

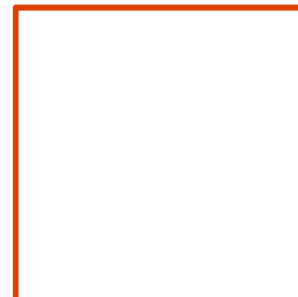
Business Development
Global Infrastructure & Network

From Smart Grids toward Smart Cities

Enel Technologies Connect the World

Valentina Pasotti

Macro Area Nord Ovest – Qualità Processi
Mestre, 11th November 2015



Enel Global Infrastructure & Networks

Key Figures – Electricity Transmission & Distribution

61 Mln of Clients

395 TWh distributed

1,9 Mln km of lines

44 Mln Smart Meters



COLOMBIA
(Codensa)

- 2,8 M clients
- 2° **distribution** operator (22%)
- 1.200 km of HV lines



BRAZIL
(Coelce, Ampla)

- 6,3 M clients
- 3° **distribution** operator (7%)
- Smart City Buzios
- 8.700 km of HV lines

Interconnection with Argentina:

- 2 lines of 500 km
- 2 converters 60-50 Hz



ROMANIA

- 2,7 M clients
- 2° **distribution** operator (36%)
- 6.600 km of HV lines



PERU
(Edelnor)

- 1,2 M clients
- 2° **distribution** operator (31%)
- 500 km of HV lines



CHILE
(Chilectra)

- 1,7 M clients
- 1° **distribution** operator (33%)
- Smart City Santiago
- 400 km of HV lines



ARGENTINA
(Edesur)

- 2,4 M clients
- 2° **distribution** operator (17%)
- 1.100 km of HV lines



SPAGNA

- 13 M clients
- 1° **distribution** operator (42%)
- 19.600 km of HV lines



ITALIA

- 31,7 M clients
- 1° **distribution** operator (85%)

One of the largest network operators worldwide



Enel Smart Grid Experience

Operational Excellence: Italian Case



Network Automation & RES integration

- **4.200 HV/MV** substations remotely controlled (**100%**)
- **~125.000 MV/LV** substations remotely controlled (**25%**)
- **550.000 Renewables (RES)** connected



Advanced Metering Infrastructure

- **31 mln** smart meters in operation
- Remote commercial operation and network management



Asset Management

- Optimization of network investments **based on risk-analysis**

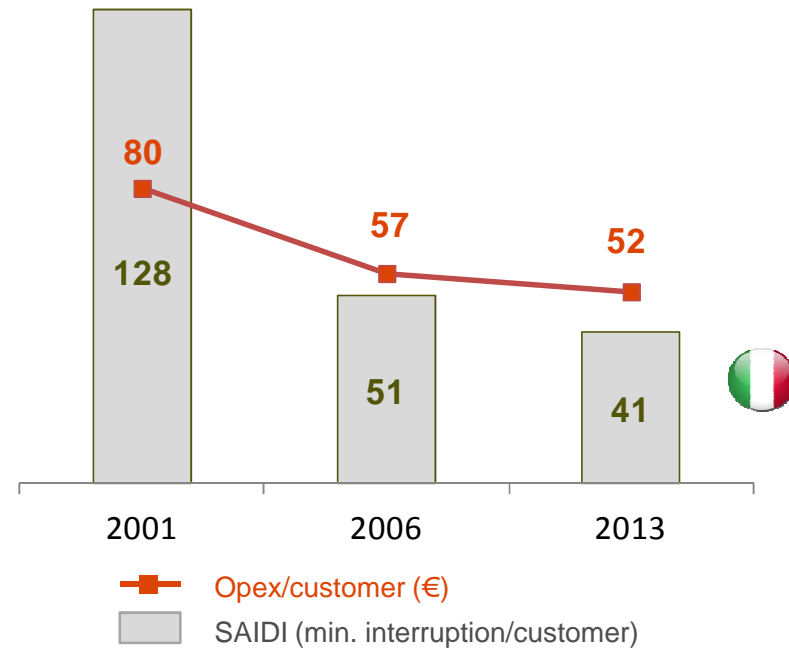


Work Force Management

- **6.400** Enel teams connected via GPRS + GPS localization
- **Dynamic work scheduling** (Up to 20.000 tasks per day)



