

RENEWABLE ENERGY DRIVE IN TURKEY

- **Energy Market Structure:**
Investment opportunities in Turkey
- **Legal Framework:**
Turkish Electricity Market Law
Rules, regulations, and regulators
- **Capacity Projections**
- **Major players**

ENERGY MARKET STRUCTURE

2009 Electricity Production (inc. October, in GWh)

| | | | |
|-----------------------|------------------|-------|----------------|
| EÜAŞ– own plants | 58,988.8 | 36.6% | |
| EÜAŞ– affiliated | 15,687.3 | 9.8% | |
| Mobile Power Stations | 0.0 | 0.0% | 46.4% |
| TETAŞ– BO | 36,290.9 | 22.6% | |
| TETAŞ-BOT | 11,509.0 | 7.2% | |
| Operational Rights | 3,602.1 | 2.2% | 32.0% |
| Autoproducers | 11,680.8 | 7.2% | |
| Private Producers | 23,106.7 | 14.4% | 21.6% |
| Total | 160,865.6 | | 100.0%* |

* Shares in electricity production for EÜAŞ, TETAŞ and others

ENERGY MARKET STRUCTURE

Resource Planning (in GWh)

| | | |
|------------|-----------|--------|
| Thermal(*) | 90,000.1 | 80.6% |
| Hydro | 20,960.1 | 18.8% |
| Wind | 704.5 | 0.6% |
| | 111,664.7 | 100.0% |

(*)Natural Gas constitutes 47.8% (53,431.3 GWh)

Hydro and Wind total < 20.0% (EU target 22%)

ENERGY MARKET STRUCTURE

| | Electricity Production (GWh) | Peak Power (MW) | Installed Capacity (MW) | Peak Power/ Installed Capacity | Production in Hours |
|-------------|---|----------------------------|------------------------------------|---|--------------------------------|
| 2000 | 124.926 | 19.390 | 27.264 | 71.12% | 4.582 |
| 2001 | 122.725 | 19.612 | 28.332 | 69.22% | 4.332 |
| 2002 | 129.400 | 21.006 | 31.845 | 65.96% | 4.063 |
| 2003 | 140.581 | 21.729 | 35.587 | 61.06% | 3.950 |
| 2004 | 150.698 | 23.485 | 36.824 | 63.78% | 4.092 |
| 2005 | 161.956 | 25.174 | 38.844 | 64.81% | 4.169 |
| 2006 | 176.300 | 27.594 | 40.565 | 68.02% | 4.346 |
| 2007 | 191.558 | 29.249 | 40.836 | 71.63% | 4.691 |
| 2008 | 198.418 | 30.517 | 41.817 | 72.98% | 4.745 |

