



# *Renewable Energy Regulation in Turkey*

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*Joint Transmission System Operator –  
Utility Regulator Workshop on Renewable Energy  
8 March 2011, Istanbul, Turkey*

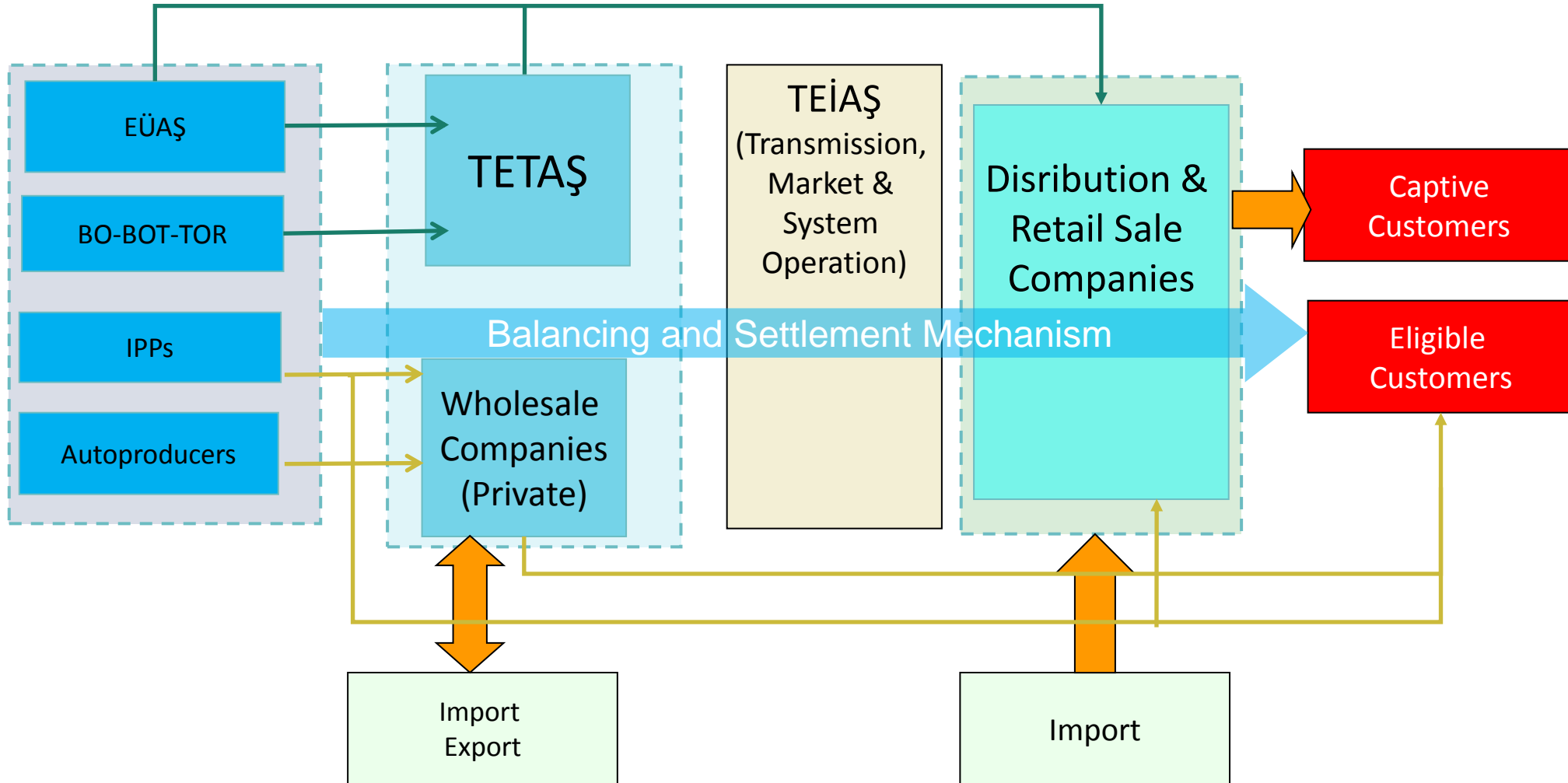
- **EMRA**
- **Electricity Market**
  - Market Structure, Balance and Settlement Mechanism, Strategies
  - Transmission and Distribution Zones, Interconnections
  - Installed Capacity, Generation and Consumption
  - Strategies in Electricity Market
- **Renewable Energy**
  - Regulation of Renewables
  - Reasons for interest, incentive mechanisms
  - Private Sector Applications
  - Facts & Figures

# Energy Market Regulatory Authority (EMRA)

- Sole regulator of Electricity, Gas, Petroleum and LPG markets,
- An autonomous authority
- Issues secondary legislation
- Controls entry to and exit from markets
- Approves tariffs
- Monitors, supervises and audits markets & market players
- Main objective is to provide;
  - Financially viable, stable and competitive energy market
  - Sustainable energy at good quality and low cost, in a reliable and environment friendly manner



