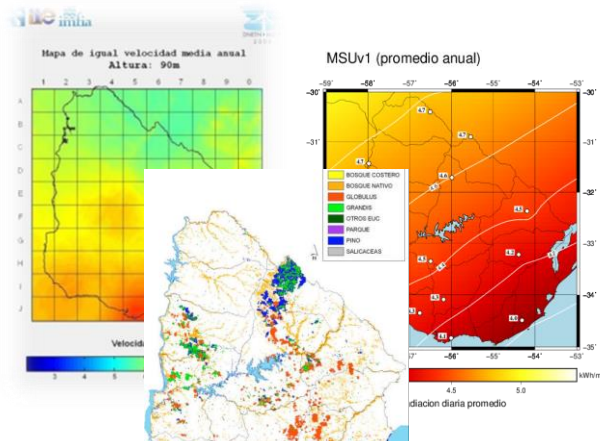
State Policy



Organized civil society



Public utility & NOC



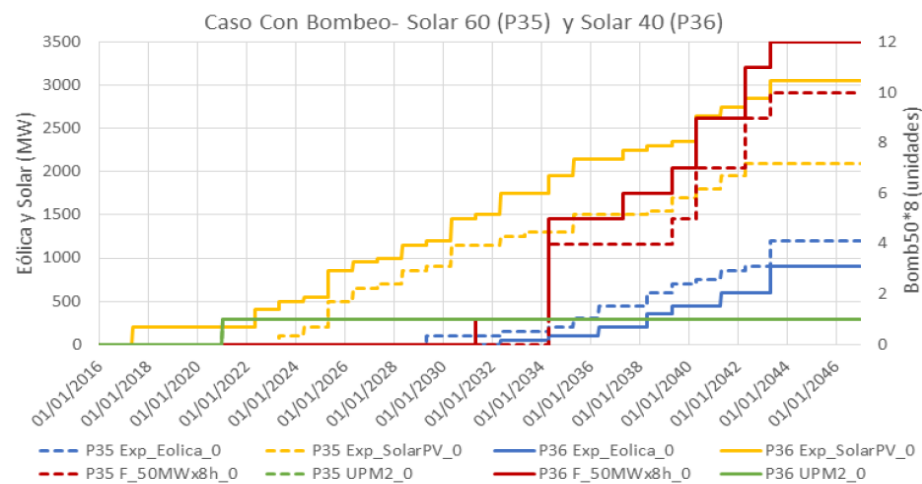
Capacity building



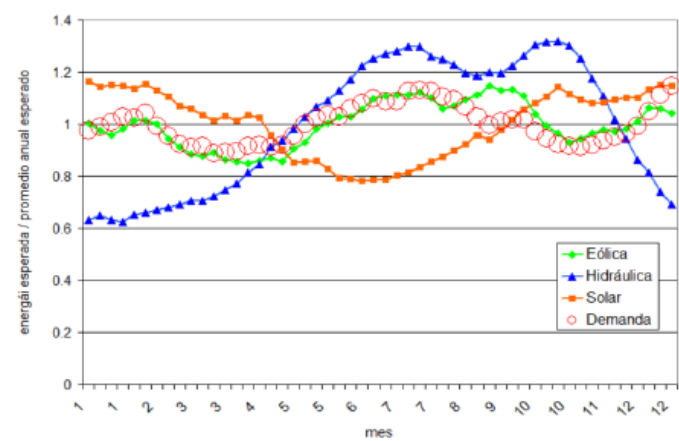
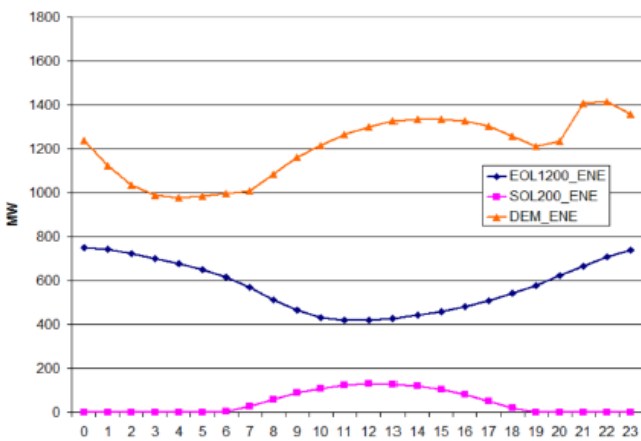
**Financial institutions
and investors**

