The TIMES model for the Italian Electricity Sector has been developed by the ETSAP team at the Energy Department of Politecnico di Torino in the framework of a national Research Programme, promoted by CESI with the aim of analysing the behaviour of the electricity sector (production, transport & distribution and demand) under different scenario options.

The model is multi regional (20 regions) and multi grid (4 technologies).

The Italian Association of Energy Economists (AIEE) is cooperating to the Research Programme for the production of mid- and long-term scenarios.
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The Italian Multi-Regional Electricity Sector

- Variable period length
- Two level TimeSlice

- 5 voltage levels
  - AAT produced & imported
  - AAT national grid
  - AT
  - MT
  - BT distribution

- 5 electricity commodities
  - ELCP
  - ECLAA
  - ECLA
  - ECLM
  - ELCB

- 4 GRID technologies
  - GRIDAAT
  - GRIDAT
  - GRIDMT
  - GRIDBT
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inter-regional trade

TRADE
GRID
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RES - electricity
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RES-el: the inter-regional trade
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Inter-regional trade

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### Supply/Demand description

#### Supply

Existing power plants:

333 units (spatially referenced) [see: VT_Ita_ELC_V6p0]

New capacity available:

54 types [see: Subres_B.NEWTECHS]

#### Demand

the demand for electrical services (49 items) has been organised in 5 sectors and differentiated for the 20 regions [see: VT_Ita_EUD_V6p0]

---

### The Italian Multi-Regional Electricity Sector

#### Supply/Demand description

<table>
<thead>
<tr>
<th>Region</th>
<th>Demand/MW</th>
<th>Supply/MW</th>
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<tbody>
<tr>
<td>Valle d'Aosta</td>
<td>-5481</td>
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<td>Piemonte</td>
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<tr>
<td>Liguria</td>
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<td>-6374</td>
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<td>Lombardia</td>
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<td>Trentino Alto Adige</td>
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<td>0</td>
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<td>Friuli Venezia Giulia</td>
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<td>1273</td>
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<tr>
<td>Emilia Romagna</td>
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<td>0</td>
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<tr>
<td>Sardegna</td>
<td>-122</td>
<td>0</td>
</tr>
</tbody>
</table>

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### Towards more detailed electricity modelling in MARKAL – TIMES

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Dipartimento di Energetica - POLITO
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Installations of new capacity

Inter Regional Exchange Matrix

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Total electricity production + import

Period

Electricity [GWh]

VEN
VDA
UMB
TOS
TRI
SIC
BAR
TUS
PE
MLU
MRA
AQM
LX
AZ
PVZ
BARI
CAM
BOL
BAS
MOL
LIG
LAZ
FVZ
EMR
CAM
CAL
BAS
ABR
Total

Total electricity production for voltage level

Period

Electricity [GWh]

BLC
BLC
BLC

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The Italian Multi-Regional Electricity Sector

Major needs for improvement:

peak/reserve requirement management, able to interact with multi-grid situations

lumpy investment approach

More warning message

(e.g. TS → Annual, demand excess, ....)
Thanks to Amit and Uwe