TEİAŞ

TÜRKİYE ELEKTRİK İLETİM ANONİM ŞİRKETİ

LONG TERM PLANNING, PRINCIPLES & PRACTICAL ANALYSES

TURKISH ELECTRICITY TRANSMISSION CORPORATION

CONTENT

- Overview of Turkish Transmission System
- Load and Generation Forecasts
- Preparing System Models
- System Model Studies
- Preliminery Discussions
- Investment Program
- Finalization of Investment Program
- Feasibility Reports

MAIN RESPONSIBILITIES

- The sole owner of Electricity Transmission System
- Responsible for the expansion of transmission network infrastructure & construction of new transmission facilities
- Operating & Maintaining the Turkish Electricity Transmission Network economically and reliably in compliance with international standards
- Monitoring real-time system reliability, purchasing and providing Ancillary Services Through “Ancillary Service Agreements”
- Publishing 10-year “Electrical Energy Generation Capacity Projection”
- Operating the Electricity Balancing-Settlement Market and Financial Reconciliation Center (PMUM)
- Carrying out studies for the Interconnection Lines with neighboring countries

TRANSMISSION GRID

SUBSTATIONS

400 kV : 93

1154 kV : 580

Total : ~130.000 MVA capacity

TRANSMISSION LINES

400 kV : 18.302 km

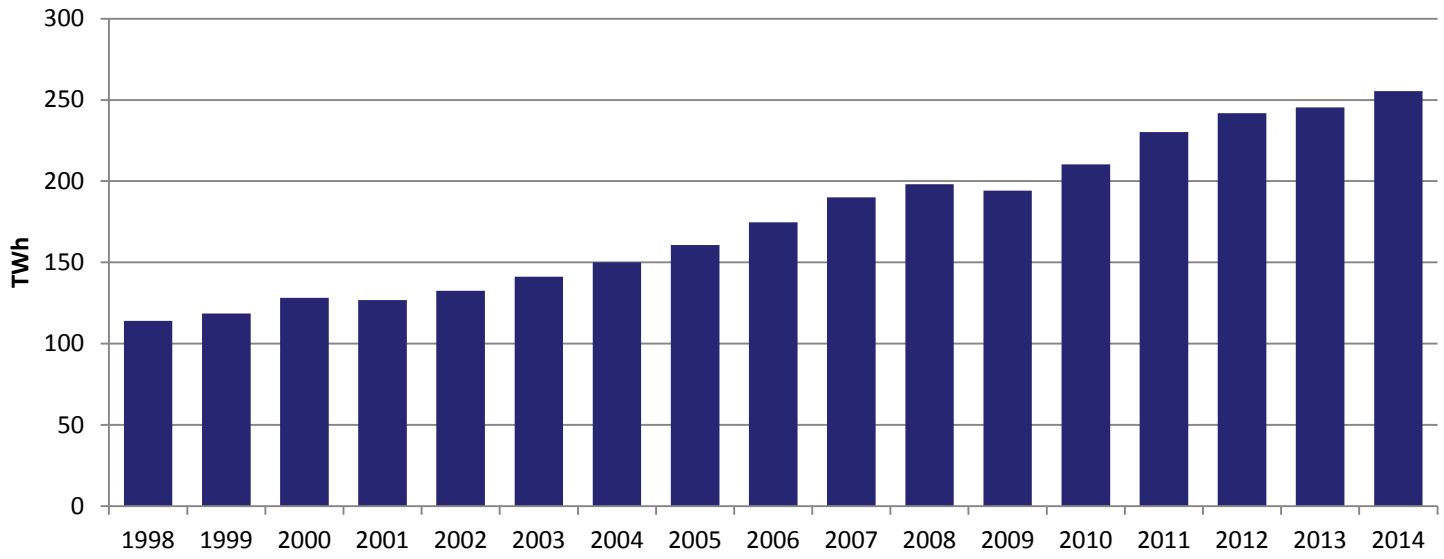
154 kV : 36.349 km

154 & 400 kV Cable: 320 km

Total : ~55.000 km

ENERGY CONSUMPTION

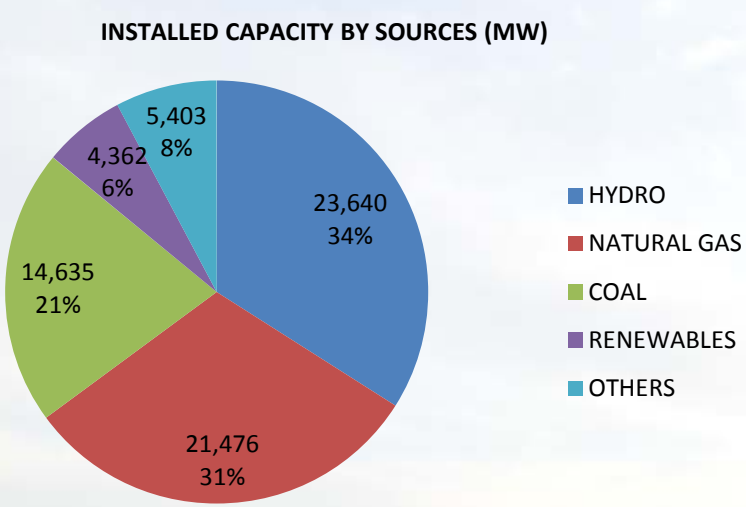
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CONSUMPTION (TWh)	114,0	118,5	128,3	126,9	132,6	141,2	150,0	160,8	174,6	190,0	198,1	194,1	210,4	230,3	241,9	245,4	257,7
INCREASE (%)	8,1	3,9	8,3	-1,1	4,5	6,5	6,3	7,2	8,6	8,8	4,3	-2,0	8,4	9,4	5,0	1,4	4,4

