THE ITALIAN ELECTRICITY MARKET

The Regulatory Authority for Electricity and Gas

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Summary

- From monopoly to liberalization
- Legislative framework
- The Italian Regulatory Authority for electricity and gas (AEEG)
- Key figures of the electricity market
- The Italian Power Exchange
- Electricity system operators
The electricity market before liberalization (1962 – 1999)

- Since the end of 1962 the whole electricity market was under the monopoly of a single vertically integrated and state-owned company: Enel.

- The transmission and distribution networks were controlled by Enel, with the exception of few cities where there were local municipal electricity undertakings.
The liberalization process brought about the replacement of old administrative procedures with market mechanisms more suited to the new framework for power trade.

Trade-off between necessity of a coordination of physical flows and development of decentralized commercial transactions among many operators.

According to Italian Legislation, implementing the European Electricity Directive 96/92/EC (common rules for the internal electricity market), operators can trade electricity through two different types of contracts:

- By means of bids/offers within the power exchange
- By means of bilateral contracts (OTC)
The liberalization process

- **July 1992**: Enel becomes a limited company
- **November 1995**: An independent energy regulator is established (AEEG)
- **1999**: Legislative decree n. 79 March 1999
  - Enel privatization starts (stock – exchange listing)
- **1999-2007**: Supply liberalization
  - Demand liberalization
The Liberalization: Legislative framework

European Union:

- Directive 96/92/CE (common rules for the internal electricity market)
- Directive 2003/54/CE which replaces the former

Italy:

- 1995: The law n. 481 sets up Regulatory Authorities for the public sector, among which the Authority for electricity and gas
- Legislative Decree n. 79 (Bersani decree) which transposes the EU Directive 96/92 to Italy
- The law n. 239/04
- The law n. 125/07 which partly transposes the EU Directive 2003/54 to Italy
Authority for electricity and gas (AEEG)

Legislative references:
Law n. 481/1995

Features of mandate:
- Independence
- Autonomy

Activities:
- Promotes the development of competition in the power market
- Guarantees adequate standards of quality and efficiency of service
- Determines tariffs (for natural monopolies i.e. Transmission, Distribution)
- Promotes consumer’s protection
- Regulates the access to electricity and gas national grids
- Monitors compliance with legislation
- Adopts resolutions
The new structure of electricity system implemented by the Bersani decree

- **Activities subject to licence:**
  - Distribution

- **Activities in natural monopoly**
  - Transmission
  - Dispatching

- **Transmission System Operator (TERNA)**
  - Electricity Market Operator (GME), that organizes the Market for dispatching services

- **Liberalized activities:**
  - Generation
  - Import
  - Export
  - Supply
  - (Metering)

  - The new Energy law proposal changes the law n.481 enlarging Authority tasks
  - The function of customer protection and of promoting competition in the market are extended to all liberalized activities
The Bersani decree: demand liberalization

Two parallel markets:
- Eligible consumers → they can choose their supplier
- Non-eligible consumers → captive market

Demand liberalization has been introduced gradually:
- 1999: 30 GWh/year
- 2000: 20 GWh/year
- 2002: 9 GWh/year
- 2003: 100 MWh/year
- 2004-2007: All non residential costumers are eligible
- **1 July 2007: All consumers are eligible**
The Bersani decree: supply liberalization

- **Asymmetric regulation of incumbent**
  The Bersani decree stated that:
  - ENEL had to retain a maximum market share of 50% after 2003
  - ENEL had to sell 15,000 MW of capacity by that time
  - As a consequence, three generation companies (or Gencos) were established and sold on the market (the sales of Elettrogen, Eurogen and Interpower were completed by the end of 2003)

  **Objective:** to introduce competition in generation

- **Vertical separation of the activities in the supply chain**

  **Objective:** to guarantee efficient and non discriminatory access to transmission and distribution networks; to avoid anti-competitive behaviours and dominant position abuses by operators in downstream market
Operators/ institutions in the electricity market

- Terna: Transmission System Operator
- GSE: Electricity Services Operator
- GME: Market Operator
- Single Buyer
- AEEG: Italian electricity and natural gas sectors regulator
- AGCM: Italian antitrust authority
Terna was created in 1999 as a separate company (100% owned by Enel S.p.A, Italy’s incumbent) to own, develop and maintain more than 90% of the National Electricity Transmission Network. Meanwhile management of the grid was entrusted to a public operator controlled by the Ministry of Finance and called GRTN - (Independent System Operator model).

