Industries
Energy, Utilities & Mining Sector

On the sunny side of the street*

Opportunities and challenges in the Turkish renewable energy market

August 2009

Contents

Dropping electricity demand against the backdrop of huge difficulties in the financial sector and expectations of recession across much of the globe has coloured the outlook in 2009. The key themes revolve around the three pillars necessary to allow the market to keep developing: finance, technology and legislation. Financing markets have been largely closed for a good part of the year, but strides forward are still being made in technology and these should accelerate as financing flows more freely. 2009 appears undeniably slower, with both volumes and prices down across almost all areas of the renewable space.

Despite not being exempted from the global doom and gloom, the Turkish renewable energy market is still heating up, as reflected in consecutive disclosures of new investments and M&A activities by 'cash-ready's, and in the supportive statements by domestic and international financing institutions for the 'cash-needy's. The sustainability of this upbeat outlook, however, is crucial given the still significant electricity demand prospect, expected to recover with the eventual turnaround hoped for in 2010.

It is true that every crisis is different, but they all create opportunities for those who can identify them and are ready to take action. Therefore, a well-designed incentive scheme based on a sustainable and predictable regulatory structure will be the main strength of the Turkish renewable market in securing its place on the sunny side of the street.

The Turkish electricity market is currently the scene of a series of changes in legislation, many of them long-awaited. The new Electricity Market Strategy Paper outlines the updated next steps in market liberalisation and introducing new resource utilisation targets in power generation. The proposed amendments to the Renewable Energy Law, meanwhile, aim to upgrade and differentiate the feed-in tariff structure with regards to sources. Accordingly this report aims to on the one hand guide existing and potential investors and their financiers and on the other communicate their expectations and concerns to decision makers. In this way we hope to bridge the two sides using PricewaterhouseCoopers' expertise as a basis.

We hope you find our comments and outlook enlightening for your future plans targeting this exciting Turkish wealth of opportunity.

Gifted with a rare geographical bounty…
Thanks to its location, climate and geology, Turkey is blessed with an abundance of clean energy resources. Prevailing westerly winds and a broad sweep of accessible hill ranges in Anatolia create ideal conditions for wind farms. The southern and western parts of Turkey enjoy up to 125 sunny days a year, making them a natural choice for solar energy plants. Rivers flowing from western parts of the country are an important source of hydroelectric energy.

…and striving to attract pending international interest…
Burgeoning economic and industrial growth, an increasing population size, and the resulting pressure on power generation made renewables the main focus of clean energy investment in 2008. Turkey started to get the foreign interest it deserved, despite ongoing regulatory uncertainties. Total renewable-energy based electricity generation grew almost threefold, although its share in the national portfolio remains negligible.

…Turkey has become a multiplayer investment field.
External financing and soft loans have been central in the achievements to date, and will remain integral to continued success, with European and regional development banks playing a particularly active role. Project financing is the main method, which transforms the simple lender-borrower relationship into a complex setting including consultants, insurers, future customers, etc.

But it didn't take long for the global investment engine to grind to a halt…
New lending activity is more closely scrutinised from a risk perspective and is especially frowned upon for long term commitments, as long term liquidity is scarce and expensive, rendering investment in additional supply capacity one of the main casualties.

…and to return cash to the throne!
Despite not being excluded from the credit crunch, the Turkish renewable market is still heating up, as reflected in consecutive disclosures of new investments and M&A activities by 'cash-ready's, and supportive statements by the domestic and international financing institutions for the 'cash-needy's. Sustainability of this upbeat outlook, however, is crucial given the still significant electricity demand prospect, expected to recover with the eventual turnaround hoped for in 2010.

The definition of a successful business plan changes…
The attention of multinational players seeking to scale-up their global presence through opportune investments will also focus on domestic companies in need of extra capital. The definition of a strong business model will be revised as the ability to attract a strong and cash-rich multinational partner.

…but this is largely contingent on regulatory sustainability and predictability.
The government's recognition of this remains crucial, given the uncertainties in regulation and the dominance of the state in new generation capacity over the medium term. The expected amendment in the feed-in tariff structure contained a glimmer of hope for the Turkish renewable energy investment arena. But the ongoing delays in licensing rounds, coupled with the uncertainties regarding the privatisation of the state generation and distribution assets, fog potential investors' sight and pulls Turkey down the attractiveness hierarchy.

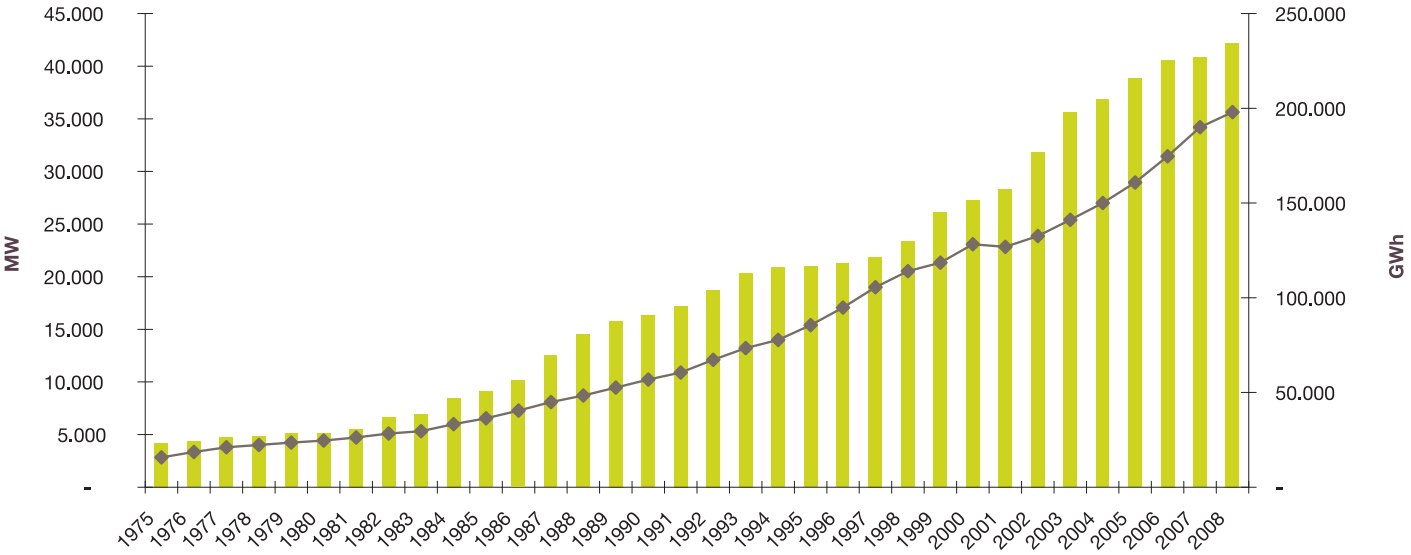
04 Part I: Turkish electricity market overview

