Electricity Market Reform in Turkey: Developments and Lessons Learned from 2001 to 2013

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Presentation Plan

• Introductory information
  • Legal framework
  • Electricity markets by figures
  • Market design and implementation stages

• Transitional challenges in the market

• Lessons learned from 12 years of reform

• Final remarks
Installed capacity (as end of 2013)  
64.044 MW

Share of renewables 40%

### Electricity installed capacity by resources

#### Installed capacity (as end of 2013)

<table>
<thead>
<tr>
<th>Fuel / source type</th>
<th>Installed capacity (MW)</th>
<th>Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>12.427,8</td>
<td>19.4</td>
</tr>
<tr>
<td>Natural gas + LNG</td>
<td>20.269,9</td>
<td>31.6</td>
</tr>
<tr>
<td>Hydraulic</td>
<td>22.289</td>
<td>34.8</td>
</tr>
<tr>
<td>Wind</td>
<td>2.759,6</td>
<td>4.3</td>
</tr>
<tr>
<td>Waste+Geothermal</td>
<td>547,7</td>
<td>0.9</td>
</tr>
<tr>
<td>Others-1- (Fuel oil+Naphta+LPG + Asphaltite)</td>
<td>708,3</td>
<td>1.1</td>
</tr>
<tr>
<td>Others-2- (Multi fuels solid+liquid+natural gas)</td>
<td>5.041,6</td>
<td>7.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>64.044</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Electricity installed capacity by resources

- Coal 19%
- Natural gas + LNG 32%
- Hydraulic 35%
- Wind 4%
- Waste+Geothermal 1%
- Others-1- (Fuel oil+Naphta+LPG + Asphaltite) 1%
- Others-2- (Multi fuels solid+liquid+natural gas) 8%

Share of renewables 40%
Electricity installed capacity by generators

Installed capacity (as end of 2013) 64.044 MW

<table>
<thead>
<tr>
<th>Generators</th>
<th>Installed capacity (MW)</th>
<th>Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUAS</td>
<td>21.068,5</td>
<td>32.9</td>
</tr>
<tr>
<td>Affiliates of EUAS</td>
<td>2.714</td>
<td>4.2</td>
</tr>
<tr>
<td>Transfer of operating rights</td>
<td>937,5</td>
<td>1.5</td>
</tr>
<tr>
<td>Build operate</td>
<td>6.101,8</td>
<td>9.5</td>
</tr>
<tr>
<td>Build operate transfer</td>
<td>2.335,8</td>
<td>3.6</td>
</tr>
<tr>
<td>Independent power producers</td>
<td>27.429,4</td>
<td>42.8</td>
</tr>
<tr>
<td>Autoproducers</td>
<td>3.456,9</td>
<td>5.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>64.044</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
Electricity generation by resources

<table>
<thead>
<tr>
<th>Fuel / source type</th>
<th>2013 (GWh)</th>
<th>Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>60.844,1</td>
<td>25.4</td>
</tr>
<tr>
<td>Natural gas + LNG</td>
<td>104.835</td>
<td>43.8</td>
</tr>
<tr>
<td>Hydraulic</td>
<td>59.245,8</td>
<td>24.8</td>
</tr>
<tr>
<td>Wind</td>
<td>7.517,6</td>
<td>3.1</td>
</tr>
<tr>
<td>Waste + Geothermal</td>
<td>2.253,2</td>
<td>0.9</td>
</tr>
<tr>
<td>Others-1-(Fuel Oil + Motorin + Naphta + Asphaltite)</td>
<td>4.431</td>
<td>1.9</td>
</tr>
<tr>
<td>Others-2-(Multi fuel Solid + Liquid + Natural gas)</td>
<td>166,5</td>
<td>0.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>239.293,3</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Share of renewable 28.8%
## Electricity generation by generators

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<thead>
<tr>
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<th>2013 (GWh)</th>
<th>Share (%)</th>
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</thead>
<tbody>
<tr>
<td>EUAS</td>
<td>66,040,6</td>
<td>27.6</td>
</tr>
<tr>
<td>Affiliates of EUAS</td>
<td>13,957,1</td>
<td>5.8</td>
</tr>
<tr>
<td>Transfer of Operating Rights</td>
<td>5,182,2</td>
<td>2.2</td>
</tr>
<tr>
<td>Autoproducers</td>
<td>12,436</td>
<td>5.2</td>
</tr>
<tr>
<td>Independent power producers</td>
<td>83,922</td>
<td>35.1</td>
</tr>
<tr>
<td>Build operate</td>
<td>44,231,2</td>
<td>18.5</td>
</tr>
<tr>
<td>Build operate transfer</td>
<td>13,524,1</td>
<td>5.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>239,293,3</td>
<td>100</td>
</tr>
</tbody>
</table>

### State
- **Private**: 66%
- **State**: 34%
History of liberalisation

- BOT Law (No: 3996)
- BO Law (No: 4283)
- Electricity Market Law (No: 4628)
- Strategy Document T-BSR
- Renewable Energy Law (REL) (No: 5346)
- REL Amendment F-BSR (No: 6094)