# Market Structure



# Interconnections



## TIME TABLE

Process	Date
Isolated test at Maximum Load Conditions	<b>11-25 January 2010</b> Has been successfully completed.
Isolated test for Minimum Load Conditions	<b>22 March – 05 April 2010</b> Has been successfully completed.
Trial Parallel Operation	<ul style="list-style-type: none"> <li>• <b>Stabilization Period (No exchange)</b> 18 September 2010</li> <li>• <b>Non-commercial exchange</b> 21 February 2011 (2nd phase will last for two weeks and the evaluation of the results is foreseen to be concluded in mid-March. Decision for 3rd phase will be given on 3 May)</li> <li>• <b>Commercial exchange</b> (11 months)</li> </ul>

# Strategies in Electricity Market

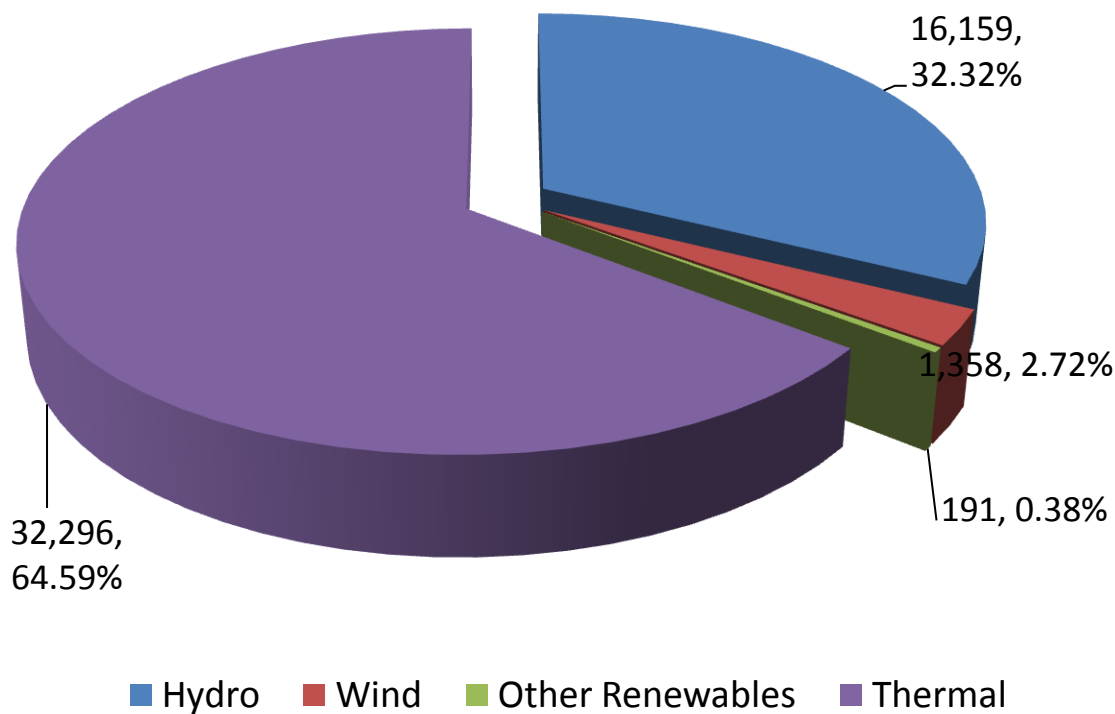
**As per the Electricity Market Strategy Document adopted in 2009 by the High Planning Council:**

2010	<ul style="list-style-type: none"> <li>▪ Privatization of public generation companies started</li> </ul>
2012	<ul style="list-style-type: none"> <li>▪ All non-residential consumers will be eligible</li> </ul>
2013	<ul style="list-style-type: none"> <li>▪ Legal unbundling of distribution and retail</li> </ul>
2016	<ul style="list-style-type: none"> <li>▪ Fully open market (all consumers will be eligible)</li> </ul>
2023	<ul style="list-style-type: none"> <li>▪ Exploitation of known lignite and charcoal reserves</li> <li>▪ Increasing the share of <b>renewable energy resources</b> to at least 30% in total</li> <li>▪ Complete utilisation of technical and economical hydroelectric potential</li> <li>▪ Increasing the installed capacity of wind energy to 20.000 MW</li> <li>▪ Commissioning all of geothermal potential which is 600 MW.</li> <li>▪ The ratio of nuclear power plants within electricity generation, till year 2020, shall be at least 5% and this ratio will be raised in the long-term</li> <li>▪ The ratio of natural gas within electricity generation will be dropped below 30%</li> </ul>