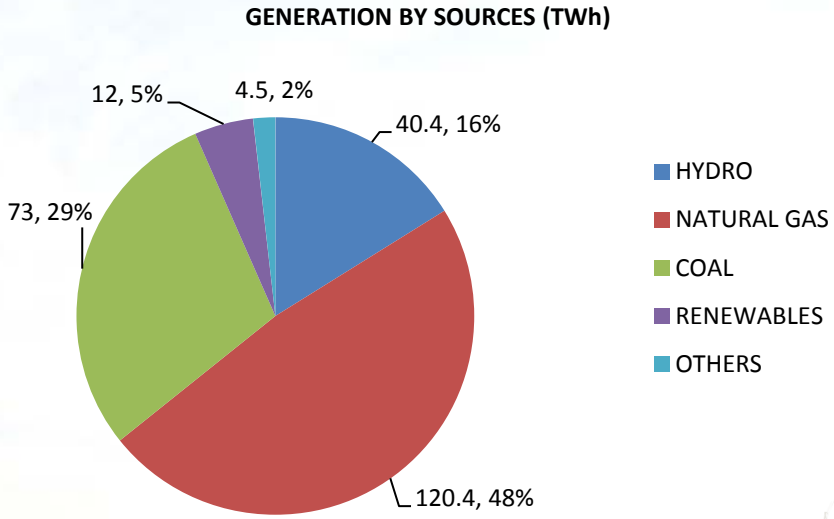


INSTALLED CAPACITY & PEAK LOAD

BY 31st DECEMBER 2014	
Installed Capacity:	69.516 MW
Annual Consumption	255,6 TWh
Peak Load	41.003 MW

BY 30th SEPTEMBER 2015	
Installed Capacity:	72.156 MW
Consumption	197,5 TWh
Peak Load (30 July 2015)	43.289 MW





INTERCONNECTIONS (EXISTING)

LOAD FORECASTS

- Criteria:

✓ Loads of each substation for last 10 years

✓ Demand forecast reports of distribution companies

✓ Demand forecast reports of industrial zones by the Ministry of Sciende, Industry &Technology)

✓ Mass housing projects by TOKI (Housing Development Administration)

✓ Mega projects (Projects included in International Agreement)

✓ Goals set by the Ministry of Energy and Natural Resources

➢ Based on information from these criteria, load forecast are prepared by each substation for next 10 years.

- For new substation:

  - After obtaining each substation's demand for different scenarios, some amount of load should be transferred to new substation which are the part of TEIAS investment program and most probably will be completed in 5 years.

  - TEIAS requested Distribution companies for giving information about load transfer for every new substation for medium and long term planning.

  - By using the information receiving from distribution company, load transfers are done.

GENERATION FORECASTS

- Existing power plants
  - Dispatcher's keep the records of each power plant's generation hourly based.
  - Generation forecasts (MW) of every existing power plant are done based on trends of each power plant
- Planned power plants
  - Taking information (commisioning date, installation timechedule…) from EMRA and company.
  - Different scenarios are taking into consideration for different types of plants.
    - NGCCPs generation are maximum at peak hours
    - run of rivers are full at Spring (April) minimum.
    - wind power plants are modeled as %30 of installed capacity for base models.

PREPARING SYSTEM MODELS

- There are 3 models for each next five and ten years.

- 2020 summer max
- 2020 winter max
- 2020 spring min
- 2025 summer max
- 2025 winter max
- 2025 spring min

PREPARING SYSTEM MODELS

- There are some submodels for particular cases:

- 2020 summer max wind full model
- 2020 summer max wind off model
- 2020 spring min hydro full model
- 2020 summer max NGCCP off model

- System models are prepared by PSS/E program.

- Main Focus:
  - OHL overloads for n cases (thermal limits)
  - OHL overloads for n-1 cases (thermal limits)
  - Loadings of autotransformers (%70-%80)
  - Region based focuses
  - System stability concern (voltage check, frequency,angular….)
- Criteria:
  - thermal limits
  - priority of the problem
  - scope of the problem
  - failure statistics
  - losses
  - short circuit
  - economical benefits

PRELIMINARY DISCUSSIONS

- After system studies, a short term planning report is prepared for each regional transsmission division of TEIAS.

- Results of the studies are discussed by engineers, senior engineers and supervisors of planning department of TEIAS.

INVESTMENT PROGRAM

- Meetings for investment program are held once a year on June.

- TEIAS's different departments and regional divisions and regional load and dispatch centers attends to these meetings.

- All suggestions are evaluated during the meetings.

- Minutes of the meetings are basis of a new investment program.

FINALIZATION OF THE INVESTMENT PROGRAM

- Following the meetings that decides investments, planning department works on every project from other aspects.

- Then, new investment program is sent to the Ministry of Development for approval.

FEASIBILITY REPORTS

- Feasibility reports included technical and economical evaluation are sent to Ministry of Development during the approval progress of the investment program.

Thank you for attention!