Following legislation envisaged that:

- Ownership and management of the network should be rebundled
- Any company (generation, import, distribution) doesn’t own more than 5% of the TERNA stockholders’ equity
- Enel reduces its equity interest in TERNA (now around 5%)
ACTIVITIES (FORMERLY THEY WERE CARRIED OUT BY GRTN):

- Transmission service
- Dispatching service
- Balancing service
- Congestions management
- Reserve service
- Upgrading transmission network
ELECTRICITY SERVICES OPERATOR (GSE)

State-controlled company (fully owned by Ministry of Finance), stemming from former GRTN after transferring dispatching, transmission and upgrading network activities to Terna. It is responsible for promoting and developing renewables resources.

Activities:
- Owns GME (Electricity Market Operator) and AU (Single Buyer)
- Buys electricity generated by renewable and assimilated sources and sells it in the market
- Issues Green Certificates and monitors producers’ and importers’ compliance with renewables obligation
- Certifies plants using renewables sources
- Issues the Guarantee of Origin (GO) of electricity generated by renewables
- Manages the scheme that incentivates electricity generation by photovoltaic plants
- Certifies co-generation plants
MO – MARKET OPERATOR (GME)

This company was set up by GRTN (now Terna) in June 2000 and it became operative on 1 April 2004 (start-up of organised wholesale electricity market). Now it’s fully owned by GSE (Electric Services Operator).

Activities:

- Organizes and manages electricity power exchange under criteria of neutrality, transparency and objectivity, with a view to promoting competition between producers and ensuring an adequate availability of reserve capacity.

- It is responsible for the organization and management of transactions within Green Markets:
  - Green Certificates (since March 2003)
  - Energy Efficiency Certificates - White Certificates (since March 2006)
  - Greenhouse Emission Units (since April 2007)
SINGLE BUYER - AU

Activities:
- Through July 1, 2007 it has had the task of procuring electricity for captive customers under criteria of continuity, security and efficiency of supply
- Since July 1, 2007 it has the task of procuring electricity for vulnerable consumers (households and small businesses)
- Purchases electricity in the market on the best possible terms and resells it to distributors

Ways of supplying:
- Concludes contracts, including multi-year contracts, for an amount of energy not exceeding one fourth of the overall demand of the vulnerable clients market
- Participates in procedures for the allocation of transmission import capacity and incentivated energy
- Enters into the multi year electricity import contracts for vulnerable clients
- Procures electricity in the power exchange
ITALY’ REGULATOR - AEEG

Activities referring to the wholesale electricity market:

- Regulation of transmission and dispatching services
- Guidelines to TSO – TERNA to adopt a Grid Code
- Definition of transmission and dispatching activities as a consequence of rebundling of network ownership and management
- Definition of merit order criteria for renewables and CHP plants
- Regulation of import conditions
- Promoting and monitoring competition in wholesale markets

In particular: together with the **AGCM, the antitrust authority**, monitors the functioning of the electricity market to detect possible anti-competitive behaviours of operators
COORDINATION AMONG MAJOR INSTITUTIONS

MO – GME
• Market Operating Discipline
  
REGULATOR – AEEG
• Grid code guidelines
• Transmission and dispatching regulation
• Merit order criteria for renewables and CHP plants
  
MINISTRY FOR INDUSTRY
• Approves
  
TSO – Terna
• Grid code
• Scheme for dispatching rules
• Guarantees merit order
  
PRIMARY LEGISLATION

COORDINATION AMONG MAJOR INSTITUTIONS

• Formulates observations
• Verifies
• Directives
The structure of the electricity market

NATIONAL AND FOREIGN GENERATORS

Bilateral Contracts
Energy

GME

Power Exchange
Energy
MGP - MA
Resources for dispatching
MSD

TERNA

TRADERS

Contracts of supply

SINGLE BUYER – AU
(Sellers / Distributors)

ELIGIBLE CONSUMERS

PROTECTED CUSTOMERS
(LV)
In the last ten years demand increased in average by 2.5%.