# Installed Capacity, Consumption & Peak Load

**Installed Capacity - MW (as of Feb. 2011)**



**Installed Capacity : 50.004 MW**

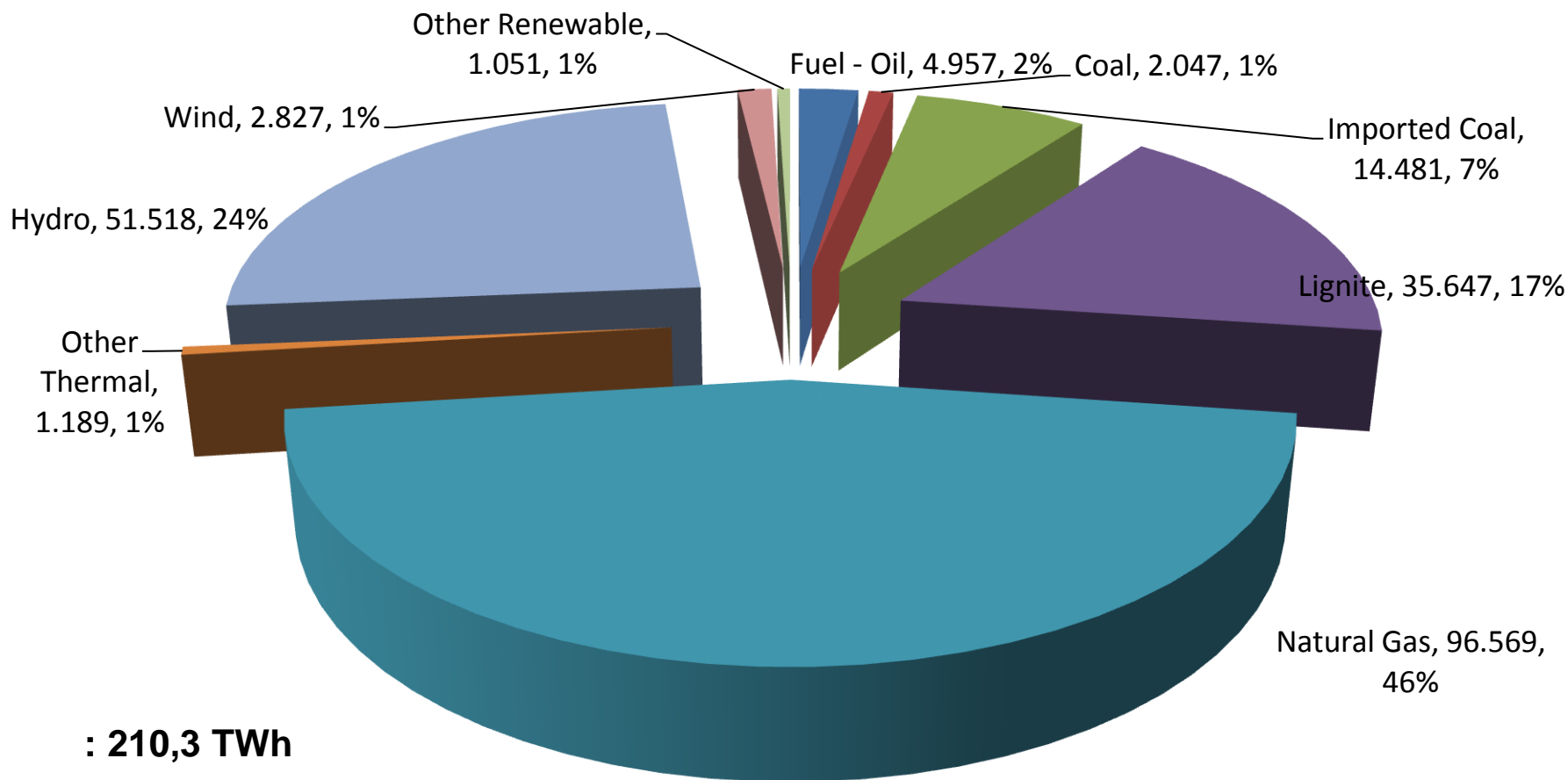
**Hydro + Renewable : 35 %**  
**Thermal : 65 %**

**Yearly Consumption (2010) : 209.4 TWh**

**Peak Load (2010) : 33.392 MW**



# 2010 Electricity Generation (TWh)



**Total : 210,3 TWh**

**Thermal : 73,7 %**

**Renewable : 26,3 %**

## EU stimulus and fears of supply insecurity led to giving the priority to renewables

- Three 20s principle has been adopted in EU: 20% of the energy from renewables until 2020.
- Kyoto Protocol necessitates clean energy consumption and decrease of CO<sub>2</sub> emission.
- Turkey is dependent on natural gas to a great extent in power production.
- Therefore, many incentive mechanisms for renewable energy has been developed via Energy Market and Renewable Energy Laws.