Demand growth has been sustained despite economic crises…

In tandem with the significant year-on-year GDP growth over the last couple of decades in Turkey, the bottleneck in provisioning the increase in the total primary energy supply (TPES) came to dominate the agenda of the institutions responsible for economic and fiscal planning. In fact, the TPES posted a staggering improvement at a CAGR of 4.3% to reach 111 MTEP between 1975 and 2008. Over the same period, electricity consumption grew by a CAGR of 7.3%, reflecting the pace of urbanisation and industrialisation in one of the largest emerging markets.

Despite the economic crises in 1994, 1998 and 2001, the installed electricity generation capacity in Turkey more than quadrupled in the last 25 years, reaching c. 42 GW in 2008.

Figure 1: Electricity demand (GWh) and installed capacity (MW) (1975-2008)



Source: TEIAS, SPO

The total installed capacity of 41.8 GW is obviously much higher than the demand of 198bn kWh reached in 2008. However, the low load factors of the power plants, unfavourable meteorological conditions and the lack of large scale maintenance and rehabilitation investments put a drain on safe capacity utilisation. Indeed, since 2005 the average utilisation rate of the installed capacity has waned from 40% to 37%.

…but this did not result in increasing use of renewable potential.

Disguised behind the enlargement in the installed capacity is the stalled exploitation of the country's huge renewable resources potential. Except hydroelectric power plants (HPPs), the share of which in total installed capacity has remained almost unchanged at around 33% since the 1970s, no material improvement has been recorded on the wind, solar and geothermal fronts. On the other hand, the 29% share of HPPs in total generation in 1972 waned to 19% in 2007, being mostly replaced by natural gas-fired power plants (NGPPs) by the mid-1980s.

Figure 2: Installed capacity breakdown (2008: 42GW)

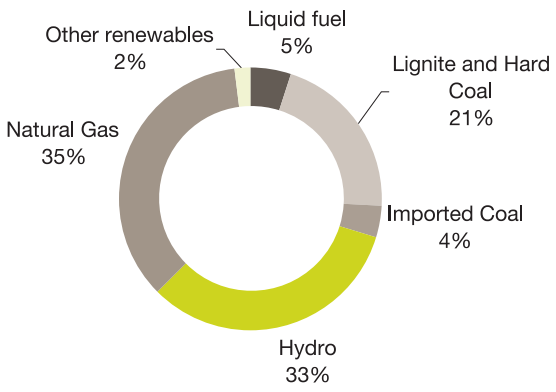
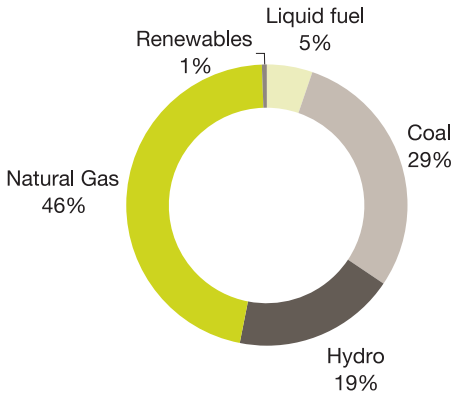


Figure 3: Generation breakdown (2008: 198GWh)



Source: TEIAS, SPO

Despite the liberalisation woes besetting the market since 2001, a closer look at the ownership structure of the installed capacity indicates an absolute state sovereignty over the power plant assets at 81% (59% under direct state control + 23% owned by the state generation company (EUAS) but operated by the private sector via Build-Operate-Transfer (BOT), Build-Operate (BO), and Transfer of Operational Rights (TOR) contracts)). The remaining 18% is shared among private players.
(Please see Figure 5 below)

Figure 4: Capacity per player (2008)

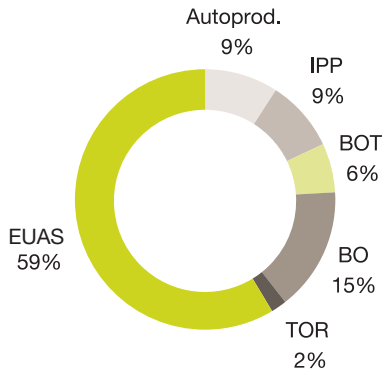
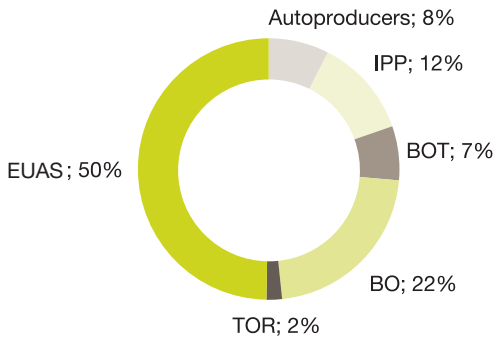


Figure 5: Generation per player (2008)



Source: EUAS

In 2008, a total of 221 generation and 18 autoproduction licences were granted for a total of 12GW, with the following breakdowns:

Figure 6: Capacity breakdown of the granted 12 GW (2008)

