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**The important role of a more flexible, competitive and back up natural gas in  
the energy transition in Latin America**

By

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The views expressed are those of the author and do not necessarily reflect  
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# The important role of a more flexible, competitive and back up natural gas in the energy transition in Latin America



8<sup>TH</sup> GLOBAL  
COMMODITIES FORUM

**Alvaro Ríos Roca**

April 24, 2018

# Offices – Gas Energy Latin America

**GAS ENERGY LATIN AMERICA (GELA)** is an energy consulting company (natural gas, oil, power and petrochemical) operating throughout Latin America and the Caribbean since 2008.

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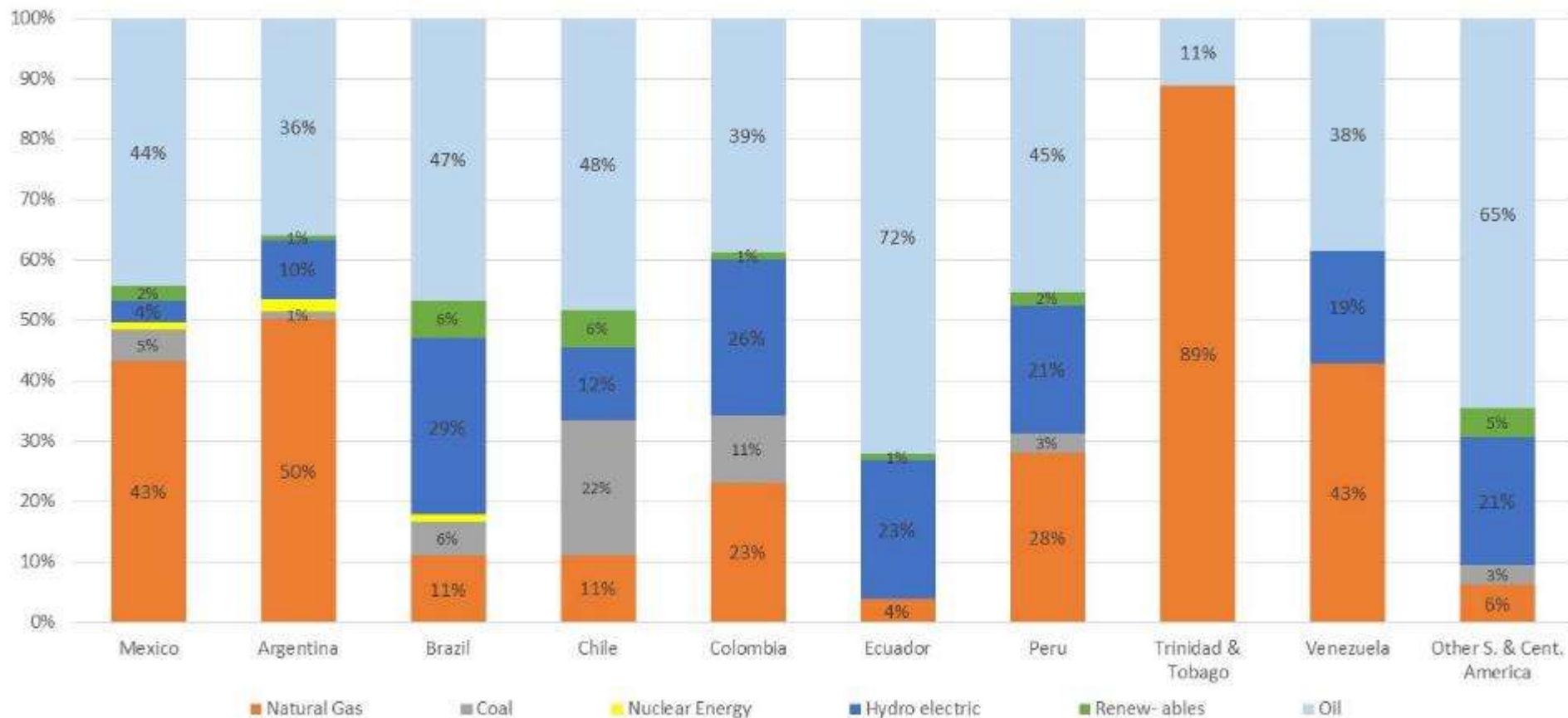


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- Energy and natural gas in Latin America
- Renewable energy penetration in Latin America
- Developments in Latin America with a cleaner, friendlier, more flexible and competitive natural gas
  - ✓ North America (EEUU, Canada and Mexico)
  - ✓ Central America the Caribbean (Panama, Dominican Republic and El Salvador)
  - ✓ North Cone (Colombia, T&T and Venezuela)
  - ✓ South Cone (Brazil, Argentina, Bolivia, Chile and Peru)
- Some conclusions and remarks

