EGP experience with auctions

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EGP Overview
Enel Green Power
A global leader

Total installed capacity by area

- Europe: 5.6 GW in operation
- North America: 2.5 GW in operation
- Latin America: 2.2 GW in operation
- Rest of World: 5.6 GW in operation

Net production by technology

- Wind: 33.6 TWh (48%)
- Solar: 2% (202 GWh of biomass)
- Hydro: 31%
- Geo: 19%

1. Includes 202 GWh of biomass

Data as of 31 December 2015
Enel Green Power
Recent achievements

- **Mexico**
  - **New Wind** Capacity: Sureste and Dominica plants (+202 MW)

- **Peru**
  - 326 MW awarded in 3 technologies

- **Chile**
  - Talinay Poniente (Wind, +61 MW) and Lalackama II plant (PV, +18 MW)

- **Morocco**
  - EGP Consortium lowest bidder for 850 MW wind

- **Brazil**
  - 683 MW awarded (PV, Hydro, Wind)

- **Germany**
  - Acquisition of an SPV for geothermal activities

- **Turkey**
  - Awarded 23 MW of PV

- **Morocco**
  - Talinay Poniente (Wind, +61 MW) and Lalackama II plant (PV, +18 MW)

- **South Africa**
  - ~ 1200 MW awarded and in execution

- **India**
  - BLP acquisition

- **Morocco**
  - EGP Consortium lowest bidder for 850 MW wind

- **Mexico**
  - New Wind Capacity: Sureste and Dominica plants (+202 MW)
### Business Development Strategy

Selection of new markets

<table>
<thead>
<tr>
<th>3 EGP criteria to select new countries:</th>
<th>Country A</th>
<th>Country B</th>
<th>Country C</th>
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</thead>
<tbody>
<tr>
<td>1 Abundance of resources for at least 2 suitable technologies</td>
<td>✔️</td>
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<td>2 Favorable macro-economic conditions and growing electricity demand</td>
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<td>3 Reliable legal framework and predictable regulatory development</td>
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High Value Creation Country/Tech Cluster

EGP selection of new growing markets is driven by creating value for stakeholders
Renewable market overview
Incentives vs Competitive mechanisms

2010 – EGP countries of presence
16 countries of which 6 with competitive mechanisms/PPA

2016 – EGP countries of presence and interest
49 countries of which 29 with competitive mechanisms/PPA

Fixed incentive schemes (GC, Tariffs)  Competitive mechanisms (tender/PPA)  Country switched to auction or tender since 2010

Source: BNEF; internal analysis
Feed-in-Tariffs vs. Market-based mechanisms
RES Regulatory Framework Overview
Feed-in-Tariffs vs. Market-based mechanisms

**Advantages**
- Attractive even for low-risk investors
- Impressive capacity boost generated by this solution
- Simple structure, applicable to mass market technologies: E.g. decentralize energy

**Disadvantages**
- No meritocratic approach
- Wrong tariff setting can lead to RES under- or over- development vs. target
- Limited adaptability: in case of technology rapid evolution, many changes required
- In case of large premium offered, high system cost

**Feed in Tariffs**
- Effective use of budget
- Specific capacity targets can be set in short span of time
- Meritocratic mechanism with cheapest and higher quality projects selected
- Learning effect over time for both parties

**Market-based mechanisms**
- Risk of not prequalified players to under-bid disrupting competition
- Remuneration value strongly linked to competition level
- Not pre-defined when a player decides to enter
- Not adequate for small size projects
Policy Best Cases
Main success factors and results achieved

### South Africa
- **Long term (2030) capacity development planning** (Integrated Resource Plan)
- **Public confrontation and timely engagement** on critical issues
- **Extremely detailed RES plan**, with clear yearly planning by technology

### Brazil
- **Long term planning** of electricity needs (10 years energy plan)
- **Stability of RES strategy and RES scheme rules** (PPAs by auction since 2009)
- **Clear and predictable auctions system** to allow Distributors to secure regulated demand

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**Critical Factor of Success**

- **Main results**
  - 5.2 GW approved in four bid rounds
  - $4.5 bn investments attracted 2015
  - In round IV awarded 1,1 GW at some of the cheapest tariffs globally (Wind 52$/MWh, PV 66 $/MWh)
  - Planned auctions for additional 6.3 GW

- **Main results**
  - In 2015 over 4 GW of RES capacity has been awarded through auctions
  - In last seven years in Brazil approx. 24 GW RES capacity was auctioned, 80% of total capacity contracted (total capacity including also conventional)

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Stability of RES development strategy, long term planning, reliable and predictable supporting schemes are the key factors of success for RES growth
Policy Best Cases

Auctions as a key factor to drive down renewable energy costs

Brazil onshore wind (Brl/MWh)

The competition introduced by auctions leads to lower energy tariffs

Source: BNEF
Recent auction awarding prices

Prices refer to $/MWh
Source: IEA; Internal analysis
EGP experience
EGP experience with Renewable’s Auctions

**EGP Auctions – Capacity Awarded in 2012-2015 (MW)**

- **2012**: 156
- **2013**: 892
- **2014**: 1,347
- **2015**: 1,877

Number of countries with EGP participation:
- **2012**: 2
- **2013**: 4
- **2014**: 4
- **2015**: 8

**EGP annual awarded capacity grew more than X10 in 4 years**

Note: In 2015 EGP participated also to the south African tender submitting 312 MW, results are still pending.
EGP experience with Renewable’s Auctions
EGP experience in PV and Wind

- In 2014 PV installed capacity was ~ 430 MW, 25% was awarded through auctions
- To date ~ 1.8 GW are in execution, of which 67% was awarded through auctions

- In 2014 Wind installed capacity was ~ 5.7 GW, only 5% was awarded through auctions
- To date ~ 2 GW are in execution of which 47% was awarded through auctions

Note: figures do not include 850 MW awarded in Morocco in partnership with Nareva and Siemens.
EGP experience with Renewable’s Auctions
EGP recently awarded auctions at record prices

Morocco
- EGP consortium with Nareva and Siemens
- Wind, lowest bidder for 850 MW at 28 $/MW

Perù
- Wind, Nazca 126 MW at 38 US $
- Solar, Rubi 180 MW at 48 US $
- Hydro 44 US $

Market Analysis & Scouting
- Global footprint

Strategic Partnership
- Partnering with local suppliers, developers and minority investors

Process Quality
- Project Selection and Design Optimization thanks to our consolidated BD expertise

Innovation & Cost Optimization
- New technological solutions (i.e. tracker) and cost optimization

Commercial Strategy
- Bid strategy for tender and selection of reliable client for bilateral PPAs
Conclusions

EGP key take-aways

- Long term contracts are crucial to ensure adequate return on investments

- As long as they are properly designed, both auctions and FITs are effective mechanisms, yet leading to different outcomes

- The world is moving towards competitive mechanisms as they reduced drastically renewables LCOE

- In several markets renewables are already competitive versus conventional technologies