Beyond Paris: the electricity industry and the accelerated momentum of climate policy

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**An investor’s view on the Paris Agreement**

*Positive signals include ambition, stability, role of markets and funding commitments*

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**The Paris Outcome**

**Ambition** - Long term goal of keeping raising temperature “well below 2°C” with efforts to stay within 1.5°C:
- Emission peak “as soon as possible“
- Carbon neutrality in the second half of the century

**Scope & Governance** - A transparent framework foreseeing :
- More than 95% of global emissions covered
- “Highest possible ambition” through NDC (*Nationally Determined Contributions*)
- 5 years pledge review system

**Carbon Markets** - Reference to carbon trading through “mitigation outcomes” and new project-based crediting mechanism

**Climate Finance** - 100 Bn USD/yr minimum floor to finance mitigation and adaptation measures. Green Climate Fund (GCF) and the Global Environmental facility (GEF) mentioned as key funding mechanisms
The decreasing costs of clean technologies…

Decarbonization goals are now economically feasible

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**Onshore Wind Levelized Cost ($/MWh)**

- **WIND COSTS HAVE FALLEN 50% SINCE 2009**
- Learning rate 19%

**Solar PV Module Cost ($/W)**

- **MODULE COSTS HAVE FALLEN 99% SINCE 1976 80% SINCE 2008**
- Learning rate 24.3%

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**Notes:**

- Pricing data has been inflation corrected to 2014. We assume the debt ratio of 70%, cost of debt (bps to LIBOR) of 175, cost of equity of 8%. Source: Bloomberg New Energy Finance
- Learning rate is defined as the price reduction rate based on capacity increase

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**Notes:**

- Prices are in real (2015) USD. ‘Current price’ is $0.61/W. Source: Bloomberg New Energy Finance, Maycock; Learning rate defined as price reduction rate based on capacity increase
Sectors’ contribution to decarbonization

Renewables and end-use efficiency supported by digitalized grids will play a major role

Source: Enerfuture Global Energy Scenarios to 2040; 2016 Edition Enerdata
Enel Group’s commitment

An investment plan fully consistent with the post-Paris Scenario

• The Enel Group is fully committed to the decarbonisation path undertaken with the goal of achieving carbon neutrality by 2050. Over 45% of the power generated by Enel in 2015 was carbon free.

• Enel’s low carbon commitments for the period 2016-19 include:
  ✓ 9 bn€ for 7.7 GW of new renewable installed capacity (equal to 85.4% of total generation investments over the same period)
  ✓ Almost 6 bn € planned investments in Smart distribution and transmission networks aimed at preparing the transition towards demand-side management models
  ✓ Cutting CO₂ emission intensity by 25% with respect to 2007 levels by 2020

Note: Enel official data updated to 31st December 2015
Assessing the low carbon side of INDCs

*Climate Policies have focused and accelerated on the renewable energy side*

- [Image: World map with various icons and text boxes.

- **32% power sector emission reduction** by 2030 below 2005 levels (estimation ref. Clean Power plan)

- **45% of all total capacity installed** in the period 2014-25 from non-conventional RES

- **18% biofuel in the energy mix** (ethanol, biodiesel) by 2030

- **45% RES in the energy mix** expanding non-hydro RES sources to 28-33% by 2030

- **At least 23% non hydro RES in the power supply** (incl. wind, biomass and solar)

- **Over 50% of installed capacity from RES sources** by 2025

- **+200 GW installed wind capacity**, and **+100 GW solar power capacity**

- **Increase the share of non-fossil in primary energy** to 20% by 2030

- **Emission peak by 2030**

- **Emissions intensity reduction** of 33 to 35% by 2030 on 2005 level

- **40% of power installed capacity carbon free** by 2030

- **60 GW wind and 100 GW solar power capacity targets** by 2022

- **At least 23% of consumed energy from RES** by 2025

- **Utilization of degraded land for RES**

- **RES expansion in next 10 years**

- **Emission peak** between 2020-25

- **Decarbonised electricity by 2050**
Assessing the infrastructure side of INDCs

*Climate policies are still overlooking the importance of digitalized grids*

- The Paris Agreement’s INDCs do not appear to realize the importance of grid upgrading and digitalization despite significant investments in:
  - Electric vehicles
  - Energy efficiency technologies
  - Distributed generation (e.g. solar panel)

- T&D investments will be crucial to manage the system and allow the interaction of smart technologies. Main aspects to be addressed include managing:
  - Demand side centers
  - Distributed generation
  - Intermittent RES

- Urgent need to emphasize key role of smart grids and long distance transmission in delivering GHG reductions

Source: WEO, 2015
Conclusions

We are heading in the right direction but more needs to be done

- Paris played a fundamental role in accelerating climate policies but a significant ambition gap exists between the global Paris goal and national targets.
- Steep reductions in the low carbon cost curve are making decarbonization more accessible.
- RES and infrastructure development will play a key role in delivering the emission reductions needed.
- Current policies reflected in INDCs provide RES with a significant role but appear to overlook the central role digitalized infrastructures will need to play.