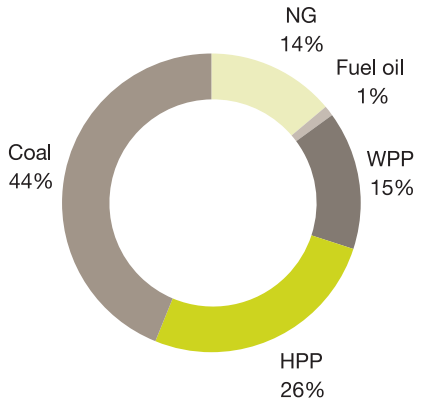
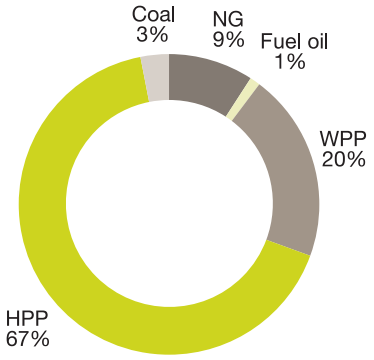


Figure 7: Number breakdown of the 239 applications (2008)



Source: EMRA

The 58% share of thermal projects in the licensed capacity and the coal share of 44% in particular, underlines the inadequate promotion of renewable technologies to date. (Please see Figure 6 above.)

Part II: Turkish renewable energy policy chronology

A - Revival of interest in renewable energy (2003-2008)

EU stimulus and fears of supply insecurity necessitated the prioritisation of renewables…

Growing demand for electricity raised awareness regarding urgency of the completion of the required investments and made a more active contribution by the private sector imperative. However, the streamlining efforts blocked the way to accomplishing this imperative via BOT, BO and TOR contracts on potential competition concerns, and required the government to instigate incentive schemes to promote a 'pure' private presence in generation.

The amendment to the Electricity Market Licensing Regulation (EMLR) in 2003 marked the first legislative step to including the definition of electricity generation plants using renewable energy resources. Later in 2004, the Strategy Paper issued by the High Planning Council to lay a liberalisation roadmap for the Turkish electricity and gas markets reaffirmed the State Planning Organisation (SPO) and the Ministry of Energy and Natural Resources' (MENR) responsibility to promote renewable energy policy. Equally important was of course the mitigation of the deepening dependence on imports for fossil fuels resulting from the spread of natural gas-fired installed capacity.

Enacted amid these challenges, the **Law on Utilisation of Renewable Energy Resources for Electricity Production No. 5346 (aka Renewables Law)** was indeed a significant step in strengthening in the country's decentralised renewable energy sector. Renewable energy resources within the scope of this Law are defined as the electrical energy generation resources suitable for wind, solar, geothermal, biomass, biogas, wave, current and tidal energy resources, together with either canal or river-type hydraulic generation plants or those with a reservoir area of less than 15 square kilometres. Despite being considered a renewable resource, large HPPs are not included in the support mechanism defined in this Law.

The purpose of this Law, on the other hand, is to increase the utilisation of renewable energy resources in electricity generation in a secure, economic and high-quality manner; to increase the diversification of energy resources; to reduce greenhouse gas emissions; to promote the reuse of waste products; to protect the environment; and to develop the related manufacturing sector with a view to achieving these objectives.

With a per capita consumption of 2.72 GWh/year, which lags well behind the EU-25 average, the Turkish electricity market represents one of the most promising markets in Europe with respect to growth potential in the years to come.

The enactment of the Renewables Law necessitated updates to the relevant legislation. In 2006, **Environment Law No. 2872** was amended to allow the use of market-based and financial tools including carbon trading, together with the provision of such incentives as obligatory standards, tax credits and fee exemptions to promote renewable and clean energy technologies, and the imposition of emission fees.

This was followed in 2007 by the enactment of **Energy Efficiency Law No. 5627**, including the provision of a 20% discount on the electricity costs of industrial enterprises signing a contract to reduce their energy intensity by 10% over a three-year period (renewable energy generation is not included in the energy intensity calculations).

…but the incentives came belatedly in 2007.

As of 2007, RES Certificate holders with PPs in operation for not more than 10 years became eligible to sell their output to the grid at a feed-in tariff, defined as the average electricity wholesale price of the previous year to be determined by EMRA, and capped between €cent 5-5.5/kWh. Certificate owners are also granted the right to sell their output at higher rates whenever available in the spot market or via bilateral contracts with eligible customers. The Council of Ministers is vested with the authority to extend this feed-in tariff period for another two years, with the condition that this decision is taken prior to 31 December 2009. (Please see Appendix 1 for the full list of the incumbent institutions in the Turkish renewable energy market.)

An important series of amendments in the renewable energy arena came in 2008: (Please see Table 1)

- a centralised tender mechanism for capacity trade has been introduced
- the possibility of the state to undertake new capacity investments is defined as a last resort
- compliance with facility construction schedules is underlined with penalties, including licence abrogation and cashing in of guarantee bonds
- TEIAS vested with the authority to launch tenders in the event of multiple wind generation licence applications for the same grid.