Continuous Improvement



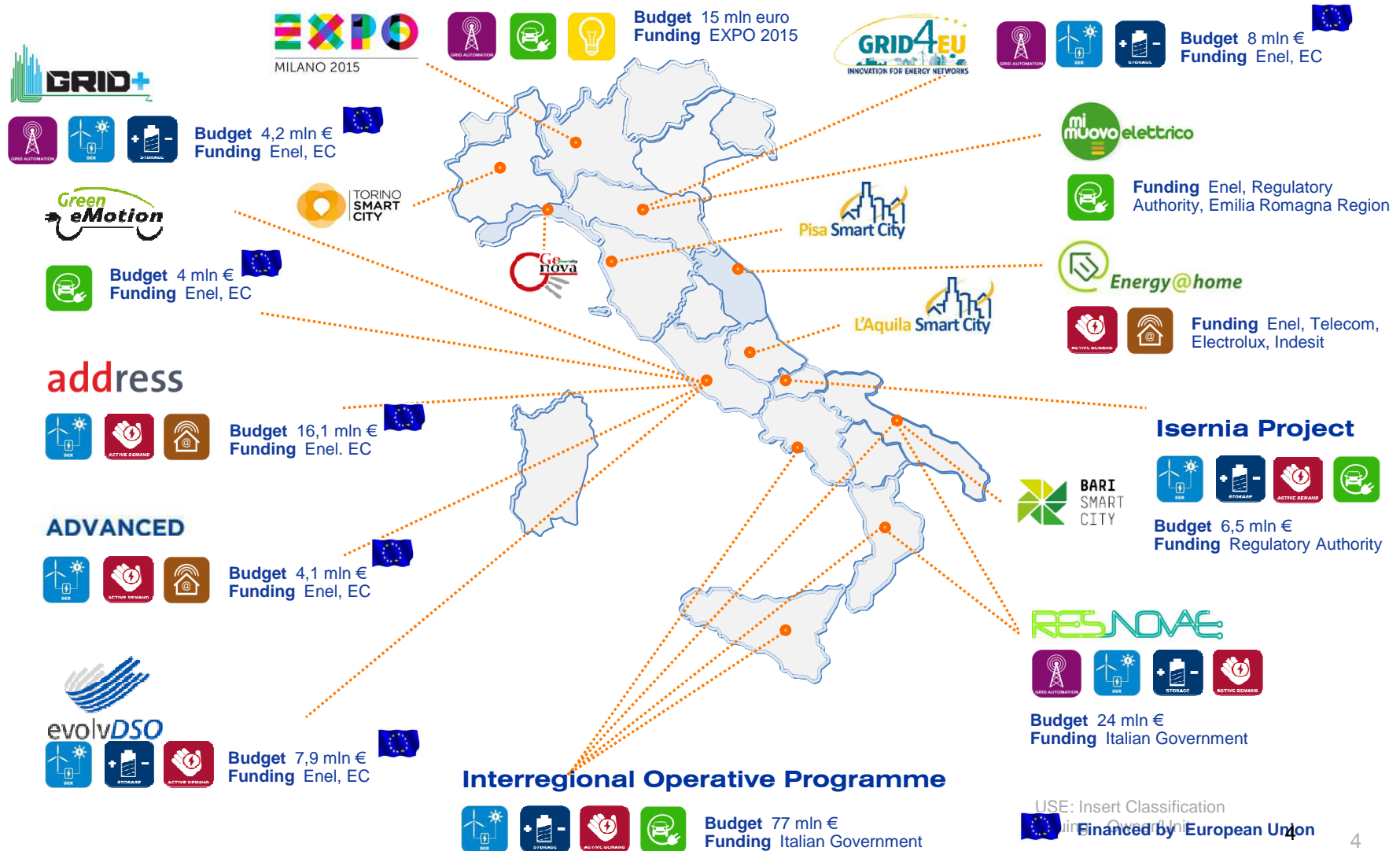
Opex reduction: - 35%

Quality of service: + 68%



Enel Smart Grids Experience

Ongoing projects: Italy





Enel toward Smart Cities

Enel Technologies Connect the World



LED Lighting

up to 70% energy savings

E-mobility

Charging Infrastructure
-50% primary energy
Pollution reduction

Smart Metering

Opex savings for DSO
Increased quality & options for customers

Renewables

RES integration
RES forecast
Dispatching

Smart Grids

Remote network control
Network automation
Work Force Management
CO₂ emission reduction

Storage

Voltage regulation
Load profiling

Advanced Services

R&D experience
(Control Centre, Multi-metering, Smart traffic, Smart security etc.)