# LA primary energy consumption by fuel - 2016

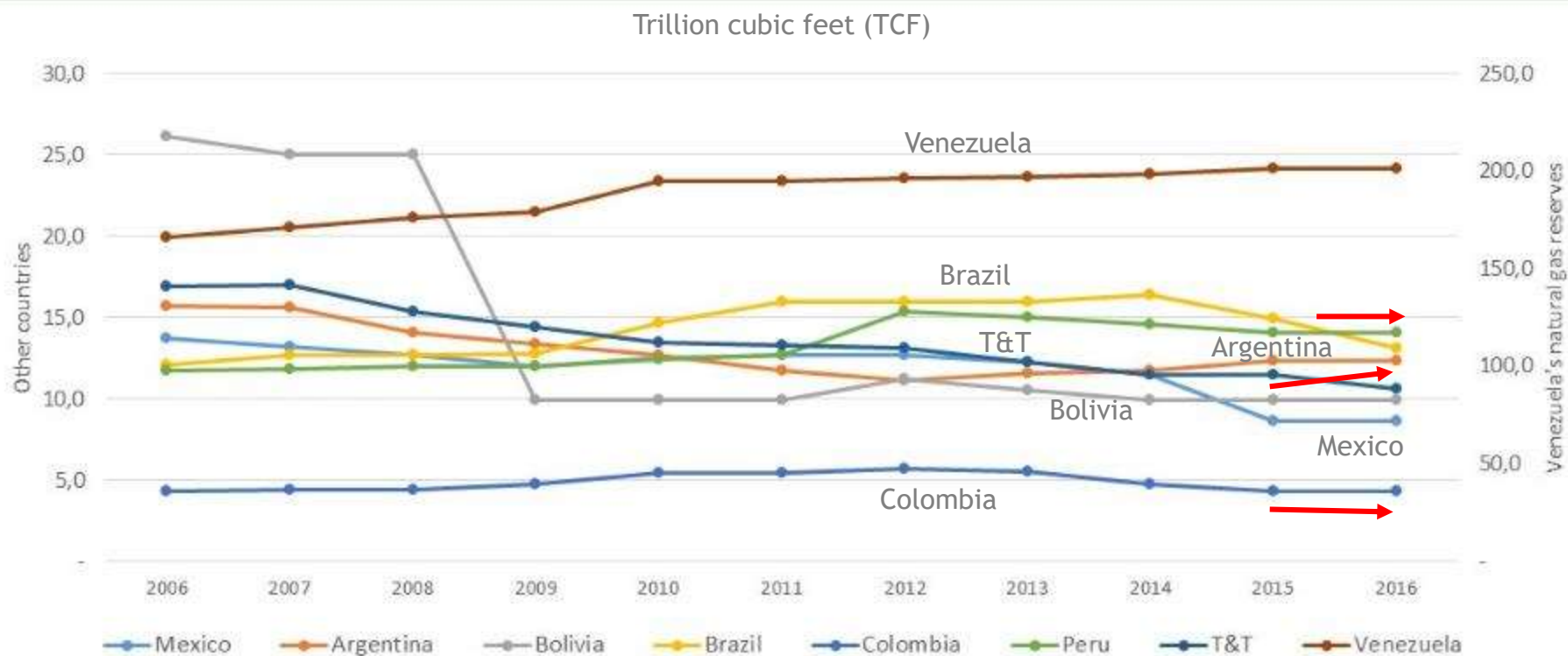
Percentage (%)



Globally, in 2016 markets adapt to the energy transition: demand grows slightly, the energy mix changes towards cleaner sources

Source: BP Statistical Review of World Energy 2017

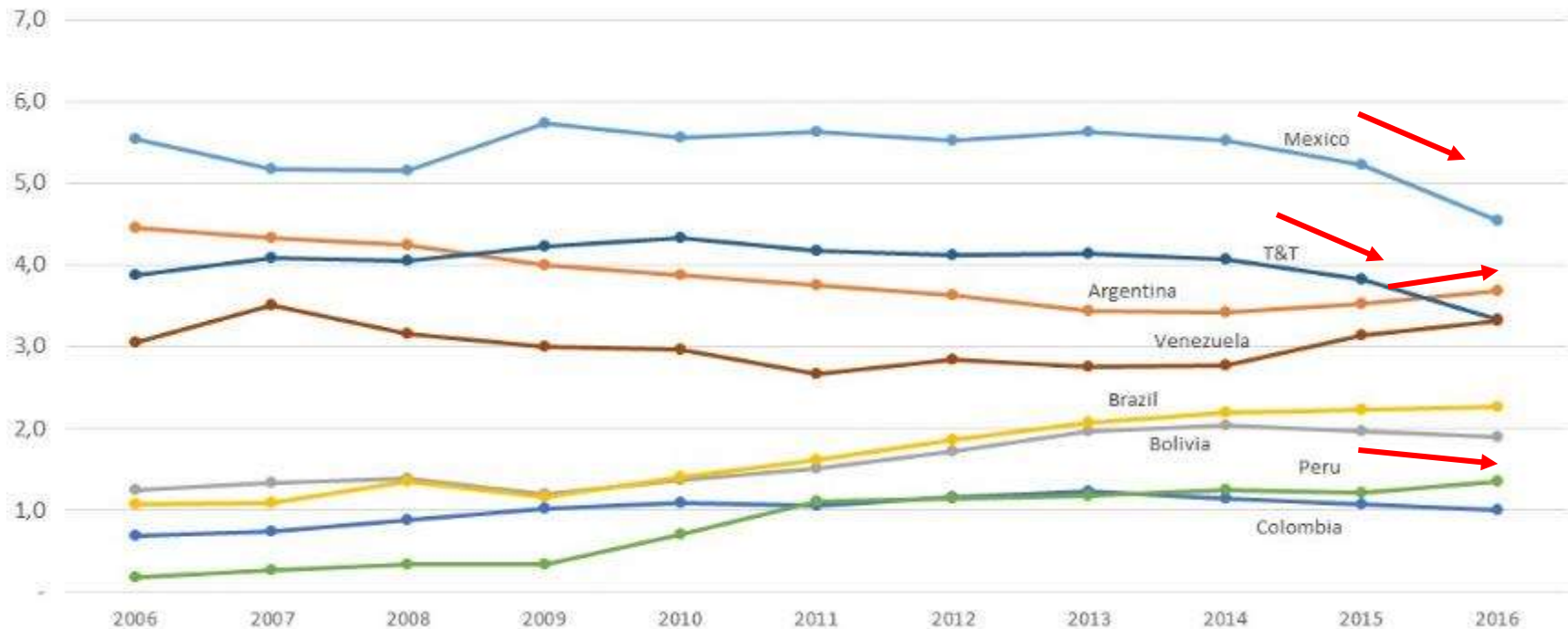
# LA natural gas proved reserves (resources) 2006 - 2016



- Venezuela most important reserves, but not the conditions for development and are associated to oil production
- Reserves in Mexico, Trinidad and Tobago, Bolivia and Colombia continue to decline
- Argentina and Brasil are to add reserves and production in Vaca muerta and Presalt.