CURRENT CHALLENGES

DEMAND MANAGEMENT AND SHORT-TERM ACCUMULATION



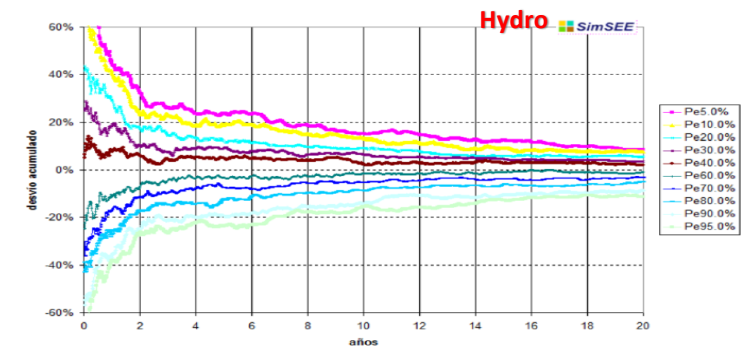
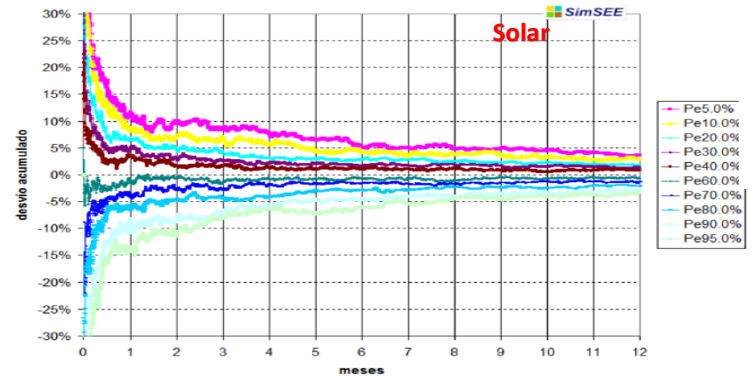
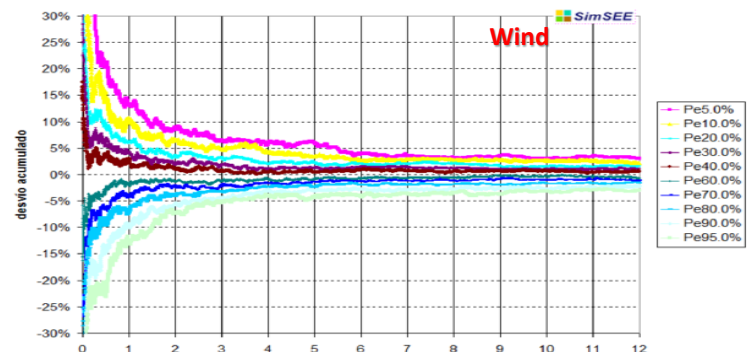
COMPLEMENTARITY HYDRO-WIND-SOLAR



Intra-day complementarity

Annual complementarity

ENERGY SURPLUSES

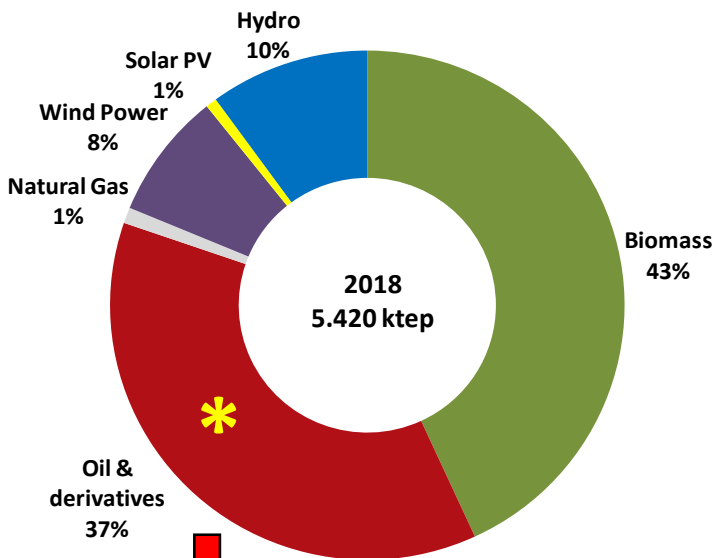


Generation deviations (for different probabilities by sources)