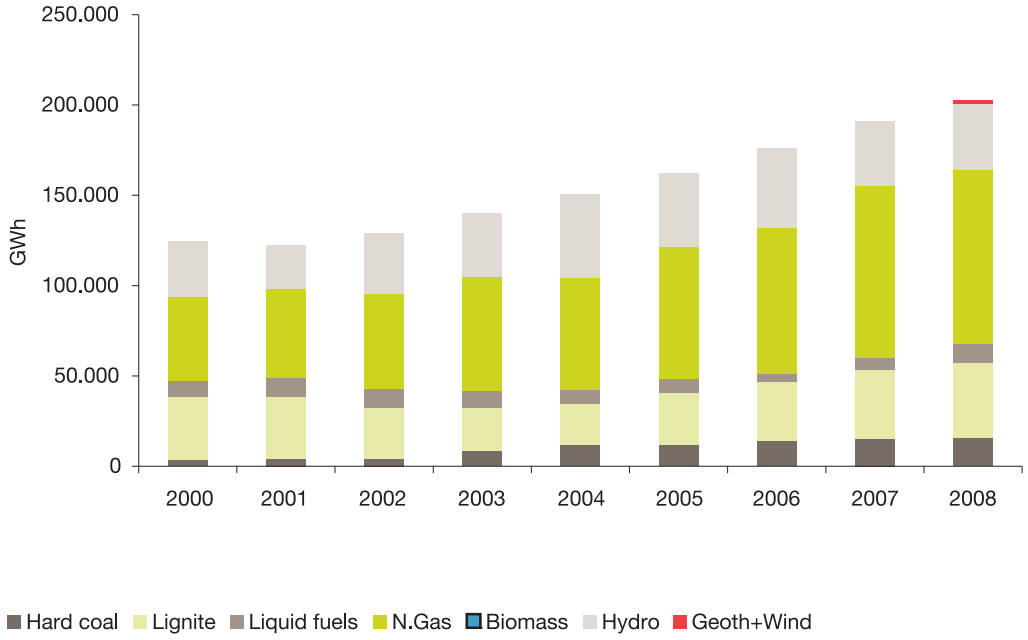
Table 1: Existing incentives to promote investment in renewable energy

Law	Incentive subject	Scope
Electricity Market Law (EML) No. 4628	Licensing fee	Initial licensing fee limited to 1% of the regular licensing fee applicable to non-renewable PPs.
		Exemption from the annual licence fee during the first eight years following the commissioning of renewable PPs.
	Connection to the grid	Priority to be granted by TEIAS and the distribution companies in connection to their grid.
	Exemption from licensing and company establishment obligations	Enjoyed by the generators / autoproducers operating renewable energy plants with a maximum capacity of 500 kW.
	Purchase obligation	In their supply to ineligible customers, the distribution companies have to procure the renewable PPs' output in case the latter's offer is less than or equal to the TETAS tariff and there is no other supply source (please see Appendix 2 for the supply structure in the Turkish electricity market).
Renewables Law No. 5346	Feed-in tariff until 2011	For renewable PPs in operation for not longer than 10 years: the average electricity wholesale price of the previous year is to be determined by EMRA and limited to €cent 5-5.5/kWh. RES Certificate owners are also granted the right to sell their output at higher rates whenever available in the spot market or via bilateral contracts with eligible customers.
	Purchase guarantee	The share of renewable output within the retail licensees' portfolio cannot be less than their domestic market share during the previous year. This obligation is to be fulfilled by procuring the output of the renewable PPs in operation for not more than 10 years.
	Fees on land use for the PPs to be commissioned prior to 31 December 2012	During the first 10 years of operation, an 85% deduction is applied to fees related to permission, rent, right of access and usage permission over the investment and operation period, in the event of the use of the property under the possession of the General Directorate of Forestry or the Treasury.
		85% deduction is applied to fees related to investments in the transportation infrastructure and power lines until the connection point to the grid.
		Exemption from the special fees charged to contribute to the development of woodland villages, promotion of forestation and erosion mitigation.
		Free use of state-owned estates located within the reservoir of HPPs holding a RES Certificate.

Pending international interest finally landed in Turkish territory…

The last three years saw a surging interest in alternative electricity generation technologies. The total generation by geothermal and wind PPs in Turkey increased from 150 GWh in 2005 to 1,800GWh in 2008.

Figure 8: Generation by fuel (2000-2008)



Source: TEIAS

A key development during this period was the increased importance of news of supply disruption and price reactions reflecting the fast-prevailing view that a medium-term supply gap might be an inescapable fate rather than a slim possibility. Indeed, the TEIAS projection for the period 2005-2020 was ringing alarm bells for an electricity shortage as of 2009, and this assumption might have become reality if no slowdown in consumption had occured.

Such shortage scenarios were immediately noticed by the multinational utility companies whose focus was already shifting from their largely saturated territories to the untapped emerging markets. As a result, with its significant renewable energy potential, Turkey has become a centre of attraction for this eastward investment flow.

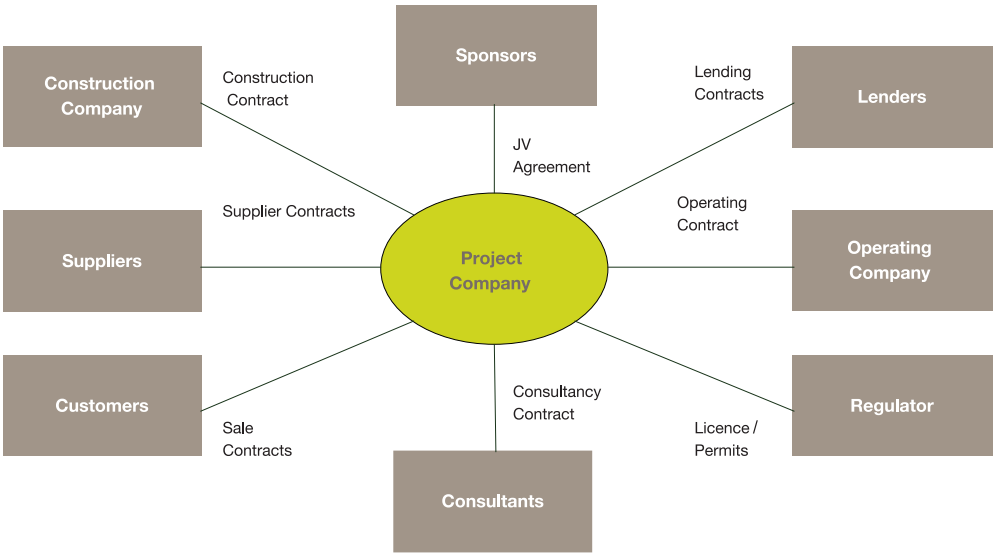
In fact, when faced with liberalisation in their home markets over the last decade, the once national champions such as Edf, RWE, CEZ and Statkraft reshuffled their overseas expansion strategies and included Turkey in their target portfolio.