LEGAL FRAMEWORK

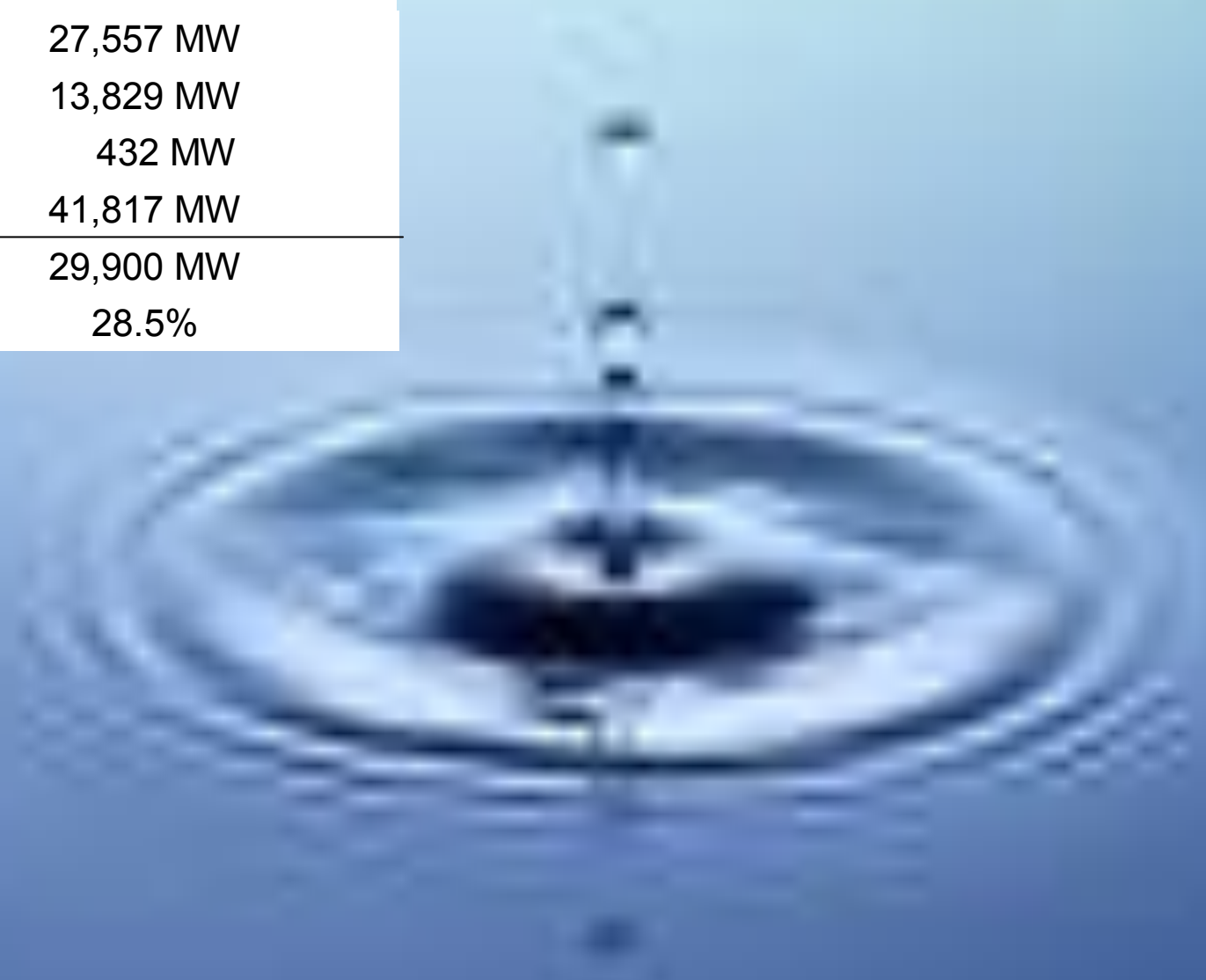
A surreal painting depicting a large, cracked egg on a beach. The egg is split open, revealing a bright, glowing sun inside. The sun's light radiates outwards, illuminating the scene. The egg is supported by wooden scaffolding on both sides. In the foreground, a person stands on the sand near a small boat. The background shows a vast, textured sky with a warm, golden light, suggesting a sunrise or sunset. The overall atmosphere is one of hope and renewal.

- ◆ Private Investment Reform
- ◆ Need for Regulatory Certainty & Clarity
- ◆ BOT and BOO Contracts
- ◆ Revenue Deficit in the Energy Sector

EXISTING SITUATION

Existing Power Plants (2009):

| | |
|------------------|-----------|
| Thermal | 27,557 MW |
| Hydro | 13,829 MW |
| Renewables | 432 MW |
| Total | 41,817 MW |
| Peak Power | 29,900 MW |
| Capacity Reserve | 28.5% |