MAIN PRIORITIES POWER SECTOR



ENERGY SUPPLY IN 2018



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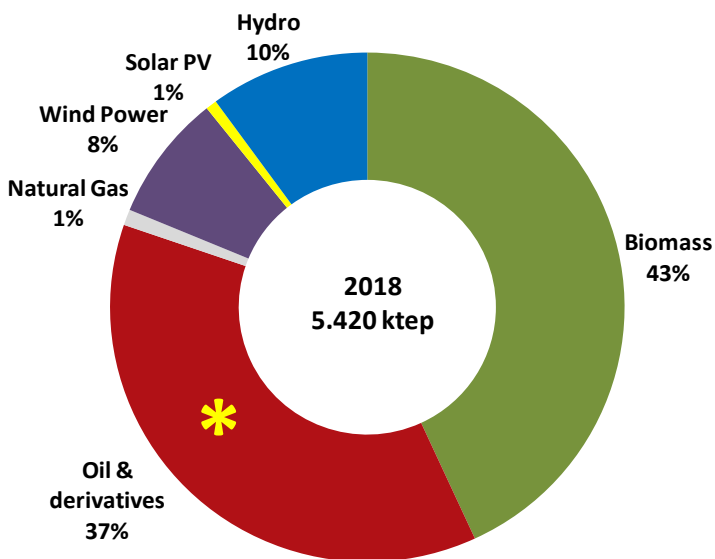
70 % TRANSPORT

BATTERIES



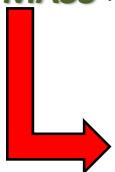
MAIN PRIORITIES POWER SECTOR

ENERGY SUPPLY IN 2018



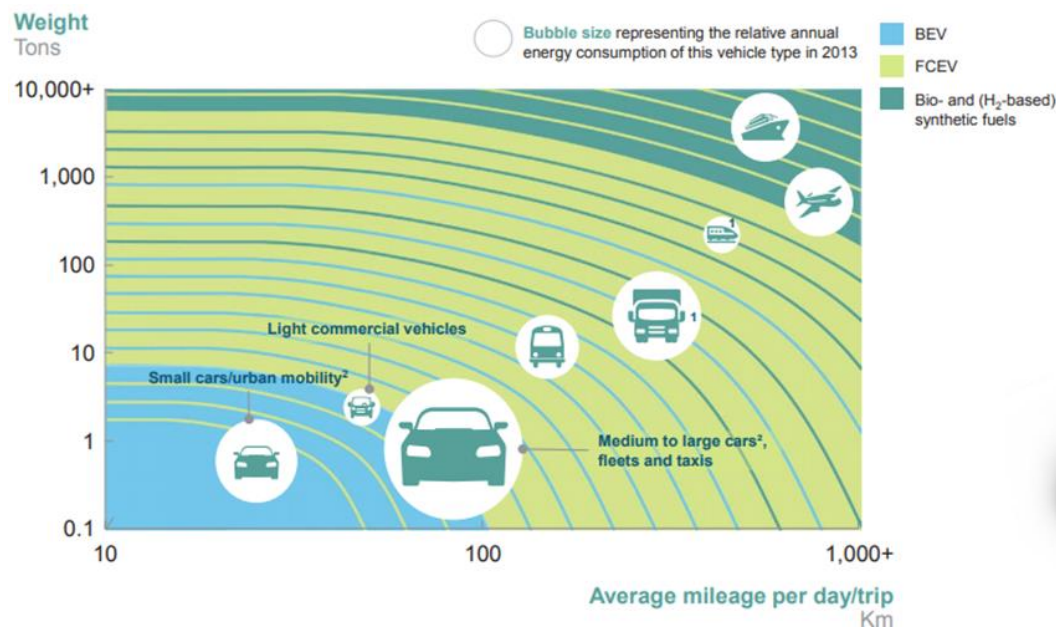
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70% TRANSPORT

