

FINAL CAPSTONE PRESENTATION:

# *Latin America Market Entry Strategy for*

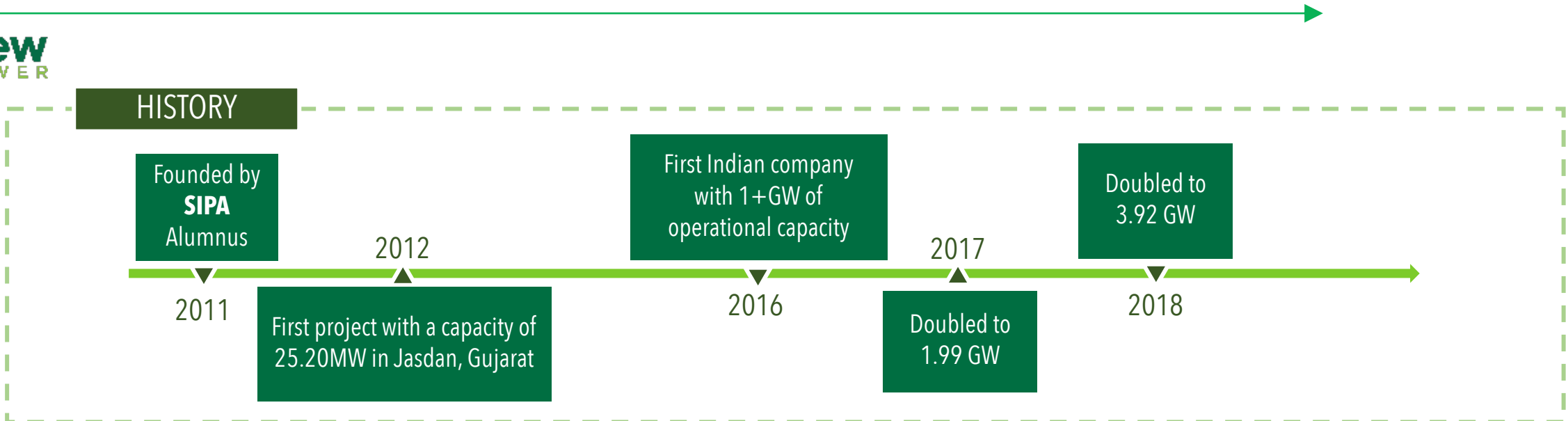


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  - i. Brazil
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# Client Overview



**FACTS**

-  **LARGEST** RE IPP in India
-  **3.9 GW** operational capacity  
**1.9 GW** in development
-  **8** states Utility Scale  
**16** states Distributed

# Project Description



## **MOTIVATION**

ReNew Power is considering expanding its business geographically and is exploring different markets:

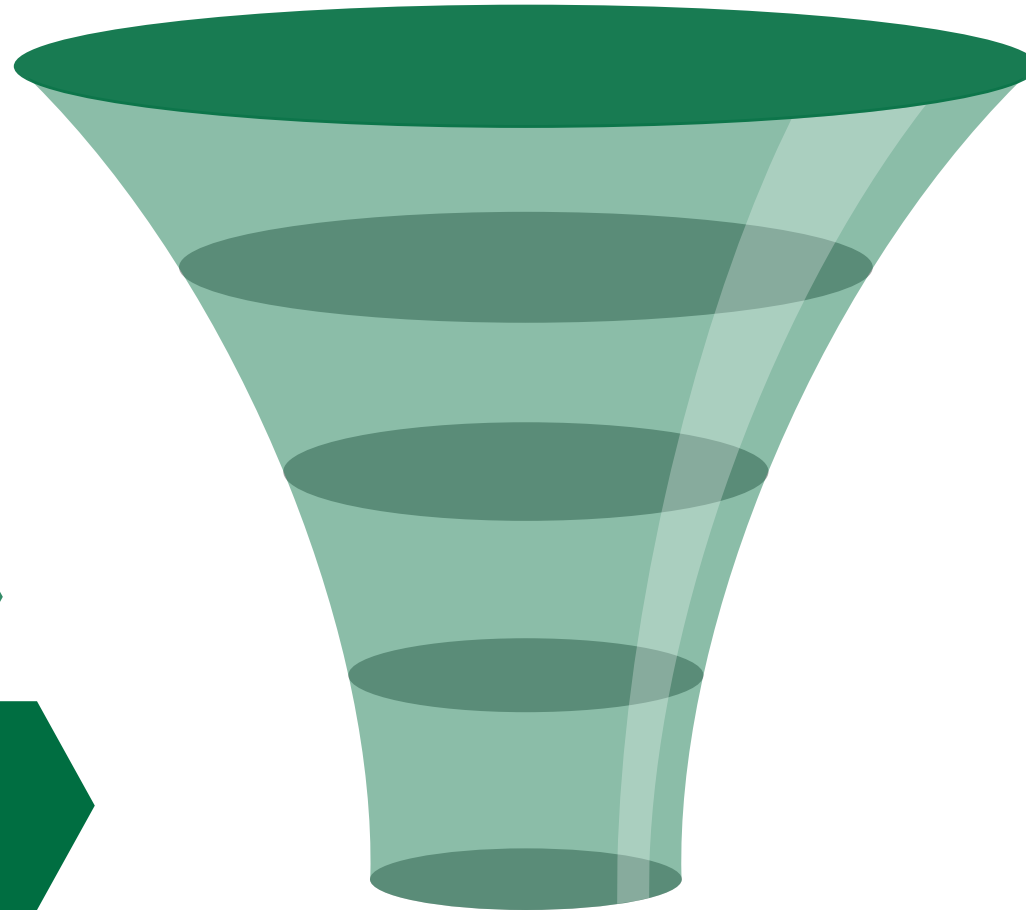
- Southeast Asia
- North America
- **LATIN AMERICA**

## **OBJECTIVES**

- Provide ReNew insightful information and recommendations for decision making on entering the Latin American market
- Select the most attractive countries in LATAM for ReNew expansion



# Research Methodology



- **Macroeconomic Indicators**
- **Ease-of-doing-business Indicators**
- **Political and Regulatory Landscape**
- **Renewable Energy Investment Climate**

# COUNTRY MATRIX

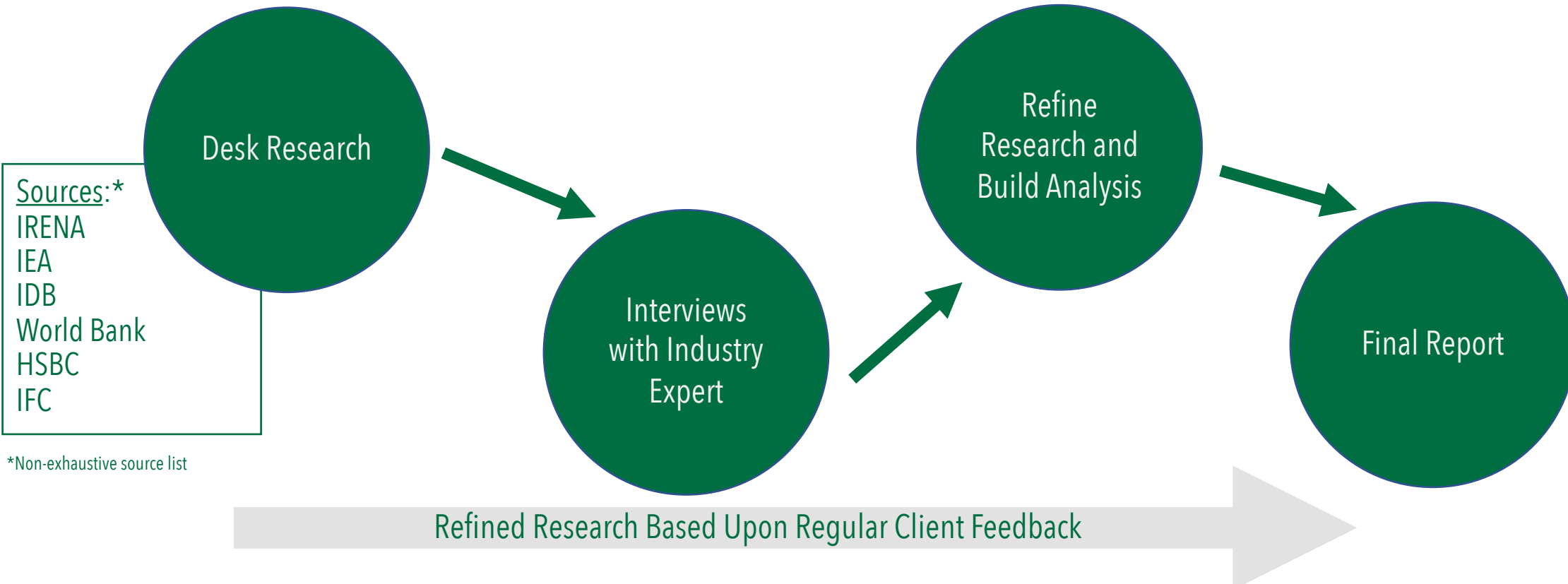
We developed an index matrix to rank and filter Latin American countries best suited for the client based upon macroeconomic and investment indicators

Economy*	Doing Business (WB)	Nominal GDP USDBn (EIU, 2018)	Real GDP Growth % (EIU)	Population M (EIU)	GDP per head (US\$ at PPP), (EIU)	Electricity production TWh 2016, (IEA)	Installed capacity GW (ClimateScope, BNEF)	Credit rating S&P Latest	Renewable electricity production share excl. hydro (%) (IEA)	Target
<b>Mexico</b>	54	1,221.3	2.10%	130.8	19,178	320.4	75.2	B+	5.7%	By 2024 Mandate to generate 35% of power from clean sources; starts at 5% in 2018 increasing gradually to 13.9% in 2022 By 2050: >70% renewable energy sources; power outages <1 hour/year; lowest average electricity prices among OECD, reduce GHG emissions/GDP by 30% by 2030 vs. 2007 levels
<b>Chile</b>	55	299.4	2.20%	18.2	25,719	79.3	23.7	AA	13.9%	1.5GW in 2022
<b>Colombia</b>	65	336.7	2.60%	45.5	15,247	76.9	16.5	AA	2.2%	100% RE in electricity by 2021
<b>Costa Rica</b>	67	60.5	2.80%	5.0	17,655	10.9	3.5	AA	98.2%	Defined 5% of electricity by 2013; reached that level, didn't establish a new one
<b>Peru</b>	68	222.2	3.70%	32.2	12,582	51.9	7.2	B+	3.7%	Panama's National Energy Plan 2015-2050 suggests that 70% of the country's energy supply could be renewable after 35 years.
<b>Panama</b>	79	65.3	4.00%	4.2	25,321	10.9	3.3	BBB	6.7%	Uruguay has 97% renewable energy including hydro. They set a goal of 15% clean installed capacity in 2015 that was easily met
<b>Uruguay</b>	95	60.0	1.80%	3.5	23,331	13.2	4.5	BBB	37.5%	45% Renewables by 2030
<b>Brazil</b>	109	1,865.0	1.20%	209.2	15,852	578.9	157.0	AA	14.6%	Reduce GHG emissions 37% by 2025 and 43% by 2030 vs. 2005 levels
<b>Paraguay</b>	113	42.2	4.00%	6.9	13,457	63.8	8.7	B+	100.0%	60% of RE consumption in total energy consumption by 2030.
<b>Argentina</b>	119	456.5	-2.00%	44.7	21,777	147.2	36.0	B	1.5%	An 8% target for renewable electricity consumption by 2018 and 20% by 2025 under Law 27.191
<b>Ecuador</b>	123	104.1	1.30%	17.0	11,779	27.3	8.2	B-	2.2%	No clear target but aims to increase clean generation by 2025. Heavily dependent on hydro
<b>Bolivia</b>	156	39.9	4.30%	11.2	7,851	9.4	2.6	AA	3.6%	NDP 2017 - 2020: Total effective capacity of 4.9GW made up of hydro (1.4GW) and wind, biomass, geothermal and solar (411MW); Increases the share of 'alternative' energy and other sources of energy (combiness cycle) to 0% in 2020"

# Data Collection Methodology

## Deep-Dive Research and Mine for Insights

The research was refined using a variety of industry reports, interviews, and information from third party sources and development banks.



# Country Selection



## Mexico

- Solid project pipeline track record
- Lowest solar bid prices ever achieved
- Policy and regulatory enabling frameworks



## Colombia

- Robust economic performance in recent years
- High political stability and strong regulatory framework
- RE is a nascent market with ample room to grow



## Chile

- The Chilean auction structure favors solar, hydro and wind
- Chile plans to add more than 6,200 km of transmission lines in next 10 years
- Highest credit rating in LATAM, due to macroeconomic stability and integration with global capital markets

## Brazil



- Largest energy consumer in LATAM, 590 TWh / year, dominated by hydropower
- Wind and solar growing exponentially through government auctions
- Open and relatively developed market for foreign investment

## Argentina



- Favorable wind & solar resources that are largely undeveloped
- 3<sup>rd</sup> largest economy in the region
- Ambitious RE targets enacted into law





# Summary of Recommendations



Based on:

- Attractive resources
- Political and economic stability\*
- Favorable regulatory framework for RE
- Established RE targets



- Gain market knowledge from local contacts
- Look for longer-term engagement through acquisitions or JV



- Target RE100 companies
- Benefit from Goldman Sachs connection

\*Excluding Argentina



# Brazil

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# Country Snapshot

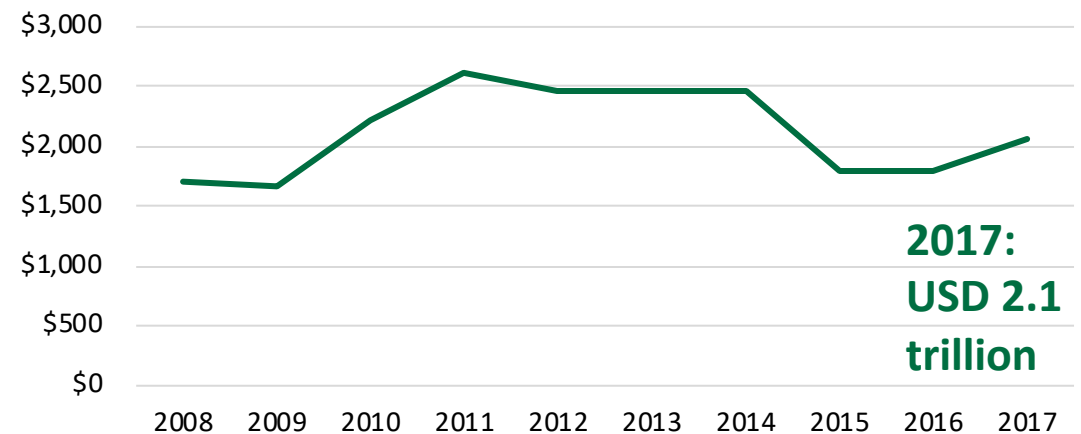
- Brazil is the 8<sup>th</sup> largest economy in the world with USD 2.1 trillion worth of GDP as of 2017, making it also the largest economy in Latin America
- Brazil's economic growth is driven by its massive population of 209 million
- The country experienced a period of economic and social progress between 2003 and 2014, where
  - > 29 million people were lifted from poverty
  - Inequality declined significantly
- However, a strong recession followed the growth period
  - 2000-2010 GDP CAGR: +13%
  - 2010-2017 GDP GAGR: -1%
  - Significant contraction in 2015 and 2016
- 2017 saw the beginning of a slow recovery in Brazil's economic activity (+1.0% Real GDP growth)
- Brazil needs to restore fiscal sustainability, stimulate productivity, and advance infrastructure development

Source: World Bank.

## KEY INDICATORS 2018

<u>GDP 2017:</u>	USD 2.1 trillion
<u>Real GDP Growth 2018:</u>	1.0%
<u>5-year Avg Real GDP growth:</u>	-0.5%
<u>GDP per Capita 2018:</u>	USD 9,821
<u>Population 2018:</u>	209 million
<u>Inflation 2018:</u>	3.79%

### GDP (USD bn)



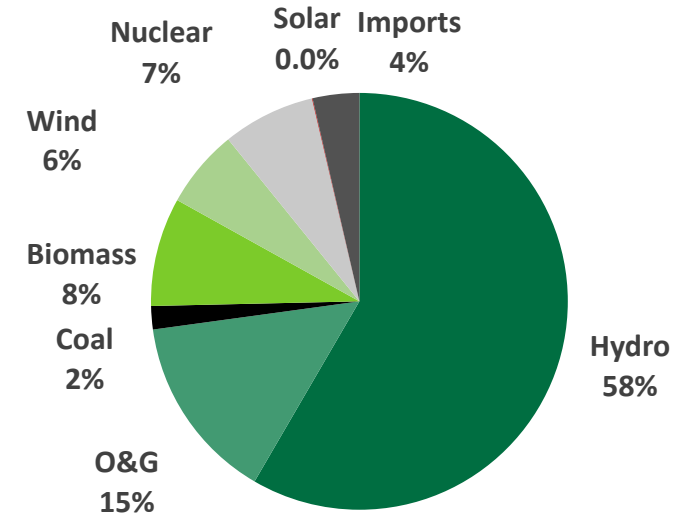


# Electricity Sector Overview

- As of 2016, Brazil was the
  - World's 8<sup>th</sup> largest energy consumer
  - The #1 energy consumer in Latin America
- Electricity Capacity: 156 GW (2016)
- Electricity Generation: 591 TWh (2017)
- 2014-2017 Drought: Hydro ≠ Assured energy
- 2014-2024 expansion plans
  - Hydro: 27GW
  - Wind: 19 GW
  - Solar 8 GW
- Capacity located far from urban demand centers
  - Significant T&D investment required
- Market administered by ANEEL (Brazilian Electricity Regulatory Agency), under MME (Ministry of Mines and Energy):
  - Regulated vs. Unregulated market since 2004
  - Government controlled Eletrobrás being privatized
  - Eletrobrás = 1/3 Generation + 1/2 Transmission

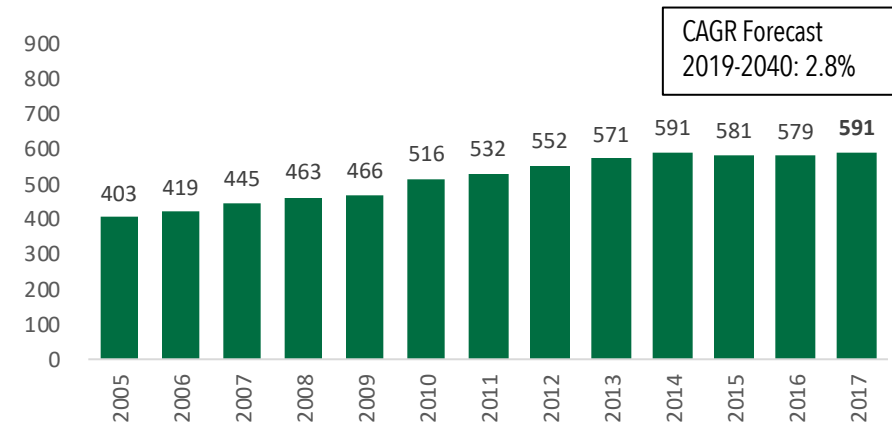
Source: EIA, BP.

ELECTRICITY CAPACITY: 156 GW



ELECTRICITY GENERATION: 591 TWh

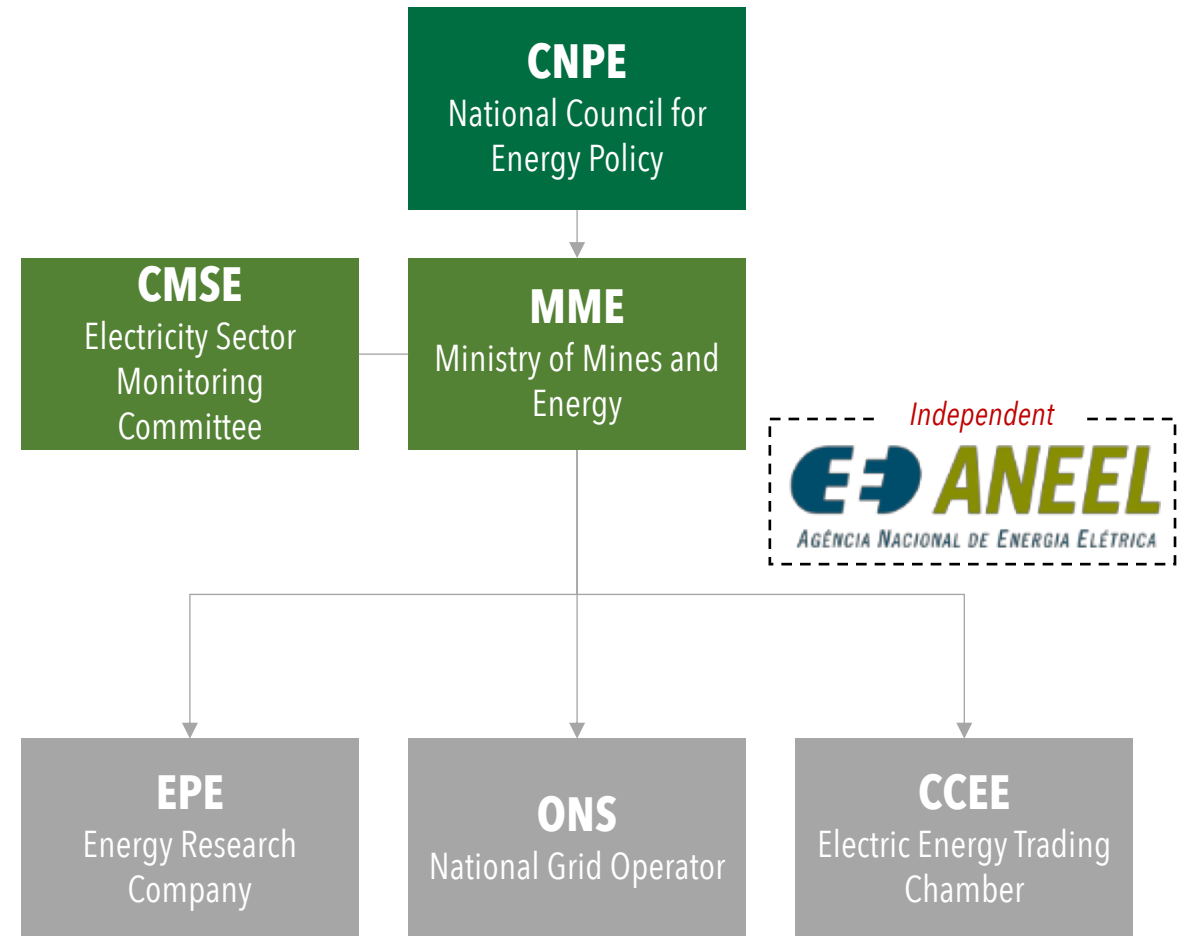
Brazil Electricity Consumption (TWh)





# Institutional Framework

- National Energy Policy Council (CNPE): A government body that advises the President. Its main function is to suggest policies and guidelines to promote the sensible and low-cost use of national energy resources.
- Ministry of Mines and Energy (MME): Ministry responsible for formulating and implementing national policies for the energy sector. MME is responsible for granting concessions and permission to exploit electric power potential.
- ANEEL: Special independent body linked to the MME. It has technical and political autonomy to regulate, supervise and monitor activities related to the energy sector.
- Monitoring Committee for the Electric Sector (CMSE): Monitors the continuity and security of electricity, natural gas and oil supply, identifying risks and developing proposals to predict and solve risk situations.
- ONS: Non-profit private entity managing the national interconnected transmission system.
- EPE: State-owned company conducting research to provide technical support for long-term power planning in Brazil.
- CCEE: Non-profit private entity mainly responsible for processing the energy contracted in the power market.



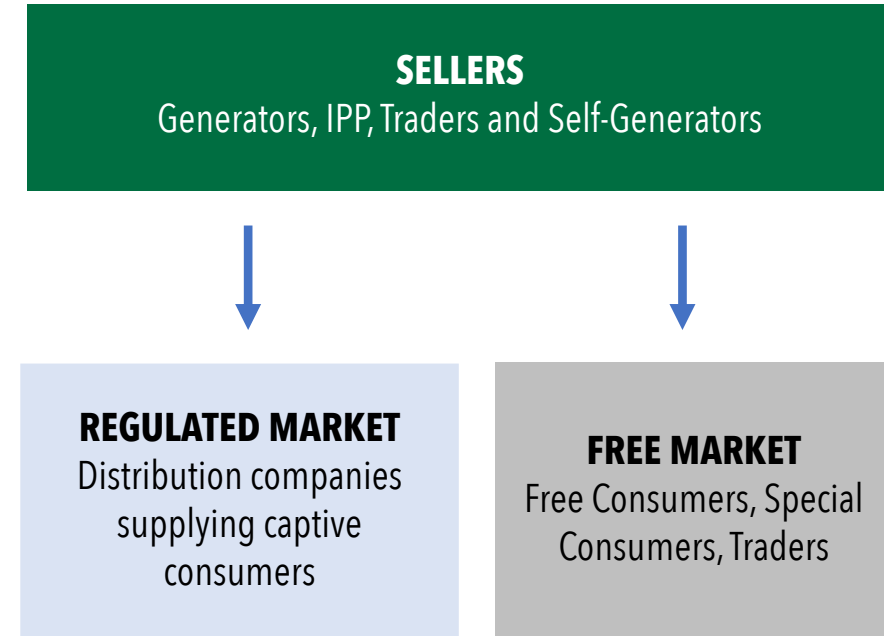
Source: Thomson Reuters.