# Regulation of Renewables (1)

- Some remarks;
  - In general, renewable energy cannot solve the security of supply (SoS) problem. But it can help.
  - Cost & benefit analysis is very important, especially while determining the scope for incentives.
  - In a liberalized market structure, price signals are one of the most useful tools for reaching the renewable objectives.
  - Market mechanism should comply with the conditions of renewables (e.g. imbalance problems, technical requirements, etc.)

## Regulation of Renewables (2)

- Some remarks;
  - Plant site and connection capacity (for wind and solar) are extremely valuable (multiple applications for the same site). Therefore, legal background (technical evaluation, selection mechanism, etc.) for granting the right should be ready in advance.
  - Installed capacity projections should be in compliance with the grid expansion plans. Resource planning is very important in terms of having the right plant at the right point.
  - Licensing procedures should be clear.
  - Licensed projects should be monitored closely.
  - Cost of a failed project is high. There should be measures.

- Summary of The Regulatory Structure in Turkey;
  - License applications are open except wind and solar (to be opened soon)
  - Licenses can be granted up to 49 years.
  - Source contract is required for hydro and biomass.
  - Technical assessment of the hydro and wind (also solar when applications are opened) projects are done by General Directorate of State Hydraulic Works (**DSİ**) and Electrical Power Resources Survey & Development Administration (**EİE**), respectively.

- Summary of The Regulatory Structure in Turkey;
  - In case of multiple applications (same water source for hydro, plant site or capacity for wind and solar) winning project is determined by tenders (based on fee/kWh).
    - by Turkish Electricity Transmission Co. (**TEİAŞ**) for wind and solar projects
    - By **DSİ** for hydro projects
  - Plant siting is quite flexible, even agricultural lands can be allocated for power plants based on renewable energy law
  - For obtaining the usage right of the plant site, EMRA completes all of the legal procedures.

# Incentive Mechanisms (1)

Incentive Type	Scope
Licensing fee	<ul style="list-style-type: none"> <li>▪ Initial licensing fee of 1% of the regular fee.</li> <li>▪ Exemption from the annual license fee in first eight years</li> </ul>
Connection to the grid	<ul style="list-style-type: none"> <li>▪ Priority by TEIAS and the distribution companies</li> <li>▪ % 85 reduction in system usage fees for 5 years (all plants to be commissioned prior to 31/12/2015 – extension possible)</li> </ul>
Exemption from licensing and company establishment obligations	<ul style="list-style-type: none"> <li>▪ For the generators with a max. capacity of 500 kW</li> </ul>
Purchase obligation	<ul style="list-style-type: none"> <li>▪ In their supply to ineligible consumers, the distribution companies have to procure renewable power in up to 20 % of its consumption</li> </ul>
Feed-in tariff	<ul style="list-style-type: none"> <li>▪ For renewable PPs in operation for 10 years: Different prices for each resource (also additional incentives for domestic production).</li> </ul>



## Incentive Mechanisms (2)

Incentive Type	Scope
<p>Fees on land-use for PPs to be commissioned prior to 31/12/2015 (extension possible)</p>	<ul style="list-style-type: none"> <li>▪ If the property in use is possessed in possession of the Treasury, for first 10 years of operation, 85% deduction is applied to fees related to rent, right of access, and usage permission.</li> <li>▪ 85% deduction is applied to fees related to transportation and transmission infrastructure investments.</li> <li>▪ Exemption from the special fees like contribution to the development of the woodland villages.</li> <li>▪ Free usage of state-owned estates located within the reservoir of HPPs holding a RES certificate.</li> </ul>

# Incentive Mechanisms (3)

## Feed – In Tariffs

(10 years for plants to be commissioned until 31/12/2015 – extension possible)

Schedule I	
Type of Production Facility Based on Renewable Energy Resources	Prices Applicable (US Dollar cent/kWh)
a. Hydroelectric production facility	7.3
b. Wind power based production facility	7.3
c. Geothermal power based production facility	10.5
d. Biomass based production facility (including landfill gas)	13.3
e. Solar power based production facility	13.3

# Incentive Mechanisms (3)

## Feed – In Tariffs

**Additional Incentive for Domestic Production - 5 years for plants to be commissioned until 31/12/2015**

Schedule II		
Type of Facility	Domestic Production	Domestic Contribution (US Dollar cent/kWh)
A- Hydroelectric production facility	1- Turbine	1.3
	2- Generator and power electronics	1.0
B- Wind power based production facility	1- Wing	0.8
	2- Generator and power electronics	1.0
	3- Turbine tower	0.6
	4- All of the mechanical equipment in rotor and nacelle groups (excluding payments made for the wing group and the generator and power electronics.)	1.3
C- Photovoltaic solar power based production facility	1- PV panel integration and solar structural mechanics production	0.8
	2- PV modules	1.3
	3- Cells forming the PV module	3.5
	4- Invertor	0.6
	5- Material focusing the solar rays onto the PV module	0.5

