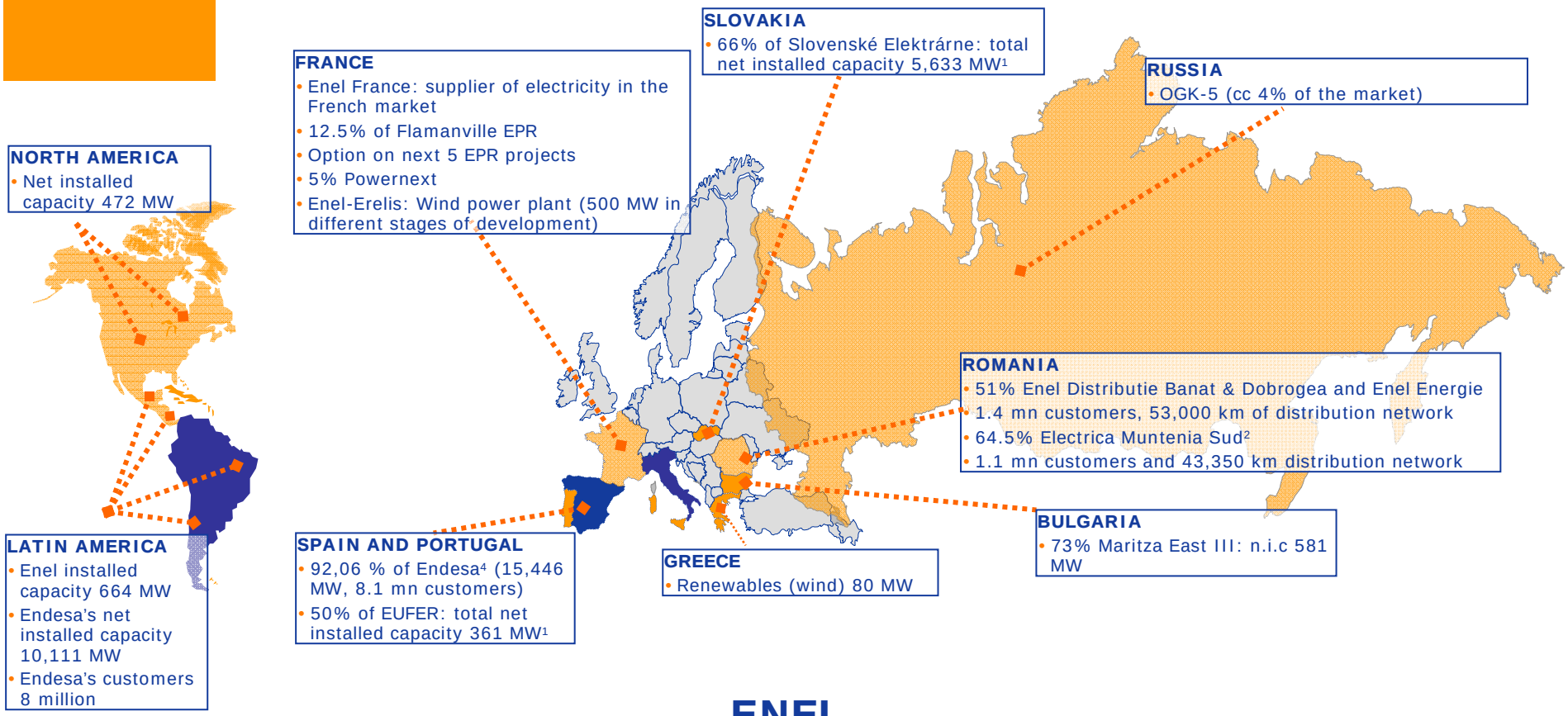
The Nuclear and the Situation of the Electricity Industry in Italy

International gas and Electricity Summit
October 22nd 2009

Enel, an international Group



NORTH AMERICA
- Net installed capacity 472 MW

LATIN AMERICA
- Enel installed capacity 664 MW
- Endesa's net installed capacity 10,111 MW
- Endesa's customers 8 million

FRANCE
- Enel France: supplier of electricity in the French market
- 12.5% of Flamanville EPR
- Option on next 5 EPR projects
- 5% Powernext
- Enel-Erelis: Wind power plant (500 MW in different stages of development)

SLOVAKIA
- 66% of Slovenské Elektrárne: total net installed capacity 5,633 MW[1]

RUSSIA
- OGK-5 (cc 4% of the market)