Another source of interest has been the energy investment arms of international financial institutions such as Cogentrix of Goldman Sachs. This interest mostly focused on hydro and wind resources, as will be detailed in the subsequent sections.

…and transformed the funding ground into a multiplayer arena.

Although not fully disclosed in most cases, off-balance sheet financing methods such as project finance became the rule of the game and transformed the simple bilateral deal desk of asset sales into a multiplayer arena.

Figure 9: Parties to renewable projects



The financial support by international finance institutions of renewable projects is encouraging for domestic commercial banks, which would otherwise hesitate to finance such sizeable upfront invesments.

Among these international finance institutions are the German Development Bank (KfW Bankengruppe), World Bank (WB), International Bank of Restructuring and Development (IBRD), Council of Europe Development Bank (CEDB), Agence Française de Développement (AFD), Japan Bank for International Cooperation and International Finance Corporation (JBIC). The latest financing news came from the World Bank for the provision of US$ 800mn for the renewable energy investments in Turkey.

B - Deepening interest in renewable energy (2009 onwards)

Updates to the Electricity Market Strategy Paper (EMSP)…

The recent update to the EMSP is significant in that it introduces resource utilisation targets for power generation, to be accomplished by 2023. The respective share target for the renewable resources including hydro within the total generation is 30%, versus the current share of 20%. The plan on the wind front in particular is to increase the existing installed capacity of 469 MW to 20 GW over the next 13 years - quite an ambitious target.

…are expected to be supported by the amendments to the Renewable Energy Law

In line with these ambitious targets in the EMSP, the recent amendment proposal to the feed-in tariff mechanism warrants particular attention. The proposed incentive scheme provisions higher and differentiated tariffs for RES Certificate holders with PPs to become operational prior to 31 December 2015.

Table 2: Proposed feed-in tariff structure

PP Technologies	First 10 years in operation (€cent/kWh)	Second 10 years in operation (€cent/kWh)
HPP	7	N/A
Onshore WPP	8	N/A
Off-shore WPP	12	N/A
Geothermal	9	N/A
Photovoltaic	25	20
Concentrating solar	20	18
Biomass (inc. Landfill)	14	N/A
Tidal	16	N/A

Source: www.tbmm.gov.tr

The new mechanism has the following components:

1- The duration of the participation to the scheme shall start from the date of commissioning for operating PPs or from the date of commissioning for those yet to commence operating. The situation regarding PPs becoming operational after 31 December 2015 shall be renegotiated after 2011.

2- Payments to the power suppliers shall be made by the Market Balancing and Settlement Center (MBSC) in TL, calculated with the Turkish Central Bank TL/€ parity on the invoice date.

3- In the case of hybrid PPs based on intensified solar technologies and any other non-renewable technology, only the output of the former shall be eligible for the incentive scheme.

4- Benefiting from this feed-in tariff scheme does not preclude participation in the spot market (Please see Appendix 2 for the supply structure in the Turkish electricity market).

5- Licensees generating power for their own need with PPs of a maximum installed capacity of 500 kW shall be eligible for the feed-in tariffs in Table 2, with the exception of the photovoltaic PPs. PVs with a maximum capacity of 500 kW are in turn provided with the following scheme:

   - Generation upto 2,999 kWh/month: €cent 35/kWh
   - Generation between 3,000 – 6,000 kWh/month: €cent 30/kWh

6- The output of the PVs can only be sold to the distribution companies.

7- A standard 90% discount on the system usage fees shall be applied to all types of renewable-energy based PPs.

8- If the mechanical and / or electromechanical equipment is procured from domestic suppliers, the feed-in tariff levels displayed on Table 2 shall be further upgraded with the rates displayed on Table 3, and be applicable over the first five years of operation.

Table 3: Proposed upgrades to feed-in tariff structure for domestic procurement

PP Type	Manufacturing good	Domestic procurement premium (€cent/kWh)
HPP	Turbine	1
	Generator and power electronics	0,8
WPP	Blade	0,6
	Generator and power electronics	0,8
	Turbine tower	0,5
Solar PV	Entire mechanical equipment in rotor and blade groups	1
	PV panel integration and solar structure mechanics	0,6
	PV modules	1
	PV module cells	3
	Inverter	1
	Focusing tool to collect solar rays onto PV modules	0,4
Concentrating solar	Radiation collection tube	3
	Solar tracking system	0,5
	Mechanical equipment in the thermal energy storage system	1
	Mechanical equipment in steam production system via collection of solar rays on roof	2
	Stirling engine	0,5
	PV panel integration and solar structure mechanics	0,5
Biomass	Steam boiler with fluid bed	0,6
	Liquid-fired and gas-fired steam boiler	0,3
	Gasification and gas removal group	0,8
	Steam or gas turbines	1,5
	Internal combustion engine or stirling engine	0,7
	Generator and power electronics	0,4
	Cogeneration system	0,3
Geothermal	Steam or gas turbines	1
	Generator and power electronics	0,5
	Steam injector or vacuum compressor	0,5

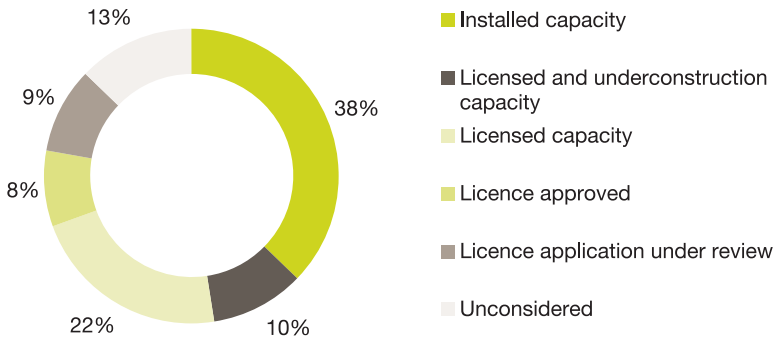
Source: www.tbmm.gov.tr

A - Hydroelectricity

62% of the economic potential is yet to be tapped

The installed hydroelectric capacity of 13.8 GW in Turkey corresponds to just 38% of the country's technical hydroelectricity capacity of 37.1 GW. The 13% share of the unconsidered portion (potential net of the licensed and applied-for-licence capacity) gives the impression that the hydro market would be soon saturated (Please see Figure 10 below). However, the low level of completion performance of the HPPs under construction and the upcoming privatisation of the EUAS hydro portfolio is likely to keep the deal ground busy enough.