# Incentive Mechanisms (3)

## Feed – In Tariffs

Type of Production Facility Based on Renewable Energy Resources	Prices Applicable (US Dollar cent/kWh)		
	Schedule I	Schedule II	Total
a. Hydroelectric Production Facility	7,3	2,3	9,6
b. Wind Power based production Facility	7,3	3,7	11
c. Geothermal power based production facility	10,5	-	10,5
d. Biomass based production facility (including landfill gas)	13,3	-	13,3
e. Solar power based production facility	13,3	6,7	20

# License Applications of Private Sector

	Capacity (MW) – As of Feb. 2011				
	Applied	Under Assessment	Approved	Licensed	Total
Wind	525,2	28.182,3	1.603,5	4.013,9	<b>34.324,9</b>
Hydro	3.119,5	2.380,1	3.241,4	15.870,7	<b>24.611,7</b>
Fuel-Oil, Diesel, LPG	7,9	0,0	25,3	1.279,8	<b>1.313,0</b>
Natural Gas	16.352,5	7.359,6	3.864,0	13.063,3	<b>40.639,3</b>
Lignite	0,0	37,0	270,0	4.281,2	<b>4.588,2</b>
Coal	6.146,7	5.891,6	900,0	8.964,4	<b>21.902,6</b>
Asphaltite	135,0	0,0	0,0	675,0	<b>810,0</b>
Geothermal	129,9	64,9	25,0	137,1	<b>356,9</b>
Others	11,0	18,9	4,0	145,4	<b>179,3</b>
<b>Total</b>	<b>26.427,8</b>	<b>43.934,3</b>	<b>9.933,2</b>	<b>48.430,7</b>	<b>128.726,0</b>

# Assessment of The Regulations

- Licensing mechanism was designed as simple as possible and this facilitates the integration of green projects.
- The regulation making process is transparent. EMRA publishes the drafts on its website and evaluates the comments received from market participants and stakeholders.
- Considering the number and the capacity of the license applications on renewable energy, it is obvious that the objectives and the results of the regulations are in parallel.

# Assessment of The Regulations

- The capacity projections (based on plants under construction) indicate that the utilization of renewable energy (especially hydro) is satisfactory.
- On the other hand, it is fair to say that wind projects were over-promoted since in only 1 day (Nov. 2007) the total installed capacity of the applications were over **70.000 MW!** It took almost 3 years to solve this problem since many projects were overlapping and the available wind connection capacity was limited.
- Despite lots of projects going in parallel with the pre-determined work plans, there are also many projects behind their schedule (even they have submitted letters of guarantees).