ROMANIA
- 51% Enel Distributie Banat & Dobrogea and Enel Energie
- 1.4 mn customers, 53,000 km of distribution network
- 64.5% Electrica Muntenia Sud[2]
- 1.1 mn customers and 43,350 km distribution network

BULGARIA
- 73% Maritza East III: n.i.c 581 MW

SPAIN AND PORTUGAL
- 92,06 % of Endesa[4] (15,446 MW, 8.1 mn customers)
- 50% of EUFER: total net installed capacity 361 MW[1]

GREECE
- Renewables (wind) 80 MW

ENEL

- **n° 1 on the power market in Italy, Spain and Latin America**
- **one of the world leaders in renewables**
- **pro-active on the Italian mid/downstream gas market**

1 Consolidated capacity
2 Values not consolidated
3 An additional 25% stake is owned by Enel's partner Acciona
4 100% consolidation percentual - Tender offer results 55.78%

Source: Enel, based on 2007 proforma data, with Endesa consolidated at 67.05% and OGK-5 at 100%. Data net of asset transfer to E.On

Italian Nuclear History before the moratorium

Caorso

- **BWR 860 MW** disigned and realized by **Enel - Ansaldo Nucleare - GETSCO**.
- Buildings : **1970-1978**
- Operation: **1981 – 1986**
- Total energy produced: **29 billions kWh**

Garigliano

- **BWR 160 MW** designed by **Senn**
- Buildings: **1959-1963**
- Connection to the grid **01/01/1964**
- Operation: **1964 - 1978**
- Total energy produced:**12,5 billions kWh**

Latina

- **GCR-Magnox 210 MW**
- Buildings: **1958-1962**
- Operation: **1964 - 1986**
- Total energy produced: **26 billions kWh**

Trino

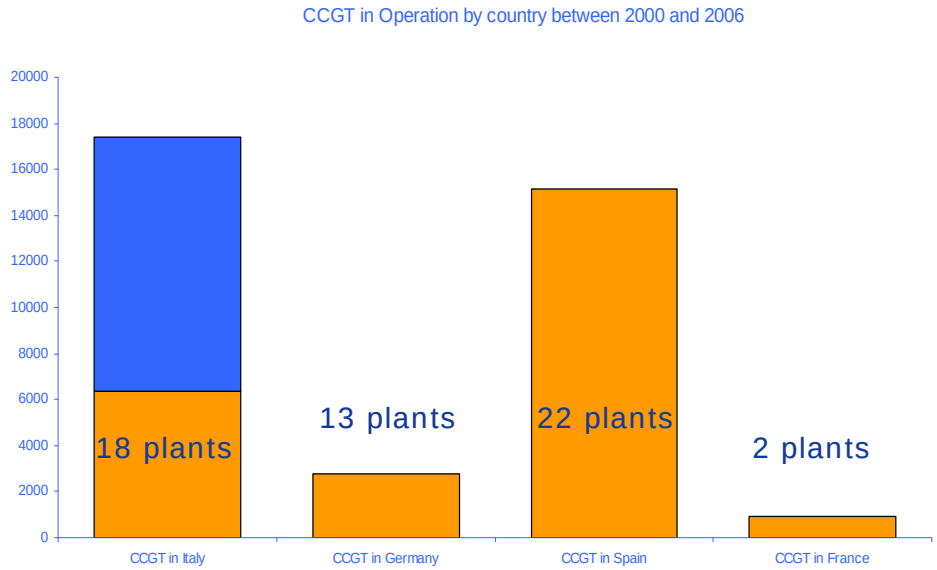
- **PWR 270 MW**
- Buildings: **1961-1964**
- Operation: **1965 - 1987**
- Total energy produced: **26 billions kWh**

Montalto di Castro

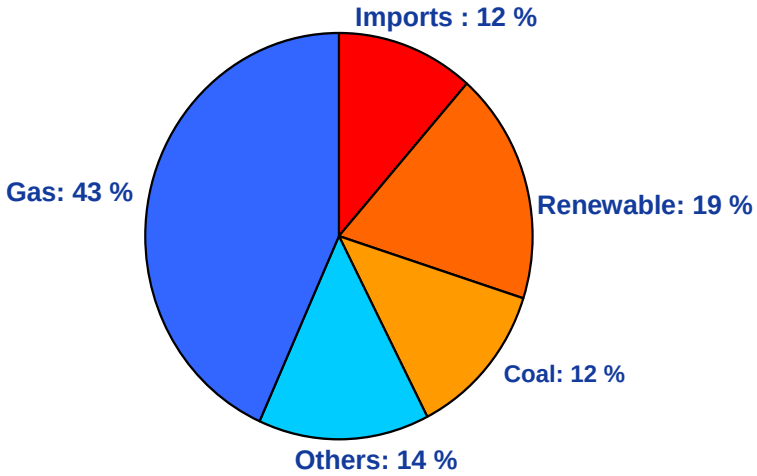
- **2 BWR units**, **980 MW**,each designed by **Enel**
- Buildings begun in **1981** and interrupted in **1988**
- In **1991**, starts of works for the conversion to conventional power plant.