# LA natural gas production 2006 - 2016

Billion cubic feet per day (BCFD)

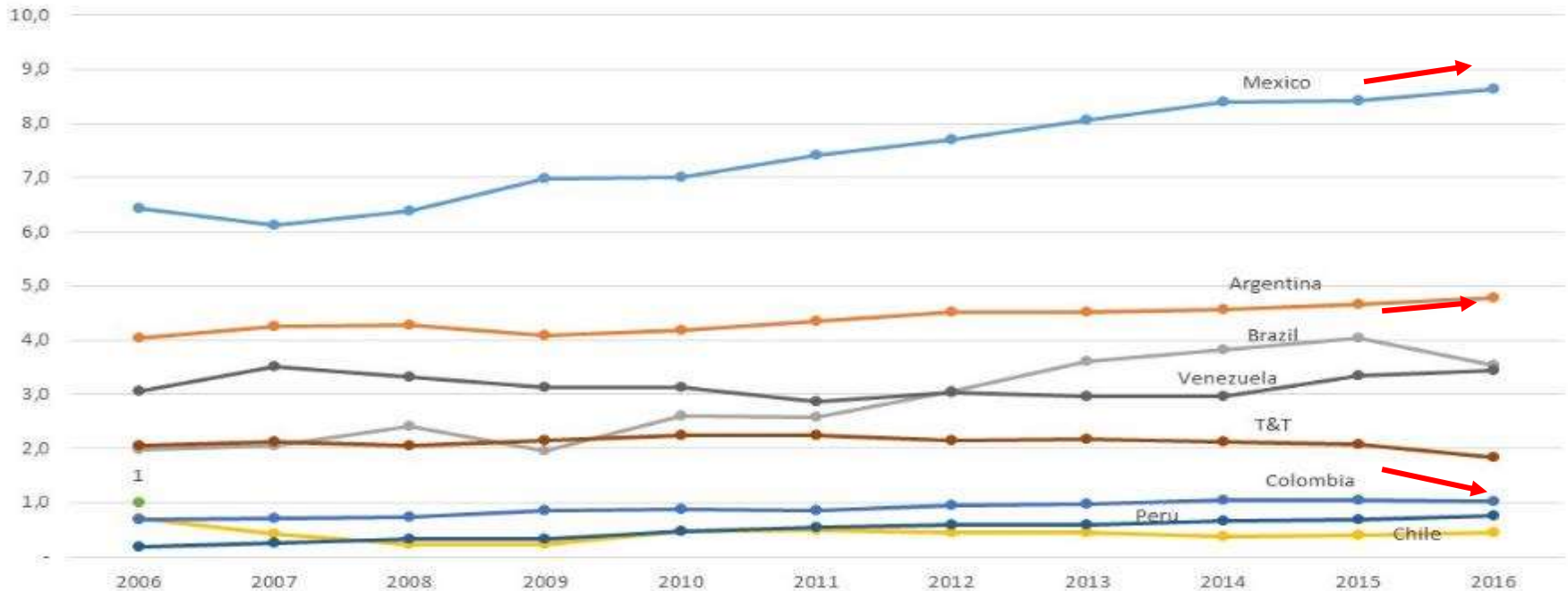


- Venezuela's production is recovering BY investment of private companies (Cardon IV)
- Natural gas production in Mexico, Trinidad and Tobago, Bolivia and Colombia are decreasing due to lack of new findings and developments
- Argentina's production is recovering as a result of the Vaca Muerta and Brazil form Presalt associated gas

Source: BP Statistical Review of World Energy 2017

# LA natural gas demand 2006 - 2016

Billion cubic feet per day (BCFD)



- Mexico continues demanding for power and replace pollutants and more expensive fuel oil.
- Argentina continues increasing demand as well as Venezuela for reinjection to produce oil.
- Brasil power thermoelectric sector competes with hydro generation and is cyclical but continues growing
- Colombia, Peru and Chile have stable growing demands.
- TT has declining demand due to lack of production in petchem facilities

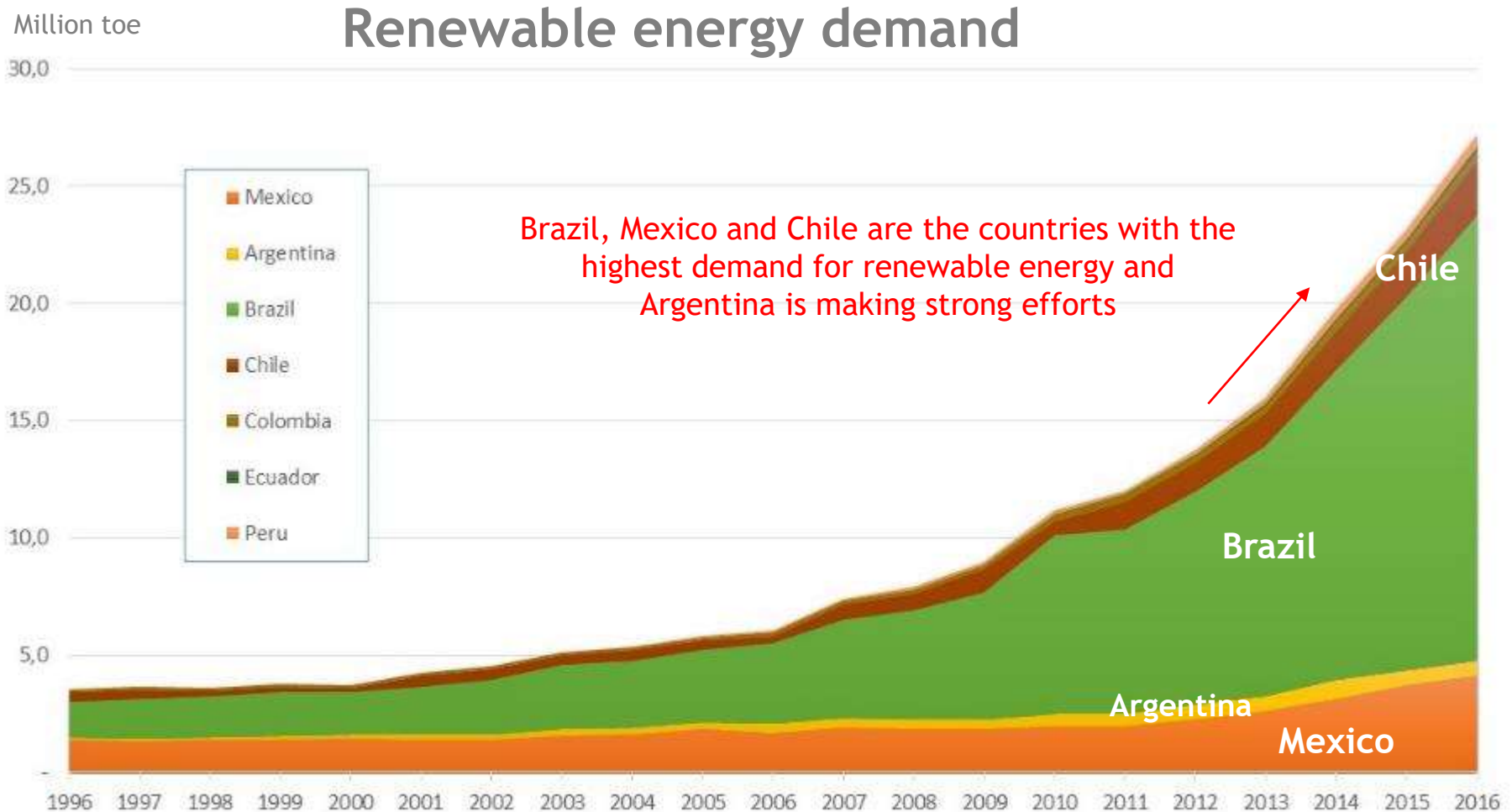
Source: BP Statistical Review of World Energy 2017