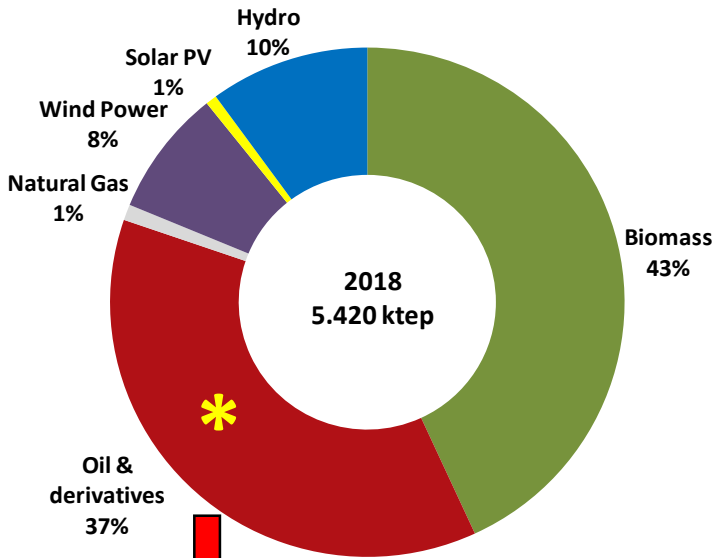
GREEN HYDROGEN



- Production of green hydrogen based of electricity from the grid and one hydrogen fueling station in Montevideo
- Approx. 10 heavy vehicles (intercity buses range 500 km / road trucks range 900 km)
- Buses operating on high frequency lines within a 250 km radius with center in Montevideo
- Trucks operating on high frequency lines within a 450 km radius with a center in Montevideo.
- Hydrogen consumption approx. 6 ~ 9 kg H₂/100 km
- 10 vehicles @ 1000 km / day => 600 ~ 900 kg H₂/day
- Annual electricity consumption 20 GWh (0.15% annual generation 2018)

MAIN PRIORITIES POWER SECTOR

ENERGY SUPPLY IN 2018



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INDUSTRY

POWER to X (heat, food, green fuel...)