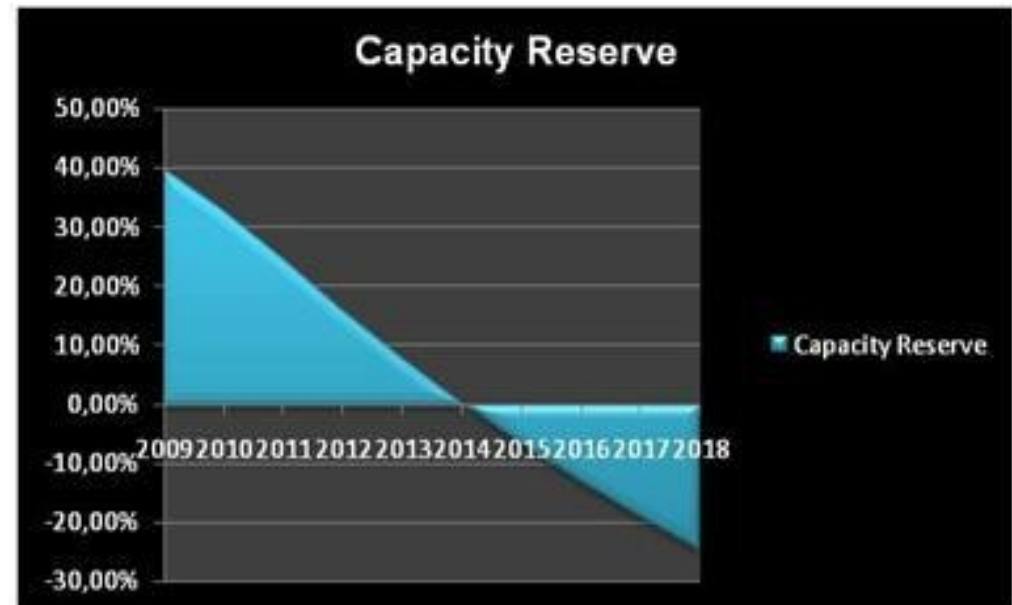
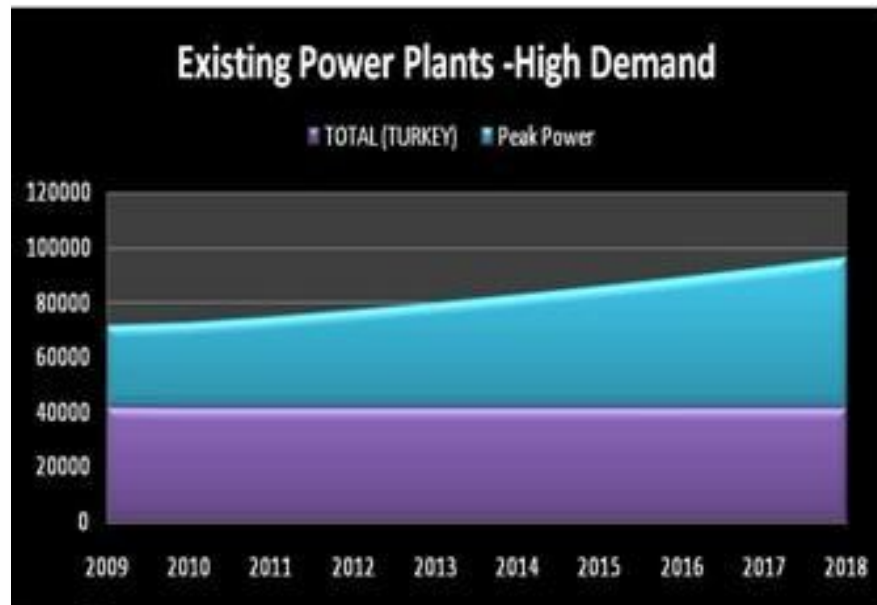


EXISTING POWER PLANTS

| High Demand (MW) | Years | | | | | | | | | |
|-------------------------|---------------|---------------|---------------|---------------|--------------|--------------|---------------|----------------|----------------|----------------|
| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Thermal | 27557 | 27257 | 27257 | 27257 | 27257 | 27257 | 27257 | 27257 | 27257 | 27257 |
| Hydro | 13829 | 13829 | 13829 | 13829 | 13829 | 13829 | 13829 | 13829 | 13829 | 13829 |
| Renewables | 432 | 432 | 432 | 432 | 432 | 432 | 432 | 432 | 432 | 432 |
| TOTAL (TURKEY) | 41817* | 41517 | 41517 | 41517 | 41517 | 41517 | 41517 | 41517 | 41517 | 41517 |
| Peak Power | 29900 | 31246 | 33276 | 35772 | 38455 | 41339 | 44440 | 47728 | 51260 | 55053 |
| Capacity Reserve | 39,90% | 32,90% | 24,80% | 16,10% | 8% | 0,40% | -6,60% | -13,00% | -19,00% | -24,60% |