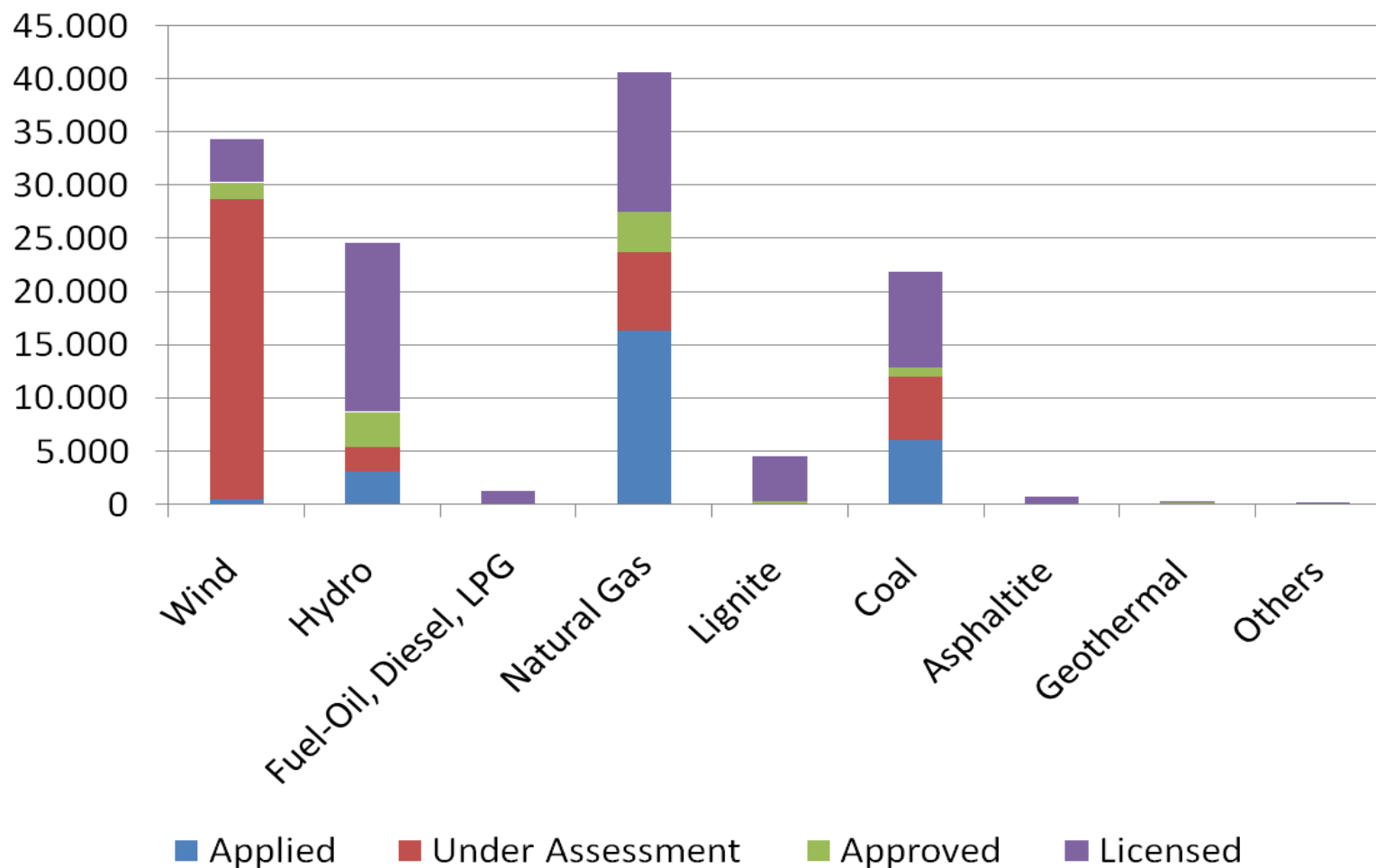
# Assessment of the Regulations

- The regulators can promote the renewables by making the procedures as easy as possible. However the easiest may not be the best!
- It is very important to have a Regulatory Impact Analysis (RIA) in order to make sure that the regulations can achieve the objectives.
- In a liberalized market, the investors are very sensitive to signals. Therefore, the regulator should protect its credit and be as transparent as possible.