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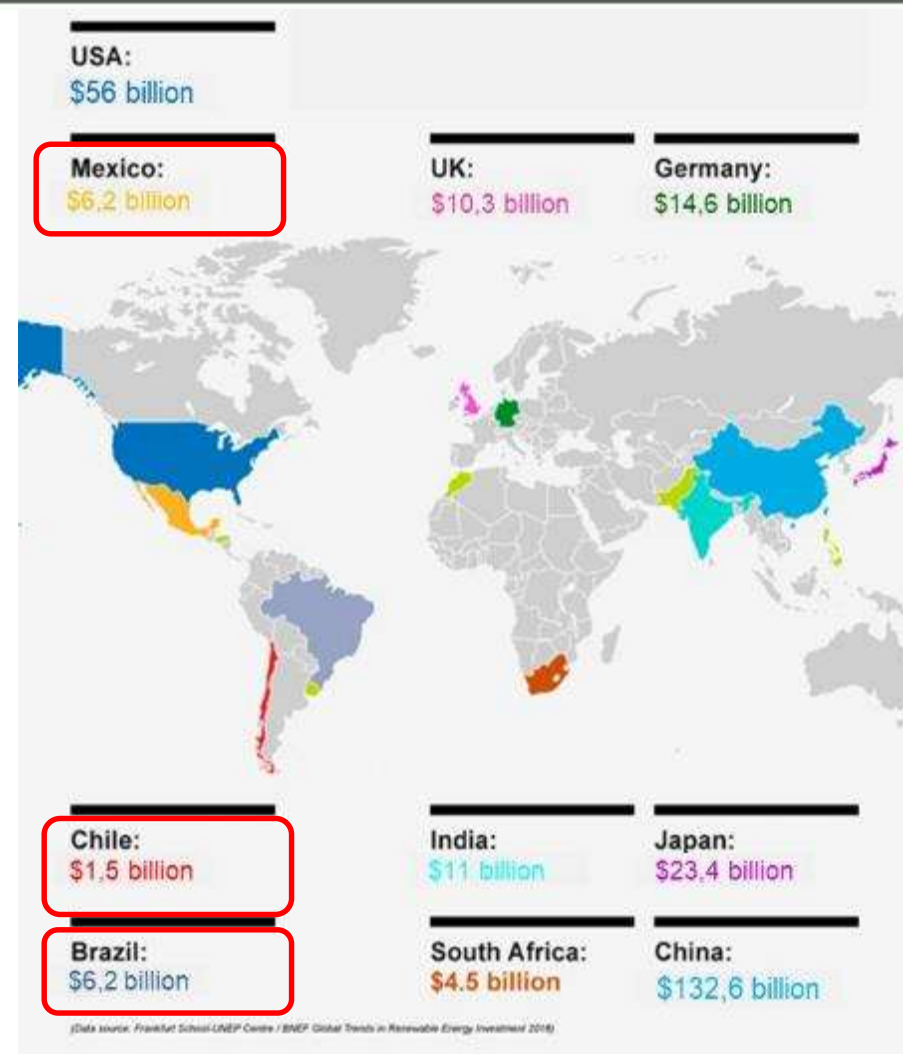
# LA renewable energy demand



\* Based on gross generation from renewable sources including wind, geothermal, solar, biomass and waste, and not accounting for cross-border electricity supply.

# LA investment in renewable energy - 2017

- Most important investment in renewable are solar and wind technologies
- Mexico, Brazil and Chile are leading investments
- Some hydro projects are being pursued but strong environmental opposition
- Natural gas ideal energy source for backing up all new intermittent RE