*2009 year beginning

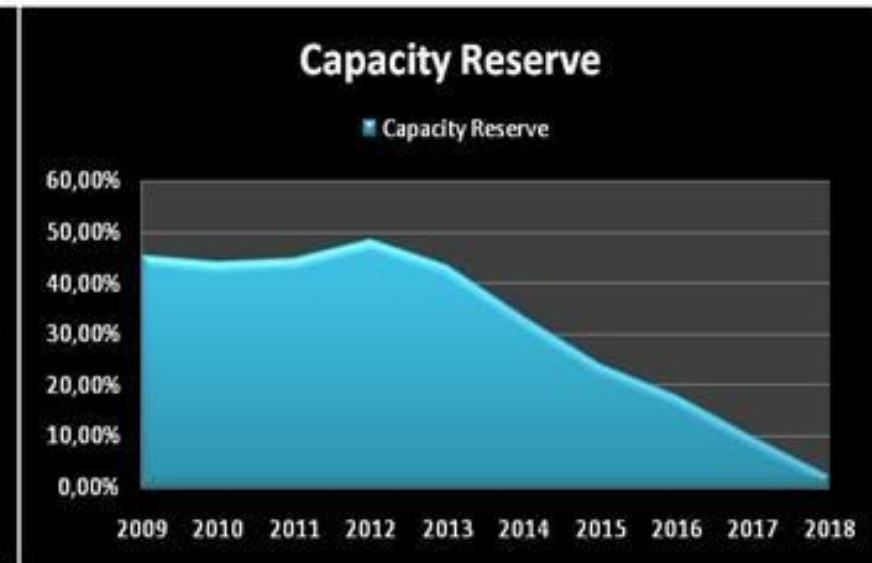
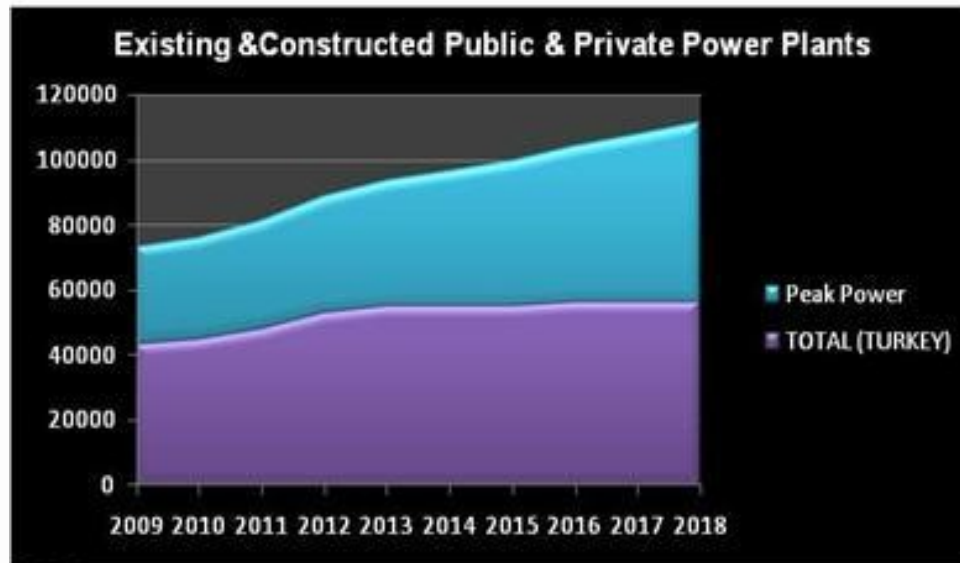
Source: Production Capacity Projection (2009-2018), Turkish Electricity Transmission Company