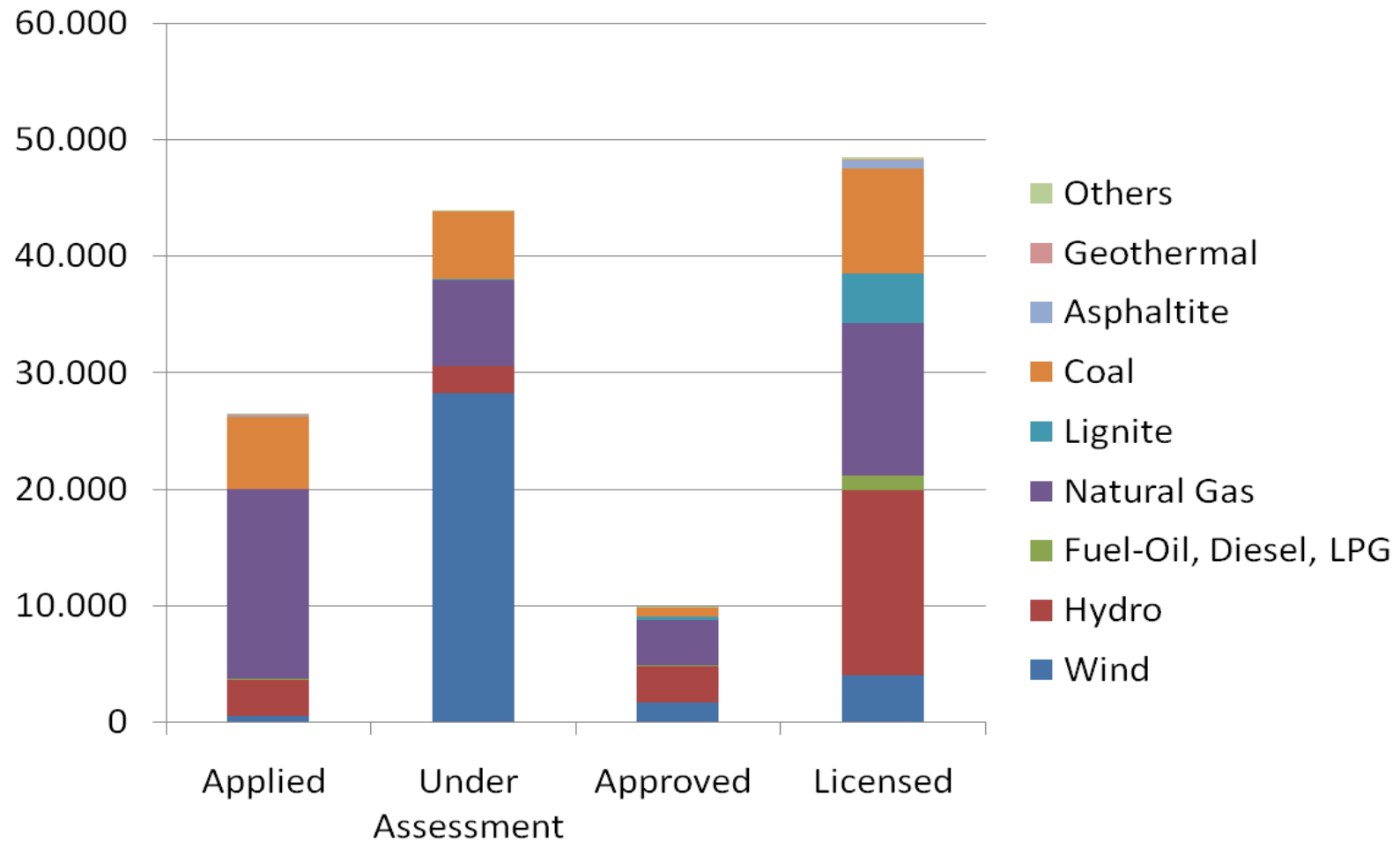
# Licensed Applications

Type	2010		TOTAL	
	Number	Ins. Capacity	Number	Ins. Capacity
Hydro	94	1.944	736	27.956
Coal	1	100	36	18.844
NG	7	420	78	16.486
Wind	6	220	91	3.500
Other	0	-	14	510
Mobil	-	-	2	263
Geo.	4	63	11	227
LFG	-	-	4	39
Biomass	3	15	4	20
Biogas	4	7	7	13
Fuel Oil	-	-	1	11
<b>Total</b>	<b>119</b>	<b>2.769</b>	<b>984</b>	<b>67.869</b>