# Electricity Market Structure

## MARKET DESIGN

- The Brazilian electricity sector was privatized and liberalized in the 1990s
- The sector is made up of two markets:
  - Regulated Market: Mainly composed of distribution companies and captive consumers, whose relationship is fully regulated by ANEEL.
  - Free Market: Free power consumers, power generators and trading companies are the main agents. These agents must have a minimum demand for electricity (500 kW) and are free to negotiate power volumes and prices.
- Reserve auctions are carried out by MME to contract for supplementary energy to increase the system's reserve margin.



Source: CCEE, Thomson Reuters.



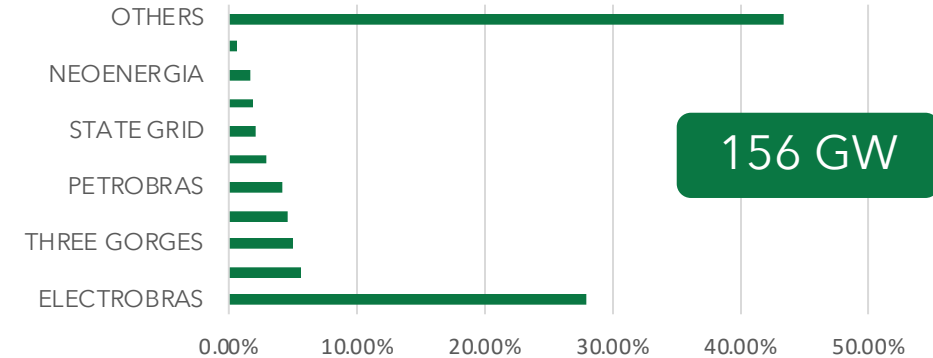
# Generation Sector

- Due to its large size (156 GW), the energy generation market in Brazil is not concentrated, presenting only one major player, Eletrobras, a state-owned company, with a market share of nearly 30% of generation.
- Hydro power is the most important generation technology in the Brazilian market, being responsible for nearly 65% of the country's installed capacity and more than 75% of its energy generation.

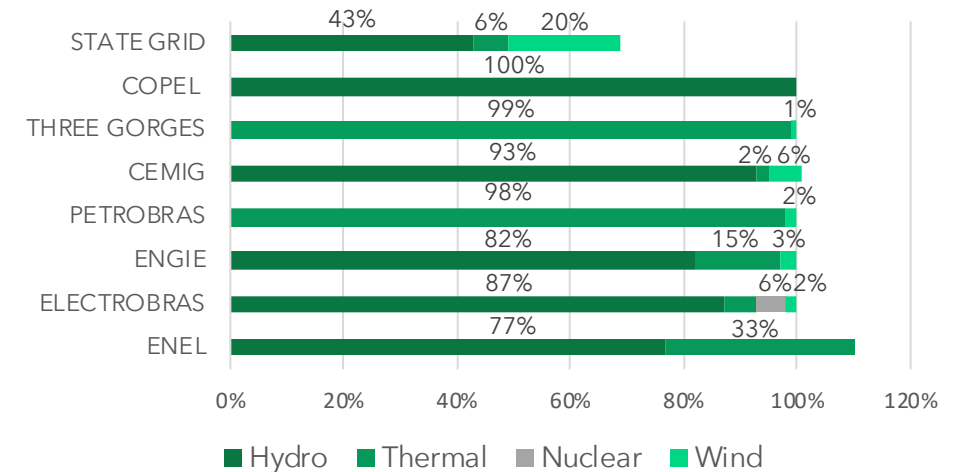


Source: Enel.

### Generation: Market Share (Installed Capacity)



### Companies Fleet Breakdown

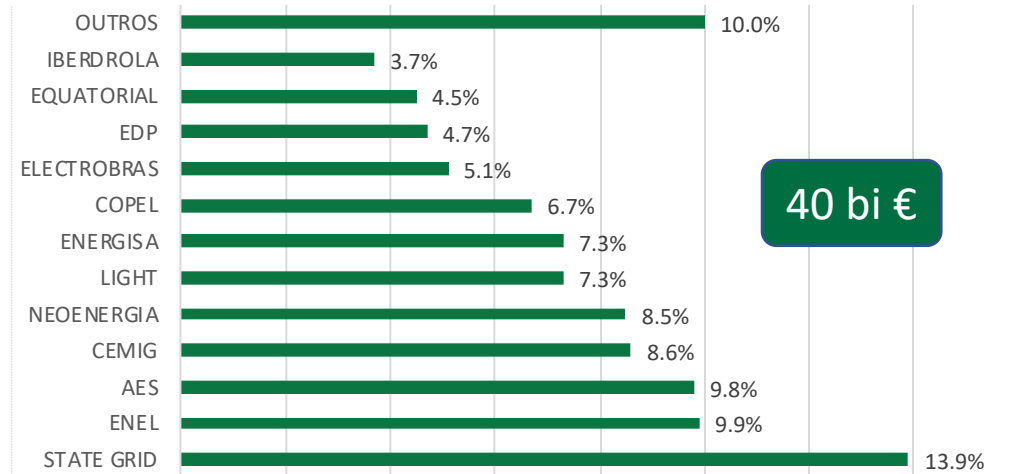




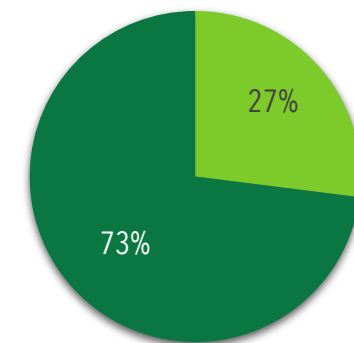
# Distribution Sector

- The distribution sector is not concentrated; CPFL (owned by State Grid) has the largest market share with around 14%.
- Electricity distribution concessionaires cannot develop any activity related to power generation, transmission or trading.
- Distcos can only acquire energy through auctions based on lowest prices and sell to captive power consumers at tariffs set by the government.

Distribution: Market Share (Revenue)



Distribution: Market Share (Revenue)



■ State Owners ■ Private



Source: Enel.

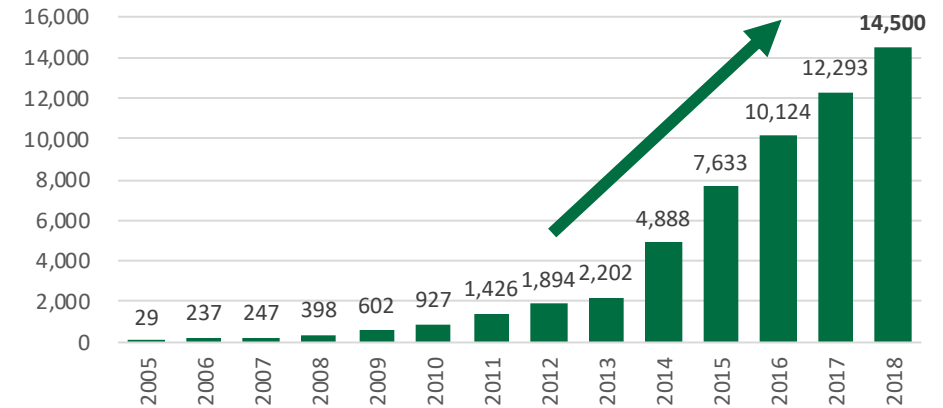


# Renewable Energy Market Size

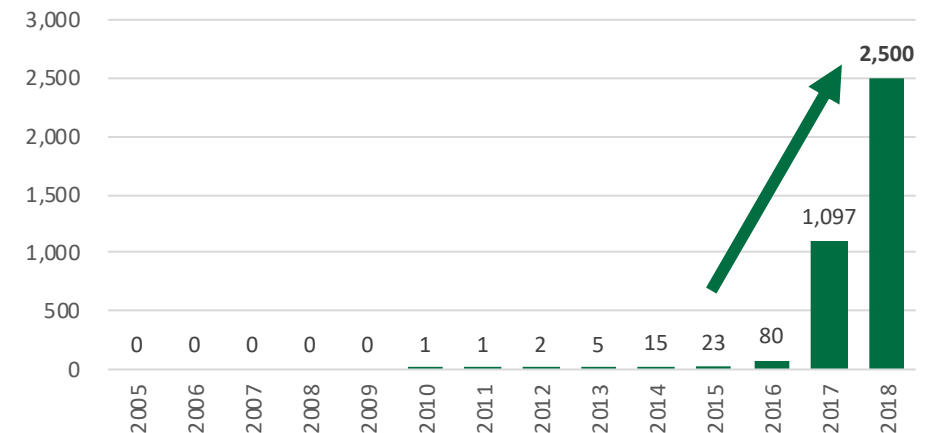
- 78% of Brazil's power generation comes from renewable sources<sup>1</sup>
- 58% of Brazil's electricity comes from hydroelectric power
- However, since the 2014-2017 drought, hydro ≠ "assured energy"
- Brazil signed an international commitment during COP 21 to:
  - Have renewables make up 45% of its total energy mix by 2030
  - Have a non-hydro renewables share of 23% by 2030
- Since the first wind energy auction in 2009, important volumes of wind power were contracted. The wind capacity in Brazil grew 20x from 2009 to 2017, and is now the world's 8th largest wind capacity at 14.5 GW
- Solar projects came later but are growing quickly. As of March 2019, 2.5 GW solar have been installed
- The main obstacle to developing wind and solar energy is the high construction costs, especially related to integration and T&D.

Source: Thomson Reuters, Power Technology  
<sup>1</sup> Includes hydro, wind, solar, biomass

### Brazil Wind Capacity (MW)



### Brazil Solar Capacity (MW)



# Energy Auction Overview

- In 2004, a legal framework to utilize energy auctions was introduced to ensure energy supply.
- The centralized procurement process by the government is based on load forecasts by distribution companies.
- Existing and new generation compete in different processes.
- The legal framework of the auctions allowed the introduction of new policy mechanisms by the government, such as the ability to conduct technology-specific auctions (Laws 10,848 and 10,847).
- The first technology-specific (biomass and small hydro) auction was held in 2007.
- Auctions have been launched annually to contract renewable energy projects.
- The first wind auction took place in 2009, where 1.8 GW of wind capacity was awarded.





# Auction Design

- The auction process is led by the regulator – ANEEL.
- Under the guidelines of the MME, an auction committee undertakes the main auction planning tasks which are distributed among different institutions: the MME, ANNEL, CCEE, and EPE.
- The committee defines the auction, suggests price caps, prepares the auction documents and coordinates with transmission planning.
- “New Energy Auctions” are used to contract new capacity needed to meet the growth in electricity demand (technology neutral or specific).
  - All projects contracted in an auction are required to start delivery after 4 or 6 years, referred to as A-4 or A-6 auction respectively (previously A-3 and A-5)
  - One A-4 auction and one A-6 auction are held every year
- PPAs are typically secured for 30 years for hydro and 20 years for wind, solar, biomass
- Pre-requisite to bid for projects: environmental and social licenses; grid access approval; technology-specific documents (such as fuel contracts for biomass and certified production for wind or solar)

## Past Auctions

Auction Rounds	Date	Technology	Awarded (MW)
2nd Capacity Auction	December 2009	Wind	1,806
3rd Capacity Auction	August 2010	Wind	528
2nd Alternative Auction	August 2010	Wind	1,520
12th Energy Auction	August 2011	Wind	1,068
4th Capacity Auction	August 2011	Wind	921
13th Energy Auction	December 2011	Wind	977
14th Energy Auction	December 2012	<i>Canceled</i>	-
15th Energy Auction	December 2012	Wind	289
5th Capacity Auction	August 2013	Wind	1,500
17th Energy Auction	November 2013	Wind	868
18th Energy Auction	December 2013	Wind	2,338
6th Capacity Auction	October 2014	Solar PV	890
		Wind	769
20th Energy Auction	November 2014	Wind	926
3rd Alternative Energy	April 2015	Wind	90
7th Capacity Auction	September 2015	Solar PV	833
...	...	...	...
A-4 Auction	April 2018	Solar PV	806
		Wind	114
A-6 Auction	September 2018	Wind	1,250
A-4 Auction	June 2019	Solar, Biomass, Hydro	TBD
A-6 Auction	September 2019	TBD	TBD
A-4 Auction	April 2020	TBD	TBD
A-6 Auction	September 2020	TBD	TBD
A-4 Auction	April 2021	TBD	TBD
A-6 Auction	September 2021	TBD	TBD



# Upcoming Auction

## HIGHLIGHTS

- Next confirmed auction: 27 June 2019
- MME is planning 9 energy auctions up to 2021
  - 6 for new large-scale power projects
  - 3 for existing plants
- For the six “new energy auctions”, MME holds 2 auctions per year:
  - An A-4 auction for power supply to begin 4 years after the exercise
  - An A-6 auction for power supply to begin 6 years after the exercise
- Solar confirmed to be in the June 26 A-4 auction
  - 806 MW solar was contracted in A-4 in 2018

## Brazil to hold next A-4 auction on June 27, solar likely to be included

The Ministry of Energy and Mines is planning nine energy auctions up to 2021. The plan includes two “new energy” procurements per year – A-4 and A-6 auctions – and one per year for existing power plants. It is unclear whether solar will be eligible and, if so, which auctions it would compete in, but Brazilian solar association ABSOLAR is confident PV will be admitted to both.

MARCH 7, 2019 EMILIANO BELLINI

MARKETS POLICY UTILITY-SCALE PV BRAZIL





# Current Players

## MAJOR DEVELOPERS

### LOCAL



### INTERNATIONAL



## FOREIGN INVESTORS

- Brazil is an open market for foreign investors and renewable energy developers
- Foreign players are free to auction
- HOWEVER, foreign developers are strongly encouraged to partner with local players
  - Local political and business environments are tough to navigate
  - There are "unknown unknowns" (Donald Rumsfeld)
- Global companies like Engie, EDP, Enel are large enough to manage a strong local team



# Land & Licensing

## LAND CONSIDERATIONS

- Foreign investors are not allowed to purchase agricultural lands in rural municipalities.
- Foreign investors are also not allowed to purchase or lease urban land areas that are >25% of the overall area in any municipal district.
- Wind and solar potential are concentrated in the rural Northeastern regions of Brazil.
- Despite above obstacles, foreign wind and solar developers have been able to secure land leases relatively inexpensively; however, local partnerships are critical to ensure legal protection.

## LICENSING CONSIDERATIONS

- Various licenses related to environmental protection and indigenous lands protection are required.
- Many sophisticated agencies and service providers exist on the ground to help with the procedure.
- Developers also have the option to purchase development projects with completed licensing.

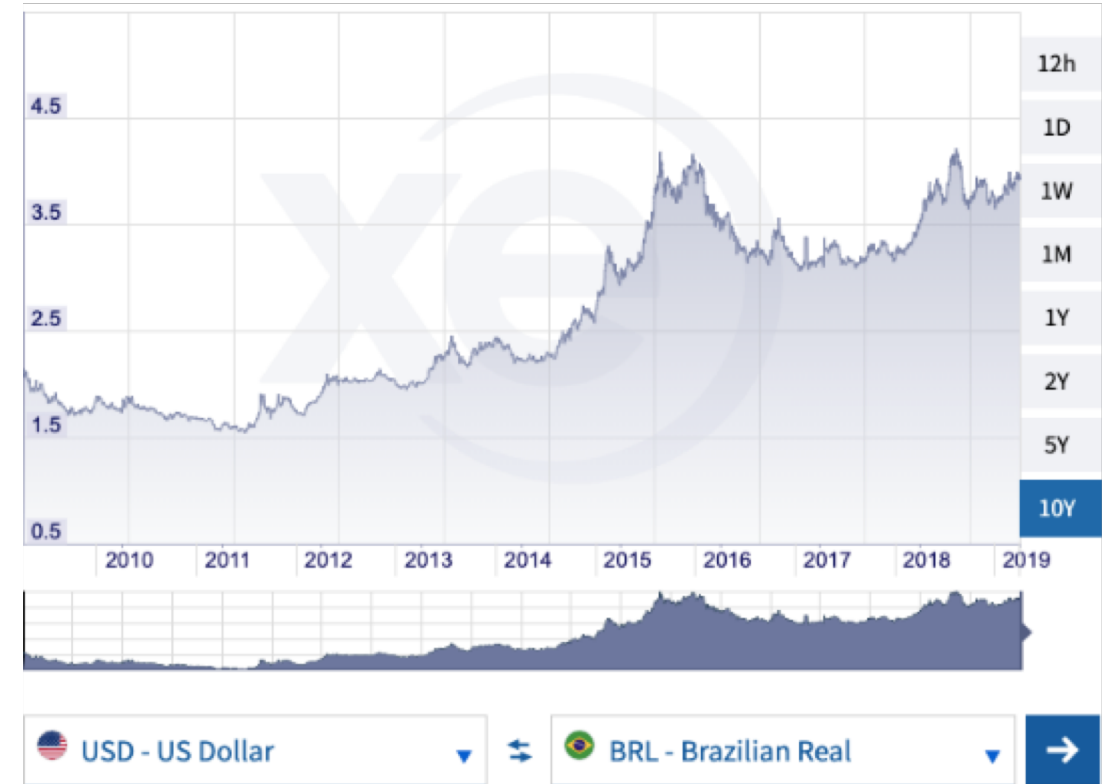
# Project Finance

## PROJECT FINANCE



- State development banks, BNDES and BNB are the major key institutions in renewable project financing
  - Most projects in Brazil financed by the two
  - Generally up to 80% of capital costs in solar and 70% of capital costs in wind
- Local content requirements: commonly requires 60% of the used equipment to be sourced locally
- TJLP (Brazil subsidized Long term interest rate): 6-7%
- TLP, a more market-based interest rate replaced TJLP on 1 January 2018, and will converge with the rate of a Brazilian sovereign note (NTN-B)

## CURRENCY



- 1 USD = 3.93 BRL
- Markets hold slightly bearish views on BRL in view of economic and fiscal pressures



# Opportunities & Challenges

## OPPORTUNITIES

- One of the largest renewable energy markets in the world
- Excellent wind and solar resources resulting in high capacity factors
- Long and successful track record of wind auctions and developments
- Solar to ramp up quickly in the next few years
- Ample government plans for renewables
- Maturing development landscape that is open to foreign investors
- Sophisticated asset pre-packaging
- Economy recovering from the recession

## CHALLENGES

- Project Development / Finance
  - Project development landscape becoming more competitive
  - Difficult to navigate for foreign investors without local partnerships
  - Immature commercial lending
  - Local content requirement for development bank financing
- Politics
  - Recent corruption fallout
  - Jair Bolsonaro's weak stance on fighting climate change



# Recommendations



- Local partnership is critical in navigating local legal and business landscape
- Partnership with majors
- Partnership with Brazil specialists



- Agencies and service providers exist on the ground to help with licensing and development
- Developers can purchase pre-packaged assets with studies, permits, interconnections



- Auctions for PPAs will become increasingly competitive, resulting in margin compression
- Bilateral contracts with large consumers will be an alternative route to profit in the future

# Chile

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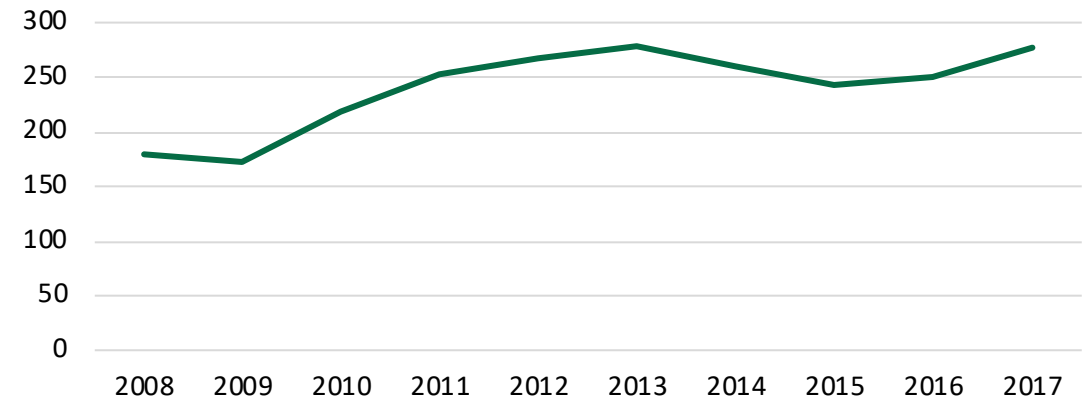
# Country Snapshot

- Chile is the forty-second-richest country globally and its GDP per capita, at USD 23,478, is the highest in South America.
- Chile is ranked 3rd among 32 countries in the Americas region in terms of economic freedom, and its overall score is above the regional and world averages.
- Chile's long record of broadly sound macroeconomic policymaking by the Piñera administration helped to boost confidence in 2018 and brought about a recovery in investment after four years of contraction.
- The Chilean Peso is a stable regional currency in South America due to the country's robust foreign trade. However, the peso can be strongly influenced by movements of currencies in neighboring countries, most notably Brazil, because of Chile's integration with the rest of the region.
- General energy sector facts:
  - Fossil fuels still the main fuel source for electricity generation accounting for 40% of electricity generation in 2015.
  - As with oil and natural gas, Chile imports most of the coal it consumes, with imports accounting for 90% of the coal used in electricity generation in 2014.

## Key Indicators

<u>GDP 2017:</u>	USD 277 bn
<u>Real GDP Growth 2018:</u>	4.0 %
<u>GDP per Capita 2018:</u>	USD 23.4k
<u>Population 2018:</u>	18.3 M
<u>Inflation 2018:</u>	2.45%

## GDP Growth (USD bn)

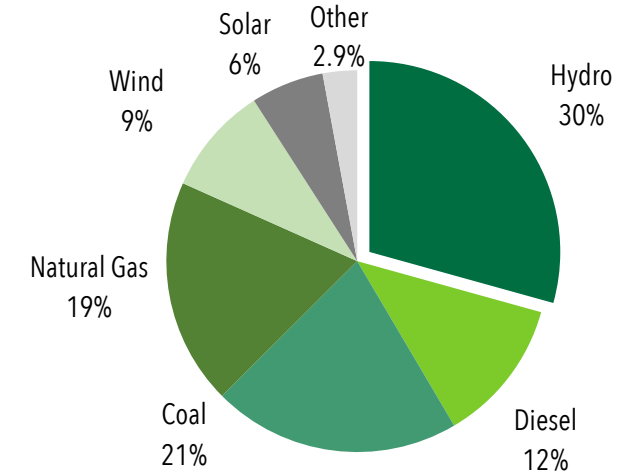




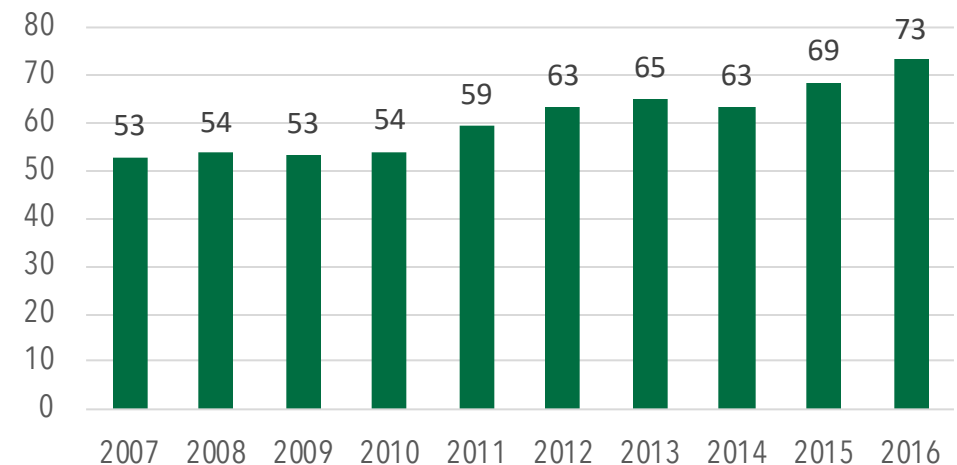
# Electricity Sector Overview

- Total installed capacity 24 GW - electricity demand for the next four years will grow at approximately 3-4% per year.
- Five years ago, Chile generated only 5% of its electricity from non conventional renewable energy sources – in May 2018, 18% excluding big hydro over 20 MW.
- Chile has had multiple successful energy auctions, the most recent of which had an average price of USD 32.5/MW and was over 90% renewables.
- Large potential for renewables:
  - 1,865 GW for wind power, solar and hydraulic projects and the Atacama Desert has some of the highest levels of solar radiation in the world.
- Utility scale solar PV has decreased in price 85% from USD 350/MWh in 2009 to approximately USD 90/MWh in 2013 and USD 50/MWh in 2017
- Chile is the top scorer in this year's Climatescope survey.
  - Three parameters: strong government policies, a track record of clean energy investment, and a commitment to de-carbonization despite grid constraints.