After moratorium, Italia had to invest in new thermoelectrical fleet

Italian CCGT investment vs Germany, Spain & France



source : *power plants around the world*



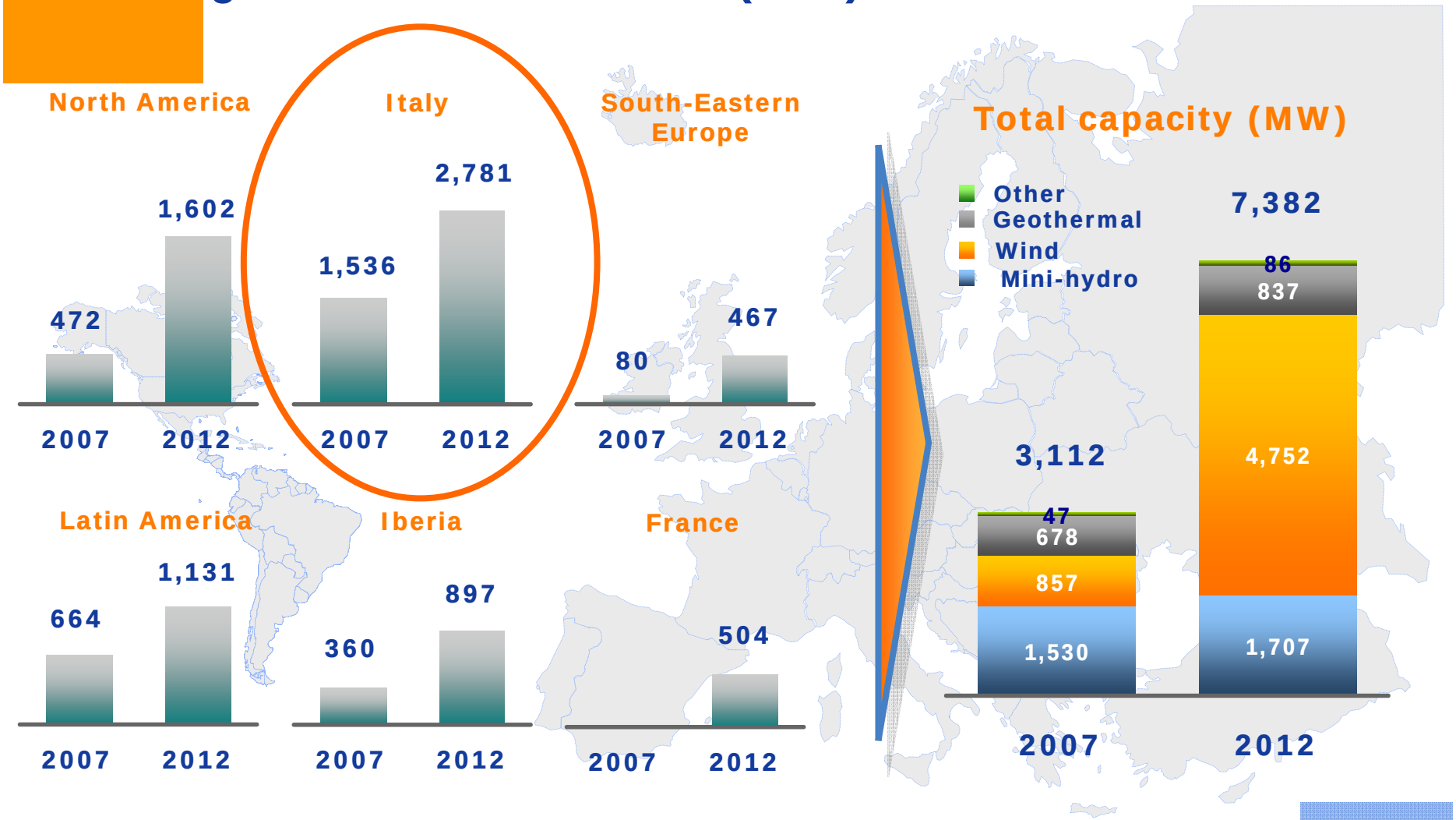
(*) Source Enel

TOTAL: 347,1 TWh

Enel is also one of the leaders in clean coal technology

Paris – October 22nd , 2009

Enel growth in renewables (MW)