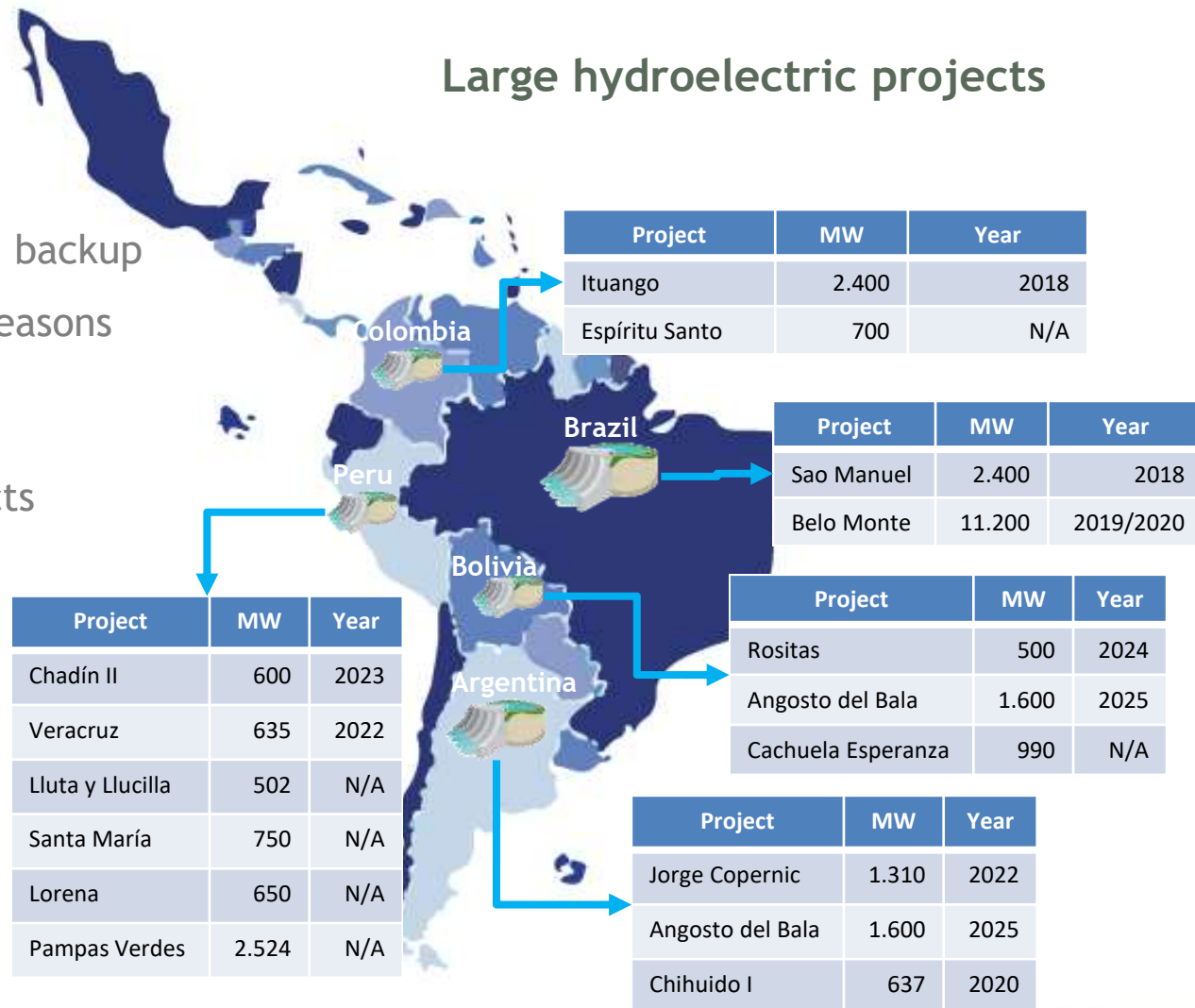


Source: Frankfurt School, «Tendencias globales en inversión de energías renovables», 2016

# LA hydro power projects

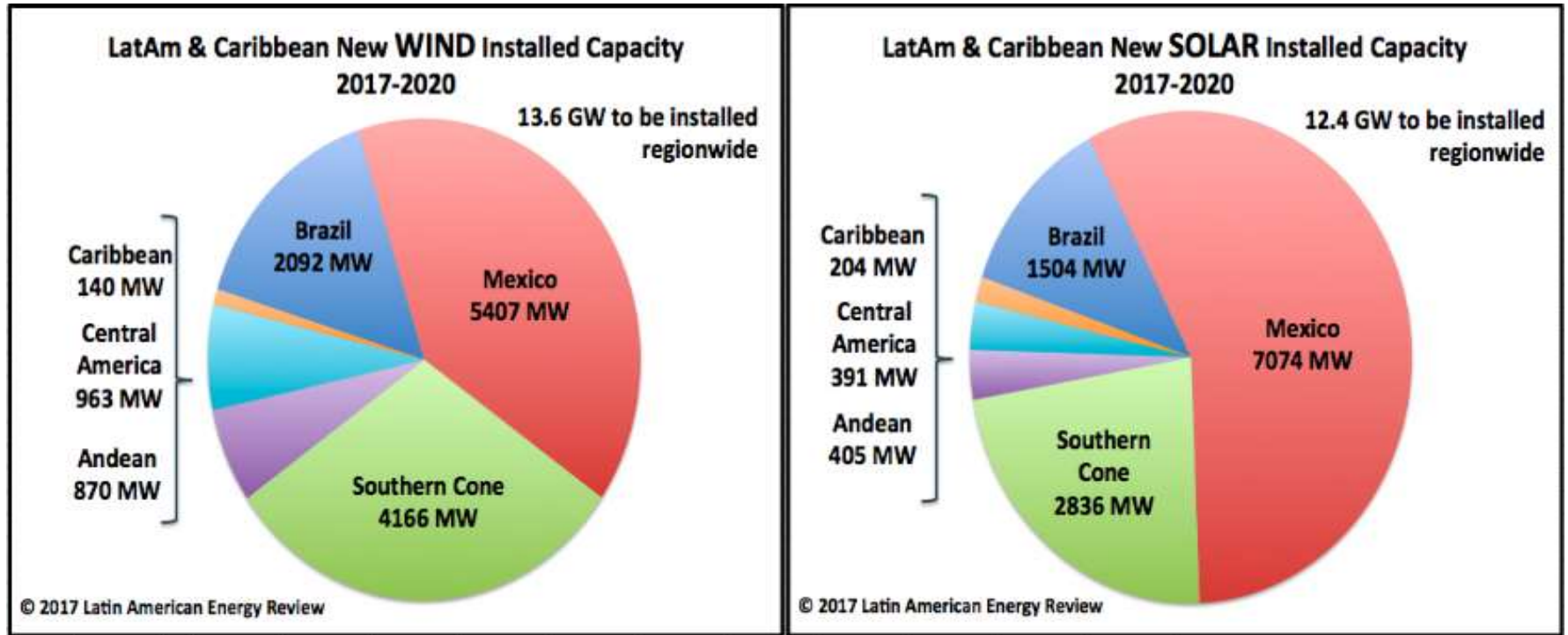
- Natural gas ideal as base and backup for hydro generation in dry seasons
- Region continues to promote development of hydro projects