Installed Capacity



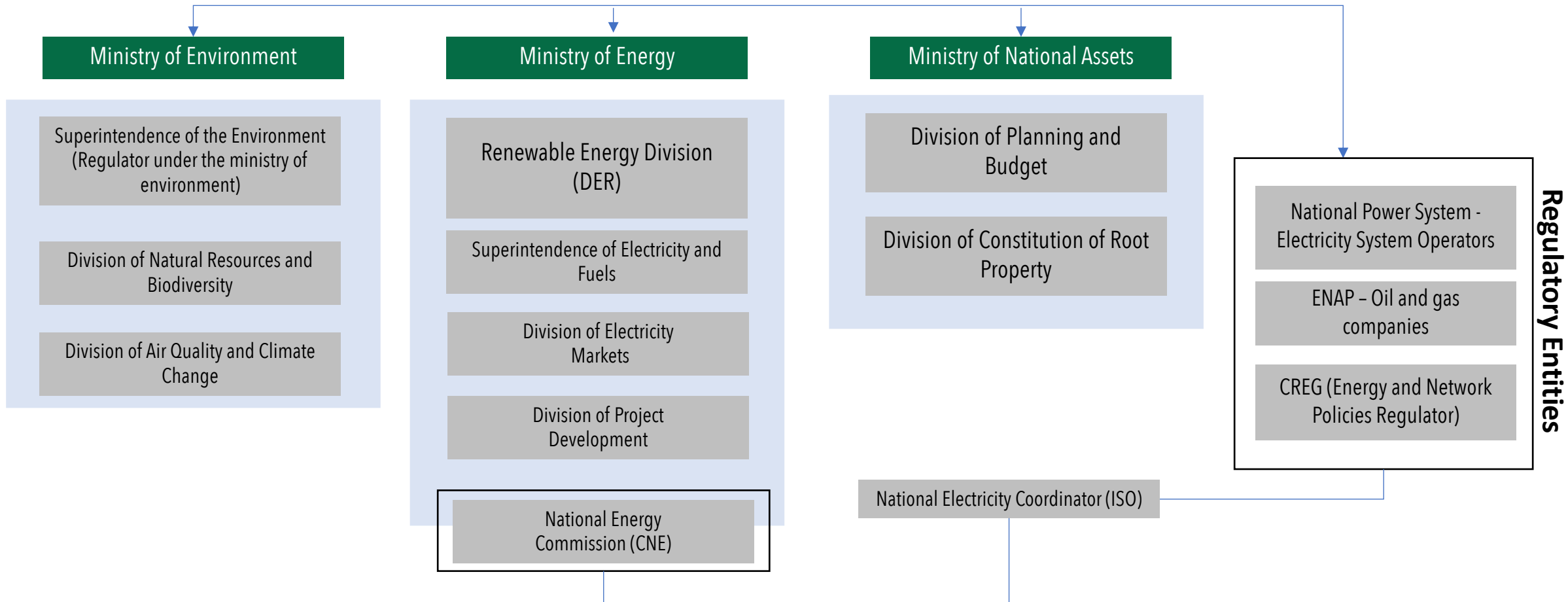
Electricity Consumption (TWh)





# Institutional Framework

The Government's supervisory and regulatory role is through the Ministry of Energy, by the CNE and the SEC, as the country's power sector is 100% privately owned.





# Power Sector

## Generation

- The energy purchase and sale market is structured as a mandatory pool-type market restricted to generators, not allowing brokers or energy traders – generators sell in the spot-market or the contract market (PPAs).
- The contract market exists with the presence of regulated auctions and bilateral PPAs
- Currently, the Chilean electrical system is 100% privately owned, the main players make up 77.3% of the market but there are approximately 26 IPPs operating in Chile. Biggest players:
  - Enel Generacion (5.2 GW, 32,8%); AES Gener (2.6 GW 16,6%); Colbún (2.5 GW, 16,3%); Engie (1.8 GW ; 11,6%)

## Main Players



## Transmission

- Chile will add more than 6,200 km of transmission lines and 24,700 MVA of transformer capacity over the next decade, requiring an investment of more than USD7.5 bn.
- Proposal to incorporate the grid requirements for large-scale solar, wind and hydropower capacity.
  - CNE 2018 expansion plan includes 10 national-level projects with a total investment of USD 1,465M and 38 zonal projects with a total investment of USD 213M.
- The interconnection of the SIC and SING power systems, completed in 2018, enables the sale of energy from solar power plants installed in the north of the country to the south and other regions.
- There are 4 main players in the transmission sector:
  - Transelec, Transnet, AES Gener, and Engie





# Power Sector Continued

## Distribution

- Distribution in Chile is deregulated and 100% open access.
- Network operators are required to provide a connection to any generator which has complied with current regulations, including environmental, technical standards, and construction regulations.
- Prices at the distribution level are determined by the sum of the node price, established at the point of connection with the distribution facilities, an added value for distribution, and a single charge or toll for the use of the trunk transmission system.
- The primary distribution owners are:
  - Enel Distribución, Compañía General de Electricidad (CGE) Distribution, Chilquinta Energy, Sociedad Austral de Electricidad (Saesa)

## Main Players



## Retail

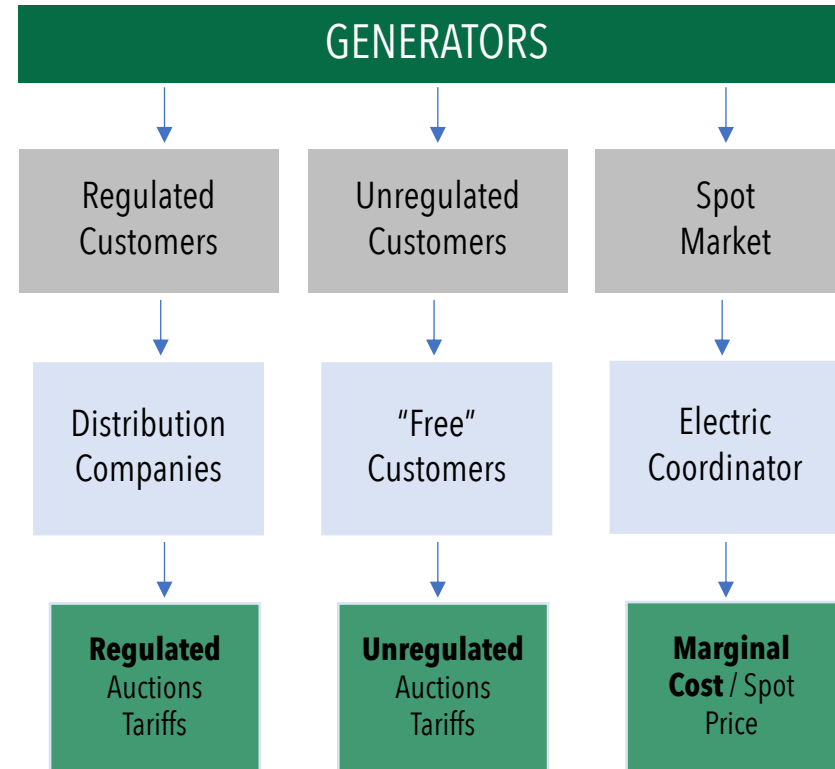
- End user prices are comprised of regulated distribution charges, a wholesale price and relevant transmission charges. However, the regulation allows consumers with an installed power of higher than 500 kW to choose the category of tariff (free or regulated).
- Chile's electricity system relies on a competitive market and a retail market for large customers. Practically all investments in generation and the regulated transmission and distribution sectors are from the private sector, although ENAP, the state-owned oil and gas company, holds stakes in some generating assets.
- Customer switching in the retail market is virtually non-existent, although official figures are not available.



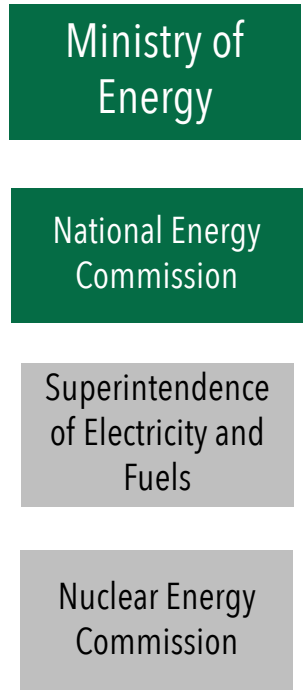
# Electricity Market Structure

- Generators can sell their power in one of the following wholesale markets:
  - Large consumer market, at a freely agreed price;
  - Market of distribution companies, at node price, in the case of electricity destined for regulated price customers;
  - The spot market where generators can buy energy at a marginal hourly cost, determined by the National Electric Coordinator (CEN).
- For supplies to end users whose connected power exceeds 5,000 kW, Act 147 N°(4) provides for price freedom, implying negotiating capacity and the possibility of providing electricity in other ways, such as self-generation or direct supply from generating companies.

## Market Structure



## Role of Gov't

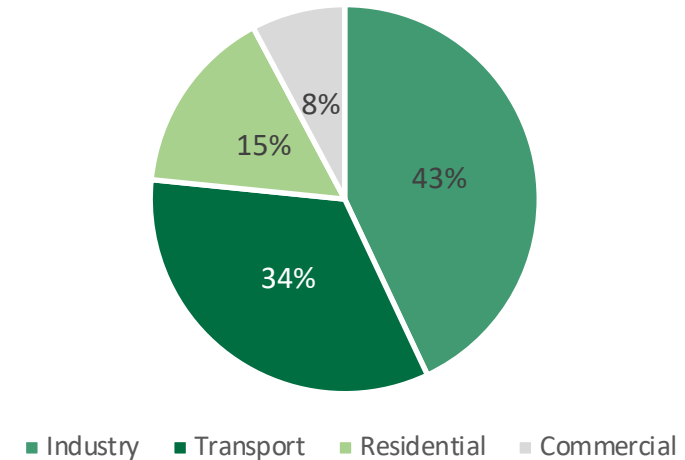




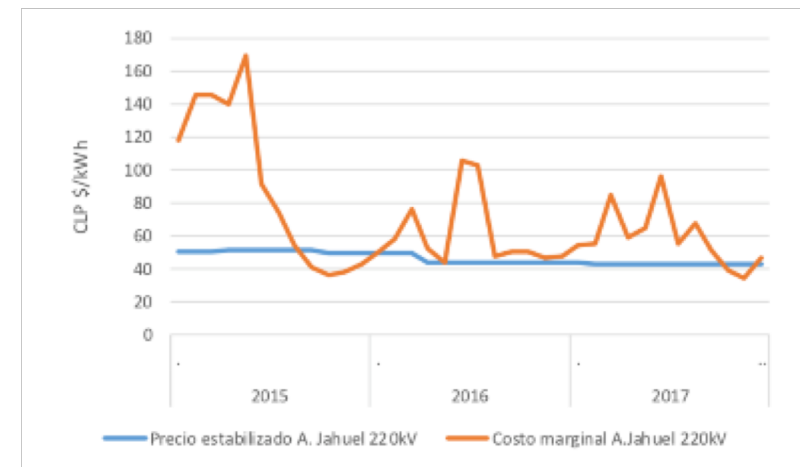
# Wholesale Electricity Market

- The National Electricity Coordinator (ISO) is the independent technical organization in charge of operating the electric facilities in the national electric grid, responsible for ensuring reliable, efficient operation of the power system, and access to transmission.
- Only generators may sell or buy electricity on the spot market. Power plants are dispatched in a merit order using regulated estimates of their marginal costs (audited variable costs).
- Spot prices are determined by the node of delivery (marginal operating costs of nodal plants and nodal demand)
  - Wholesale prices have been volatile: in 2017, SIC prices slipped to zero at times during midday, while shooting back to USD 60/MWh at night.
- Tariffs are based on peak load pricing (demand pricing). Average national commercial, industrial and residential tariffs were USD 214/MWh, USD 149/MWh and USD 199/MWh, in 2017.
- The wholesale market also includes a market for firm capacity.
  - Generators awarded on firm capacity at a price for capacity calculated by CNE on USD/kW basis.

Electricity Consumption by Sector



Spot Market Prices





# Renewable Energy Resources

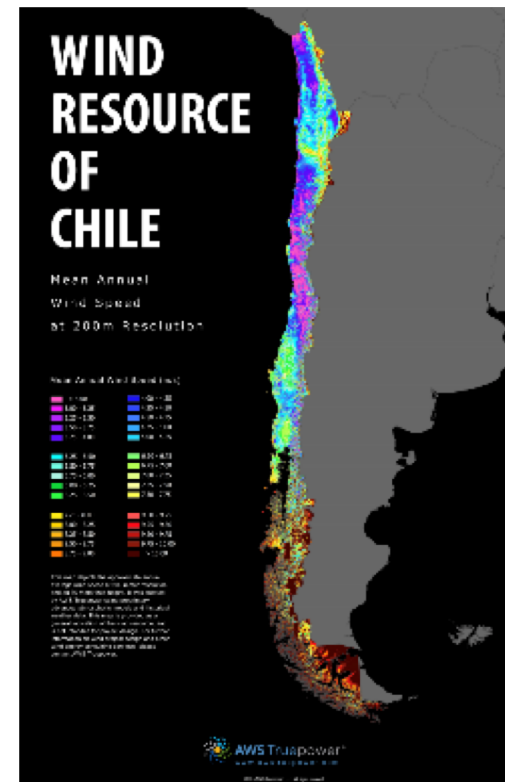
## Solar Resource

- The Atacama desert has some of the highest solar irradiance in the world – this region is also home to mining operations and can be a primary source of business for solar IPPs operating outside of the auctions to sign bilateral agreements.



## Wind Resource

- Chile also has several high wind areas inland and on the coasts - From 2006 to 2016, electricity generation increased on average by 3.3% per year to reach a record of 78 TWh





# Energy and Renewables Laws

- Short Law II, Law 20 018 (Ley Corta II) – May 2005, stipulates energy supply bids to regulate customers through long term contracts up to 15 years.
  - Modified in 2015, improves competition conditions in generation activities, as distribution agents are required to buy energy through public auctions instead of using the price regulated by the CNE.
- In 2013, the state required generation and distribution companies to supply 20% of their contractual obligations with NCRE by 2025.
- The Non-Conventional Renewable Energy Law (“NCRE” Law 20.257) helps to develop non-conventional renewable sources for electricity generation, such as geothermal, wind, solar, tidal, biomass and small hydroelectric plants.
- In October 2014, Chile enacted the first climate pollution tax in South America – imposes an annual tax on emissions from boilers and turbines with a thermal input of at least 50 MW.
- Chilean congress approved a new law (Law 20805) that modified the tender process to supply energy to distribution companies, transferring the management of the auction to the National Energy Commission away from distribution.

## **RENEWABLE ENERGY TARGETS**

60% by 2035

70% by 2050

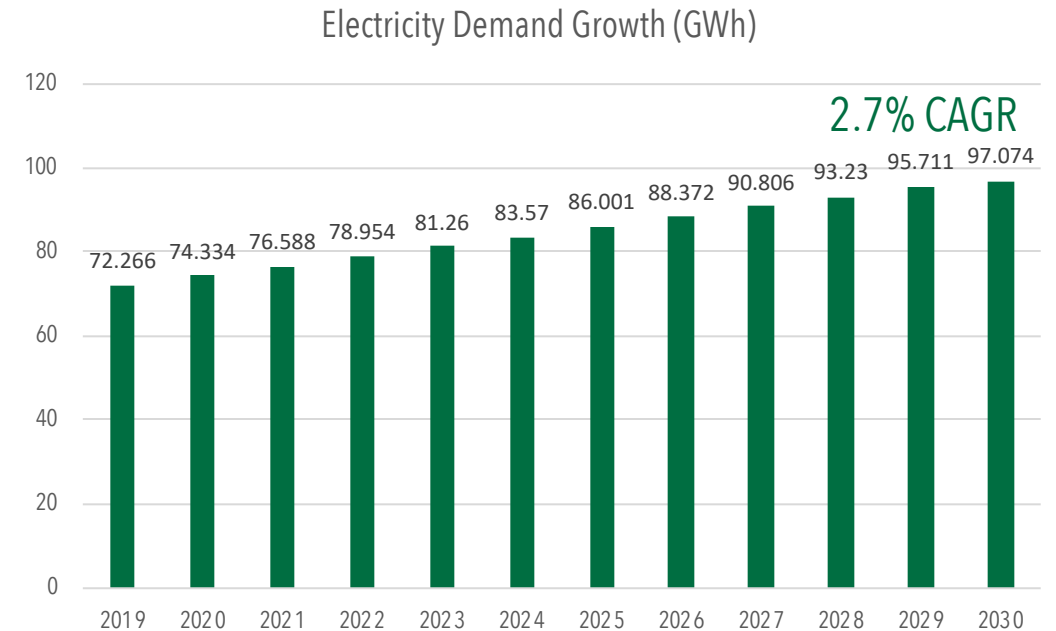
20% of generation from utilities  
by 2025

Current Mix: 40% (including large  
hydro)



# Renewable Energy Market Size

- Chile's renewable capacity is expected to grow by 50% reaching 5 GW over the forecast period.
- Driven by renewable energy targets, technology-neutral competitive auctions and the scheme for small project procurement (under 9 MW).
- According to ACERA, about 1,200 MW of new renewable energy capacity is currently under construction and much of it is expected to start operation by the end of 2019.
- CEN expects 1,173.5 MW to join the grid in 2019, of which 34.3% are wind energy projects and 23.1% are solar power ones.
- USD 3.5bn in renewables investment in Chile in 2017 - Chile has invested USD 880M in grid infrastructure to reduce curtailment and is investing considerably more in the expansion of its grid.





# Auction Structure

- All PPA's are fixed in USD (\$/MWh) and extend for 20 years. Developers could submit bids from a single project or a portfolio of projects. Companies did not need to disclose the specific plants behind their bid submissions.
- Auctions are conducted 5 years before the actual supply starts and includes a mechanism that allows an awarded company to delay the start of supply under specific circumstances (up to 2 years) and the length of the contracts are 20 years.

## Static Auction

### Volume of Tender

Energy in Supply Blocks

Volume of supply in hourly blocks

Hourly blocks divided into 50 sub-blocks

### Pricing

Pay-As-Bid

Reserve Margin (2.5% above ceiling can modify bid)

Total present cost of supply - levelized price used for bid ordering

### Technology

Technology Neutral

Developers offer a certain amount of capacity

State the type of power plant to build but not observed

Offtakers = distribution companies

## Qualifications

- Minimum credit rating of BB+
- Specific purpose company registered in Chile
- Identification of existing and projected (if not registered, pledge bid bond)
- Generation sources (name, type and installed capacity)
- Must purchase insurance if win the bid
- Name of the owner company of each generation source.
- Location (existing or expected).
- Estimated date of entry into operations.
- Primary fuel and origin of the fuel.
- Connection point (current or projected).
- Physical features of the power lines.
- Own production of energy in the last 5 years.
- Copy of the balance sheets and consolidated income statements in the three years before the year of bid submission.
- Commercial and financial background of the bidder.

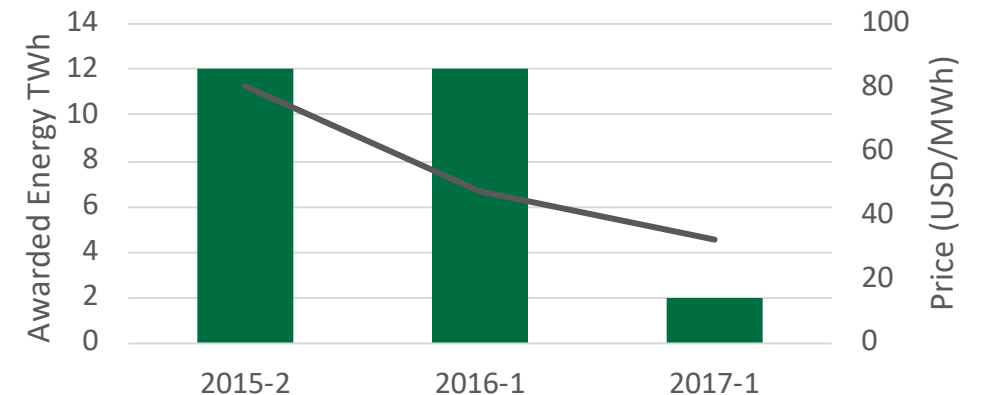


# Energy Auction Results

- PPA contracts have been those obtained through public tenders organized by CNE.
  - Producers compete to obtain 20-year PPA contracts with offtakers - Chilean distribution companies.
- 4 largest distribution companies in Chile (Enel, CGE Distribución, Chilquinta, Saesa) concentrate 97% of the market, their counterparty credit risk is systemic risk.
- Chile does not have support mechanisms like tax benefits or feed-in tariffs.
  - When financed by investors or banks, strong emphasis is put on modelling and spot prices forecasts (as well as the Stabilized Price regime).
- Last 2 tenders - renewables accounted for over 90% of all generation.
- In November 2017, Chile awarded 2.2 TWh/year of generation (which was 10x oversubscribed)
  - The weighted average contracted price was USD 32.5/MWh, a 32% decline compared with 2016 and a 60% decline from the 2015 auction.
- The four generators with coal assets and other players are working on a decarbonization plan that aims to retire or convert all coal plants by 2040.

Auction Rounds	Date Wins Announced	Bids	Companies Awarded Contracts	Awarded Capacity (GWh/year)	Average Price (USD/MWh)
Chile Power Tender 2015/02	October 2015	<b>38</b>	7	12,430	80.5
Chile Power Tender 2015/01	June 2016	-	11	12,430	47.6
Chile Power Tender 2017/01	November 2017	<b>24</b>	5	2,200	32.5






### Past Auctions





# Recent Auction Winners & Current Players

Offers were submitted on October 11, 2017 and CNE received 24 bids, totaling 20.7TWh/year – nearly 10 times the volume up for contract (2.2). Developers could submit bids from a single project or a portfolio of projects. Companies did not need to disclose the specific plants behind their bid submissions

<u>Company</u>	<u>Country</u>	<u>Introduction</u>	<u>Win</u>
	Chile/Italy	Italian multinational energy company that is active in the sectors of electricity generation and distribution.	54% of total
	Chile	Founded in 2006, <b>Fotowatio Renewable Ventures (FRV)</b> is a leading global developer of renewable energy solutions for a cleaner and more sustainable future.	25% of total
	UK/Italy/Bermuda	Multi-national <a href="#">solar power</a> producer with 138 solar power plants/farms across 8 countries Sonnedix is majority owned by institutional investors advised by J P Morgan Asset Management	10% of total
	Spain	<b>Cox</b> Energy, a Spanish company of renewable energies, specifically solar photovoltaic, began operations on July 25, 2014.	6% of total
	Chile	<b>Atacama Energy Holdings</b> SpA. is a Chilean company involved in the development of energy, mining and real estate projects.	5% of total



# Land & Labor

## ESTABLISHING A BUSINESS

- Foreign investors have access to all productive activities, except for the internal waterways freight transportation sector, in which foreign equity ownership of companies is capped at 49 percent.
- Most enterprises in Chile may be 100 percent owned by foreigners. Concessions and contracts are assigned without discrimination against foreign investors.
- The Chilean government took significant steps towards business facilitation, and according to the World Bank, Chile has the smoothest procedures to establish a foreign-owned company in Latin America and the Caribbean.
- [Entrepreneurs have to go through six steps, some of them simultaneous, taking in total less than five days.](#)

## LAND AND LABOR

- The Ministry of Energy and the Ministry of National Assets have collaborated to provide auctions of public land for non-conventional renewable energy projects auctions for investors. Allocation of public lands simplified extending maximum term of use to 35 years:
  - Almost 90km<sup>2</sup> of state land available through concessions for the development of renewable energy, targeting wind and solar projects.
  - Environmental impact study to be conducted for renewable energy projects to be presented to the Environmental Assessment Service (SEA)
- Article 19 of the Labor Code stipulates that at least 85 percent of the staff hired by one and the same employer must be Chilean, except in the case of firms with less than 25 employees.
- Article 20 of the Labor Code includes several provisions under which foreign employees can exceed 25 percent, independently of the size of the company.