Figure 10: Breakdown of technical hydroelectric capacity (37.1 GW)



Source : MENR

The majority of the HPPs are operated by the state itself. The rest is divided among BOT and TORs and the private sector players. In practice, licences are usually granted for 49 years.

The private share in the Turkish hydro portfolio is set to increase…

The 67% share in the total number of new licences granted to the private sector in 2008 being for the construction of new HPPs is obviously to improve the private presence in the hydroelectricity generation sector (Please see Figure 7 on page 6).

On the other hand, 41% of the 2009 energy investments budget of TL2.8bn is allocated to the State Hydraulic Works (SHW) for the completion of HPP projects and rehabilitation. In addition, the 2009 Investment Plan prepared by the SPO includes a clear reference to the promotion of investments in pump-storage HPPs, and vests the EIE with the responsibility to determine the potential for the use of this technology.

…for those who master the rocket science of licensing.

These provisions are also reiterated by the new EMSP, referring to the provision of the necessary funding to the SHW.

A HPP project can be started by a private player in two ways (please see Tables 3 and 4 for the details of a typical HHP project schedule in Turkey):

1- Self-initiated projects: Private players may develop their own project and apply to the SHW for Water Use Agreement (WUA).

2- SHW and/or EIE announces the list of HPP projects to be transferred to the private sector for operation:

- more than one applicant: a tender is launched to collect bids per kWh to be generated, and the winning bid is posted as income by the SHW.

- one applicant: the project is granted to the single applicant.

Table 4: Project schedule to build an HPP in Turkey (Projects developed by SHW and / or the EIE)

	Steps in HPP projects	Description	Duration
Step 1	Launch of the HPP project list by the SHW	The SHW periodically discloses its HPP projects to be transferred to private players	N/A
Step 2	Application period	Private legal entities can apply for pre-qualification.	30 days
Step 3	Evaluation period by the SHW	The SHW evaluates the applications and requests a preliminary feasibility report from the eligible ones.	75 days *
Step 4	Preliminary feasibility report preparation	The winning bidder is set to prepare a preliminary feasibility report for the project to be submitted to SHW.	max 90 days
Step 5	Extension allowance (if required)	SHW may grant extension for the submission of the preliminary feasibility report, which cannot exceed the initially granted period.	max 90 days
Step 6	SHW evaluation	SHW evaluates the preliminary feasibility report.	90 days *
Step 7	Hydroelectricity Contribution Fee Tender	The applicants with accepted preliminary feasibility submit their bids for the SHW for Water Use Right (WUR).	1 day
Step 8	Detailed feasibility report preparation	The highest bidder is requested to submit a detailed feasibility report.	90 days
Step 9	Review of the detailed feasibility report	The SHW reviews the detailed feasibility report of the highest bidder. If the feasibility submitted by the highest bidder is not accepted than, the process goes on with the second highest bidder.	N/A
Step 10	Period between SHW approval and licence application to EMRA	Upon the approval of the feasibility report by SHW, the applicant is to apply to EMRA for the licence.	max 15 working days
Step 11	EMRA evaluation	EMRA evaluates the licence application.	100 days *
Step 12	Period between EMRA approval and application to SHW to sign the Water Use Agreement (WUR)	Upon the notice to proceed by EMRA, the applicant is to reapply to SHW to sign the WUA	15 working days
Step 13	Second review of the feasibility report by the SHW and signature of the WUA	The SHW revises the detailed feasibility report for a second time and the WUA is signed between the applicant and the SHW. The validity of the WUA can not exceed the duration of the licence to be granted by EMRA.	30 days
Step 14	Licence granted by EMRA	If EMRA declines to grant the licence, then the SHW reshuffles the feasibility process with the second highest bidder. In the event of the process prove aborted with the second highest bidder too, then the project in question is announced again on the SHW taking the process back to square one. This time, the applicants who had not complied with the rules during the previous post-bid period are excluded.	N/A
Step 15	Environmental Impact Assessment (EIA)	P≤0.5MW: No EIA requirement	N/A
		0.5<P<25MW: EIA requirement is subject to the discretion of Provincial Environment Directorates	
		25MW≤P: EIA is required	
Step 16	Declaration of 'public benefit' opinion	To proceed with the expropriation, EMRA's 'public benefit' opinion is needed.	N/A
Step 17	Expropriation	Expropriation process would include the permits from the Provincial Forestry Directorates and Land Registry, and court cases with third parties depending on the status of the land.	N/A
Step 18	Approval of the final project	Following the completion of EIA and expropriation, SHW is to approve the final project.	N/A
Step 19	Pre-construction period	The licence holder reports the status of the proceedings to EMRA every four months.	max 16 months for canal or run-of-river types max 24 months for HPP with reservoirs
Step 20	Extension allowance (if required)	The pre-construction period can be extended up to an additional 50% of the initial period.	max 9 months
Step 21	Construction period	Upon the completion of the pre-construction stage, EMRA determines a binding construction schedule registered on the licence. The licence holder reports the status of the proceedings to EMRA every four months.	Canal (P≤50MW): 32 months Canal (50MW<P≤100MW): 38 months Canal (100MW<P): 54 months Reservoir (Vg≤1.000.000): 36 months
Step 22	Extension allowance (if required)	Construction period can be extended up to an additional 50% of the initial period.	N/A
Step 23	Registration to the network	Following the completion of the plant, the licensee is to register with TEIAS or TEDAS Provincial Directorates (where relevant) for network connection.	N/A

Source: PwC

Table 5: Project schedule to build an HPP in Turkey (Projects developed by the private sector)