In 2007 demand was 339.9 TWh, of which 293.6 TWh covered by internal production and 46.3 TWh by import (15.7%).
Development of peak load (MW)

Source: Terna

Maximum summer peak: 55.619 MW 2006 (1st peak during summer)

Maximum winter peak: 56.810 MW 2007
The major players in the market

Market shares in national gross production in 2007

Source: AEEG
The composition of national production

NATIONAL NET PRODUCTION BY SOURCE IN 2007

- More than 80% of total generation is from thermal power plants
- Natural gas has a central role in energy production, covering more than 50% of total production

Source: TERNA
Power Import in 2007

- In 2007 total net import (48.9 TWh)
- Great part of net import is from France and Switzerland (90%)
New interconnectors may be realised by:

- **In general:** by the transmission system operator (TSO):
  - Project approval by the relevant Ministry in the framework of the annual grid development plan
  - Capital investment considered by the Regulator designing the transmission tariff (possible incentive rate of return applied)
  - The new line is subject to third party access (TPA) regulation (market measures to allocate the capacity)

- **As an exception:** by a private investor not operating transmission or distribution grids that may build the interconnector being granted an exemption from TPA for a determined period – Reg. UE 1228/2003, DM 21/10/2005
New interconnectors by private investors: merchant lines

- Exemption granted by the Ministry for economic development, with the consultation of the Authority and the TSO. For interconnectors connecting Member States the Commission agreement is mandatory.

- Exemption grantable to direct current DC (or equivalent technology) interconnectors; AC interconnectors may be granted the exemption only in case of exceptionally risky and costly investments.

- The period of granted exemption should be proportional to the level of risk of the investment.

- The owner of the interconnector may use the line its trading activity (import/export) or may apply a network tariff to third parties willing to have access to it.
Merchant lines project approved
(Decree 21/10/05 and EU Reg 1228/2003)

- Exemption granted to 2 merchant lines between Italy and Switzerland

1. **Interconnector: Tirano (IT) – Campocologno (CH)**
   - Investors: Edison, Raetia Energie, Comune di Tirano
   - AC line, 150 kV
   - Exemption granted: 150 MW for 10 years

2. **Interconnector: Mendrisio (CH) – Cagno (IT)**
   - Investors: Ferrovie Nord Milano, Azienda Elettrica Ticinese
   - AC line, 380 kV
   - Exemption granted: 150-200 MW for 13 years
Power plants and peak load covering

NET POWER CAPACITY IN ITALY IN 2007 (MW)

SHARE OF PEAK LOAD COVERING BY POWER CAPACITY (%)

- Total net capacity in 2007 was 93.598 MW, mostly thermal (74%) and hydro (22%)
- Import contributes substantially to the covering of peak load, especially during summer

Source: TERNA
Generation plants distribution in Italy

Source: TERNA
New thermal power plants 2008-2011 (MW)

Source: Terna
IPEX (Italian Power Exchange): market structure

**Mixed model:** Bilateral contracts and non mandatory bidding system, based on exchange of physical power contracts

**Two energy markets:**
Transactions take place the day ahead of the day in which electricity is physically produced and consumed

- **Day-ahead market (MGP)**
- **Adjustment market (MA)**

**A market for dispatching services (MSD):**
The System Operator procures resources to solve grid congestions, to purchase operational reserve and to balance the power system in real time
## IPEX: market structure

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3 Phases for IPEX

- **PHASE 1** (Ended on 30 March 2004)
  Technical trials with operators

- **PHASE 2** (1 April - 31 December 2004)
  Partial functioning: only supply side