# Recent Transactions

- Chilean power company Colbún reached an agreement with First Solar to acquire a multitude of the PV company's assets in Chile, including a 150 MW PV project.
- Ingeteam supplied 140 MW of photovoltaic inverters to Chile for solar projects coming under the Distributed Generation by Small Power Producers (PMGD) program, which supports the execution of generation projects with rated powers of up to 9 MW.
- Grenergy Renovables finalized the sale of three small-scale PV facilities in Chile totaling 12 MWp to Latin American power plants operator InterEnergy Holdings for USD 66.5 million.
- Engie Energia Chile SA (EECL) has signed contracts agreeing to purchase two solar PV parks with a combined capacity of 55.3 MW located in the Chilean region of Atacama – to purchase all shares in USD 34.9 M



**Ingeteam**





# Project Finance

Current projects are not going through an auction process, and are instead being contracted as bilateral agreements with distribution companies and signing long-term PPAs.

- In general terms, percentages of equity (48%) and debt (52%) are similar for all technologies.
- Without debt, 20 projects corresponding to USD 1.5 bn, were financed, and developed by large international utilities (on balance sheet financing), national enterprises, enterprises from other sectors (mining).

## Debt Financing

- On the private side, the predominance is from the national origin, linked to local commercial bank financing such as BICE, BCI and Banco de Chile.

Table 4 : Debt according to origin, USD million

Debt	National	International	Total
Public	38	1,331	<b>1,369</b>
Private	1,766	508	<b>2,274</b>
<b>Total</b>	<b>1,804</b>	<b>1,839</b>	<b>3,643</b>

OECD, 2016

## Currency



XE, 2019

Table 6 : Debt origin by technology, millions of USD

Technology	Debt				Total
	National	International	Public	Private	
Solar PV	902	1,183	1,059	1,026	2,085
Solar thermal	14	-	-	14	14
Biomass	71	72	63	80	143
Hydro	363	228	162	429	591
Wind	452	354	84	722	806
<b>Total</b>	<b>1,802</b>	<b>1,837</b>	<b>1,368</b>	<b>2,271</b>	<b>3,639</b>

OECD, 2016



# Alternative Opportunities in Chile

## Smaller Projects

- Chile's PMGD program for distributed generation, which includes all projects up to 9 MW, is growing in popularity. These medium sized generation projects are seeing more growth as large Chilean auctions cool down and the PMGD program offers certain benefits:
  - Eligible for the stabilized price regime calculated by the Chilean National Energy Commission (CNE).
  - The program grants automatic connection to the medium voltage grid
  - Certainty that all power production will be injected to the electricity system.

## Bilateral Agreements with Mining Operations

- The Chilean government owns the lithium resources in the Atacama salt flat through Corfo, the Economic Development Agency. Albermarle and SQM are currently exploiting the mineral. Chile is expanding the production capacity through a recently signed agreement with Albermarle (ex Rockwood Lithium).
- Lithium and Copper mining energized by solar PV or CSP power in the Atacama desert with a single offtaker PPA with mining companies like Albermarle and Glencore.

## Examples

- Sonnedix, a global independent solar power producer, has acquired two portfolios with a total capacity of 32 MWp in Chile. The projects, which range in size from 3 to 9 MWac. The projects have been purchased from Imelsa, a local partner active in energy commercialization through PPAs with industrial consumers and the solar component consumed by the end client will be sold through a PPA with Imelsa Energía SpA.

### SOLAR ENERGY PROGRAM 2016-2025



This Roadmap seeks to take advantage of the Atacama Desert's unique features to develop a national solar power industry with technological capabilities and export-oriented. To this end, an initial portfolio of 50 initiatives was identified, with a total budget of US\$800 million.

#### TECHNOLOGICAL DEVELOPMENT

- Photovoltaic systems for desert application
- Solar mining and metallurgy program
- CSP and Thermal energy storage system program
- Solar desalination
- Solar fuels program
- Advanced human capital program

#### INDUSTRIAL DEVELOPMENT

- Open innovation platform
- Innovation challenges financing
- High-tech investment attraction program

#### REINFORCING QUALITY INFRASTRUCTURE AND HUMAN CAPITAL FOR INDUSTRY

- Climate characterization
- Metrological network
- Standards
- Conformity assessment schemes
- Certification of labor competencies program



# Recommendations



- The business model adopted by Codelco for the Gaby copper mine is an interesting example of increasing industrial competitiveness and reducing energy-supply risks.
- A ten-year heat supply PPA was signed with a solar thermal plant owned and operated by the Chilean-Danish consortium Energía Llama/Sunmark.



- ReNew could follow the example of Sonnedix and other international players of acquiring 9 MW projects (in development).
- Secure a fixed price for a long-term generation



- The next auction is not scheduled and many new projects are being contracted directly with distribution companies:
  - An opportunity could be to work with a developer on the ground to provide financing and materials and bring projects online

# Colombia

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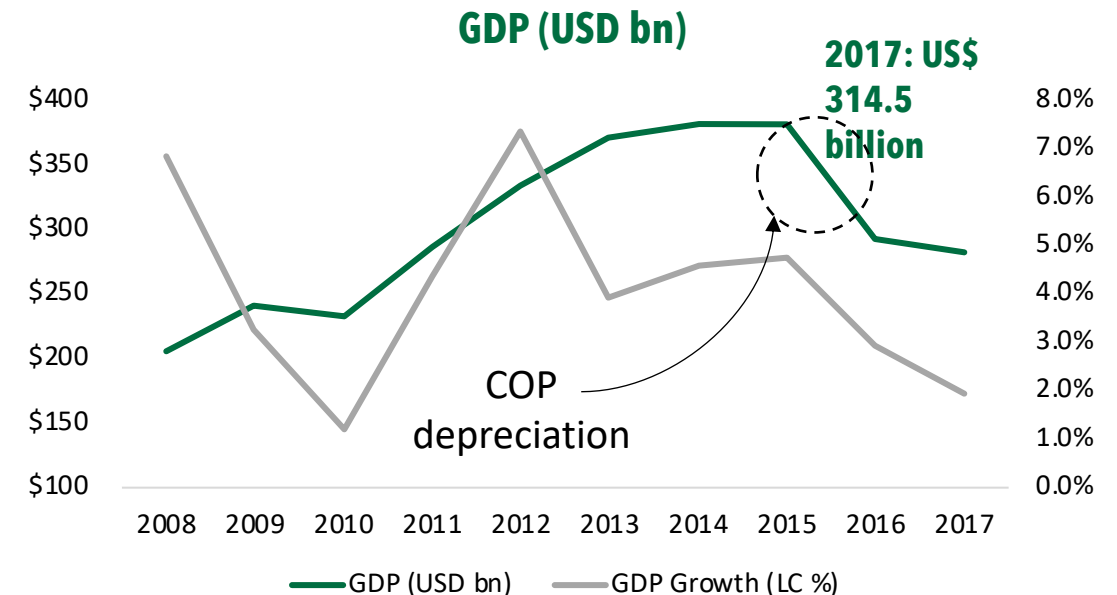
# Country Snapshot

- Colombia has maintained a robust economic performance in recent years.
- IMF indicates that Colombia is the country with highest GDP in the Andean region and has one of the lowest annual inflation (below 4%).
- International Trade Agreements:
  - TLC's: Colombia-USA, Colombia-AELC (EFTA), Colombia-Canadá, ALADI, Colombia -Chile Agreement, CAN -Mercosur, Comunidad Andina Centroamérica y Caribe-Acuerdo de Asociación CAN -UE
- Became an OECD Country in 2018
- Other general facts:
  - Around 0.8MM Barrel per Day (3<sup>rd</sup> biggest producer in LATAM)
  - Fifth largest coal exporter WW and 1<sup>st</sup> in LatAm
  - 4<sup>th</sup> largest crude palm oil producer WW

Source: EIU & World Bank

## KEY INDICATORS 2018

<u>GDP 2018:</u>	USD 337 bn
<u>Real GDP Growth 2018:</u>	2.6%
<u>5-year Avg Real GDP growth:</u>	3.0%
<u>GDP per Capita 2018:</u>	USD 15.3k
<u>Population 2018:</u>	45 M
<u>Inflation 2018:</u>	2.60%

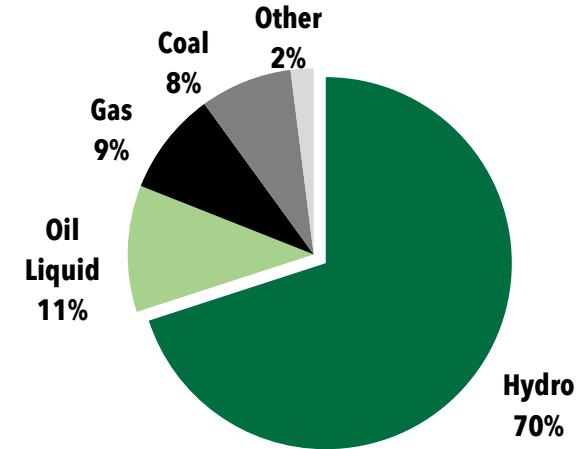


# Electricity Sector

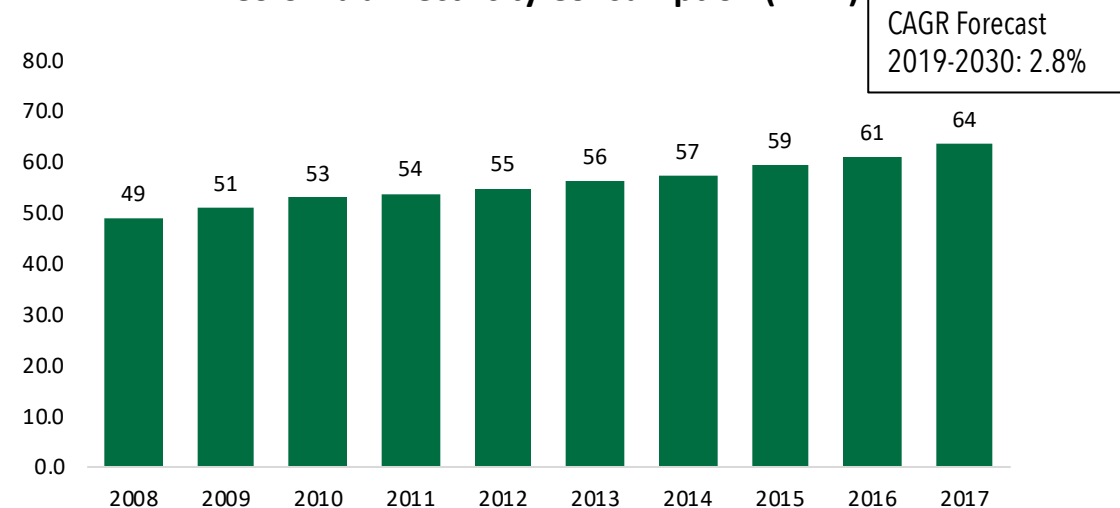
- In 2017, Colombia had 16.8 GW of installed electricity generation capacity of which hydropower represented 70% of the installed capacity, followed by fossil fuels (oil, gas, and coal).
- Electricity demand grew on average 2.5% each year during the last decade, reaching 66,893 GWh in 2017
- To meet the demand, Colombia generated 66,667 GWh and imported 194.2 GWh mainly from Ecuador.
- Generation mainly came from renewable resources accounting for 87% of total generation.
- Renewable energy sources include hydro, wind, solar, and biomass; hydropower accounted for more than 80% of all power generation in 2017.
- As of Q1 2019, only 50 MW of wind and solar were installed; however, on Apr 19 the El Paso Solar 86 MW solar plant came into operation, turning into the first large-scale solar plant in the country.
- The government's target is to reach 1.5 GW of solar and wind installed capacity by 2022; 1.4 GW were awarded in an auction that took place in March 19

Source: EIA, BP, XM.

**Capacity: 16.8 GW**



**Colombia Electricity Consumption (TWh)**



# Institutional Framework

## Policy:

- The Ministry of Energy and Mining: Designs the energy sector policies

## Planning:

- UPME: Electrical network and market expansion strategic planning unit

## Regulation:

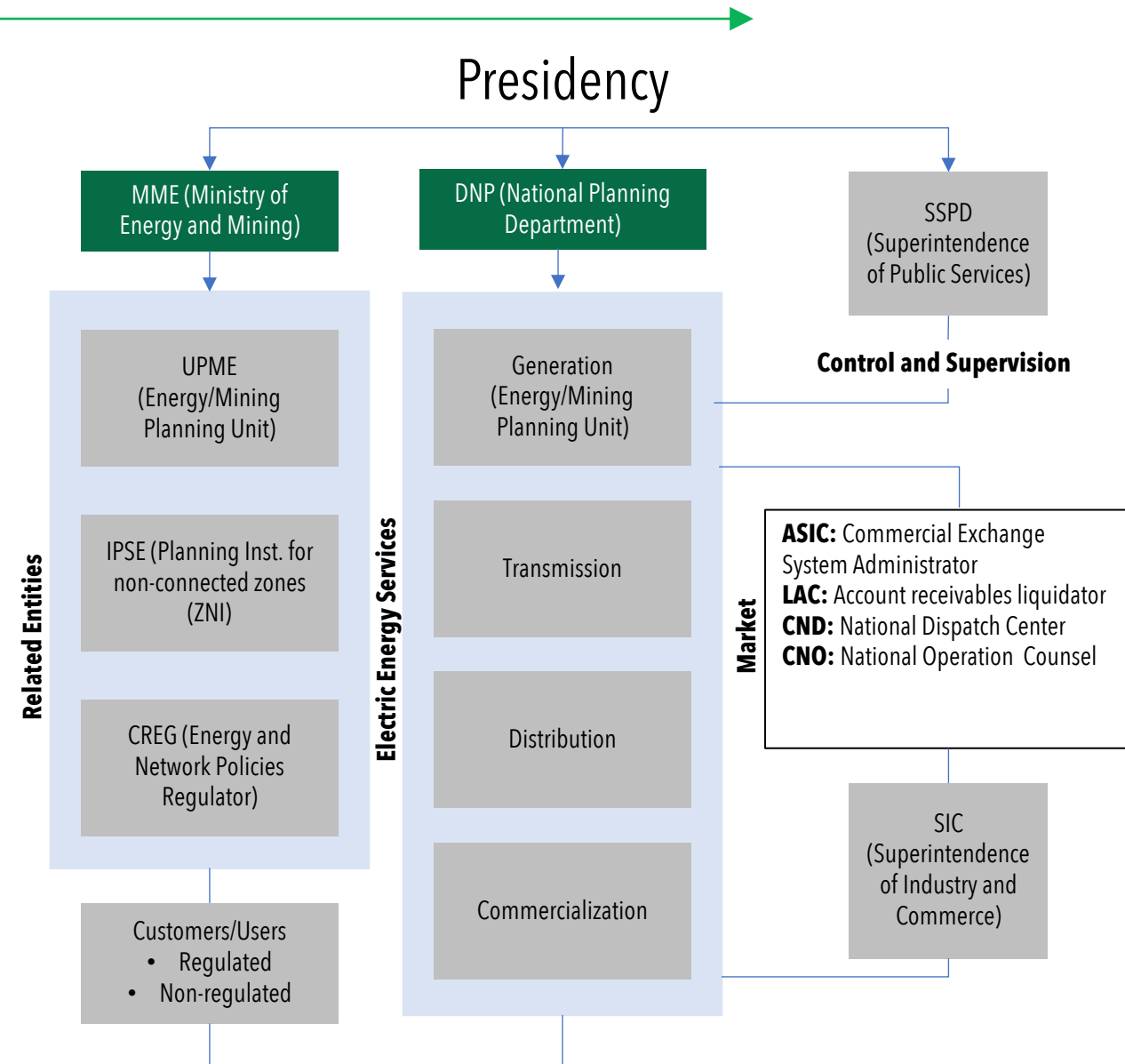
- CREG: Energy and connections policy regulator

## Market: Composed of regulated and unregulated users or agents

- Regulated agents purchase the electricity subjected to the tariffs established by the CREG; made up of mostly commercial users, some industrials, officers and the residential areas
- Unregulated agents have energy requirements greater than 2 MW. They can freely negotiate generation and commercialization activities

Agents: They take the energy to the last user (generators, carriers, distributors, marketers and administrators).

Supervision and Control: The Superintendence of Domiciliary Public Services (SSPD), is in charge of supervising the agents' behavior and sanctioning the laws and rule violations.



Source: CREG, MME

# Power Sector

## Generation

- Short-term energy market (spot market) where generators offer to XM (operator) energy prices based on their capacity and availability. XM then economically optimizes the offers for market dispatch.
- Long-term energy market (also known as long-term agreements) that are signed between generators and end users or retailers.
- Main generation companies are: EPM, ISAGEN and EMGESA (ENEL Group) with about 65% share.

## Main Players



## Transmission

- Is a regulated market, where CREG (regulator) defines the transmission fees, derived from a formula that gives a cost per KWh which is then paid by the commercialization companies or any entity that uses the transmission lines.
- Main transmission company is ISA (81% share).
- Transmission is composed of STN (National Transmission System) and STR (Regional Transmission System).



Source: CREG, XM

# Power Sector Continued

## Distribution

- OR (Network Operator) is a regulated market. Fees are also defined by CREG (via a formula, per kWh) depending on the location and voltage level.
- Main distribution companies are: CODENSA (Enel Group), Electricaribe and EPM, with more than 50% share.

## Main Players



## Retail

- These are the only companies allowed to sell/trade energy both to regulated and non-regulated clients.
- Clients with consumption less than 55 MWh/month or power demand higher than 100 kW could opt to be treated as non-regulated and then establish a direct agreement and negotiated tariff with a retailer. Regulated clients should pay the energy tariffs regulated by CREG.
- ISAGEN is the biggest non-regulated retailer. In the regulated market, the biggest players are EPM, CODENSA and Electricaribe.



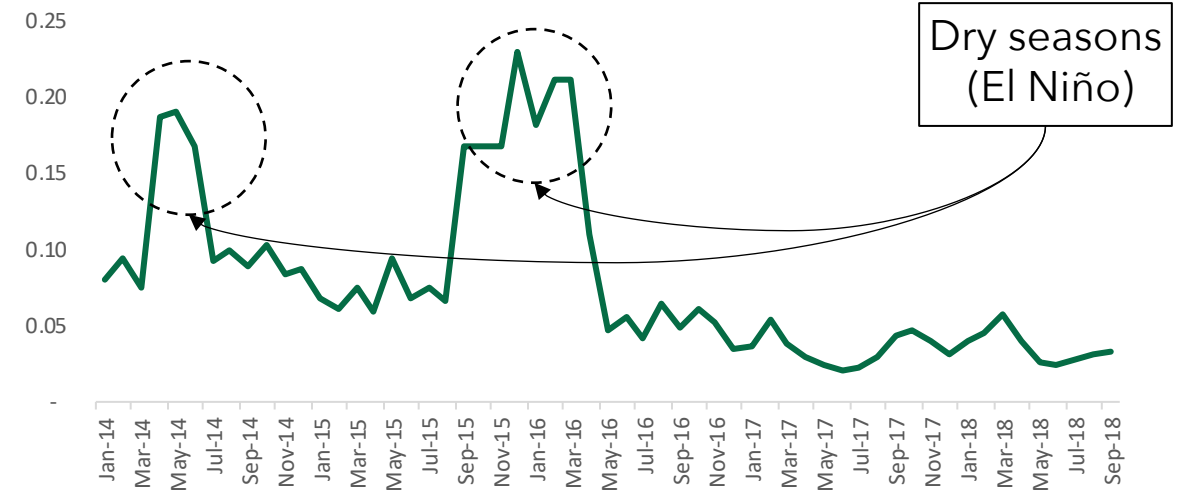
Source: CREG, XM

# Electricity Market Structure

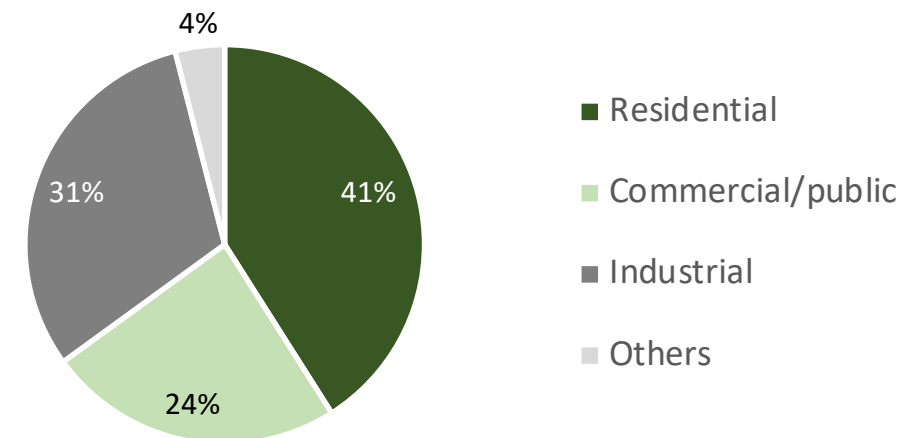
- The wholesale electricity market (MEM, its acronym in Spanish) is made up of information exchange systems between generators and retailers operating in the SIN (interconnected system), allowing these agents to carry out their short and long-term electricity purchase and sale transactions.
- The energy required to supply the demand of the users connected to the SIN, represented by the marketers, is traded, and offered by the generators that connect their plants or generation units to the System.
- Generators are obliged to participate in the MEM with all its generation units connected to the SIN with a capacity greater than 20 MW, which must be dispatched centrally by the CND. All marketers that serve end users connected to the SIN are required to carry out their energy transactions through the MEM.
- The transactions in the MEM are made under these conditions:
  - Hourly transactions in the energy exchange
  - Bilateral energy financial contracts
  - Auctions for the assignment of Firm Energy Obligations of the Reliability Charge
- All generation companies in the MEM can freely participate in any or all of the above mentioned transactions under conditions of equality.

Source: CREG, XM

**Spot Price Colombia USD/kWh**



**Energy Demand by Sector**





# Renewable Energy Overview

- Colombia has great potential for renewable energy development given its solar and wind resources
- The country has not developed large scale RE projects given its vast hydro resources, which provide cost effective electricity and represents 70% of the installed capacity.
- However, diversifying the energy matrix has become a priority as recent dry spells (El Niño) represent a big threat for Colombia's energy security; also the risk of Hidroituango, largest Colombia energy project (2.7GW), not entering into operation has added pressure.
- Colombia has various regions that have usable wind output, having exceptional resources in the Atlantic Coast region.
- La Guajira department, in the Atlantic Coast region, is considered to have the best wind resources of South America with 9 m/s of annual average speed; its potential is estimated to be 18GW.
- Today, Colombia only has 19.8 MW of wind installed capacity, but has more than 500 MW of projects under construction.
- Solar irradiation like wind has the best resources in the La Guajira region.
- As of Q1 2019, Colombia only had a combined solar and wind capacity of 50 MW; however El Paso Solar project (86MW) entered operation in April turning into the large-scale project in the country.
- The current government set the goal of 1.5GW of installed capacity by 2022; 1.4GW are under construction and will enter operation in 2021 (See Reliability Auction Slide).

Regions with greatest wind potential	
Region	Wind potential (MW)
Atlantic Coast (including Guajira)	20,000
Santander	5,000
Boyaca	1,000
Risaralda-Tolima	1,000
Huila	2,000
Valle	500

Irradiation in regions of Colombia	
Region	Avg irradiation (kWh/m2/day)
Guajira	6.0
Atlantic Coast	5.0
Orinoquia	4.5
Amazon	4.2
Andean Region	4.5
Pacific Coast	3.5

Source: UPME



# Legal & Regulatory Framework

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## LAW 1715 -RENEWABLE ENERGY LAW

*This law, among other supporting regulations, allows investors in new projects with non-conventional renewables energy to consider the following benefits:*

Tributary and fiscal incentives: income tax rebate of 50% of the invested capital in 5 years.

- Economic incentives: VAT (19%) exemption.
- Import customs fee exemption (reduces between 5% to 10% CAPEX costs on imported components).
- Accelerated depreciation (20% max. annual project depreciation during 5 years).

*Additionally:*

- Colombia signed a binding agreement in Paris (COP21-2016) with a commitment to reduce 20% greenhouse effect Gases emissions by 2030.
- In February 2016, Colombia formally adopted IRENA's (International Renewable Energy Agency) statute into its own legislation.
- Renewable energy sources such as solar and wind power are now being more accepted by the industrials, large consumers as a reliable alternative to mitigate changing financial and capacity conditions of a market controlled by few.