	Steps in HPP projects	Description	Duration
Step 1	Application of a private player to the SHW for WUR	-	N/A
Step 2	Application review by the SHW	The EIE opinion is also required. If the proposed project clashes with the one under development by the SHW and / or EIE, the application must wait until the compleiton of the studies by these public entities, and the WUA process comes to be classified under the projects developed by the SHW and / or EIE.	60 days
Step 3	Announcement of project	If the application is approved, the project is announced on the SHW website to the attention of the potential developers. If there is no other interested parties in the announced project within this 30-day period, then a detailed feasibility study is required from the single applicant and the process goes on from Step 7 below.	max 90 days
Step 4	Preliminary feasibility report preparation	If there are other interested parties, then they are required to submit a preliminary feasibility report to the SHW.	max 90 days
Step 5	Extension allowance (if required)	SHW may grant extension for the submission of the preliminary feasibility report, which cannot exceed the initially granted period.	max 90 days
Step 6	Hydroelectricity Contribution Fee Tender	The applicants with accepted preliminary feasibility submit their bids to the SHW for Water Use Right (WUR).	1 day
Step 7	Detailed feasibility report preparation	The highest bidder is requested to submit a detailed feasibility report.	max 90 days
Step 8	Extension allowance (if required)	SHW may grant extension for the submission of the detailed feasibility report, which cannot exceed the initially granted period.	max 90 days
Step 9	Review of the detailed feasibility report	The SHW reviews the detailed feasibility report of the highest bidder. If the feasibility submitted by the highest bidder is not accepted, the process goes on with the second highest bidder.	N/A
Step 10	Period between SHW approval and licence application to EMRA	Upon the approval of the feasibility report by SHW, the applicant is to apply to EMRA for the licence.	max 15 working days
Step 11	EMRA evaluation	EMRA evaluates the licence application.	N/A
Step 12	Second revision of the feasibility report by the SHW and signature of the WUA	The SHW revises the detailed feasibility report for the second time and the WUA is signed between the applicant and the SHW. The validity of the WUA can not exceed the duration of the licence to be granted by EMRA.	30 days
Step 13	Getting TEIAS approval for grid connection availability, transformer capacity and proximity	TEIAS approval is required only for self-initiated projects.	90 days
Step 14	Period between SHW approval and licence application to EMRA	-	15 days
Step 15	Licence granted by EMRA	-	N/A
Step 16	Environmental Impact Assessment (EIA)	P≤0.5MW: No EIA requirement 0.5<P<25MW: EIA requirement is subject to the discretion of Provincial Environment Directorates 25MW≤P: EIA is required	N/A
Step 17	Declaration of 'public benefit' opinion	To proceed with the expropriation, EMRA's 'public benefit' opinion is needed.	N/A
Step 18	Expropriation	Expropriation process would include the permits from the Provincial Forestry Directorates and Land Registry, and court cases with third parties depending on the status of the land.	N/A
Step 19	Approval of the final project	Following the completion of EIA and expropriation, SHW is to approve the final project.	N/A
Step 20	Pre-construction period	The licencee should finalise the pre-construction phase within the schedule registered on the licence, covering the completion of MEF, EIA, expropriation and construction approvals. The licence-holder reports the status of the proceedings to EMRA every four months.	max 16 months for canal or run-of-river types max 24 months for HPP with reservoirs
Step 21	Extension allowance (if required)	Pre-construction period can be extended up to an additional 50% of the initial period.	max 9 months
Step 22	Construction period	Upon the completion of the pre-construction stage, EMRA determines a binding construction schedule registered on the licence. The licence-holder reports the status of the proceedings to EMRA every four months.	Canal (P≤50MW): 32 months Canal (50MW<P≤ 100MW): 38 months Canal (100MW<P): 54 months Reservoir (Vg≤1.000.000): 36 months
Step 23	Extension allowance (if required)	Construction period can be extended up to an additional 50% of the initial period.	20 months
Step 24	Registration to the network	Following the completion of the plant, the licensee is to register with TEIAS or TEDAS Provincial Directorates (where relevant) for network connection.	N/A

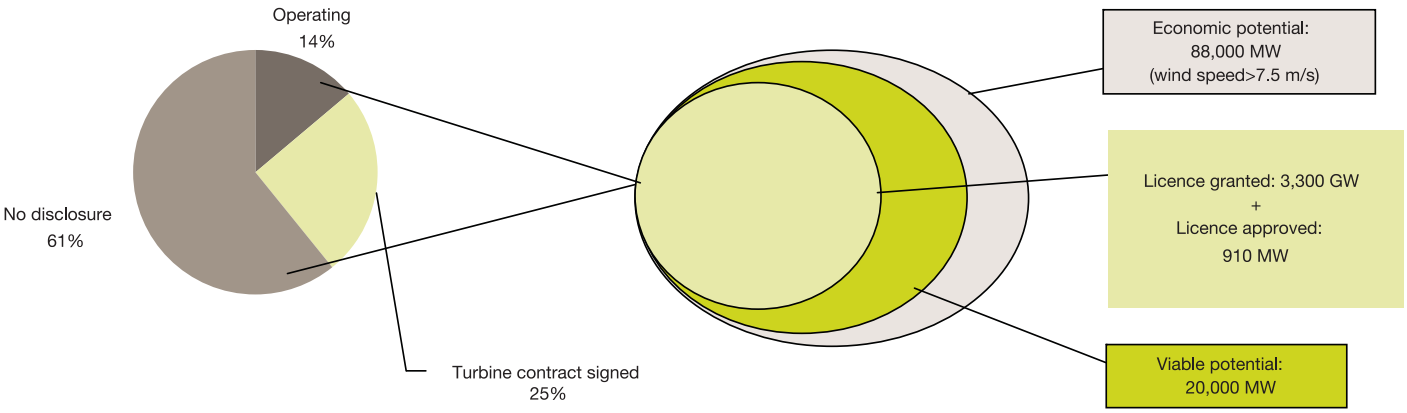
Source: PwC

B - Wind

Tribute to Zephyrus…

With its climate and topography, Turkey represents an attractive geography for wind energy investments. The Marmara, Aegean and Eastern Mediterranean regions have high economic potential for wind power generation. Given the grid infrastructure constraints, however, the highest feasible wind-power generation capacity is estimated at 20 GW, which has been also set as the target capacity to attain by 2023 in the new EMSP.