- **PHASE 3**
  Complete functioning: demand and supply sides
  ✓ 1 July - 31 December 2004: technical trials
  ✓ Since 1 January 2005: actual starting

- **NEXT PHASE (IDEX):**
  ✓ Introduction of a financial derivatives market on electricity prices
IPEX: selling and purchase price in the day-ahead market

- **Selling price**: segmentation of the market in different zones
  It’s the price that remunerates operators that provide energy

- **Purchase price** (National unique price – PUN): calculated as weighted average of zonal prices on clients’ consumption
  It’s the price paid by demand side operators
In the Day-ahead Market and the Adjustment Market, prices are fixed using a ‘system marginal price’ approach, while the Market for dispatching services is based on a ‘pay-as-bid’ approach.
Both demand bids and supply offers (purchase and sale offers) may be submitted into the Day-ahead Market. Three types of offers/bids may be submitted:

- simple offer/bid, consisting of one quantity-unit price (MWh, €/MWh) pair;
- multiple offers/bids, consisting of a maximum of four quantity-unit price pairs;
- pre-defined offers/bids, i.e. simple or multiple offers that each Market Participant may submit on a one-time basis.
The Adjustment Market (MA)

- The Adjustment Market allows Market Participants to submit appropriate demand or supply offers in order to accommodate their own schedules in the Day-ahead Market.
- Up to now the market is open only supply side.
The Market for dispatching services

- This is the market where the TSO procures the resources for its dispatching service. The process of acceptance of offers/bids takes place in two stages:
  - immediately after the close of the sitting, i.e. when the accepted offers/bids are used to revise the injection and withdrawal schedules resulting from the Day-Ahead Market and the Adjustment Market, so as to relieve any residual congestion and to create the reserve margins needed to guarantee the security of the system;
  - throughout the day of delivery (i.e. in real time), when offers/bids are accepted in order to balance the system in real time.

- Both demand bids and supply offers are submitted into the market, but they can only be specified in the "simple offer" format.
- Operators are rewarded using a pay-as-bid approach
- The market is very concentrated: the first operator in 2006 sold 60% of total energy
IPEX: the zonal selling prices in the Day-ahead market

- In the North zone, during 2007, prices have been more than 4% lower than in other zones.
- In the same year prices have been higher in the islands, Sardinia (+5.0%) and Sicily (+11%).
- In the North the degree of competition is higher than in other zones especially in the off-peak hours.
- Sicily and Sardinia are particularly penalized by the presence of significant congestion limits.

The purchase price is calculated as a weighted average of zonal prices and is strongly influenced by dynamics at zonal level.
IPEX: the zonal selling prices in the Day-ahead market

Source: GME
IPEX: the purchase price in the Day-ahead market

Source: GME
IPEX, Powernext and EEX, price indexes 2006-2007
IPEX: supply-side in the Day-ahead market

- 70% Private operators
- 21% GSE
- 8% Import
- 1% Bids by TSO

Source: GME
IPEX: demand-side in the Day-ahead market in 2007

Source: GME
The IPEX: fact sheets in 2007

Day-ahead Market:
- Operators: 89 (71 supply side, 74 demand side)
- Total demand: 330 TWh (liquidity: 67.1%)

Adjustment Market:
- Operators: 32 (29 supply side, 32 demand side)
- Total demand: 13 TWh

Market for dispatching services:
- Operators: 19
- Total demand: 47 TWh
The registration of bilateral contracts and the forward market

- From 1 April 2007 it is active a new platform (Forward Electricity Account Trading Platform – PCE) for the registration of bilateral exchanges of electricity
- The new system only applies to transactions planned for the next two months
- This is not a forward market: it only allows to increase flexibility in the bilateral contracts’ registration procedure
- IDEX (derivatives financial market) will be introduced in 2009
- In 2009 a real forward market will be also introduced (MTE) (testing phase ongoing at present) that should allow:
  - a better risk management activity in energy trading
  - an energy trading activity for future delivery based on market prices (now prices for future delivery are determined only by trading via bilateral contracts)
  - exchange security allowed by proper guarantee form