Source: MEM

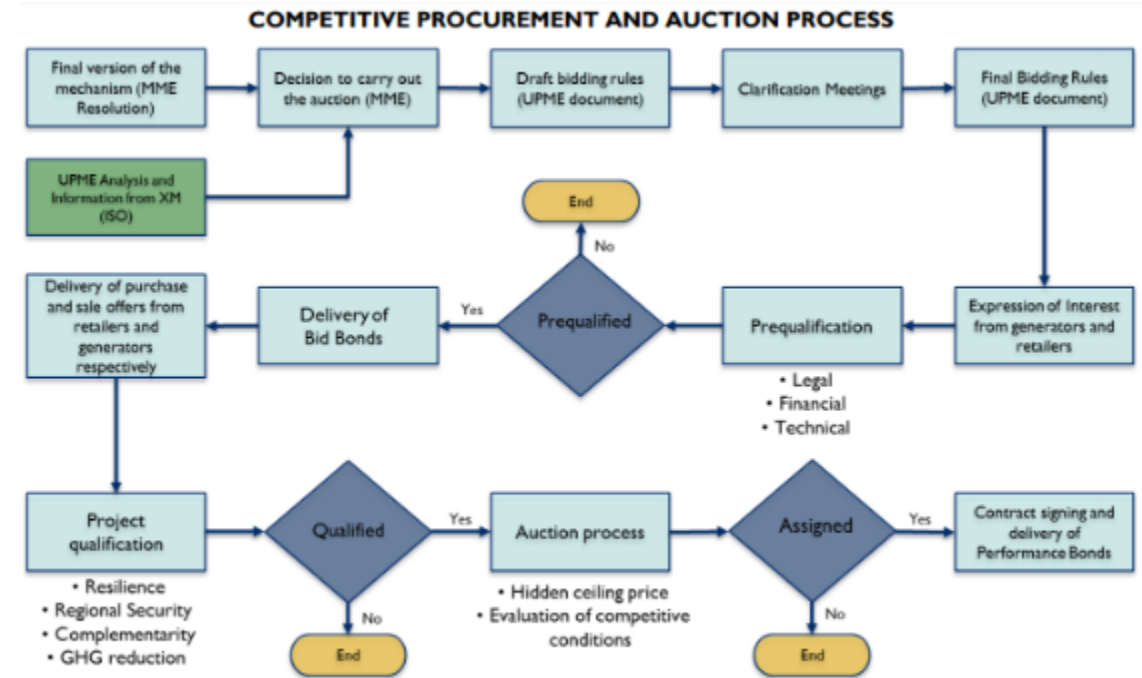
# Renewable Energy Auction Design

- In February 2019, Colombia launched its first long-term renewable energy auction which failed in awarding projects, as two of the proposed indicators were not met (See next slide)
- The auction had 4 main objectives on which the auction was designed and the projects were evaluated
- Objectives:
  - Diversify the generation mix: Projects that add new sources of generation will receive the highest scores
  - Reduce GHG emissions: Projects that did not emit GHGs had the highest scores; projects that reduced emissions through technological changes will be scored proportionally to their reduction; projects that emit GHGs will score 0 in this objective
  - Increase regional system security: Projects that improve the regional balance between demand and supply, and/or reduce costs in terms of operation restrictions (e.g. network congestion) will receive the highest scores
  - Balance hydro-dependent energy mix: Projects that better complement hydro resources, both in terms of location and time (hourly, daily, monthly, seasonally, and annually) score higher

Source: UPME

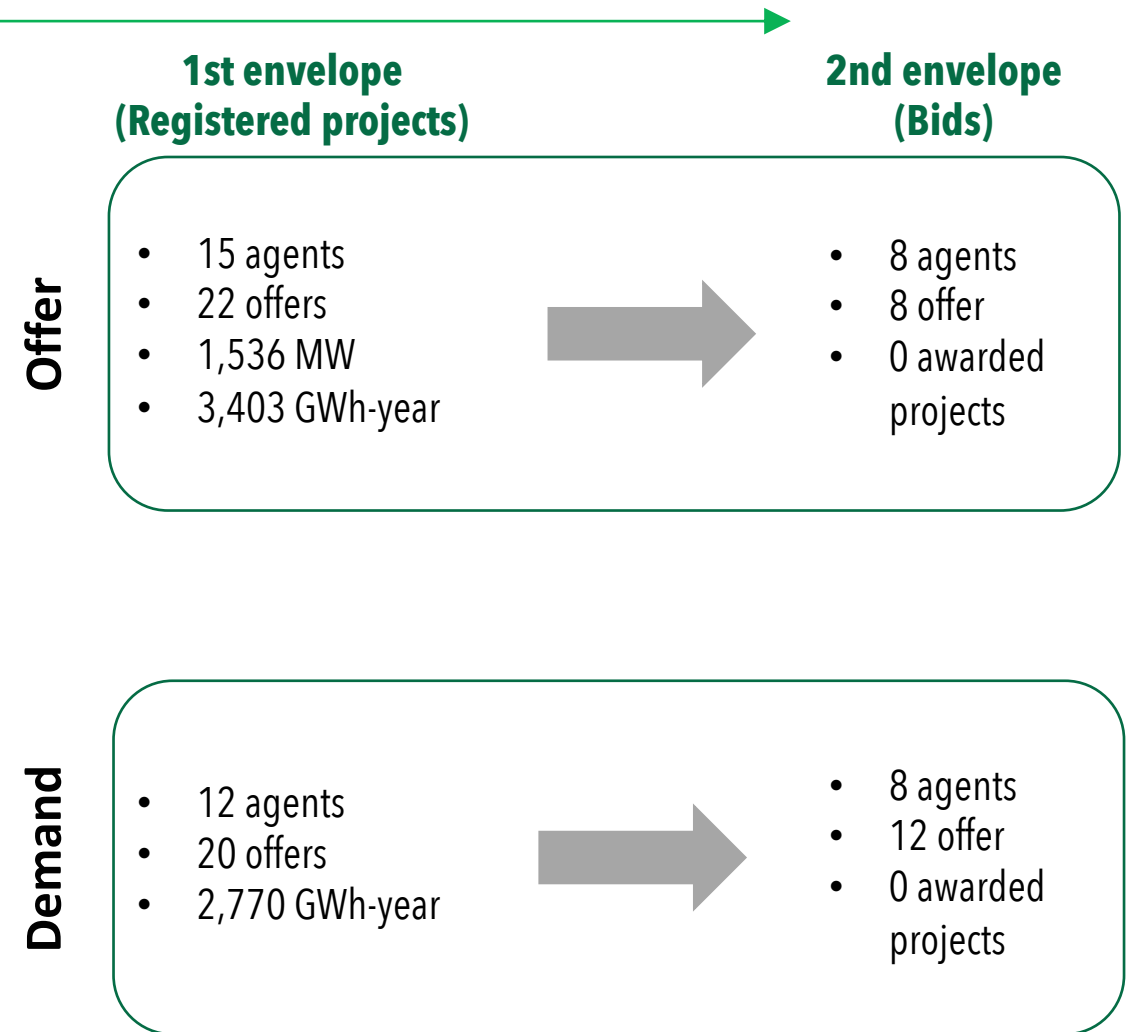
## Auction Highlights

<b>Technology:</b>	Neutral
<b>Product:</b>	Annual average energy (MWh)
<b>Duration:</b>	12 years
<b>Currency:</b>	COP
<b>System</b>	Sealed Envelope Bid
<b>Target</b>	1.2TWh/year
<b>Energy delivery date</b>	Dec-21
Only new projects allowed	



# Renewable Energy Auction Results

- **Participants:** 8 sell offers and 12 buying offers
- To ensure transparency and competitive fairness, 3 indicators had to be met: Participation, Concentration and Dominance; **only 1 (Participation) out of the 3 was met.**
- **Indicators:**
  - **Participation:** More than 50% of the offers could not come from the same group. **Result:** Both Enel and Brookfield had offers on both sides of the auction. The sell side was competitive as 8 projects from 8 different firms were presented. However, on the buy side, Enel presented half of the offers through Codensa and Emgesa. Nonetheless, this indicator was met
  - **Concentration:** Herfindahl-Hirschman Index (HHI) lower than 2.400. The purpose of this measure was to avoid one offer being disproportionately larger than the rest. **Result:** The HHI was 7.836, which, if true, meant that the share of one single participant had to be of between 85% and 90%.
  - **Dominance:** The dominance criteria aimed to avoid that one single project would take more than 12% of the matched energy. The dominance indicator was 88%, meaning that one project would have absorbed 88% of the total matching-demand.



Source: CREG, MEM



# Reliability Charge Auction

## Background:

- Hidroituango, Colombia's largest energy project (2.7GW) was supposed to enter operation in 2018; however, the project was at risk of collapsing and it is now not clear if it will enter into operation
- Due to this, Colombia was likely to have a deficit in available Firm Energy to cover growing energy demand; to address this, the government launched the Reliability Charge Auction which took place on the 28<sup>th</sup> February, 2019

## Results:

- The auction awarded 70 projects tendering a combined 4.0 GW in new capacity across all forms of energy
- 1,398 MW were awarded to wind and solar projects; 1,160 MW to wind projects (6 projects) and 238 MW to solar projects (2 projects)
- Most of the renewable energy awarded capacity is owned by AES Colombia ( 1 wind project) and Enel Green Power (4 wind projects, and 1 solar).
- AES Colombia acquired a wind portfolio with almost 650 MW of capacity from developer Jemeiwaa-Kai. One of these projects (Casa Eléctrica), was awarded in the auction.

Company	Project	Technology	Capacity MW
Emgesa	El Paso Solar	Solar	86.2
Enel Green Power	Chemesky	Wind	100
Enel Green Power	La Loma Solar	Solar	173.2
Enel Green Power	Tumawind	Wind	198
Enel Green Power	Windpeshi	Wind	195
Eolos Energía	Parque Beta	Wind	280
Jemeiwaa ka I s.a.s. (AES)	Casa Eléctrica	Wind	180
Vientos del norte (Renovatio)	Parque Alpha	Wind	200

Source: CREG, MEM

# Foreign Investment

- Colombia is the third best country to do business in LATAM after Mexico and Chile, according to the WB Doing Business 2019 ranking,
- Colombia is the third host of FDI in LATAM after Brazil and Mexico, receiving USD 14.5 bn in 2017
- Colombia's FDI regime is based on 3 principles:
  - **Equality:** There is equal treatment for both foreign and national investments. There is no discrimination or favorable treatment for foreign investments (including land purchase and lease)
  - **Universality:** Foreign investment is authorized without limit in all economy sectors except for i) defense and national security ii) toxic or dangerous waste management iii) Television
  - **Automaticity:** Foreign investment doesn't need prior authorization; it must be registered before the Central Bank for statistic purposes. Foreign investment only needs authorization for the following sectors: i) Mining ii) hydrocarbons and iii) Insurance and financial
- Colombia has different instruments to protect FDI:
  - International Investment Agreements (17 including **India**)
  - Double taxation agreements (10 including **India**)
  - Free trade agreements (18)

## Energy Success Stories



- Between 2017-2019, Enel will invest over USD 500 M in energy projects in Colombia
- Enel owns El Paso solar, the largest RE project in the country as of Apr 19



- Termopaipa, a low-grade thermal coal plant, was the first plant planned, financed, and built overseas by steag



- AES owns Chivor, one of the country's largest power generators 1,000 MW
- AES recently bought a 650 MW wind portfolio in Colombia

## Selected Indian Companies Operating in Colombia



Source: Procolombia



# Opportunities & Challenges

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## OPPORTUNITIES

- Robust economic performance during >15 years with positive perspective ; in 2019, Colombia will be the second LATAM growing economy (3.5%) after Peru
- Since 2014, Colombia is an investment grade country because of its positive growth forecast and sound fiscal management
- Colombia is a free market economy open to FDI and with multiple commercial agreements including India
- Colombia is the oldest and most stable democracy in the region
- Energy matrix diversification is a priority: Colombia is one of the most vulnerable countries to climate change, for which its energy security is at risk during drought seasons
- It is a nascent market, only 50 MW of solar and wind installed as of Q1; ample room to grow
- There is political will and it is consolidating its regulatory framework for expanding renewables
- The government has announced new auctions for renewables in H2 2019

## CHALLENGES

- First renewable auction failed; the government must redesign and provide the right incentives to have a successful long-term renewable auction
- Areas with abundant solar and wind resources are inhabited by indigenous communities which are resistive to infrastructure projects
- Hydro power provides cost-effective and clean electricity, for which renewables benefits are not yet well recognized in the country
- Colombia may have overcapacity when not in dry season, affecting prices for consumers
- There is an infrastructure deficit to connect resourceful regions; however transmission lines constructions and tenders are already in process
- Lobby from generators against renewable energy government incentives

# Recommendations



- Major milestones to take place in the next months:
  - Second renewables auction happening before August
  - National development plan will include incentives for renewables



- Gain market dynamic knowledge from contacts in the public and private sector



- There are 30 RE 100 companies in Colombia



- Colombia has commercial and fiscal agreements with India
- Various Indian companies have successfully entered the Colombian market
- Learning from their experience would be very useful

# Mexico

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# Country Snapshot

- Mexico is the 2<sup>nd</sup> largest economy in LATAM
- International Trade Agreements
  - Trans-Pacific Partnership Agreement, Panama-Mexico, Peru-Mexico, Pacific Alliance, TLC Costa Rica-El Salvador - Guatemala - Honduras - Nicaragua - Mexico, MERCOSUR, Japan-Mexico, Uruguay-Mexico, Brazil-Mexico, Israel-Mexico, EU-Mexico, Nicaragua-Mexico, Costa Rica-Mexico, Chile-Mexico, G3 Colombia-Venezuela-Mexico, Argentina-Mexico, USMCA
- Became an OECD Country in 1994
- Other general facts
  - Around 2.1 M Barrels per Day (11<sup>th</sup> biggest oil producer in the world, 4<sup>th</sup> in the Americas)
  - Abundant natural resources: petroleum, silver, antimony, copper, gold, lead, zinc, natural gas, timber
  - 13<sup>th</sup> largest crude oil exporter WW and 1<sup>st</sup> in LatAm

Source: EIA 2019

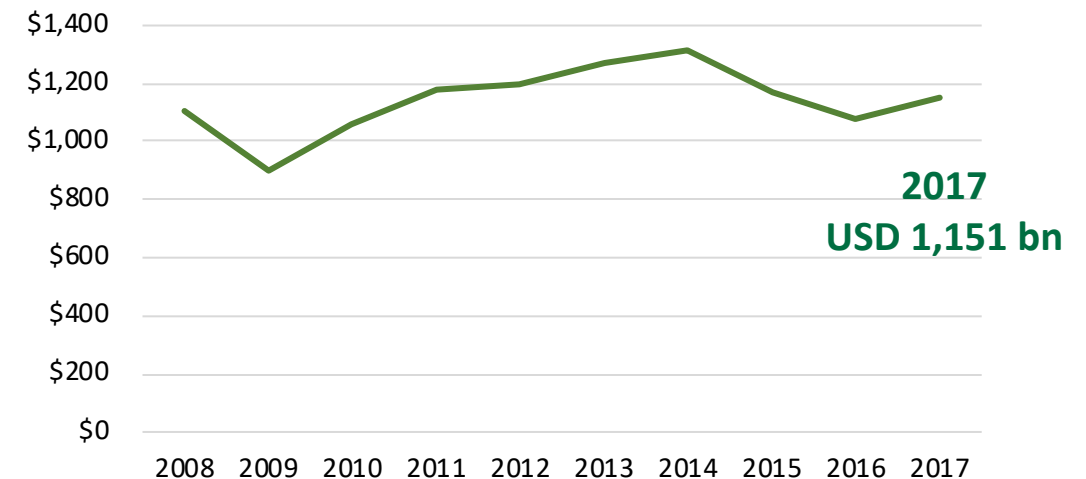
## Key Indicators 2018

Source: IMF 2019

<u>GDP 2018:</u>	USD 1,151 bn
<u>Real GDP Growth 2018:</u>	2.1%
<u>5-year Avg Real GDP growth:</u>	2.5%
<u>GDP per Capita 2018:</u>	USD 19,178
<u>Population 2018:</u>	130 M
<u>Inflation 2018:</u>	1.66%

## GDP (current USD bn)

Source: WB Data 2019



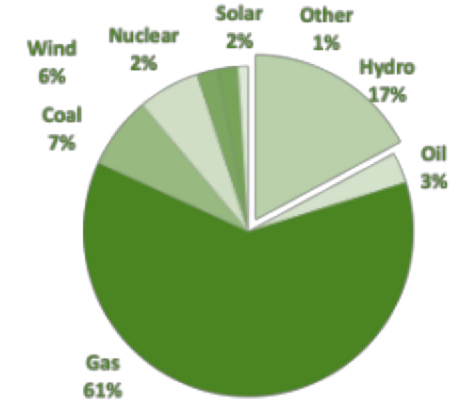
# Mexico Electricity Sector

- In 2017, Mexico had 75 GW of installed capacity of which hydropower represents 60%, followed by fossil fuels (oil, gas, and coal).
- Electricity demand is expected to grow at a 3% rate per year until 2032, to reach some 483 TWh by 2032 (PRODESEN 2018)
- To meet the demand, Mexico generated 310 TWh and imported less than 5 TWh from the US (EIA 2019).
- Generation mainly came from conventional fuels (about 80%) incl. combined cycle (50%), thermoelectric (13%), coal (9%), turbogas (4%). Clean sources contributed to about 21% (10% from hydro and 11% from non-hydro renewables)
- The government's target is to source 35% of electricity generation from renewables by 2024

Total Capacity:  $\cong$  75 GW

Source: CFE 2017

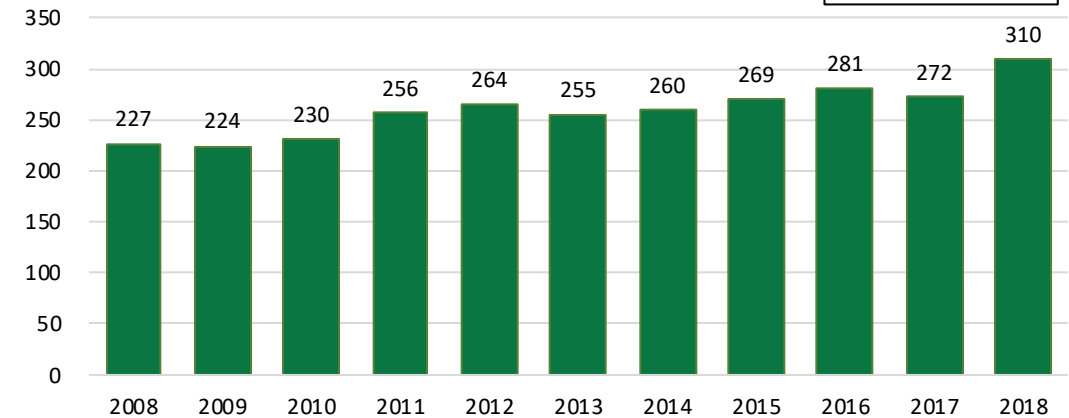
71% is from fossil fuels  
29% from clean sources, of which 8% non-hydro renewables



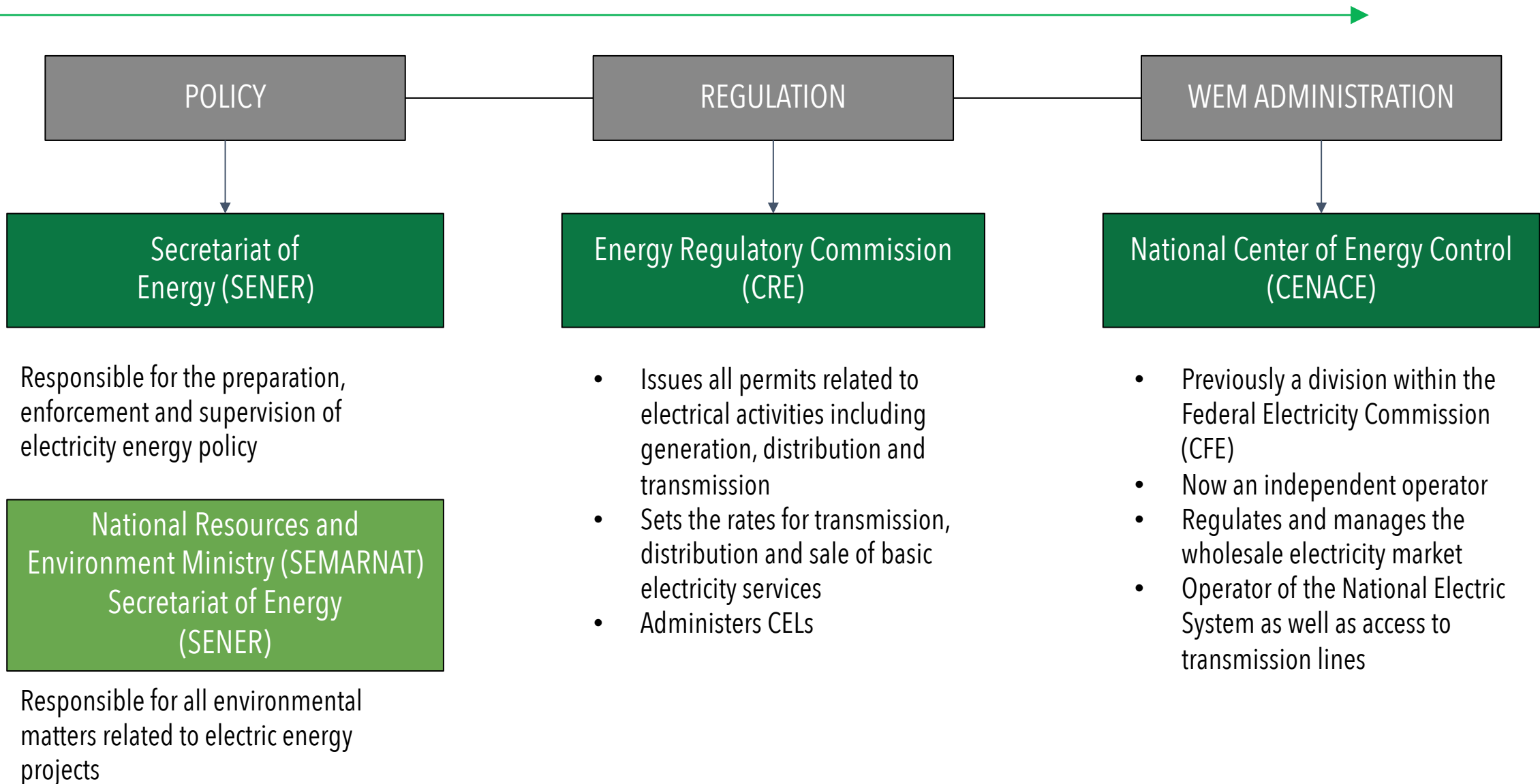
Electricity Consumption (TWh)

Source: IEA 2018, CENACE 2018

CAGR Forecast  
2019-2032: 3.0%

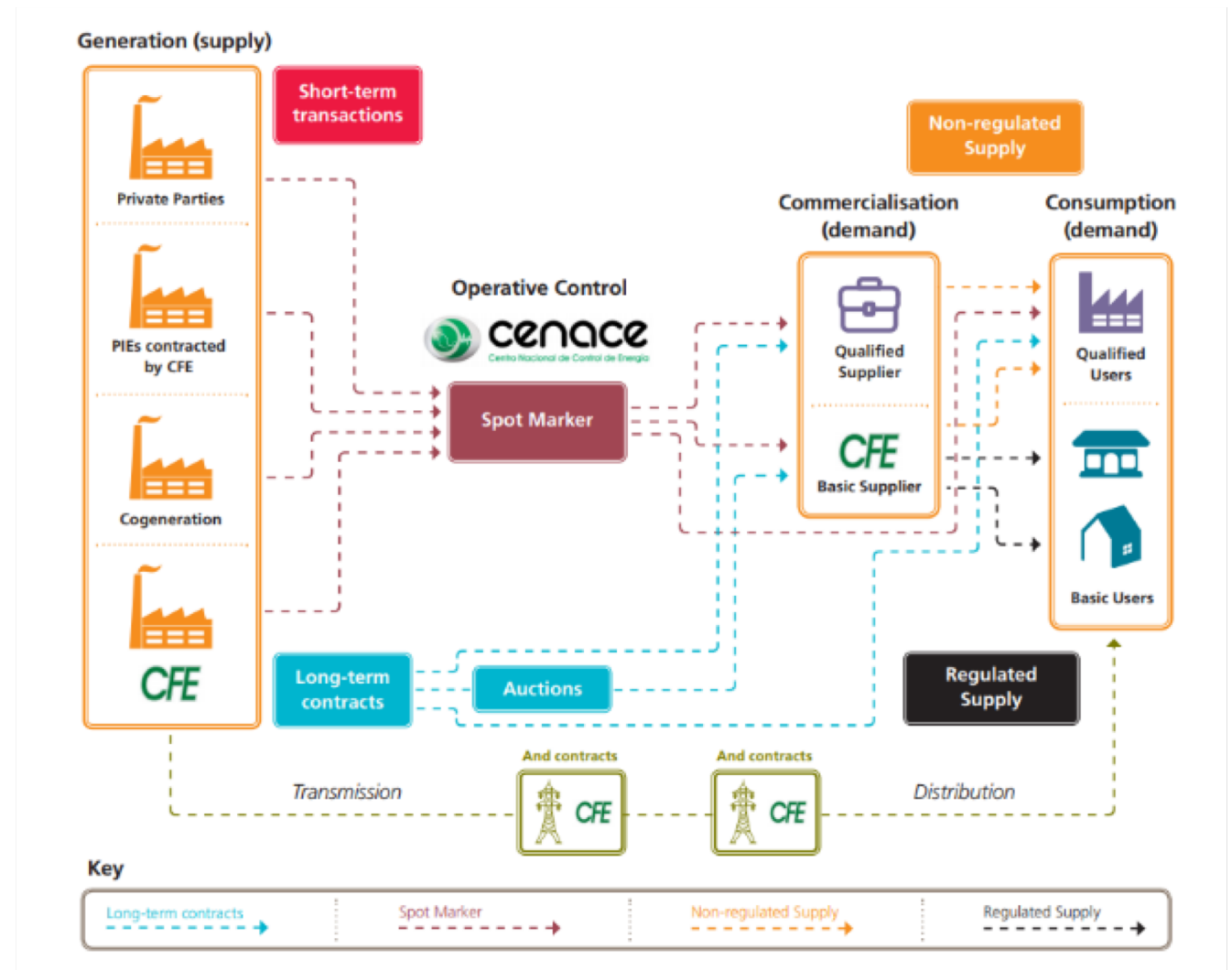


# Institutional Framework



# Electricity Market Structure

- Energy Reform of 2013 created a brand new wholesale electricity market open to the private sector
- Market transactions organized based on term and products with three types of market transactions:
  - Short-term Market
    - Day-Ahead market
    - Real-time market
    - One-hour ahead market
  - Medium-term (1-3 years)
    - Imbalance Capacity Market
    - Bilateral Contracts
    - Auctions
  - Long-term (3-20 years)
    - PPA
    - Auctions
- Generators sell electricity directly into the system through CENACE to:
  - Qualified Service Supplier
  - Basic Service Supplier
  - Participating Qualified User



