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Grid Futurability®



Enel GI&N 2020 numbers





Section and the second



• slew of updated targets for carbon removals from the land-use and forestry sectors.



IEA: WEO 2021

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Main outcomes @October2021

Main Energy scenarios

- 1. Stated Policies Scenario (STEPS) policy targets
- 2. Announced Pledges Scenario (APS): meet 100% COP26 targets

Electricity demand 2050: **48.042 TWh** RES capacity in 2050: **72%** on total (**13,7 TW** vRES)

3. NetZero by 2050 (NZE): netzero emission by 2050:



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 Distribution grid share represents
 66% of the average investments in grids in the past 5 years.

 This share will continuously increase ranging from 72 to 76% in the different scenarios in the next 3 decades.

Grid investments will represent 1/3 of total investment in power sector in 2050

Investments in Grids: Analysts scenarios

Yearly average worldwide forecast in 2021-2050





Investments in 2021-2050 will be at least 3 times than the 2020 ones (~260bn\$³)

Source: BloombergNEF: New Energy Outlook 2021, DNV-GL: Energy Transition Outlook 2021, IEA NZE: Net-Zero Emission by 2050

1) DNV-GL: costs considers TOTEX approach (CAPEX+OPEX 2) BNEF: investment range include min/max of the estimations of the 3 BNEF scenarios (Grey/Green/Red scenarios) 3) IEA: World Energy Investment 2021

Energy transition and decarbonization

South America





Main Policies

Mision de Transformación Energetica/Colombia Plan de Acción Indicativo/Energy Policies on RES – *Colombia*

National Transit Law for EVs in the regulatory framework/Renovar for RES deployment – *Argentina*

2050 Energy Strategy /Energy Route/Energy Efficiency – Chile

2050 Energy National Plan (PNE 2050) for DER/ Rota 2030 for EV - Brazil

Ministerial Resolution No. 250-2019 -DM, the draft of the Supreme Decree (DS)/The Renewable Energy Portfolio Standard - *Peru*

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Global Infrastructure and Networks Sustainable vision



Grid Futurability

An holistic approach to new DSO role



A systematic and customer-centric approach for the evolution of the Grids to enable the Energy Transition, based on a common framework that defines I&N GLOBAL technology roadmap and investment pipeline



DSO leader for Reliability, Quality, Efficiency and Sustainability of the service for the Community, through Resilient, Digital and Flexible Grids



LEVERAGES

Customer-oriented approach, leveraging on Innovation, Digitalization, integration of new technologies and sustainability

Sustainability as lever for increasing competitive advantage in I&N





New business opportunities /services





Quality of service and Customer centricity





Attract long term investors and project financing



Enel Target: 70% SUS bond @2030

BLACKROCK

Climate Impact

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Climate change

Gr Extreme weather events are increasingly affecting power network all over the world

Relevant natural loss events worldwide 1980 – 2018



Progressive intensification of climate change and related force majeure phenomena 13



A new approach: Innovative Resilience

Innovation and Digitalization 20

Enel Vision on Smart Grids

OPEN METE

C-distribuzio

10 10

Work Force Management

Augmented reality



Edge computing

- Edge Intelligence
- Cloud Computing
- Cyber security

TLC

- Ultra-broad Band
- Fiber Network
- 5G MVNO

Data

- Artificial Intelligence
- Machine Learning
- Big Data

Active Demand and Flexibility

- DSO Services
- Smart-Info
- Load balancing

- Electric Mobility
 Fast-Charge
- Load Shaping
- Distributed Storage
- · Vehicle-to-Grid

"Towards a new ecosystem enabled by smart technology"

Renewables Integration

- Dispatching
- MV/LV Network Automation
- · Real-time self-healing
- Forecast
- Storage

Secondary Substation as Data Hub

- Sensor network
- · Urban, environmental, energy data

Digital and technological solutions DSO sustainable transformation



Technological solutions to accelerate energy transition

Planning process and on-site works digitalization



Grid digitalization and flexibility to face future challenge





Smart meter Metering Mgmt systems Remote control

Workforce Management AR-VR* solutions 3D modelling and LIDAR

D modelling and LIDAR

Quantum Edge Device Fiber optic and 5G connectivity Advanced automation

Advanced automation

* Augmented and Virtual reality

Storyline of Enel's Smart Meter





As of 31/12/2020
 Installations from 2017 to end of 2020

Circular and Sustainable





Smart Metering: Benefits for all



ELECTRIC SYSTEM AND MARKET

through the coordination with other market players (TSO, aggregators, prosumers, ...) and the support to implementation of free-market and retail competition.

OPERATIONAL EFFICIENCY

by means of remoting and automation of the activities (cut, reconnection, reading,...) and optimizing commercial operation as well as the grid visibility even at LV level

ENERGY LOSSES

thanks to real-time balance at LV substations and simplifying inspection and fraud detection activities

CUSTOMER ENGAGEMENT

(faster supply restoration, integration of new technologies and smart-home apps, increase in consumption awareness, dynamic tariff,...)

SUSTAINABLE ASPECTS

CO₂ emission reductions and Circular design. Energy Efficiency

Smart Metering: Customer Engagement



Customer can become more aware about their consumption patterns and realize that a change in these patterns could be possible and beneficial (lower bills/demand side programs) for them contributing to the decarbonization too.

REAL-TIME RECONNECTION

FASTER OUTAGES DETECTION AND SERVICE RESTORATION

INVOICES BASED ON REAL CONSUMPTION

CONSUMPTION OPTIMIZATION AND AWARENESS INCREASE

SMART-HOME APPLICATIONS, DOMOTICS TECHNOLOGIES AS WELL AS E-MOBILITY, DG AND STORAGE INTEGRATION

Regulatory Framework for SM Deployment

Boosting measures for smart metering (not exhaustive):

Measures to promote the Smart Meters deployment should be adapted and calibrated upon specific Country Regulation, in light of existing or envisaged regulatory schemes and tariff models, favouring remuneration schemes that optimize expenditures leveraging also on output-based mechanisms and finally considering tariff affordability for customers.

Some examples of measures are summarized below:

CERTIFICATION PROCEDURES BASED ON INTERNATIONAL STANDARDS

REGULATORY INCENTIVES

TAX REDUCTION FOR SMART METER INVESTMENTS

TREATMENT OF EXISTING METER ASSETS INFRA-CYCLE REGULATORY RECOGNITION OF INVESTMENTS

GRANT FULL REGULATORY RECOGNITION OF SMART METERING

New DSO role

New funcionalities

From a DSO that **plans, manages and controls** the network, according to a "fit-and-forget approach...

...to a DSO that manages network, leveraging on automation and digital transformation, enhancing RES hosting capacity, supporting electric mobility and integrating flexible solutions

Electricity Demand RES Integration New Actors

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EVOLUCIONAMOS PARA HACER EL FUTURO AHORA

25. 29. OCTUBRE

Gracias