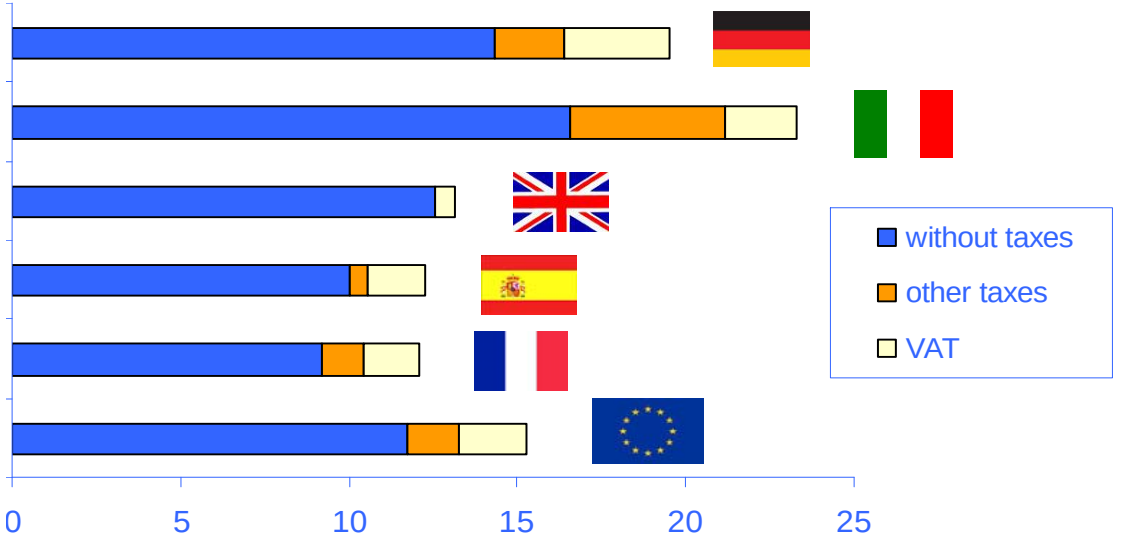


Strong investment plan of 6.8€bn in total

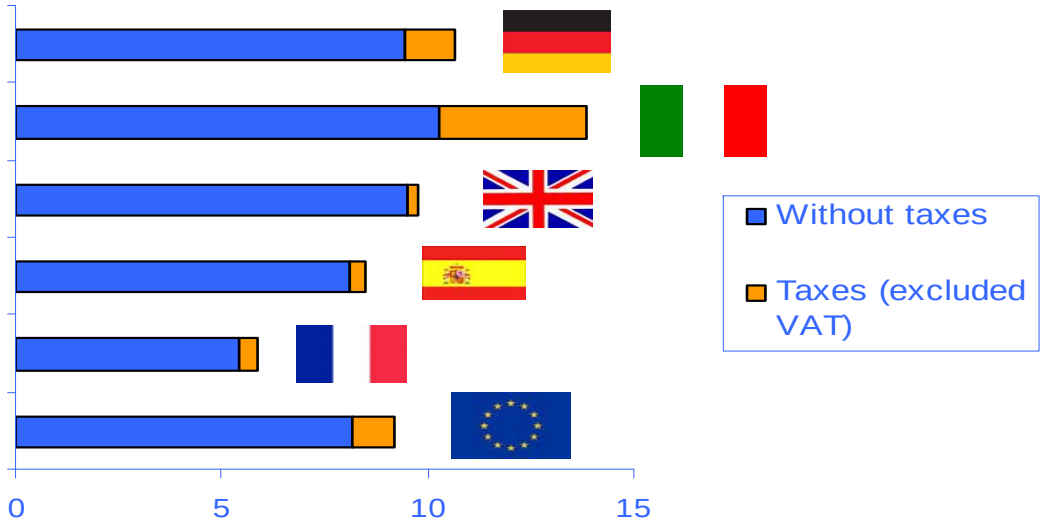
Breakdown of power prices according to users and countries