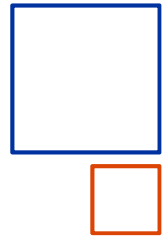
Energy Efficiency

ESCO within Enel Group
Enhanced awareness on energy use

Energy Management

Active energy management
Consumption or generation data available on various interfaces
Savings up to 20% for users





Enel Smart Mobility

EV Recharging Infrastructures



Over **2400** recharging stations installed

Cutting-edge technology
for **slow, quick and fast** recharge

E-mobility projects in **Roma, Vatican City, Pisa, Bari, Bologna, Genova, Barcelona, Málaga**

Electric Car Sharing projects in progress



Home Station



Pole Station



Fast Recharge





Enel Smart Lighting

LED Street and Urban Furniture



Over 3,5 millions of managed spotlights

Over 180.000 LED luminaires
in Italy and Spain

Energy consumption reduced **up to 70%**

Over 1200 urban
and artistic lighting projects

Archilede



Enel Global Infrastructure & Networks

Key Figures – Public Lighting



Over **3,5** Mln of managed spotlights

Over **180.000** LED lamps installed



COLOMBIA

- 35 municipalities
- **City of Bogotá**
- 395.000 spotlights



BRAZIL

- 173 municipalities
- 409.000 spotlights



SPAGNA

- 18 municipalities
- 91.000 spotlights



PERU

- 33 municipalities
- **City of Lima**
- 347.000 spotlights



CHILE

- 22 municipalities
- **City of Santiago de Chile**
- 226.000 spotlights



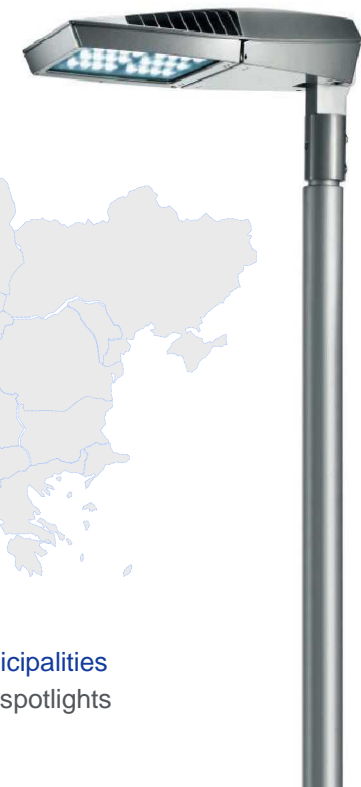
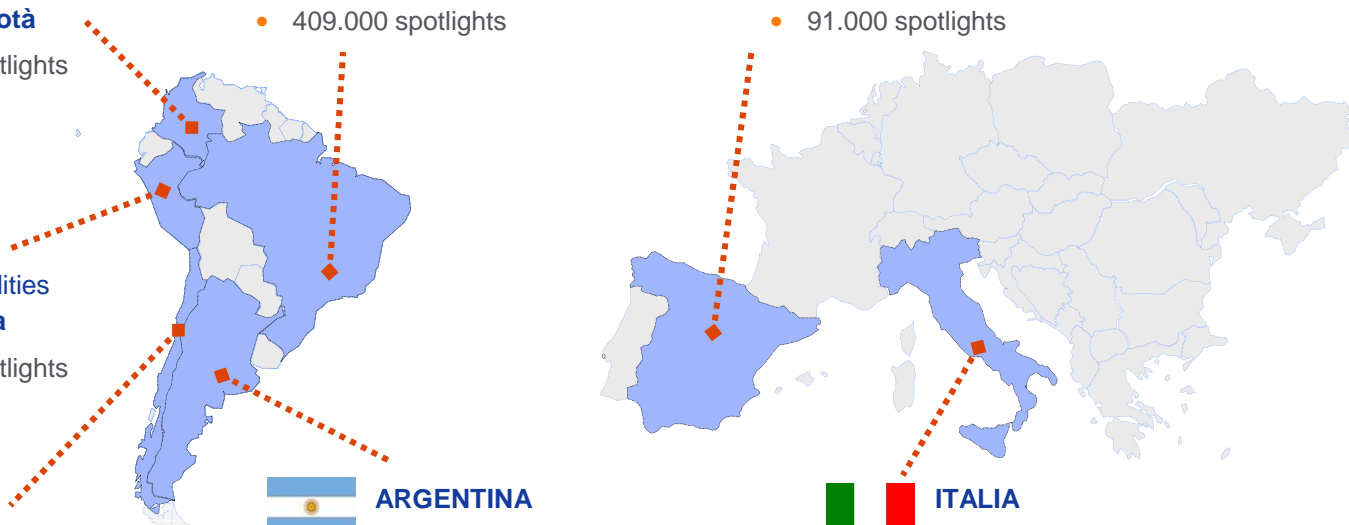
ARGENTINA