1984
1994
1997
2001
2003
2004
2005
2006
2008
2009
2010
2011
2013

Private sector is allowed to operate in generation, transmission and distribution

- EMRA
- Financial Settlement Communiqué
- Start of Privatization of Distribution Companies
- Start: T-BSR Application
- Start of 52 small HEPPs Privatization
- Day Ahead Market Collateral Mechanism
- Full Liberalization Power Exchange
- **Electricity Market Law:** First Law in 2001 and the new law in March 30, 2013.
- **Establishment of an autonomous regulator:** EMRA in 2001.
- **Unbundling:** Unbundling of state owned companies and relevant activities.
- **Eligible Consumers:** Consumers with a higher consumption than the eligible consumer limit.
- **Network Access:** Regulated third party access.
- **Wholesale Market Design:** Bilateral contracts market complemented by a day-ahead market and a residual balancing market.
- **Mitigation of market power:** Static precautions in terms of limiting market share;
  - No generation company can exceed %20 of total generation in Turkey,
  - No supplier company can procure more than %20 of total consumption in Turkey.
- **Licensing:** All market activities must be licensed by EMRA with some exemptions
- **Tariff:** Network tariffs and sales to captive customers as well as tariffs for last resort customers are regulated.
- **RES Support Mechanism:** Feed in tariffs depending on technology. Also an extra premium for the use of local equipment.
- **Distributed Generation:** Renewables up to 1 MW and certain cogeneration plants are exempted from licensing obligation.
Electricity market structure

- Market of bilateral contracts complemented by power pool
- 4.5 MWh/year eligibility limit for 2014 (theoretical market opening is 85%)
- Retail unbundling completed in 2013
Shares of public and private sectors in the installed capacity over years

The share of private sector has been higher than that of the state since 2010.
New capacity additions by private sector over years

Average 4.000 MW new capacity is added every year.
• Full market opening is planned as the beginning of 2015
• There is a significant difference between theoretical and realised market openings due to insufficient infrastructure and lower supply available for bilateral contracts
Number of eligible customers and meters over years

There is a significant increase in the numbers of eligible customers and meters over years.
There are 21 distribution regions in Turkey

- The state owned TEDAS owns the ownership of all distribution assets.
- All distribution utilities are run by private companies.
- Shares of utilities were transferred to private investors.
**Major challenges in reform**

**Problems**

- Differences between regions and consumer groups
- High losses
- Increasing demand & high investment requirement
- Lack of competition in market activities
- Import dependence on natural gas

**Solutions**

- Price equalization mechanism for a smooth transition
- Loss targets and incentive-based regulation
- Enhanced trade opportunities for generators, long-term tariff setting with satisfactory returns for network operators
- Unbundled market activities, privatization, and supplier switching
- Encouraging diversity via incentives, increasing utilization of renewables and distributed generation
• Dominant position of the state
  • Market share of state - Generation 45% and wholesale over 50%
  • Handling of existing contracts (BO, BOT, and ToOR)
  • Privatisation of state owned generation & distribution assets
Uniform National Tariff for Retail Tariffs
(Cost based pricing mechanism)

• Applied as transitional implementation until Dec.31, 2012
• Cross subsidy among regions with lower and higher losses in compliance with Electricity Market Law (The Law)
• The Law allows cross subsidy
• High loss and leakage rates in distribution system
• Cost based pricing mechanism is applied to electricity retail prices since July 1, 2008 – Dec. 31, 2012

• The mechanism envisages the quarterly adjustment of electricity retail prices based on changes in input prices
  • Coal and natural gas prices
  • Inflation
  • Exchange rates

• Known as “Automatic Pricing Mechanism”

• Applied to state owned energy companies
  • TKİ (coal enterprise)
  • BOTAŞ (natural gas and oil transportation)
  • Electricity generation portfolio groups under EÜAŞ
  • TETAŞ (electricity wholesale and trading)
  • Electricity distribution companies
Cost based pricing mechanism for retail tariffs

- Distribution companies who get much more than his total revenue requirement, are required to transfer this extra amount to TETAŞ who acts as financial mediator.

- The mechanism envisages cross subsidies among customer groups.
Training of market participants to redefine attitudes compatible with liberal market philosophy

- Inform all stakeholders about the market model and developments in the market
- Eligible consumers selecting their own suppliers with competing firms through bilateral contracts
- Getting public support
Lessons learned from 13 years of reform

• Reform process in the energy market
  • is always a challenging issue
  • requires political commitment
  • necessitates a comprehensive restructuring process
  • needs continuous effort
  • should be tailor-made
  • has to be better implemented gradually
  • can be succeeded via public support
• The liberalization process in Turkish electricity market, which started in 2001, is continuing.

• With the privatization of state owned generation assets, the final stage will be reached in the process of establishing a competitive electricity market envisioned in the Electricity Market Law.
Thank you...

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