Sources : Panorama of energy-Eurostat, in € / 100 kWh

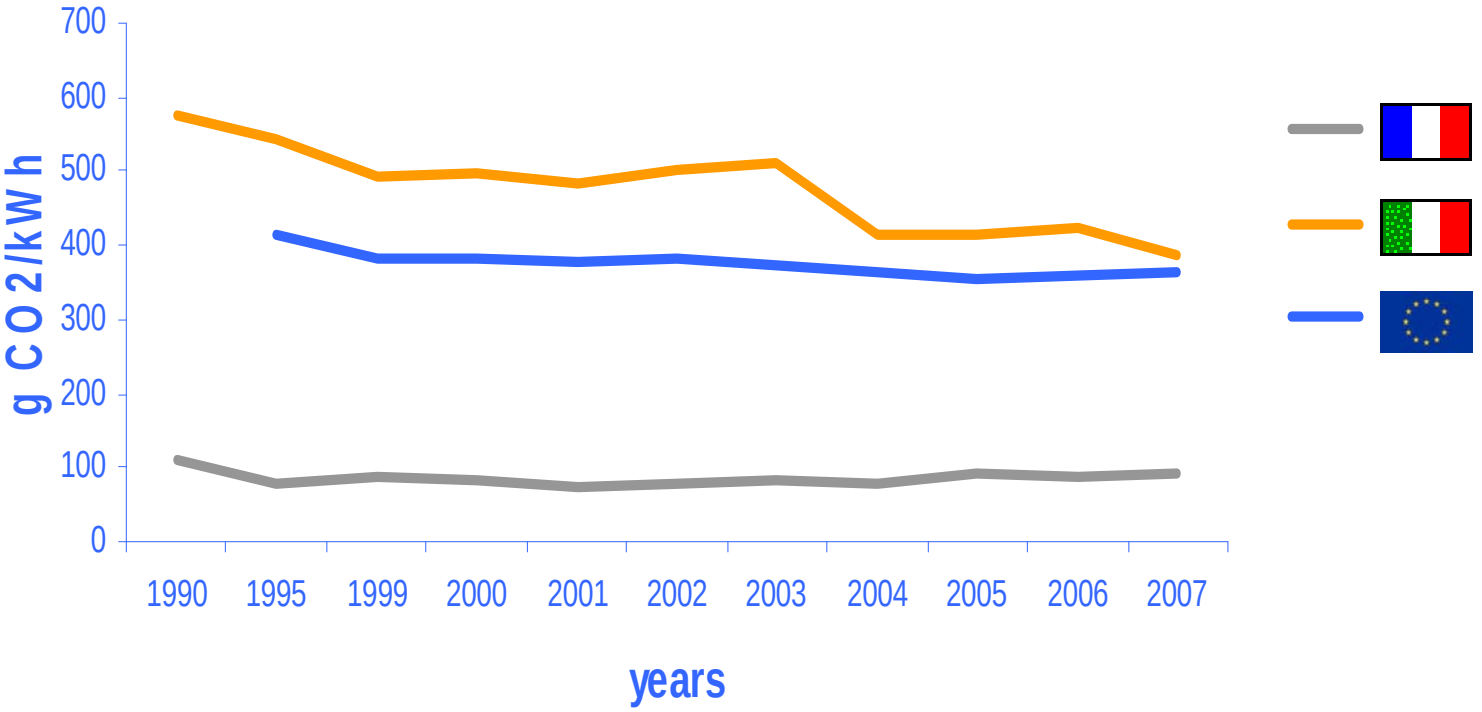
Breakdown of electricity prices for **household consumers** on 1 January 2007