## Large hydroelectric projects



Source: BNAmericas March 2018

# LA renewable energy outlook

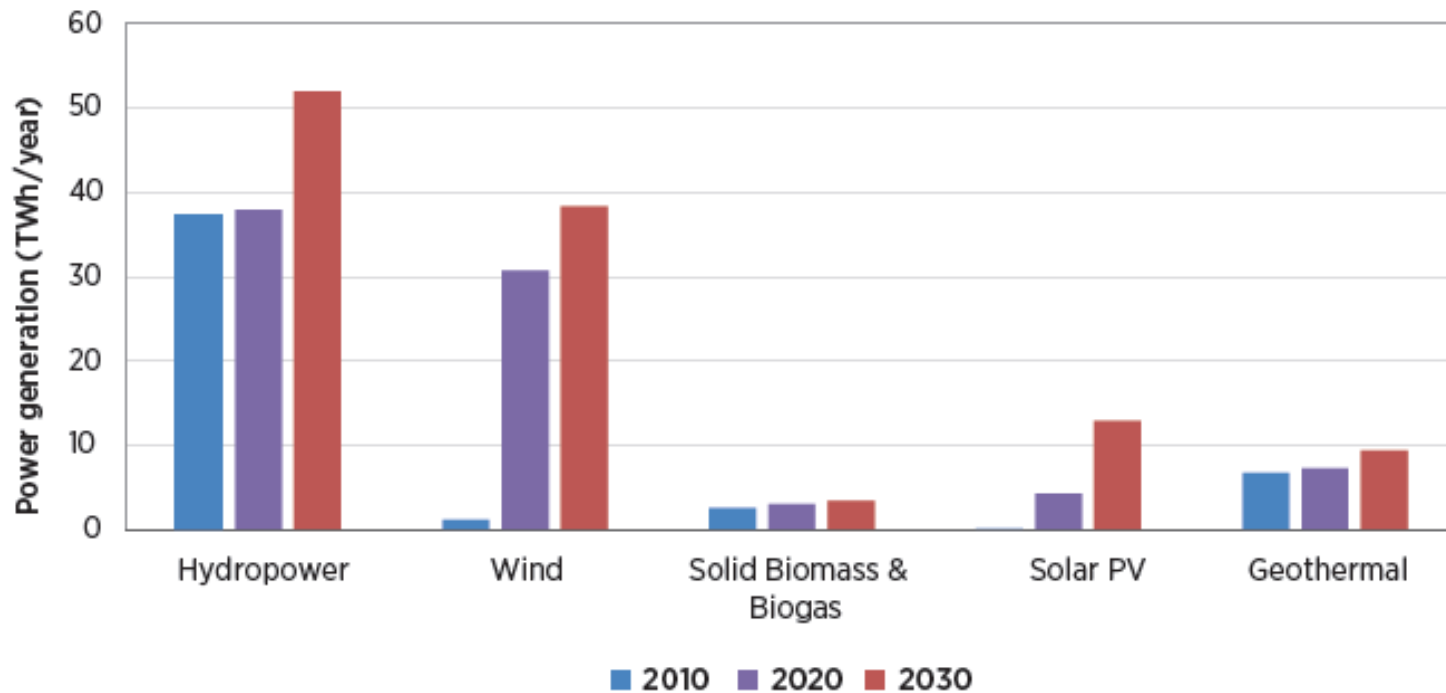


Increased competition from renewable energies, increasingly competitive throughout the region.

Source: Latin American Energy Review, 2017

# Mexico - Renewable energy

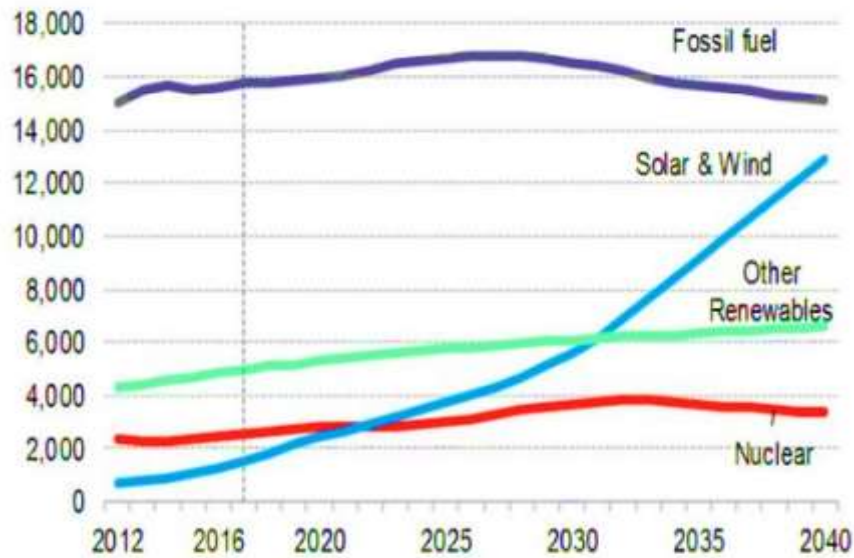
Renewable power generation growth  
2010 - 2030



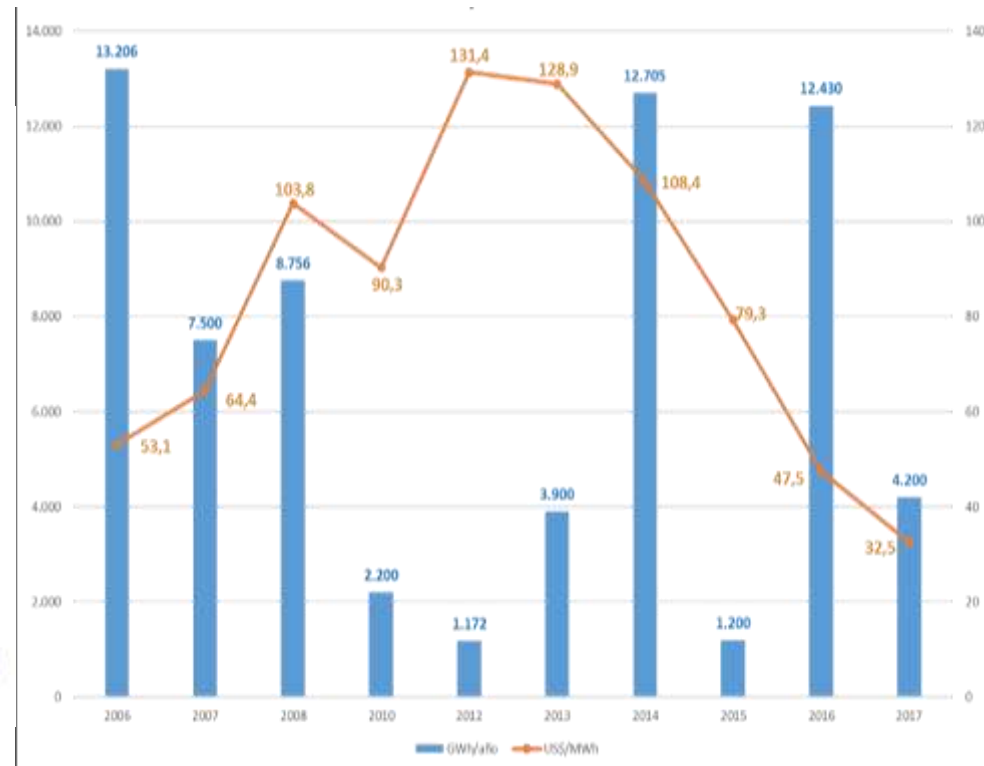
The projections show the share of renewable energy in Mexico's energy mix