Source: CMS 2017

# Mexico Power Sector

## Generation

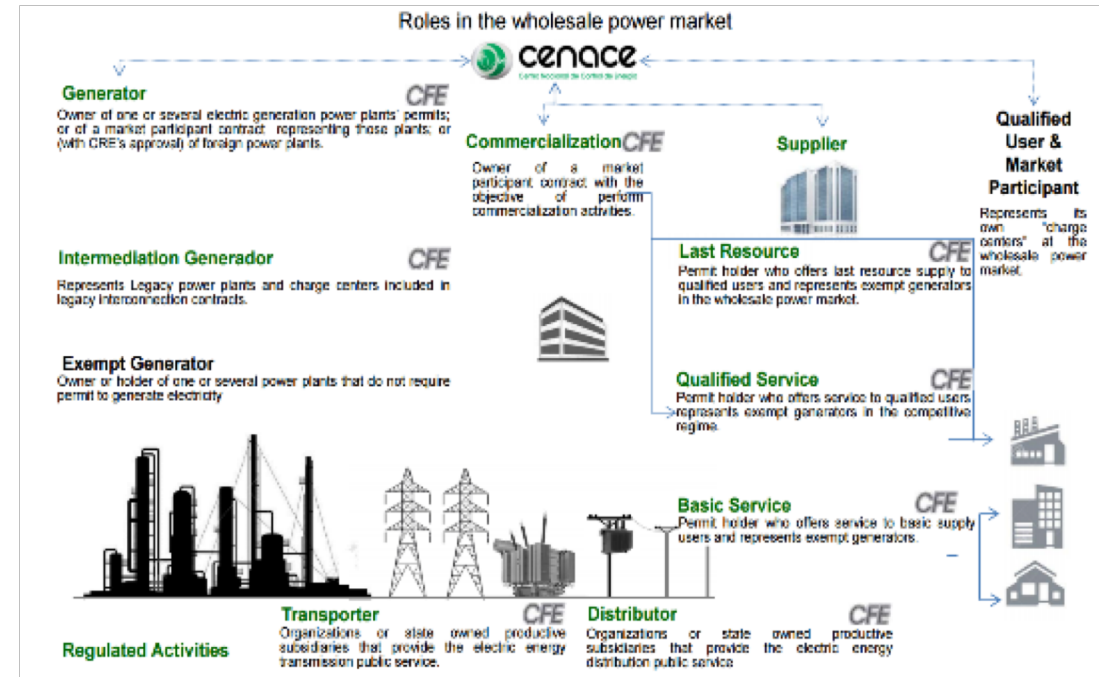
- Unbundled sector, open to competition
- State-owned utility, CFE, became competitor in the generation segment after the Energy Reform
- Generators required to have a permit with CRE
- Nodal prices calculated on the basis of cost of electricity generation, transmission losses, congestion
- Breakdown of total installed power capacity: 59% of installed capacity owned by CFE; 23% privately-owned for self-supply; 18% IPP contracts with CFE
- Day-ahead, hour-ahead real-time spot markets allow the transaction for energy and ancillary services and zonal prices are merit-based
- Auctions allowed significant international private participation
- Market players: Generators, Qualified Users/Suppliers, Basic Service Users/Suppliers, Market Participant Qualified User, Last Resort Supplier, Non-supplying broker
  - Qualified suppliers with CEL obligation can engage in WEM; enter into bilateral agreements or meet Qualified Users' needs
  - 72 active players, 68 in registration process by end 2018
  - CFE, Enel Green Power, Ammper, Iberdrola

## T & D

- Grid independently operated; role moved from CFE to CENACE in charge of guaranteeing open and non-discriminatory access to transmission
- The transmission and distribution grids are regulated and open to private participation
- Operated by CFE
- Private participation in construction, finance and maintenance of the transmission grid

## Trading

- Bilateral agreements between generators and qualified suppliers, qualified users, or traders
- Energy, capacity, ancillary services, Financial Transmission Rights, CEL for short- and medium-term markets
- Energy, capacity and CEL trading in medium- and long-term markets

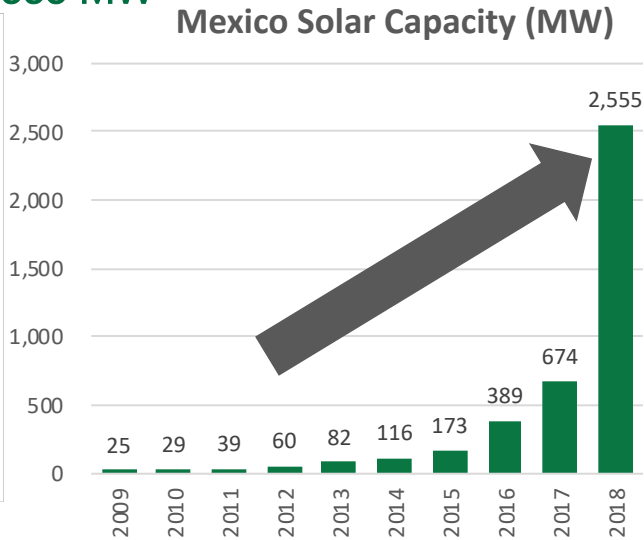
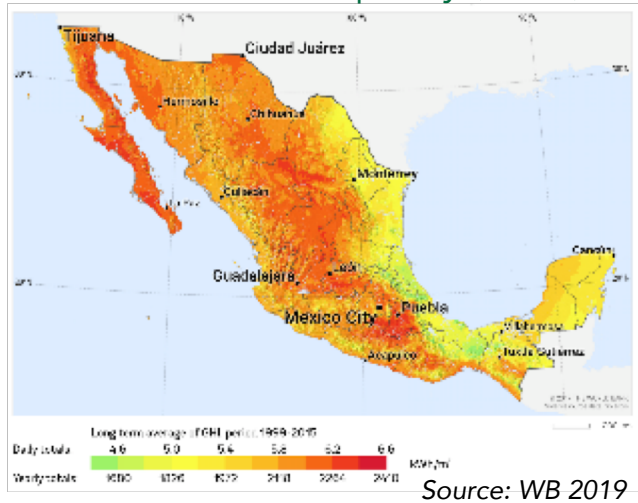


Source: KPMG 2018

# Mexico Renewable Energy Resources

## Solar

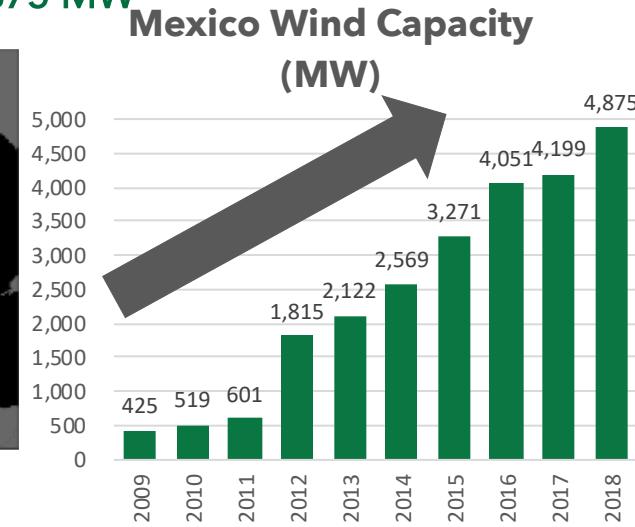
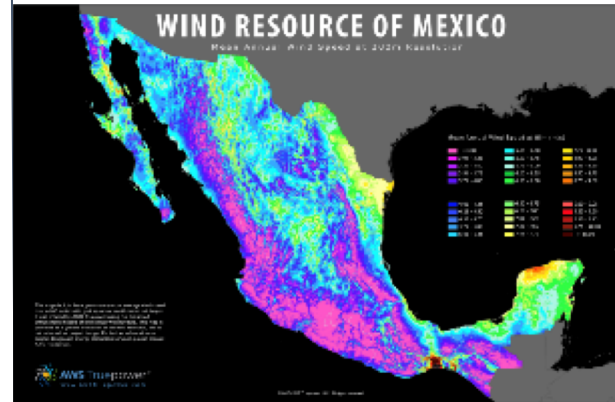
- Richest region: Northwest with solar irradiation of more than **6.15 kWh/m<sup>2</sup>**
- Installed capacity (2018): **2,555 MW**



Source: IRENA 2019

## Wind

- Richest regions: Coastal Baja California, Northeast and South west reaching more than **8.5 m/s**
- Installed capacity (2018): **4,875 MW**



Source: AWS 2019

Untapped potential

Scenario	Available area (km <sup>2</sup> )	Installable capacity (MW)	Power generatable (GWh/year)
1	511,167	23,929,631	59,371,346
2	275,039	12,875,592	31,881,155
3	59,609	2,790,538	6,932,762
4	204,297	9,546,586	23,886,562

Source: IRENA 2019

**Assumptions:**  
 25%+ of area required for wind project  
 3.5%+ of area required for solar PV project

# Mexico Renewable Energy Overview

## Policies, Incentives, Legislations

Legislations

Incentives

**RE Target:  
35% of  
electricity  
operations  
by 2024**

**2010 (October)**  
Climate Change Law

**2013 (December)**  
Constitution Energy Reform

**2014**  
CELS &  
Carbon Tax\*

**2015 (March)**  
Mexico NDC

**2010 (March)**  
Net metering

**2004**  
Accelerated  
depreciation for  
RE machinery &  
equipment

**2008**  
Energy  
Transition and  
Sustainable Use  
of Energy Fund

**2015 (November)**  
1<sup>st</sup> Long-Term  
Auction

**2016 (October)**  
2<sup>nd</sup> Long-Term  
Auction

**2017 (November)**  
1<sup>st</sup> Long-Term  
Auction

~~**2019 (February)**  
4<sup>th</sup> Long-Term  
Auction~~

# Current Players

## Solar

Player	No. of Projects	Installed Capacity (MW)	Investments (\$USM)
Enel Green Power	9	2,480	2,654
Energía Aljaval	20	1,200	2364
Neoen	3	970	1,028
Atlas Renewable Energy	7	960	1,334
Iberdrola Renewables	7	800	1,920
X-Elio	10	620	893
FRV	4	610	750
Fisterna Energy	4	550	1,403
ENGIE	3	500	425
BayWa r.e	2	400	436
Jinko Solar	4	400	452
Planta Solar Villa de Reyes	1	350	378
El Gitrón Solar	1	340	303
Cimaron Solar	1	340	364
Renersolar Consortium	1	340	442
Cubico Sustainable Investments	2	340	299
Tuto Energy	2	320	211
Solarcentury	3	180	153
174 Power Global	2	180	293
Kronos Solar	2	90	132

88 projects • 11,977 MW • USD 16,4 bn

Source: Mexico Energy Review 2019

DISCLAIMER: \* Rough capacity & investment figures for planned projects

## Wind

Player	No. of Projects	Installed Capacity (MW)	Investments (\$USM)
Acciona Energía	6	809	1,617
Enel Green Power	5	712	1,423
EDF Renewable Energy	3	391.5	783
Iberdrola Renewables	3	270.8	541.5
Naturgy	1	234	468
Renovalia Reserve	2	228	455
EDP Renováveis	1	199.5	401.2
Siemens Gamesa	4	180	360.7
Mexico Power Group	1	180	360
INova InterGen	1	156	312
Mexico Power Group	1	180	360
GEMEX Energía Renovable	3	154	308
Grupo ACS	1	297	148.5
ENGIE	2	102	204
Grupo Dragón	2	97	164.8
CFE	1	84.2	168.8
Industrias Peñoles	1	84.2	160
Grupo México	1	74	148
Zuma Energía	1	50	99
COMEXHIDRO	1	22	44
CIC, PDR Green Power	1	20	40

42 projects • 4,525 MW • USD 8.6 bn

# Mexico Auction Design

01

Technical requirements

- Track record to build operate, build, maintain projects of similar size
- Other assets to total 33% of current capacity proposed and operational in last 10 years

02

Financial requirements

- Bid bond (USD or MXN) to cover interconnection fees: USD 99,000; USD 21,000/MW + USD 10/MWh; USD 5/CEL
- Limited-recourse project finance by multilaterals, ECAs, local development banks, private equity funds

03

Submitting a bid

- Pay-as-bid sealed auction
- Submit different bids for capacity in MW, energy in MWh, CELs (it can be zero)
- Bid to include: tech type, price indexed to inflation, COD, interconnection point, quantity

04

Winning a bid

- Duration: 15 years for energy, 20 years for capacity
- CENACE to select based on purchase price setting auction volume and corresponding sales

05

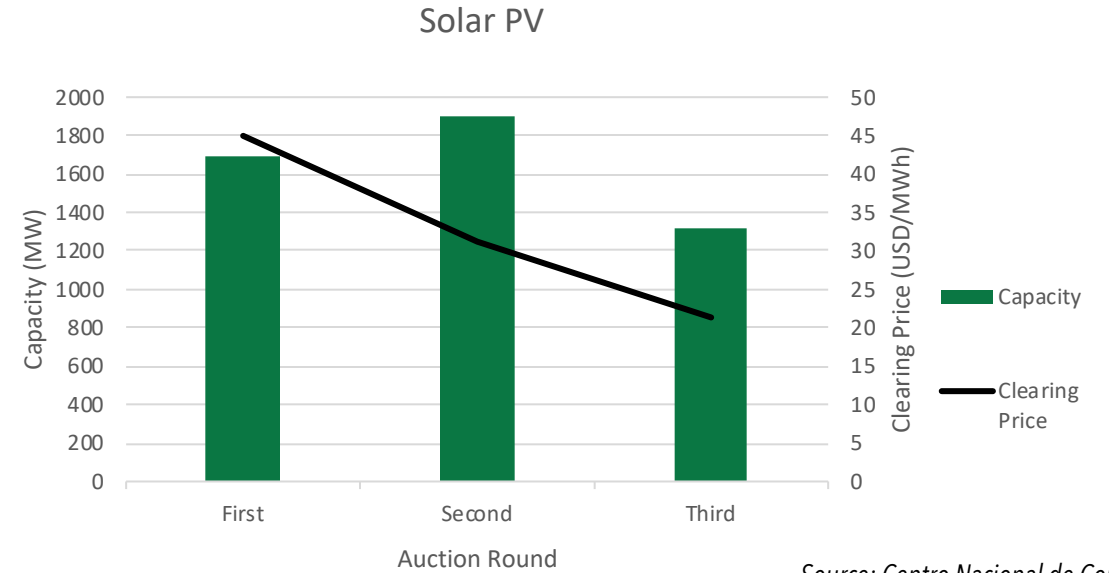
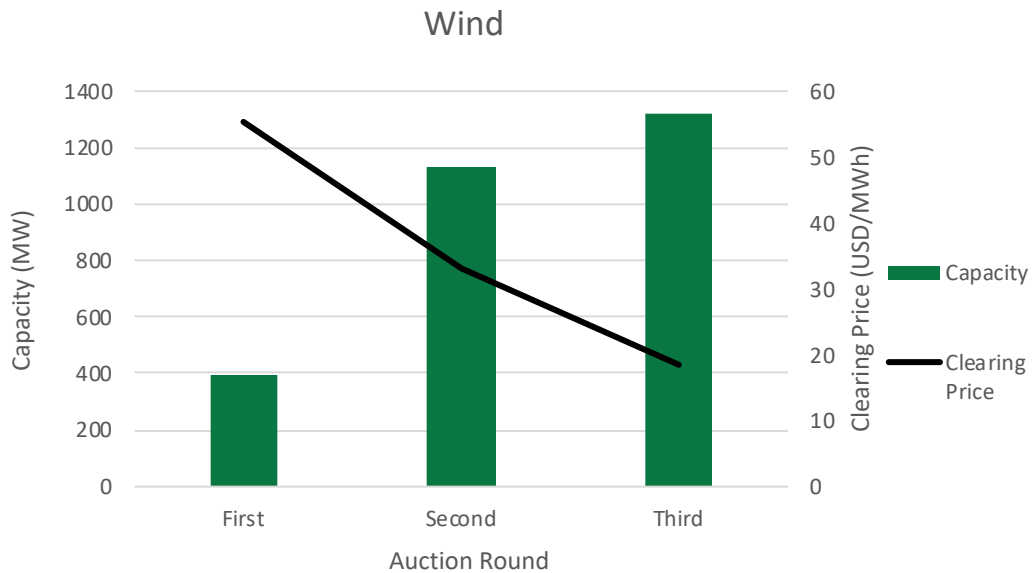
Securing the land

- Formal consultation with residents
- Social impact assessment required
- Access right payments based on direct negotiations
- Government authorizations required

- Approval from SENER of social impact assessment
- Authorization from SEMANART of environmental impact authorization
- Authorization for the change of forest land use
- Approval from the National Institute of Anthropology and History
- Other local land use and construction licenses
- Interconnection feasibility and cost study (preferably) based on CENACE data

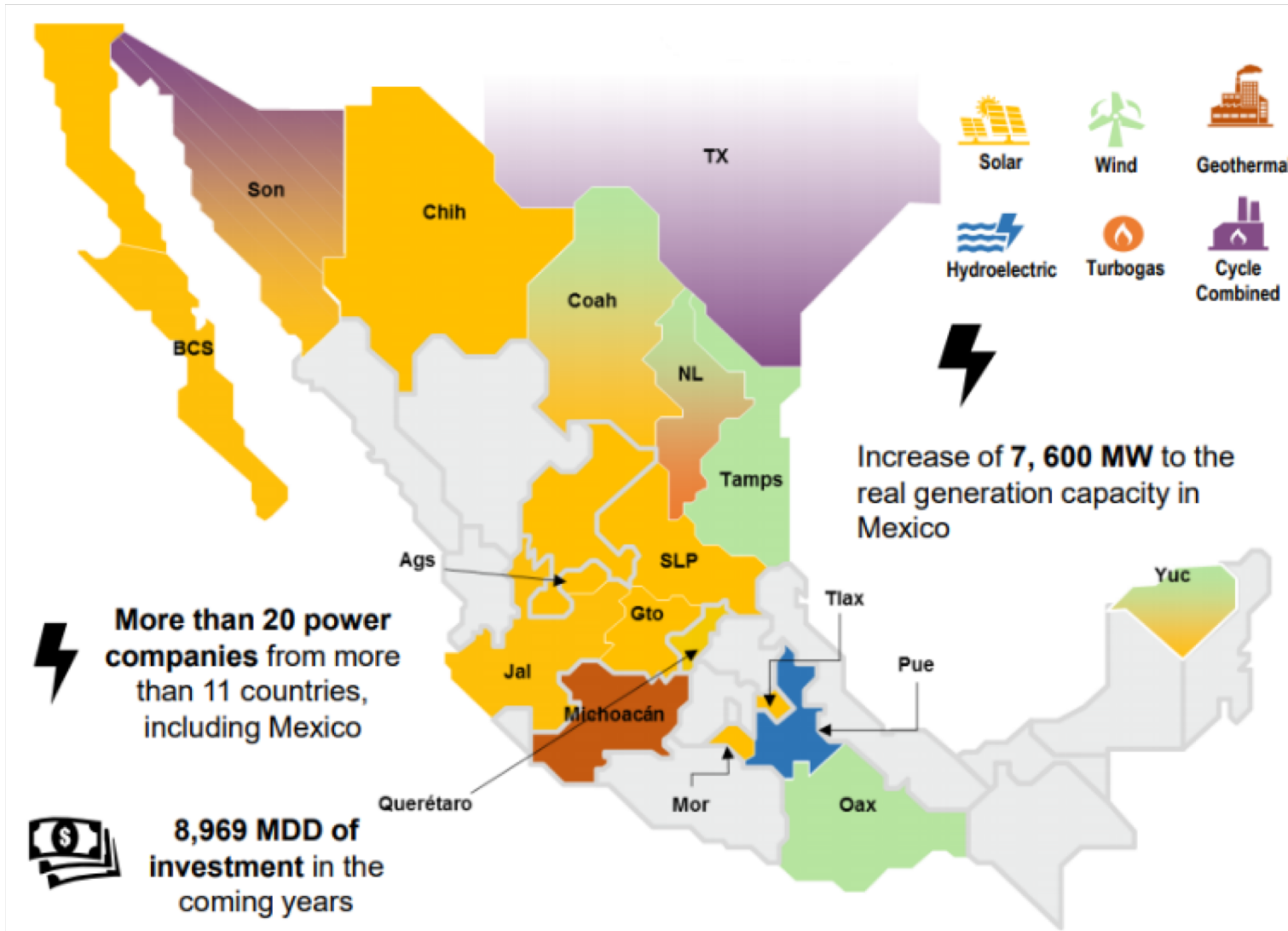
# Mexico Past Auctions

Auction Round	Date	Technology	Contracts	Awarded Capacity (MW)	Clearing Price (USD/MWh + CEL)
First	March 2016	Wind	18	394	55.33
		Solar PV		1,691	44.97
Second	September 2016	Wind	56	1,128	33.27
		Solar PV		1,903	31.22
Third	November 2017	Wind	16	857	18.48
		Solar PV		1,323	21.34



Source: Centro Nacional de Control de Energia 2017

# Mexico Result of Most Recent Auction (Nov 2017)



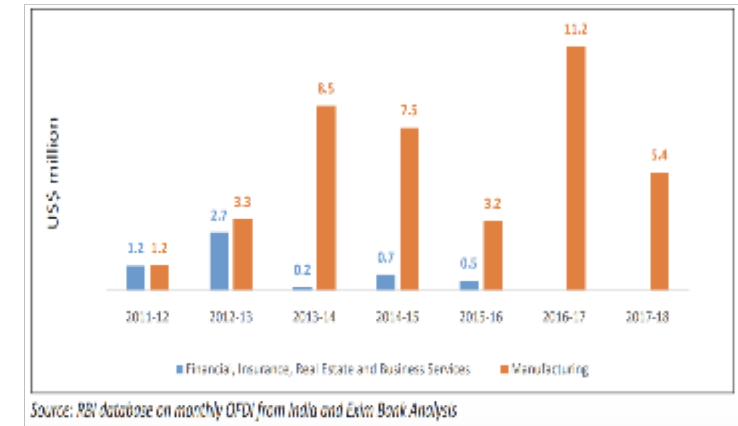
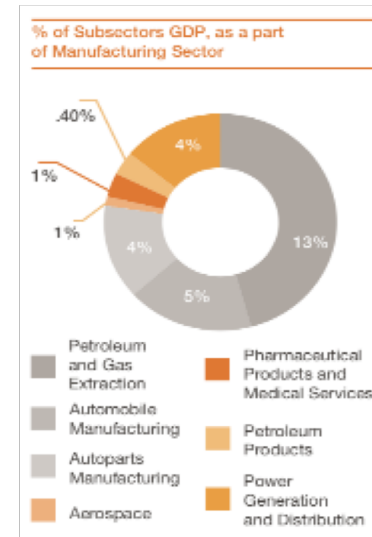
## Participating Companies