La energía que nos une

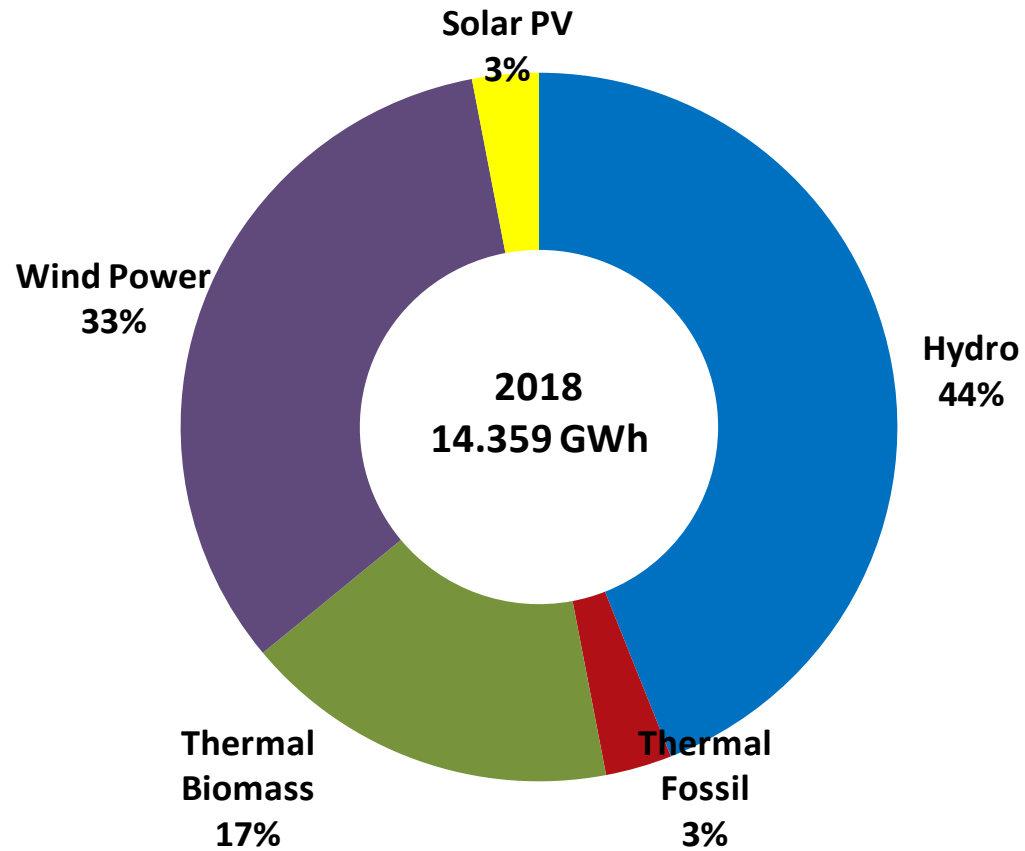


MAIN PRIORITIE: SOCIAL DIMENSION

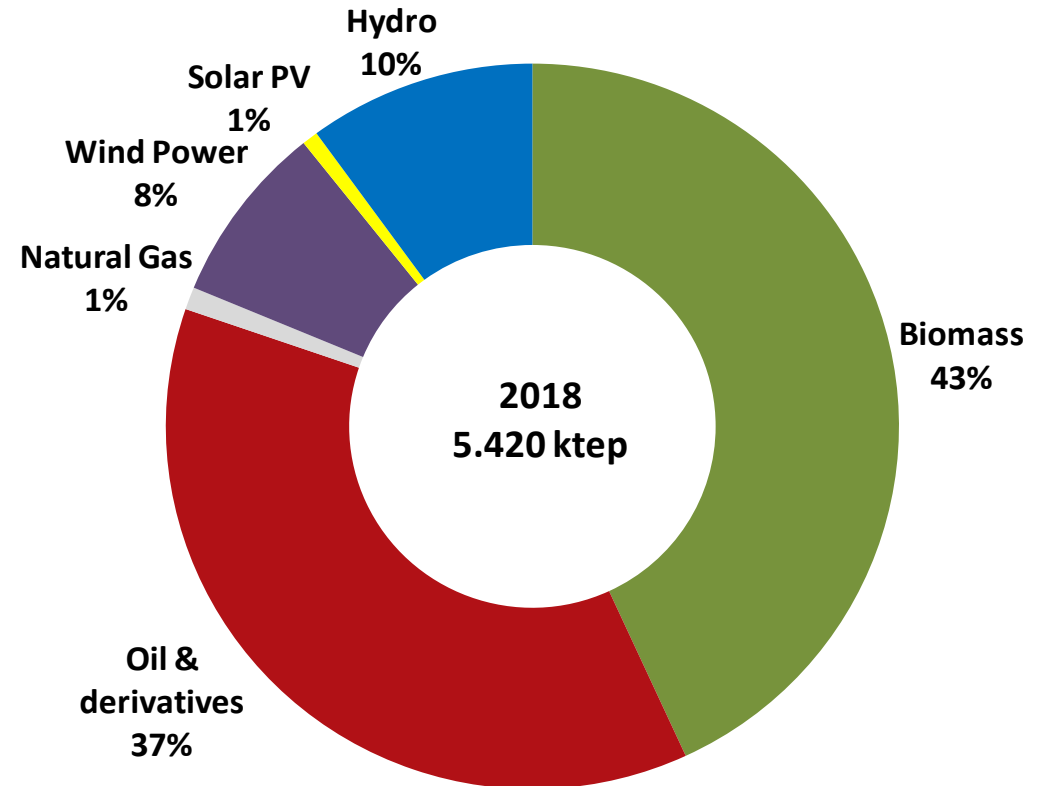


BIG CHALLENGE AND HUGE OPPORTUNITY...

ELECTRICITY GENERATION 2018



ENERGY SUPPLY IN 2018



...electrify to decarbonize.

Thanks for your attention!

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