# Chile - Renewables energy

Renewable energy projections  
TWhr



Average prices for bid processes

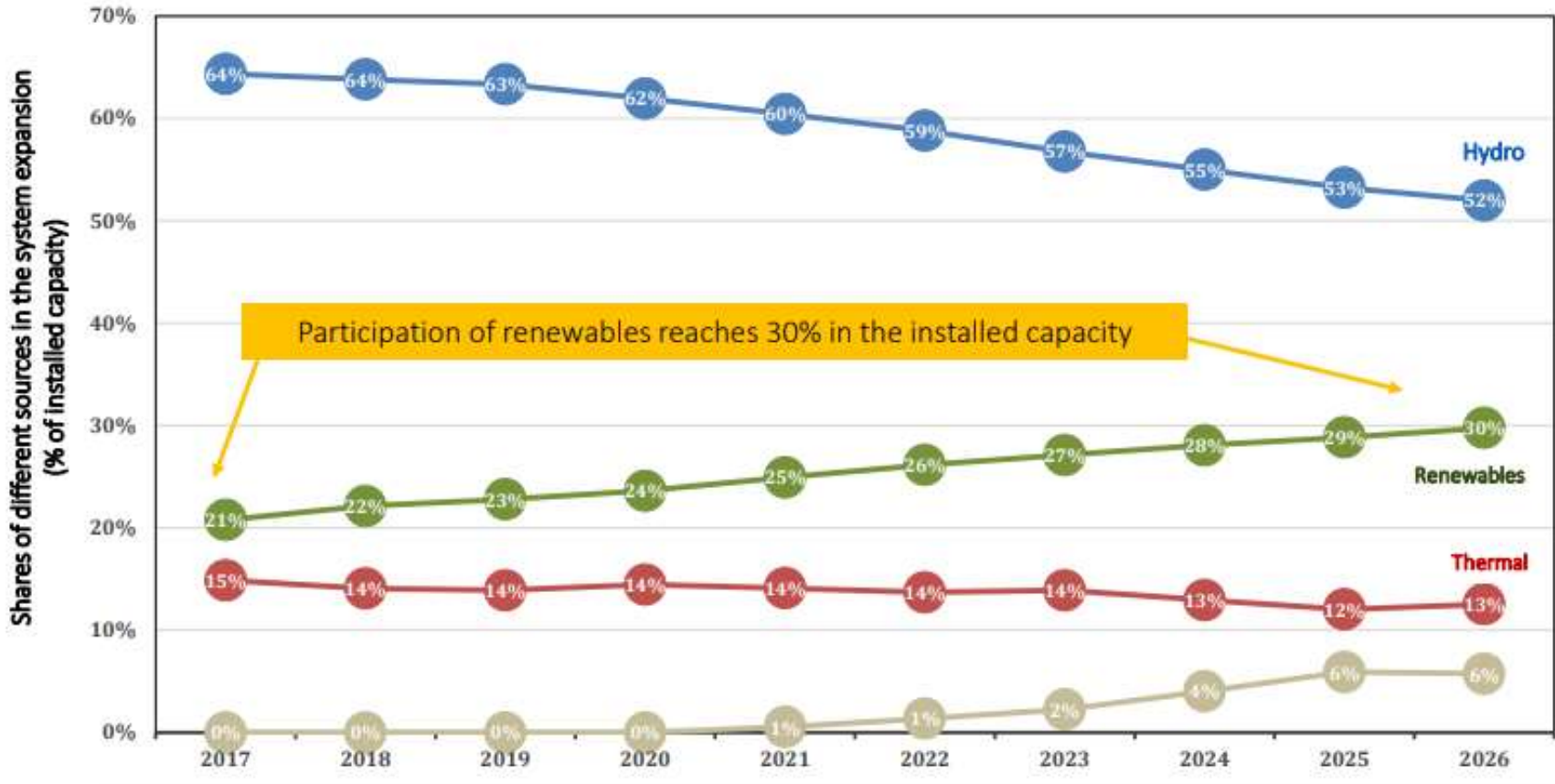


Source: New Energy Finance, New Energy Outlook 2017 (BNEF)



# Brazil - Renewable energy

An outlook of the matrix in the 10 years horizon





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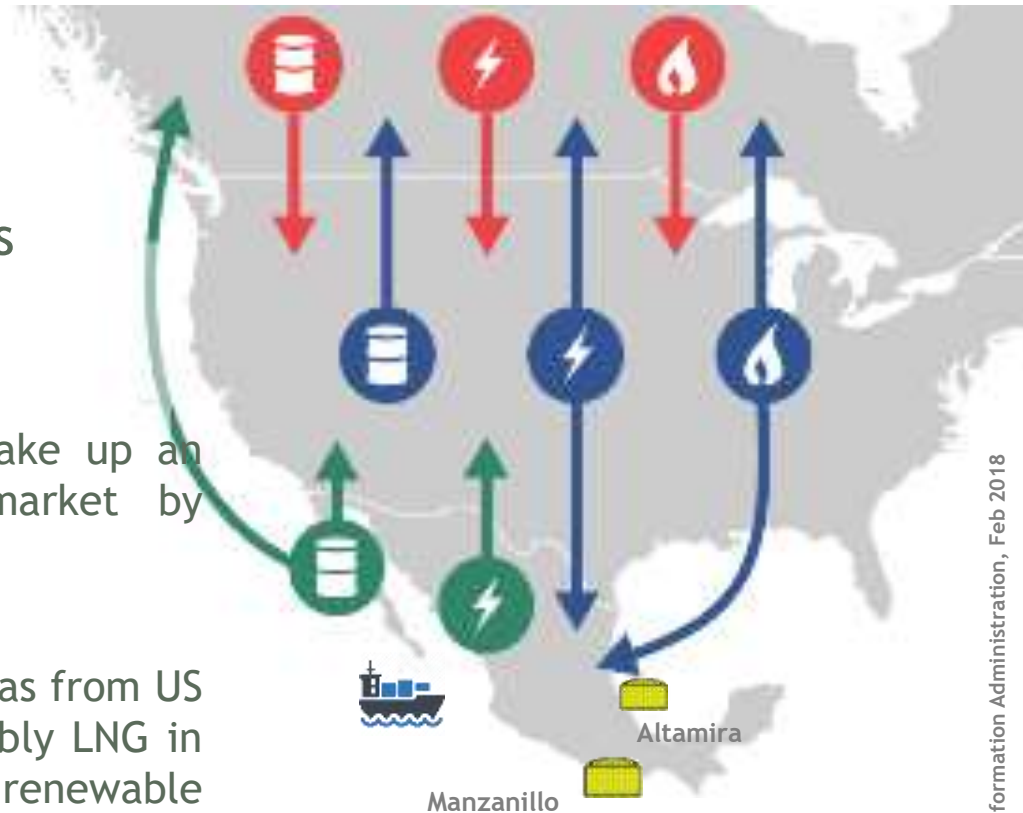
# Natural gas exchanges in Latin America