Source: ERRA 2018

# Mexico Foreign Direct Investment

- Mexico as the best country in the region conducive to investment (*WB Doing Business 2017*)
- Renewable Energy one of the priority sectors for investments (*ProMexico - Mexico's Investment Promotion Agency*)
- Indian investor activity in Mexico = USD 2 bn
  - **180 Indian** owned business in 15 states of Mexico
  - Manufacturing sector (IT/software, pharmaceutical and automotive companies)
- Enabling government policies for FDI:
  - 100% foreign ownership
  - No capital controls for repatriation of profits
  - No established initial capital requirements to form company
  - Allows establishment of LLC by foreign companies
  - Specific policies:
    - 2008: MoU on Cooperation in the Field of New and Renewable Energy
    - 2017: Tax Reform: Corporate Tax Reform = Flat 30% and 30% tax credit for R&D expenses



**Table 5.3: Top Destinations in LAC Attracting Investments in Alternative/ Renewable Energy and its Share in India's Global Capital Investments**

Rank	Recipient Country	Global Capital Investments in Recipient Country (US\$ Millions)	India's Share in Global Capital Investments in Recipient Country (%)	Share of sector in India's Global Capital Investments (%)
1	Chile	27,187.7	-	8.0
2	Mexico	19,505.5	-	
3	Brazil	13,111.2	-	
4	Panama	4,373.0	-	
5	Uruguay	2,444.2	-	
6	Peru	1,752.7	-	
7	Honduras	1,731.6	-	
8	Dominican Republic	1,317.0	-	
9	Argentina	1,235.6	-	
10	Costa Rica	786.7	-	

Source: fDI Markets database and Exim Bank Analysis. Data ranges from January 2011 to December 2017

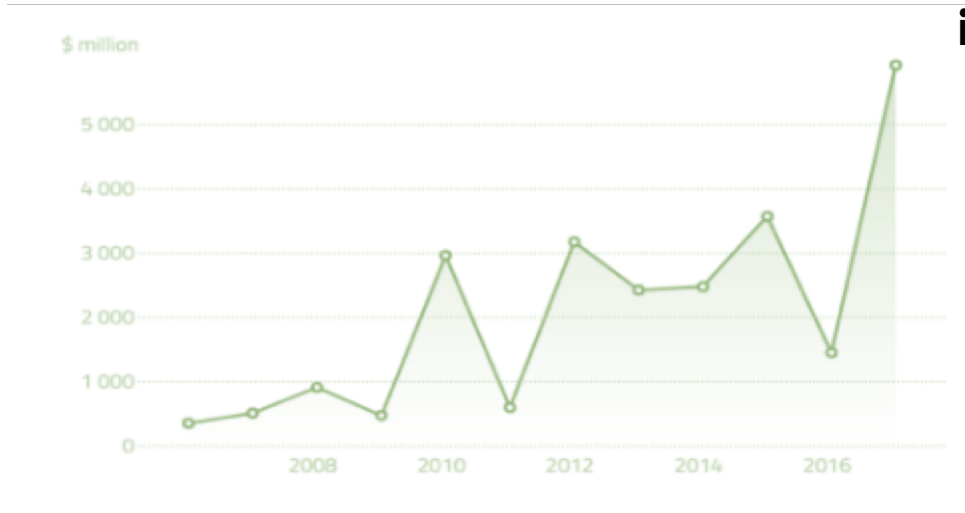
Note: "-" signifies nil or negligible

# Foreign Direct Investment



## INVESTMENT TRENDS

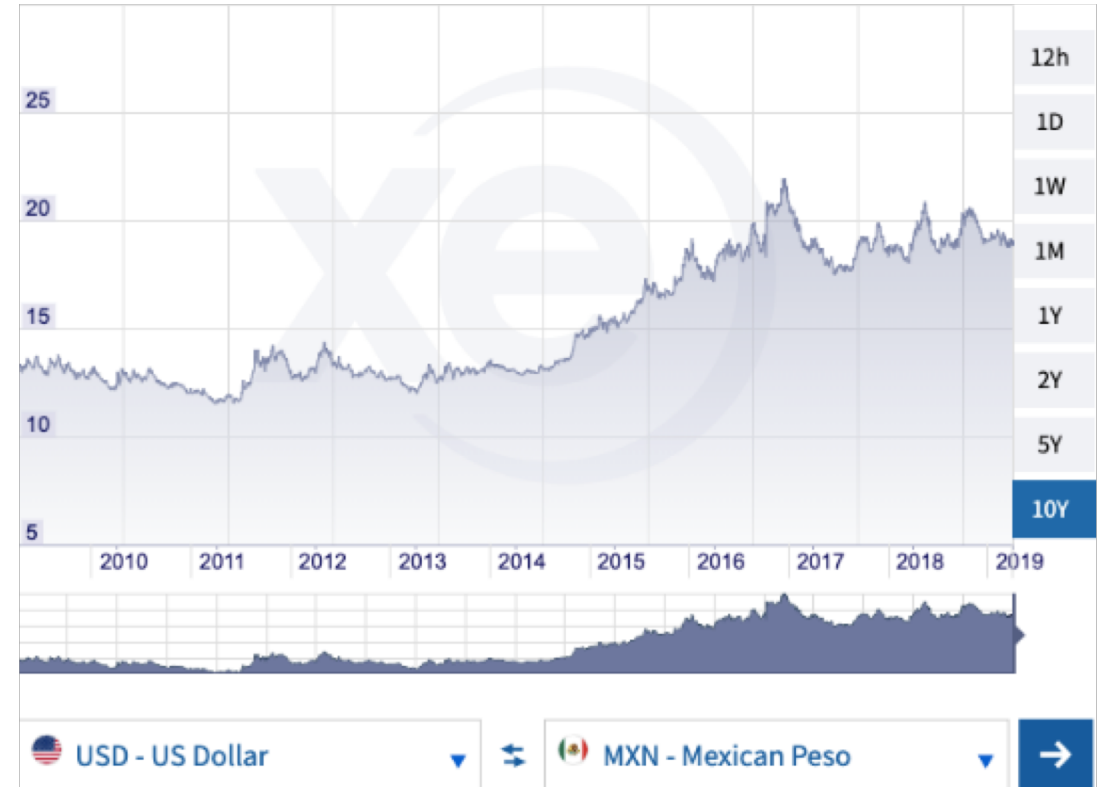
**USD 6.2 bn  
in 2017**



6-fold increase in investments from 2016 - 2017

- Prior to the recent elections, Mexico was at the forefront for international investment by energy companies and lenders
- Now, "wait and see" approach
- Many industry participants are concerned that the reforms enacted by the Peña Nieto administration will be reversed or undermined by new policies or regulations
- 4th auction cancelled

## CURRENCY



- Economic and political stability in comparison with other countries in the region
- Economy vulnerable to fluctuations in oil prices

# Project Finance - Lenders

## GREEN BONDS

- 6<sup>th</sup> largest green bond issuer for 2017 with a single deal (Mexico City Airport Group)
- Nacional Financiera SNC (Nafin) - "Climate Bond Certified" green bonds
- Mexico City

## DEVELOPMENT BANKS & COMMERCIAL FINANCIAL INSTITUTIONS

- Banco Nacional de Comercio Exterior (Bancomext)
- Nacional Financiera SNC (Nafin)
- National Bank for Public Works and Services (Banobras)
- North American Development Bank (NADBank)
- EXIM India Bank
- Natixis
- Sumitomo Bank

## 2018 RE Finance Transactions

Project	Capacity	Project Owners	Secured Financing	Lenders	Equity
Reynosa Wind Farm	424 MW	Zuma Energía (80/20 JV of Actis & Mesomerica)	USD 600 M Project Financing	Bancomext, Banobras, Santander, EKF	Not Disclosed
El Mezquite Wind Farm	250 MW	Cubico Sustainable Investments – Majority; Alten Renewable Energy - Minority	USD 220 M Non-Recourse Project Finance Debt	NADBank, Bancomext, Banobras,	Close to USD 200 M of Equity
Solem Solar Complex	350 WMP	Cubico Sustainable Investments – Majority; Alten Renewable Energy - Minority	USD 230 M Non-Recourse Project Finance Debt	Inter-American Investment Corp (on behalf of IADB), Canadian Climate Fund for the Private Sector in the Americas, China Co-Financing Fund for Latin America & the Caribbean, IFC (USD 45 M), Bancomext, Banobras and MUFG	Tamaulipas
Orejana and Santa María Solar Parks	158 MW + 179 MW	Zuma Energía (80/20 JV of Actis & Mesomerica)	USD 294 M Project Financing	Bancomext, Banobras, Nafin and NADBank	Not Disclosed
Potosí Solar Farm	342 MW	Fotowatio Renewable Ventures (FRV)	Not Disclosed	KfW, Bancomext, ING	Not Disclosed

Source: MIREC 2018

# Opportunities & Challenges

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## OPPORTUNITIES

- Second largest power market in LATAM
- Installed capacity: 75 GW
- ~ 29 % renewables – 60% hydro
- Target: 35% of electricity operations by 2024
- Growing international IPP presence
- Benefits: Accelerated depreciation for RE equipment and machinery, long-term auctions, Clean Energy Certificates (CECs)

## CHALLENGES

- Private capital required to develop renewables
- Low price environment and competitive market
- New government with aspirations to roll over liberalization of RE market
- Lower investor confidence environment
- Fourth long-term auction cancelled

# Recommendations

Beyond auctions, how else to engage in Mexico's renewables sector?



JV to submit to the Mexican Federal Competition Commission

- Know-how exchange if partnering with companies in country which have projects in a development or pre-construction phase



Corporate sourcing for RE100 companies based in Mexico

- 2018 was the year with the highest number of corporate renewable offtake agreements. This is a good strategy to bypass the auction process



Support construction of utility CFE-owned solar and wind

# Argentina

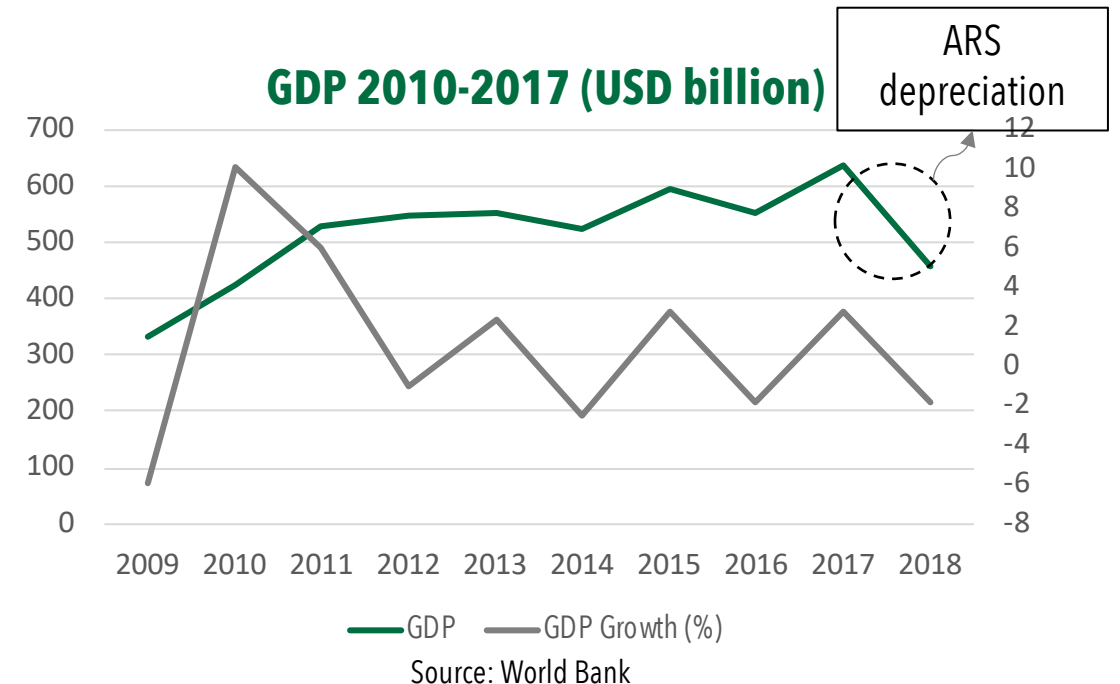
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# Country Snapshot

- Argentina is the 3<sup>rd</sup> largest economy in LATAM.
- Argentina is endowed with extraordinary fertile lands and has great potential for renewable energy. It is a leading food producer with large-scale agricultural and livestock industries.
- Argentina's economy experienced high volatility in recent years.
- Recession in 2018—caused by severe drought, and compounded by currency crisis and the ensuing tightening of macroeconomic policy.
- Amid a crisis of confidence in the economy, the president, Mauricio Macri, has committed to an austerity program that will dominate the remainder of his term of office.
- There are many uncertainties towards the incoming presidential election in October 2019. President Macri is in a difficult position in the election because of the economic crisis.

## KEY INDICATORS 2018

<u>GDP 2017:</u>	USD 456.5 bn
<u>Real GDP Growth 2018:</u>	-2 %
<u>GDP per Capita 2018:</u>	USD 21.7k
<u>Population 2018:</u>	44.7 M
<u>Inflation 2018:</u>	47.6%



Source: EIU & World Bank

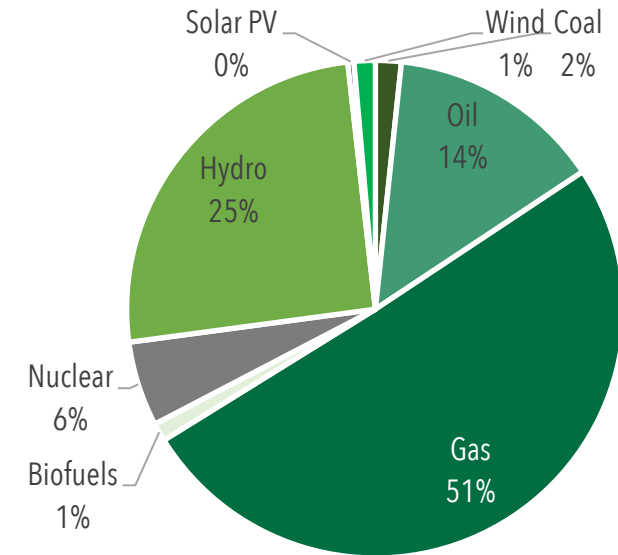


# Electricity Sector Overview

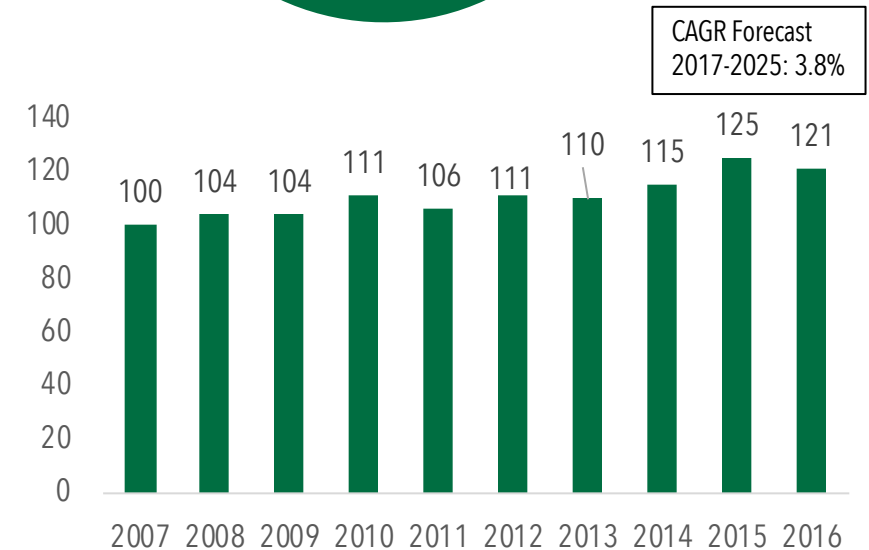
- 2<sup>nd</sup> largest electricity consumer in LATAM
- In 2016, electricity consumption: 121 TWh; consumption per capita is an average of 2,733 KWh; CAGR 2007-2016: 2.14%
- In 2016, Argentina imported 9.9 TWh through electrical transmission interconnections with Brazil, Chile, Paraguay, and Uruguay to meet increasing domestic electricity demand.
- It is estimated that Argentina's electricity demand will grow to 200 TWh by 2025.
- Electricity Capacity: 38 GW (#3 in LATAM)
- Solar PV and wind accounts less than 2% of the total capacity. The main sources are gas (51%) and hydro (25%)
- Law 27.191 sets the target that renewables should comprise 20% of the electricity consumption by 2025.

Source: EIA

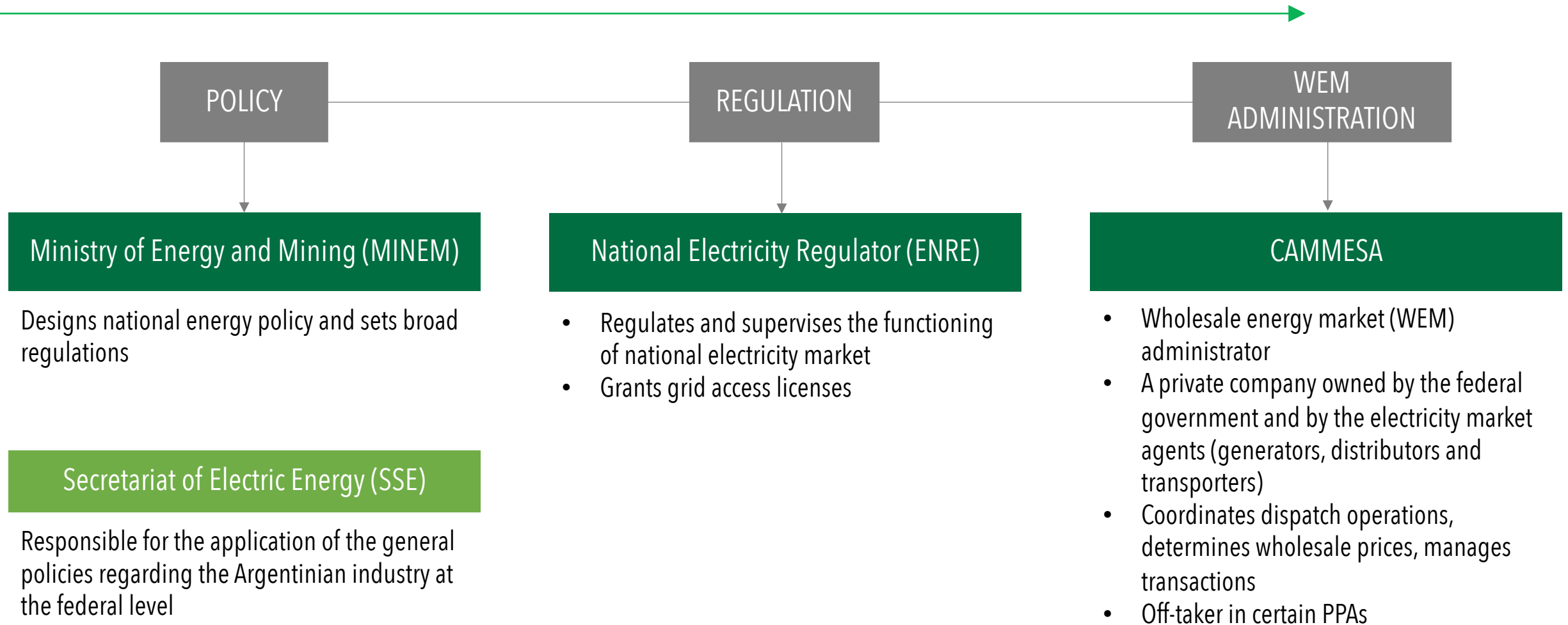
TOTAL  
ELECTRICITY  
CAPACITY:  
38 GW



ELECTRICITY  
CONSUMPTION  
2016:  
121 TWh



# Institutional Framework



# Power Sector

## Generation

- 353 participants registered as generators
- Private generators participate in CMMESA through Argentine Association of Electric Power Generators, or AGEERA
- Generators are subjected to the scheduling and dispatch rules set out in the regulations and managed by CMMESA



## Transmission

- Transmission activities are regulated as public services as they are natural monopolies
- Two systems: the High Voltage Transmission System (500 kV) and regional distribution system (132/220 kV)
- Energy transmission companies must be independent from other WEM participants and cannot purchase or sell electricity
- PPP projects are expanding the transmission capacity. E.g. 2.175 km of High-tension lines are projected for the first round of tenders (2018)



# Power Sector

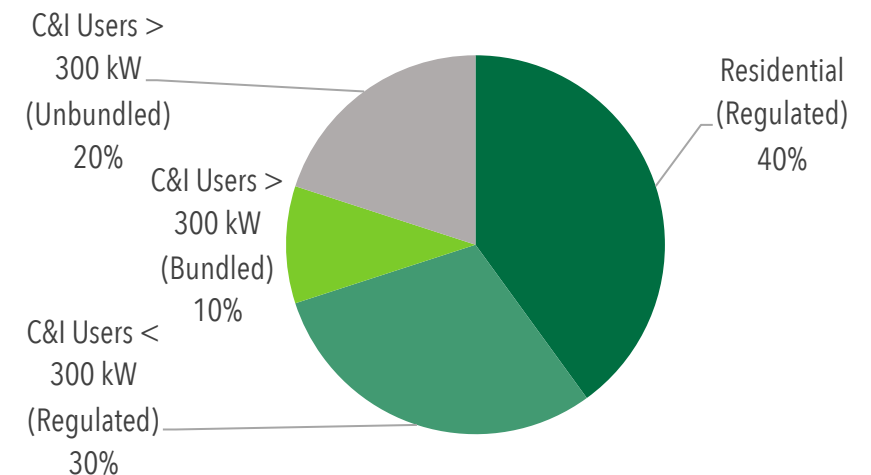
## Distribution

- Electricity distribution is regulated only at the federal level for the City of Buenos Aires and the districts in the metropolitan area of Greater Buenos Aires
- Electric power distribution service is regulated at the provincial level for the rest of the country and is subject to concessions granted by provincial authorities
- The three distribution companies divested from SEGBA (Edenor, Edesur and Edelap) represent more than 40% of the electricity market in Argentina



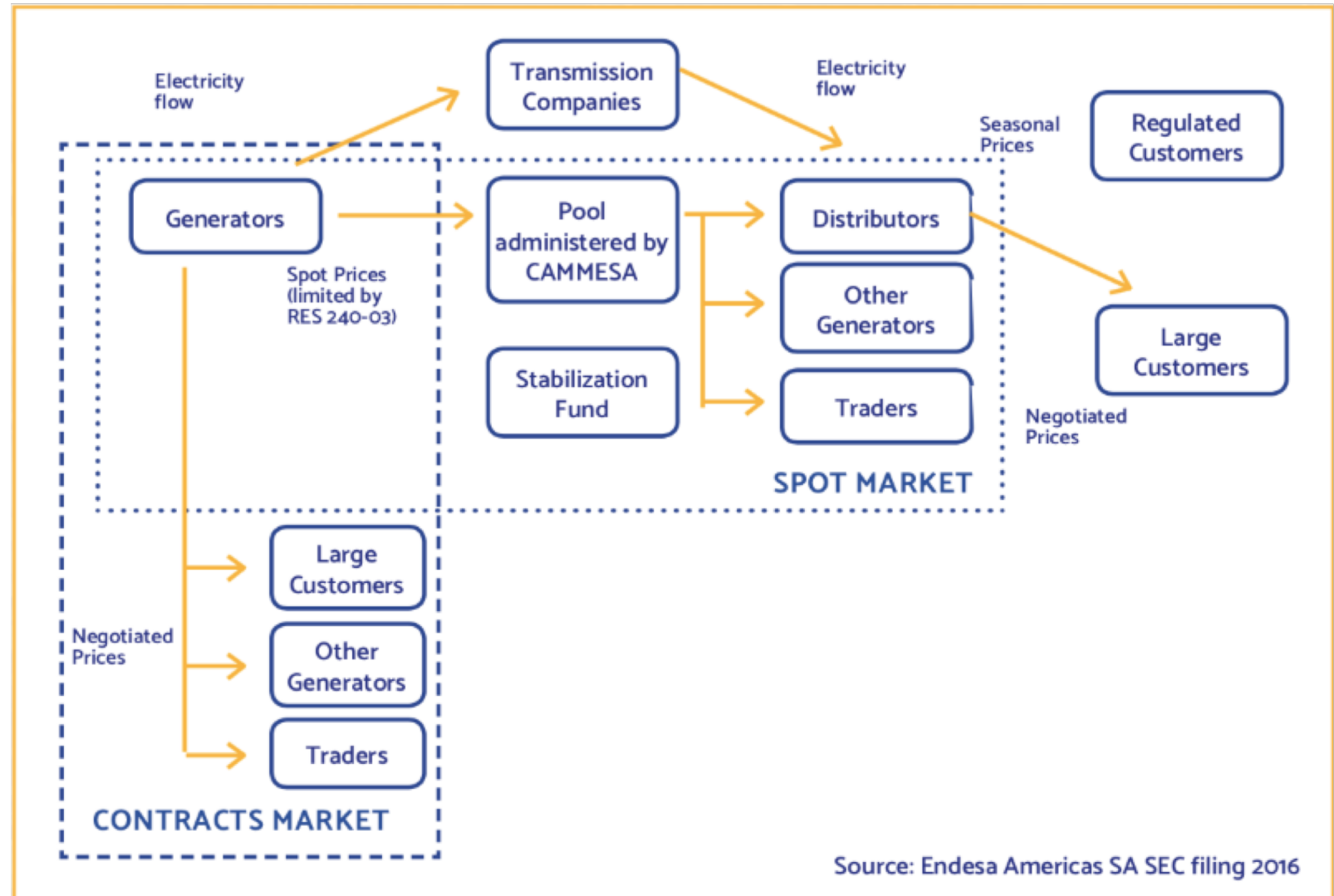
## Large User

- The wholesale electricity market classifies large users of energy into three categories:
  - Major Large Users (GUMAs, annual demand > 300 kWh)
  - Minor Large Users (GUMEs)
  - Particular Large Users (GUPAs)
- GUMAs are required to purchase 50% of their demand through supply contracts and the remainder in the spot market
- GUMEs and GUPAs are required to purchase all of their demand through supply contracts



# Electricity Market Structure

- All electricity transactions are conducted through a wholesale electricity market (WEM) which acts as a clearing house for electricity trading.
- The WEM in Argentina is organized as a competitive market, including a spot market and a term market.
- Prices on the spot market are established on an hourly basis as a function of marginal cost of production measured at the system's load center.
- On the term market, quantities, prices and contractual conditions are agreed upon directly between sellers and buyers.