EXISTING & CONSTRUCTED PUBLIC & PRIVATE POWER PLANTS

| High Demand (MW) | Years | | | | | | | | | |
|-------------------------|---------------|---------------|---------------|---------------|--------------|---------------|---------------|---------------|---------------|--------------|
| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
| Thermal | 27905 | 27750 | 28966 | 32094 | 34147 | 34147 | 34147 | 34147 | 34147 | 34147 |
| Hydro | 14886 | 16381 | 18058 | 19877 | 19877 | 19877 | 19877 | 21077 | 21077 | 21077 |
| Renewables | 695 | 880 | 1157 | 1157 | 1157 | 1157 | 1157 | 1157 | 1157 | 1157 |
| TOTAL (TURKEY) | 43485 | 45011 | 48182 | 53128 | 55182 | 55182 | 55182 | 56382 | 56382 | 56382 |
| Peak Power | 29900 | 31246 | 33276 | 35772 | 38455 | 41339 | 44440 | 47728 | 51260 | 55053 |
| Capacity Reserve | 45,40% | 44,10% | 44,80% | 48,50% | 43,5% | 33,50% | 24,20% | 18,10% | 10,00% | 2,40% |

Source: Production Capacity Projection (2009-2018), Turkish Electricity Transmission Company



CAPACITY PROJECTION-1

Scenario I - High Demand until 2017:

| | | |
|------------------|------------------|------------------|
| Thermal | 53,984 MW | 26,734 MW |
| Hydro | 35,472 MW | 22,077 MW |
| Renewables | 1,250 MW | 1,059 MW |
| Total | 91,827 MW | 49,870 MW |
| Peak Power | 62,782 MW | |
| Capacity Reserve | 46.3% | |

49,870 MW to be constructed until 2017!

CAPACITY PROJECTION-5



Electricity Consumption (2000– 2008)

| | | | |
|------|---------|-----|--------|
| 2000 | 128,276 | GWh | 100.0% |
| 2001 | 126,871 | GWh | 98.9% |
| 2002 | 132,553 | GWh | 103.3% |
| 2003 | 141,151 | GWh | 110.0% |
| 2004 | 150,018 | GWh | 116.9% |
| 2005 | 160,794 | GWh | 125.4% |
| 2006 | 174,637 | GWh | 136.1% |
| 2007 | 191,559 | GWh | 149.3% |
| 2008 | 198,055 | GWh | 154.4% |



HYDROPOWER AVAILABILITY

| Months | Average Water Inflow | 2008 Actual | 2009 Program | 2009 Actual | Change with Respect to Average % | Change with Respect to 2008% | Change with Respect Program % |
|---------------------|----------------------|-------------|--------------|-------------|----------------------------------|------------------------------|-------------------------------|
| January | 4.737,9 | 2.530,8 | 3.023,8 | 3.421,0 | -27,8 | 35,2 | 113,1 |
| February | 5.200,1 | 2.553,4 | 3.349,1 | 5.614,8 | 8,0 | 119,9 | 167,7 |
| March | 9.381,5 | 9.738,3 | 6.374,6 | 9.088,5 | -3,1 | -6,7 | 142,6 |
| April | 16.102,4 | 9.210,3 | 9.823,9 | 11.265,9 | -30,0 | 22,3 | 114,7 |
| May | 14.608,1 | 5.817,8 | 8.057,2 | 10.751,6 | -26,4 | 84,8 | 133,4 |
| June | 7.143,6 | 3.865,5 | 4.412,1 | 4.888,7 | -31,6 | 26,5 | 110,8 |
| July | 3.508,0 | 2.447,5 | 2.534,2 | 3.409,3 | -2,8 | 39,3 | 134,5 |
| August | | | | | | | |
| September | | | | | | | |
| October | | | | | | | |
| November | | | | | | | |
| December | | | | | | | |
| Yearly Total | 60.681,6 | 36.163,6 | 37.574,8 | 48.439,8 | -20,2 | 33,9 | 128,9 |

POWER PLAYERS

According to Installed Power:

- ⇒ Leading Groups with more than 2,500 MW
 -Ltd
 -Ltd
 -Ltd
- ⇒ Medium League with 500 - 2,500 MW
 -Ltd
 -Ltd
 -Ltd
- ⇒ Small and Regional less than 500 MW
 -Ltd
 -Ltd
 -Ltd

RENEWABLE RESOURCES

⇒ Hydropower (1500 €/kW, 3000 hrs / yr)

Small and compact hydro

River basins against development

⇒ Wind

Grid limitations

⇒ Solar (2500 €/Kw, 2000 hrs/ yr)

Photovoltaics or csp?

If you are interested in, please do not hesitate to contact us for the full article.

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