# 1) North America (EEUU, Canada and Mexico)

## More flexible and competitive gas

- Mexico, the US and Canada already make up an integrated competitive natural gas market by pipeline.
- Mexico will continue importing pipeline gas from US to replace dirtier combustoleo and possibly LNG in the future as back up felxible source for renewable energy
- Competitive price structure and huh market prices



Source: EIA, Energy Information Administration, Feb 2018

## 2) Central America and the Caribbean

### LNG regional distribution network



- Virtual commercial integration to displace oil products (LPG, diesel, fuel, gasoline)
- LNG and small LNG competing in price with other fuels
- Back up source for future renewable energy coming in the region

source: AES, 2017

### 3) Northern Cone (Colombia, T&T and Venezuela)

#### Future integration



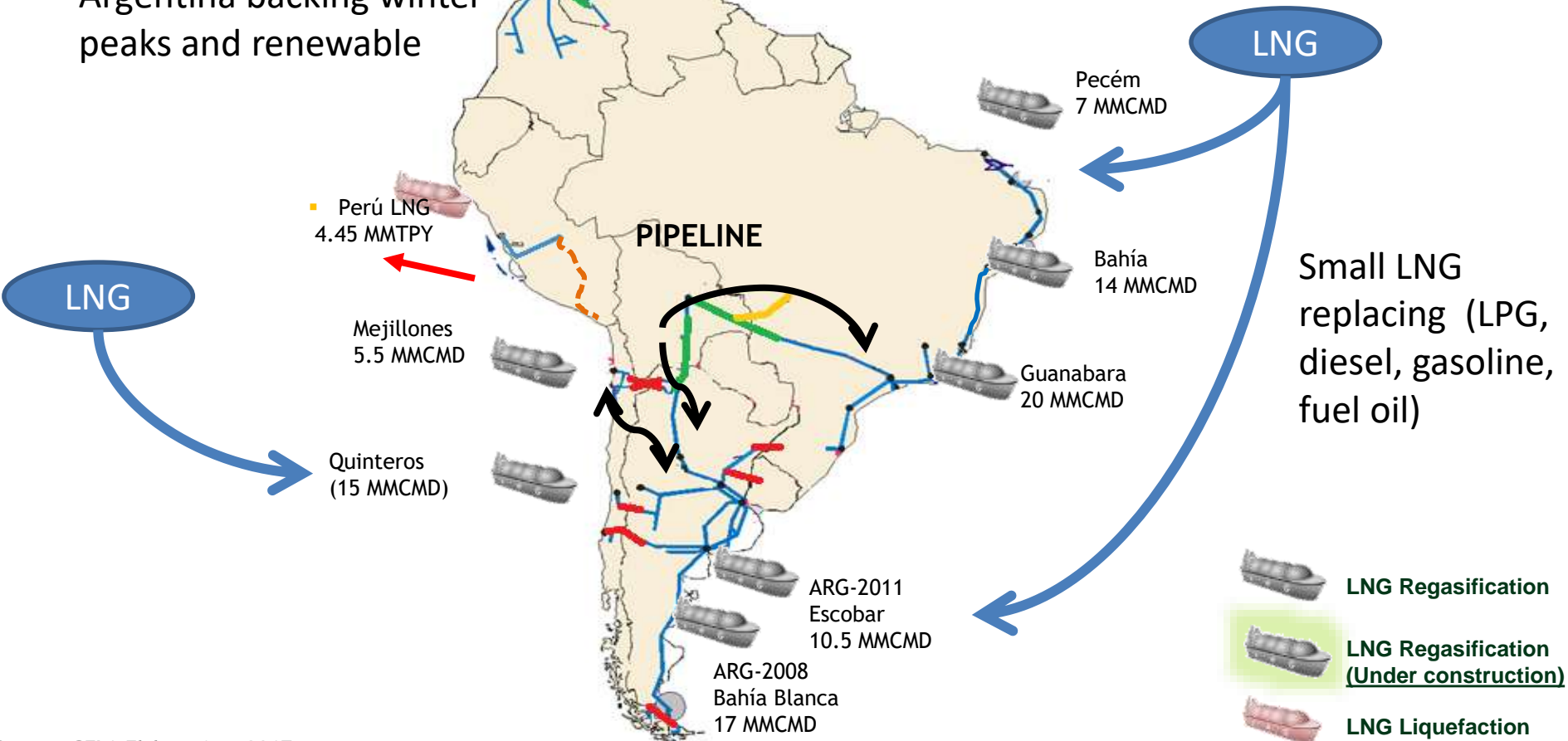
- Venezuela still trying to sell pipeline gas in Colombia but contract remains in stand by (uncertainty issues)
- Colombia declining production needs flexible gas for hydro power back up and is studying one more LNG terminal
- Venezuela gas to substitute declining production to move gas to 4 LNG plants is under study



# 4) Southern Cone (Brazil, Argentina, Bolivia, Uruguay, Chile and Peru)

- Brazil backing large hydro
- Chile backing solar/wind
- Argentina backing winter peaks and renewable

## Gas on gas competition



Source: GELA Elaboration, 2017.

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# Conclusions and remarks

- Most countries in LA have potential and reserves of conventional and unconventional natural gas
- Natural gas is moving to a more commercial integration competing with prices and pollution issues against dirtier energy sources.
- Several countries in LA have strong hydro power capacity and there are further plans to continue developments
- New renewable energy (solar and wind) are to continue penetrating in the energy mix in all LA
- Natural gas as LNG is providing that
- Natural gas keeps displacing oil products in all segments (power, industrial, vehicles, commercial, residential)
- Small LNG continues to penetrate strongly into the region in smaller markets
- LNG and pipeline natural gas are ideal for competitively backing up water, solar and wind





**MUCHAS GRACIAS!**

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