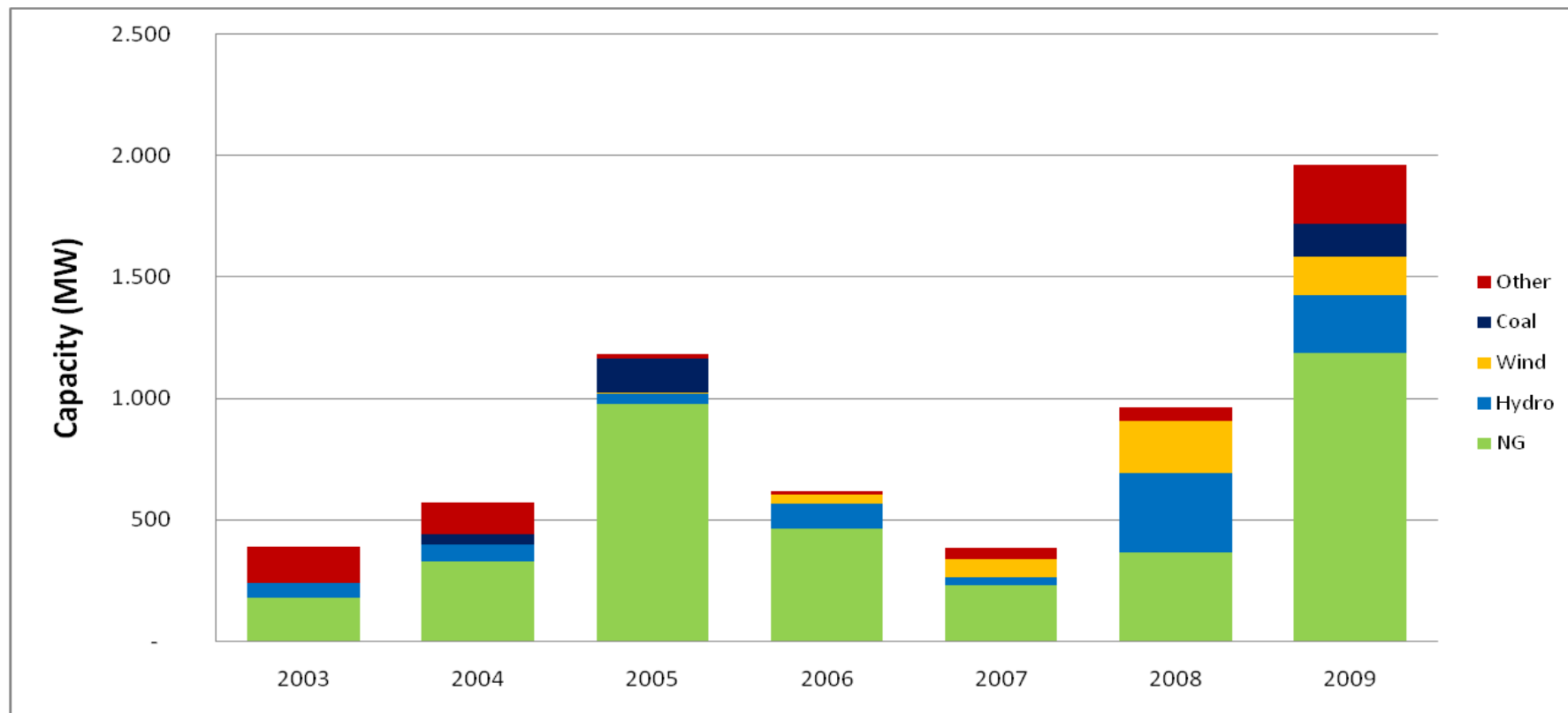
# Capacity in Licensing Process



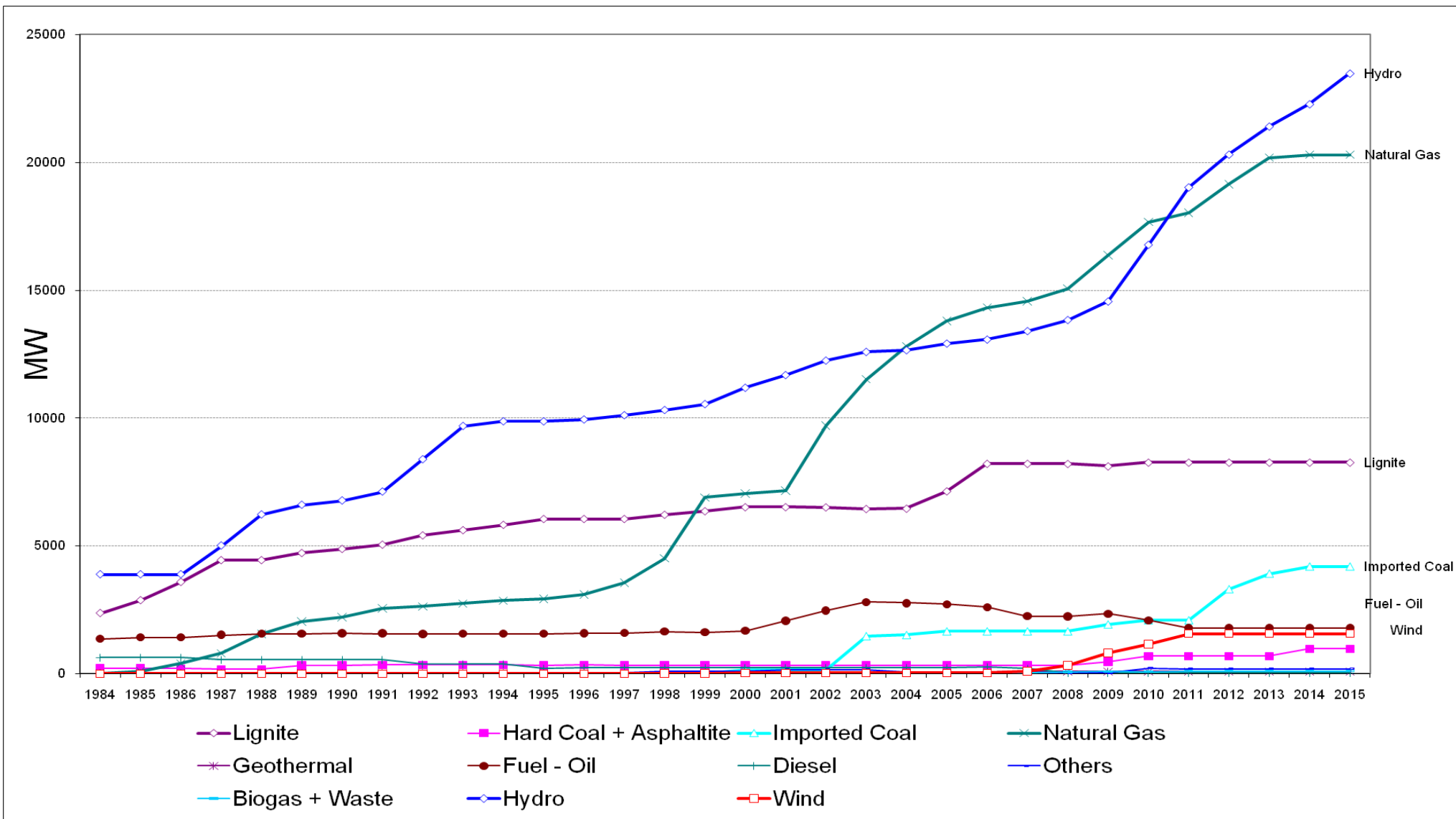
# Capacity in Licensing Process



# Capacity Commissioned



# Capacity Development



# Thank you for your attention.

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