- **City of Buenos Aires**
- 10.000 spotlights



ITALIA

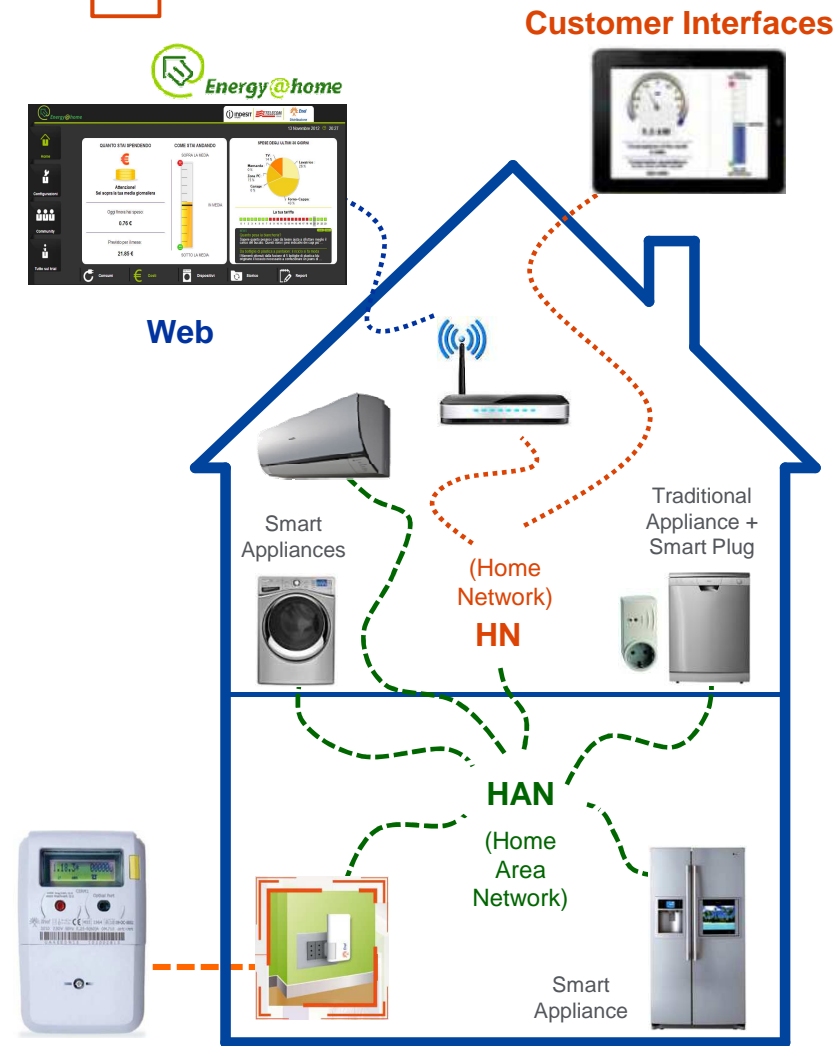
- 4.000 municipalities
- 2.100.000 spotlights



The first public lighting operator in the world

Enel Energy Management

Customer engagement & Home automation



Enel Smart Info

- Plugged into house electricity sockets
- Univocally associated to customer's meter
- Makes consumption or generation data available on various interfaces
- 2 USB ports for wired connection or wireless communication dongles
- **46.000 devices in ongoing projects**



Small pilot of an integrated platform:

- to allow cooperation between home appliances and devices involved in energy management
- to enable new, ICT-based services



Expo 2015

Enel Smart Energy and Lighting Partner



MILANO 2015

Official Global Partner

Strategic partner of the Universal Exposition for Smart Grids technologies



Smart City



Services for expositors