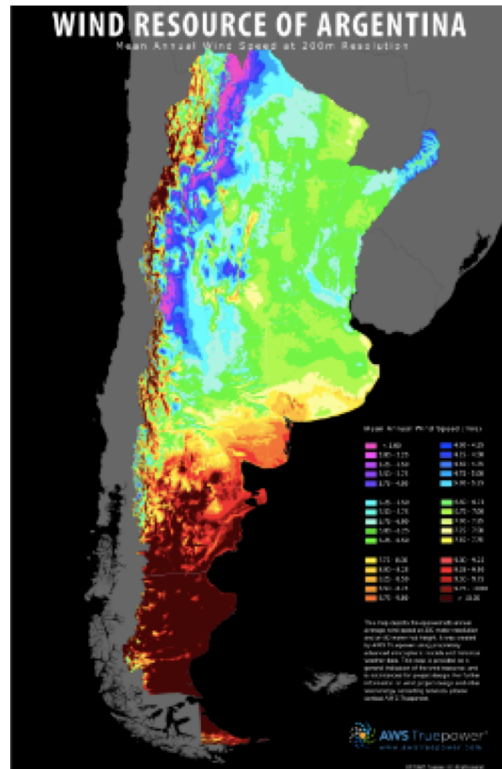


Source: Endesa Americas SA SEC filing 2016

# Renewable Energy Overview

## WIND

- Average wind speeds of 6 m/s over 70% of territory, 10 m/s in Patagonia and Central areas
- In 2017, Argentina had 228 MW of installed wind power capacity, lagging behind in the region
- Wind generation soared around 2015 because of clean energy policy and tenders



# Legal & Regulatory Framework

## **LAW 27.191 (2015)**

### Target

- RE as 8% by 2018; 20% by 2025

### Fund for the Development of Renewable Energies (FODER)

- USD 819M added in 2016
- Payment guarantees and project finance

### Financial Incentives:

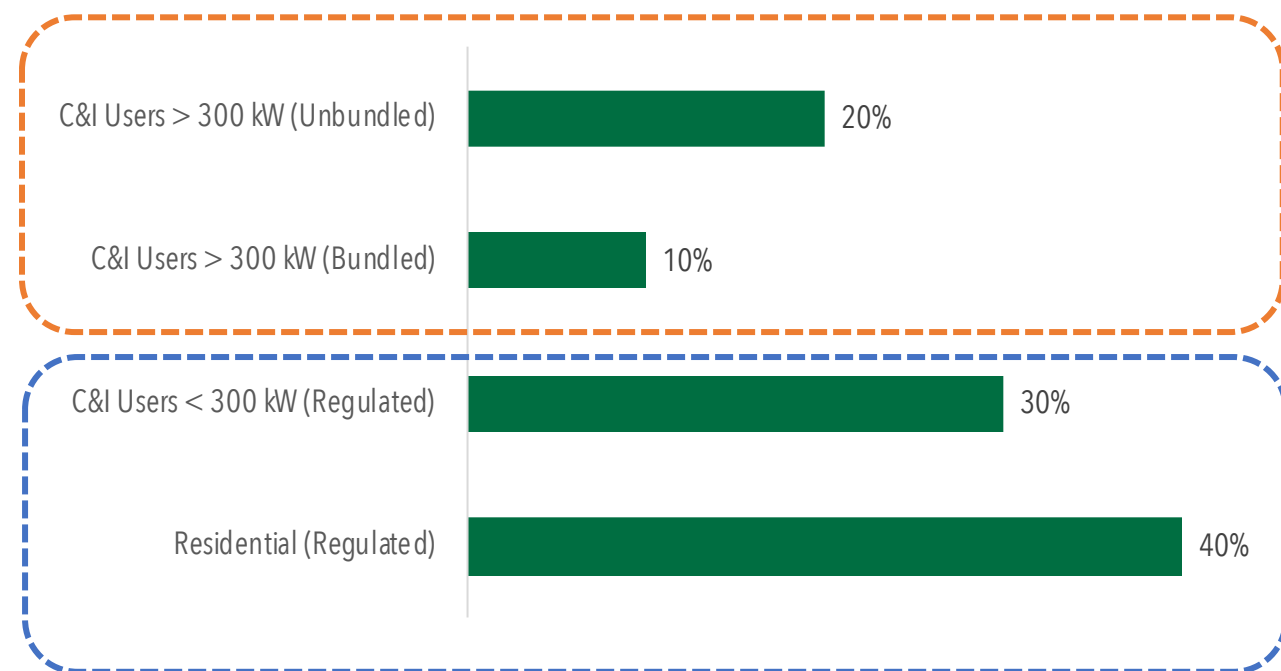
- Exception of import duties
- Accelerated fiscal depreciation
- Anticipated refund of VAT paid on pre-COD purchases
- Tax deduction of all financial expenses

### PPA:

- 20 years
- Denominated in USD

## **MATER (2017)**

C&I users >300 kW have the right to purchase from IPPs and/or traders or self-supply



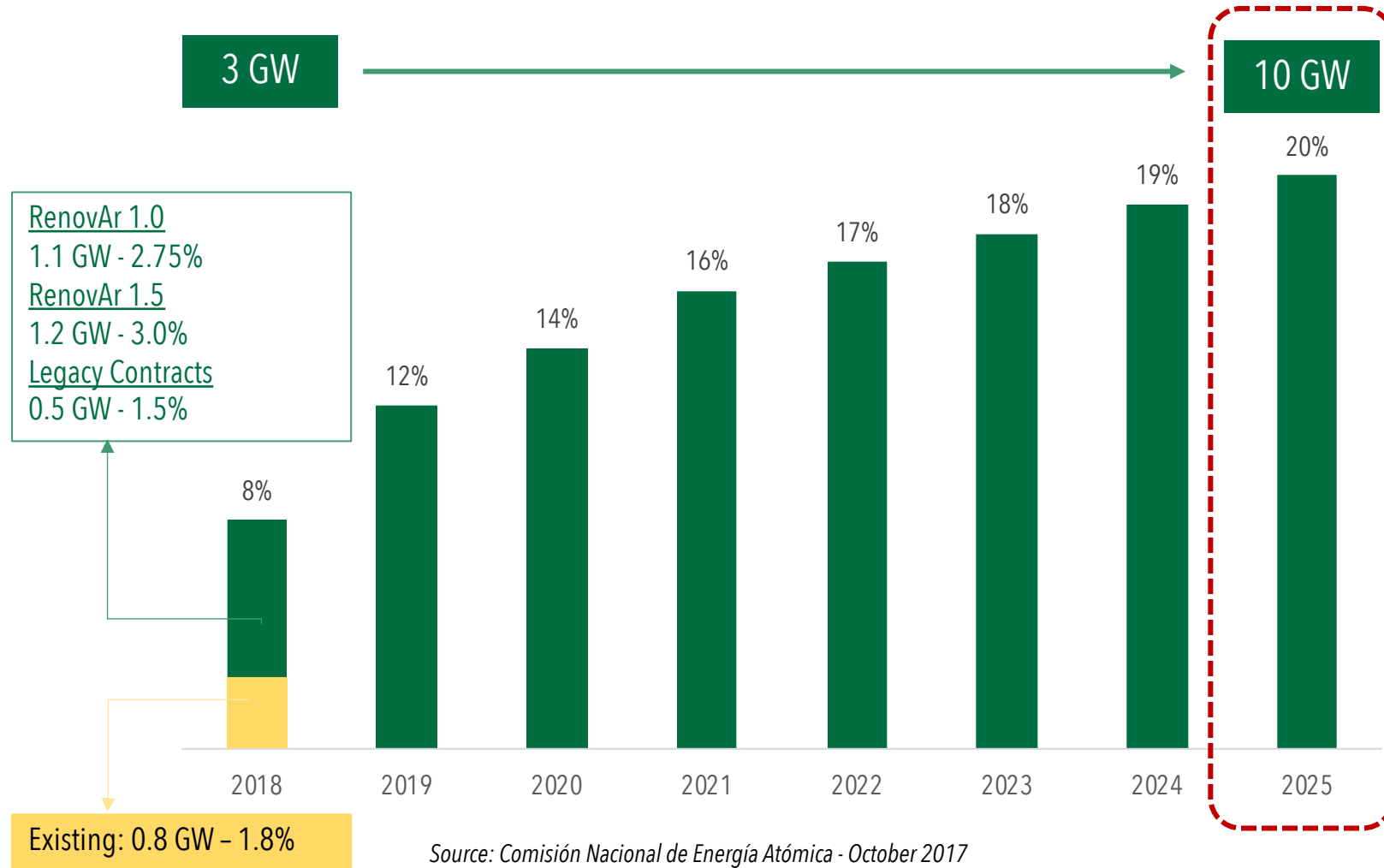
## **LAW 27.424 (2017)**

Provides the right to residential and commercial users to sell excess RE into the grid



# Renewable Energy Market Size

Target: Renewable Energy as % of Total Installed Power Capacity





# Auction (RenovAr) Design

## PARTICIPATION

Requirements for bidders:

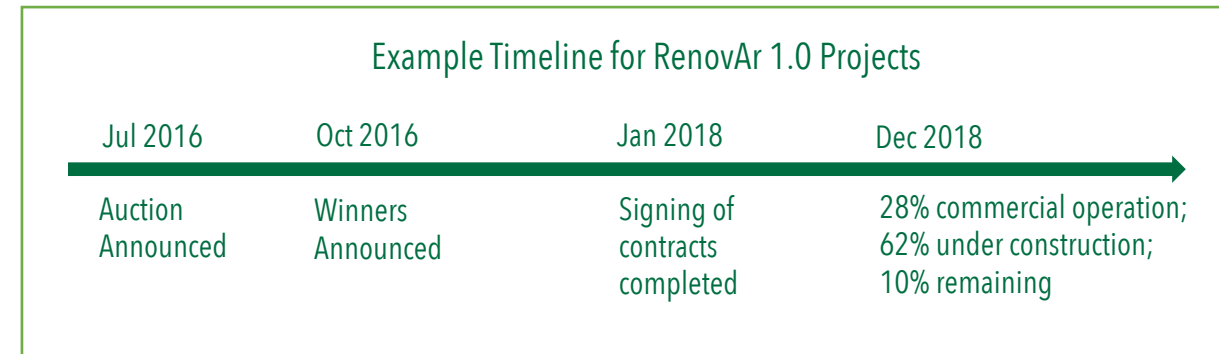
Legal	Capital	Experience	Technology	Grid Connection
<ul style="list-style-type: none"> <li>• Legal &amp; accounting docs</li> <li>• Full environmental authorization</li> </ul>	<ul style="list-style-type: none"> <li>• Min net worth of USD 500k/MW offered</li> </ul>	<ul style="list-style-type: none"> <li>• Experience of construction and operation of projects which at least a third of the size of the proposed projects</li> </ul>	<ul style="list-style-type: none"> <li>• Description of the project along with technical characteristics</li> </ul>	<ul style="list-style-type: none"> <li>• Approval from the transmission provider, proof that authorization process from wholesale market agent has been initiated</li> </ul>

## WINNERS

- Price
- Location of the project
- Interconnection node
- Commercial operation date
- Compliance with the requirement

## AUCTION DESIGN

Timeline (RenovAr 1.0)



## Contractual Framework

- Contracts:
  - PPA – signed with CAMMESA, 20-year, USD
  - RE Development Trust Adhesion Guarantee
- Guarantees: (Payment + Solvency Guarantee)
  - Trust Guarantee – Energy Payment
  - Sovereign Guarantee – Termination Payment 1
  - World Bank Guarantee – Termination Payment 2

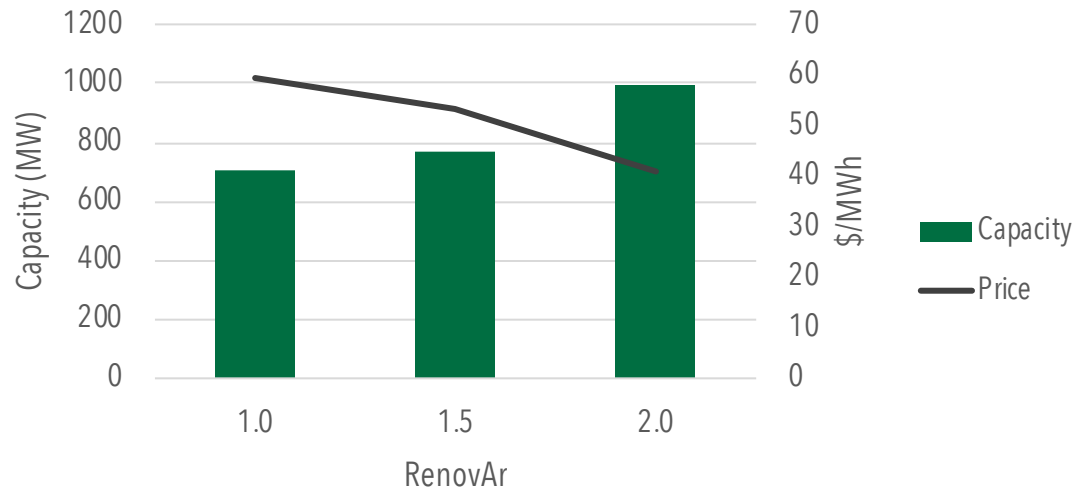


# Past Auctions

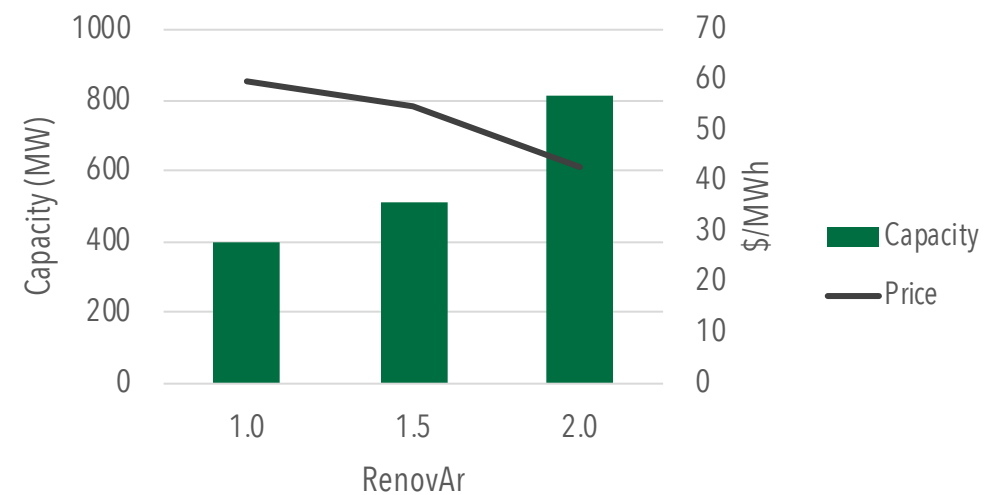


Auction Rounds	Date	Technology	Projects	Awarded Capacity (MW)	Awarded Price (\$/MWh)
RenovAr 1.0	October 2016	Wind	12	707	59.39
		Solar PV	4	400	59.75
RenovAr 1.5	November 2016	Wind	10	765	53.34
		Solar PV	20	516	54.94
RenovAr 2.0	November 2017	Wind	12	993	40.91
		Solar PV	17	816	42.84

### Wind




### Solar PV



# Upcoming Auction

## RENOVAR 3.0 (MINIREN)

- Announced by CAMMESA on March 12, 2019, RenovAr 3.0 opens to any qualifying and eventual award of tenders human or legal persons, trusts or temporary, domestic or foreign entities.
- Total power awarded for Wind and Solar PV is 350 MW.
- Offered maximum power of each power generation for any technology may not exceed 10 MW and the minimum shall not be less than 0.5 MW. For wind the maximum power is 13.5 MW.
- The maximum awarded price for each technology is USD 60/MWh.
- Projects must be connected to networks between 13.2 kV and 66 kV.
- Submission of the bids deadline: May 30, 2019; Awarding of tenders: July 22, 2019.
- RenovAr 3.0 Generation capacity on offer is on a smaller scale compared to previous auctions due to transmission network constraints.



<u>Regions</u>	<u>To Be Awarded</u>
Total	350 MW
Region 1	40 MW
Region 2	60 MW
Region 3	60 MW
Region 4	30 MW
Region 5	30 MW
Region 6	70 MW
Region 7	60 MW

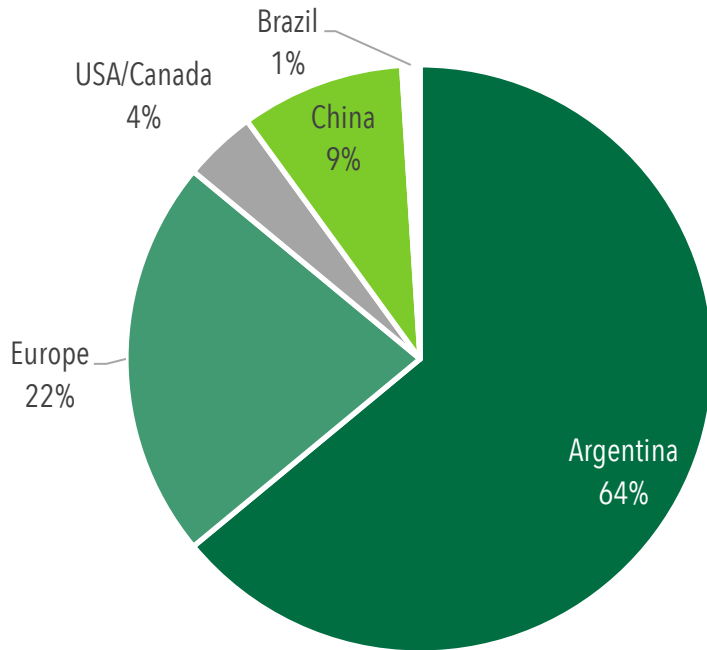
The total capacity will be distributed among the 7 regions as shown by the table.

[LINK: Full tender terms and conditions \(in Spanish\)](#)



# Current Players

## RenovAr Awarded Bidder's Origin



Source: AIRECWeek - 2018 Argentina Renewable Energy Report

Technology	Company	Country	Description	RE Projects in Argentina
Wind	<b>Central Puerto</b>	Argentina	Leading private group in power generation in Argentina, renewables installed capacity of 383MW.	100-MW La Castellana wind project in Buenos Aires
	<b>Parque Eólico Arauco</b>	Argentina	Made up of the La Rioja government (75%) and local firm Enarsa (25%) in La Rioja.	25-MW Arauco I wind farm in La Rioja
	<b>Envision</b>	China	Private company based in Shanghai, has global offices.	75-MW Los Meandros in Neuquen
	<b>eren</b> GROUPE	Luxembourg	Has a project portfolio exceeding 1,500 MW.	97.2-MW Vientos los Hércules Wind Farm
Solar PV	<b>EMESA</b> EMPRESA PÚBLICA DE ENERGÍA S.A. <b>MENDOZA GOBIERNO</b>	Argentina	Energy Company from Mendoza and pioneers in the energy sector	72.5-MW five solar projects in Mendoza
	<b>360 ENERGY</b>	Argentina	Develops, builds, and operates solar energy projects; headquartered in Buenos Aires.	70-MW five solar projects
	<b>NEOEN</b>	France	Aiming for more than 5 GW of capacity in operation and under construction by 2021.	100-MW solar farm in Altiplano
	<b>TALESUN</b>	China	An internationally operating EPC and turnkey solution provider of PV power plant.	300-MW Cauchari solar complex

# Foreign Investment

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- Argentina seeks continued foreign direct investment (FDI) to enhance the nation's productive capacity and GDP growth potential
- Regulations:
  - Foreign companies may invest in Argentina without registration or prior government approval, and on the same terms as investors domiciled in Argentina.
  - Investors are free to enter into mergers, acquisitions, green-field investments, or joint ventures.
  - Foreign firms may also participate in publicly-financed research and development programs on a national treatment basis.

## ENERGY

- Registration: Registering as an electricity agent with the Secretariat of Electricity and CAMMESA
- Regulation:
  - General environment and health and safety regulations (both federal and provincial) apply to the construction of power plants.
  - In major cases, safety and environmental permits and authorizations must also be requested from the local authorities.
- Authorization: The operation requires an authorization from the Secretariat of Energy or the provincial authorities
- Transmission: Prior authorization from the transmission company is required for interconnection to existing capacity in power lines.

## LAND

- Law No. 26,737 restricts foreign ownership to a maximum of 15 percent of all rural land, on both national and provincial/municipal levels.
- There are no specific regulations regarding land lease and acquisition of residential and commercial real estate by foreign investors.

# Project Finance

## PROJECT FINANCE

- Renewable energy projects in Argentina mainly seek financing from domestic banks and for relatively short-term loans.
- Development finance institutions (DFIs) and export agencies can also be approached as well as the green bond market.
- Though international banks are becoming increasingly interested in the Argentine power sector, they have yet to enter the market. Therefore, projects rely on equity more than is common in other markets.

Project	Capacity	Project Owners	Debt Financing	Lenders
San Juan Solar Power Project	80 MW	JinkoSolar	USD 60.15m	IDB Invest, Canadian Climate Fund
Vientos los Hercules Wind Farm	97.2 MW	Total Eren	USD 167m	KfW IPEX-Bank, DEG, FMO, Euler Hermes
La Castellana Wind Project	100 MW	Central Puerto	USD 119m	IFC, MCPPP, IDB, Banco Galicia
Cauchari solar complex	300 MW	JEMSE, Shanghai Electric Zhongli Talesun Solar	USD 331.5m	China Exim Bank

Source: AIRECWeek – 2018 Argentina Renewable Energy Report

## CURRENCY USD/ARS



- The country risk remains very high, the central bank would probably not lower the interest rates. Instead they will continue to buy dollars to maintain peso's competitiveness in the short term.
- In the context of weaker flows in the capital account, peso depreciation is expected to resume.

# Opportunities & Challenges

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## OPPORTUNITIES

- Large untapped potential resources
- Estimated market growth
- Standardized auction process welcoming foreign investors
- FODER & World Bank guarantee to mitigate risks

## CHALLENGES

- Policy risk
  - Upcoming presidential elections in October 2019 and resulting political uncertainty
- Currency risk
- Decreasing auction prices
- Constrained transmission and distribution network – resulting in decreasing awarded capacity in future tenders

# Recommendations



- ReNew potential market entry should be in the mid- to long-term due to:
  - Economic and political uncertainty,
  - Shrinking RenovAr awarded capacity,
  - Constrained transmission network



- The legal framework and ambitious target reflects that IPPs should not ignore Argentina's potential
- Producers should wait at least until the election in October 2019 and see how the economy recovers



- ReNew should consider entering into bilateral PPAs or waiting for the following rounds of RenovAr with each awarded projects > 100 MW.
- ReNew could consider joining partnerships with local IPPs and seek financing from IDBI

THANK YOU