Breakdown of electricity prices for **industrial end-users** on 1 January 2007



CO2 emissions / kWh from electricity and heat generation

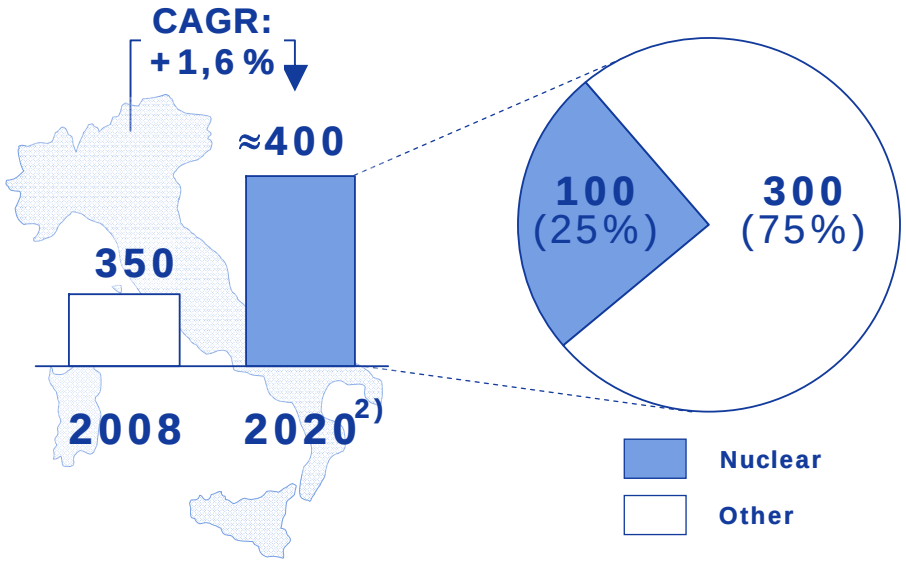


Sources : IEA STATISTICS - 2009 highlights

The Italian Nuclear Program

Basic assumption for the Program definition

National Consumption [TWh/y] → **Target nuclear portfolio** [TWh/y; (%)] → **Required Capacity** [MW_e]



≈ 13.000 MW_e

8 units of 1.600 MWe 1) each or 12 units of 1.100 MWe each, located in 3 o 4 sites

- Final target by 2020
- With a load factor of about 90%
- AREVA EPR technology: 8 units of 1.600 MWe; Westinghouse AP1000 technology: 12 units of 1.100 MWe

Enel growth in the Nuclear sector

Italy

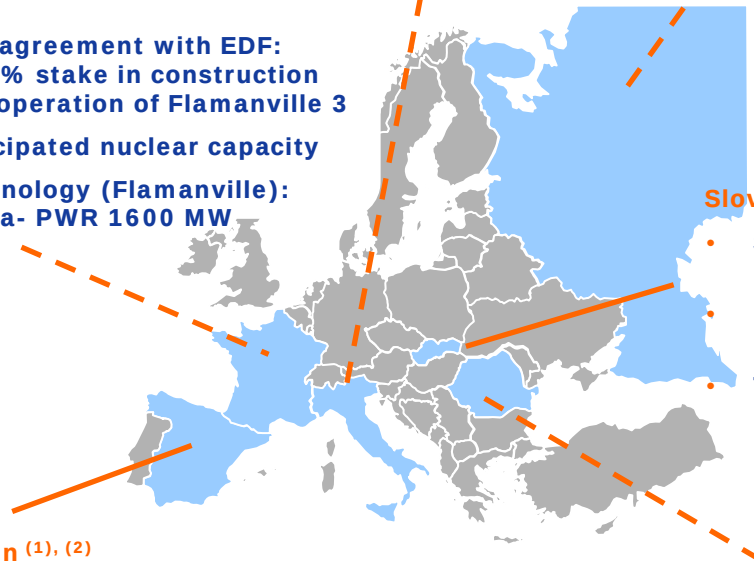
- New legislation to restart nuclear under discussion

Russia

- Agreement with Rosatom for the co-development of new NPP
- Russian VVER-1000 MW Technology

France

- EPR agreement with EDF: 12.5% stake in construction and operation of Flamanville 3
- Anticipated nuclear capacity
- Technology (Flamanville): Areva- PWR 1600 MW



Slovakia (2)

- Slovenske Elektrarne's nuclear power plants: 2050 MW
- Development of Mochovce 3&4 Units (2x440 MW)
- Technology: Russian-PWR 440 MW

Spain (1), (2)

- Endesa's nuclear power plants: 2441 MW
- Technology: Westinghouse-PWR 1000 MW

Romania

- Participation in the Cernavoda project: 2x750 MW units CANDU Technology

4,500 MW

Know-how improvement and pipeline of new capacity

Presence in leading technologies for nuclear generation

1. Endesa consolidated proportionally (67.05%)
2. 2007 figures

The collaboration Enel / EDF

Key elements of the february 24th 2009 agreement

Theme		Description
Programme		• **Realization of a 4 nuclear power plants series in Italy**
Technology choice		• **The EPR technology**, Flamanville's model, is considered as the reference technology.
Participation structure	**Project development phase**	• **Creation of an equal shares Joint Venture** (50/50) **to develop the Project**
	Property and operation of the installation	» **Majority share of Enel in the installations property** » **Enel Leadership for installations operation** » **Opening to the property to third parties, knowing of the maintain of the majority by Enel and EDF.**