Figure 11: State of play in Turkish wind market



Source: EMRA, www.ytu.edu.tr

The small share of operating wind farms within the whole licensed capacity, currently hovering at 14%, has been the result of such barriers as shortage in the global turbine supply, high upfront investment cost and ineffective feed-in tariff mechanism in financing. All these translate into a total installed wind capacity of just 469 MW within the total installed capacity of 42GW as of the end of 2008, although it represents an almost threefold jump from its 2007 level of 169 MW.

The licensing for wind-based generation started in 2002, and since then 1,118 applications, all for onshore projects, totalling 86 GW, have been filed. On this timeline, 01 November 2007 marks a milestone, in that a total of 725 licence applications making a total 71.4 GW were filed, most of which targeting overlapping locations, and exceeding the available grid capacity. According to TEIAS, a grid capacity of 7 GW is to be supported, meaning that only one 10th of the total application figure can be licensed. The next step in this process will be a technical review of the applications by EIE, mainly to comment on the feasibility of the non-overlapping applications and to determine the overlapping ones. At the end, TEIAS is to launch a tender for the second group and the highest bidder among the applications targeting the same grid location will be granted the licence to build a wind PP.

Given the high interest in such a limited grid capacity as explained above, the applications for WPP generation and autoproduction are only accepted subsequent to an application launch by the EMRA. And to mitigate such a drawn-out tender process, reviews by EIE and TEIAS are now required prior to EMRA's final decision.

...is only feasible with a working incentive regime.

Given the high upfront costs, the incentive structure in general, and the feed-in tariffs in particular, are crucial to the investment decision.

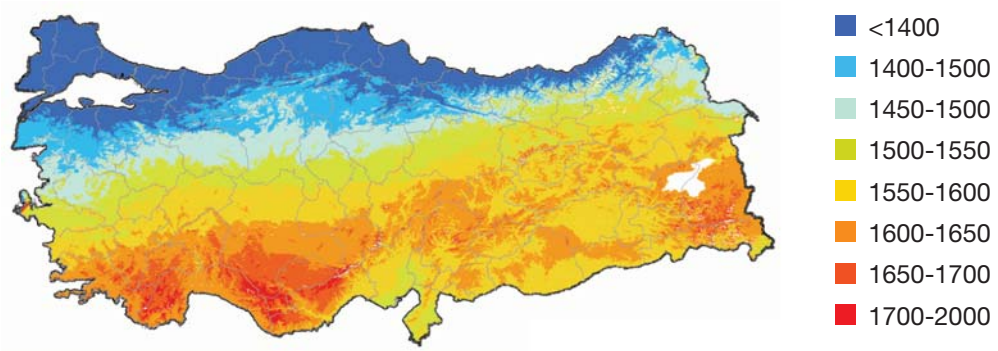
Much higher feed-in tariff levels and longer support periods in European countries emerge as the basic competitive disadvantage in terms of Turkey's wind market receiving a comparatively lower level of interest, despite the favourable wind regime. In fact, with a long coastline, wind farms are proven to be capable of registering a high average capacity factor of 30-35% (globally 20-25%). The picture is expected to change with the recent amendments to the feed-in tariffs, in that the new tariff levels are €cent 8/kWh for onshore WPPs and €cent 12/kWh for offshore WPPs over the first 10 years of operation (Please see Table 2 on page 11). In addition, this differentiation between onshore and offshore technologies is also encouraging in terms of incentivising utilisation of all available resources.

C - Solar power

Rooftops shine as bright as 5-stars in GDP contribution…

According to the solar energy potential atlas of Turkey, an area of 4,600 km^2 is feasible for investment in solar applications, with a technical power generation capacity of 380,000 GWh per annum, equivalent to an output from c.56 GW natural-gas fired capacity. This potential out of a total insolation of 2,640 hours per annum renders Turkey second in Europe. The southern and western parts of the country offer the highest solar potential.

Figure 12: Annual Solar Radiation in Turkey (kWh/m2-year)



Source: EIE

Such a huge potential also has significant implications for employment in the southern and western parts of the country in particular. According to the MENR, each 1MW of solar power generation requires the employment of 33 workers during construction and 10 workers during operation.

…but if but well incentivised.

Despite this huge potential for electricity generation, flatplate solar collectors for domestic hot water production in coastal regions are the only real current use of solar energy. The number of photovoltaic generation applications is insignificant due to high installation costs. Currently, the total photovoltaic generation capacity in Turkey is just 1 MW, basically used by fire-watch towers of the Ministry of Environment and Forestry (MEF), communication towers, meteorological stations, emergency phones and lighting of highways and several research institutes.

However, a recent step by the MENR to incentivise the generation of solar power by housing estates and commercial enterprises by granting them with a purchase guarantee for their excess output, is expected to spark the proliferation of this technology.

The significant upgrade proposal to the feed-in tariffs for solar power generation by differentiating between PVs and concentrating technology (please see Table 2) is expected to add to this momentum and to further promote domestic equipment procurement.

D - Geothermal power

Not everybody is in the 'seething zone'...

Just 5% of the globe falls within the geothermal zone. With its c.1000 resources putting it first in Europe and seventh in the world, Turkey is inside this zone. Two-thirds of the country's geothermal resources are located in the Aegean region. The number of zones with temperature exceeding 40ºC is 170, 11 of which are classified as feasible for electricity generation.

The exploration, development, ownership rights and economic use of geothermal resources are regulated by the Geothermal Resources and Mineral Waters Law No. 5686, enacted in 2007. Licensing and feed-in tariff issues, on the other hand, fall within the scope of the Electricity Market Law and Renewables Law.

…but those who are should use it for electricity generation too.

Out of 2,000 MWe of economic power generation potential, just 30 MWe has been materialised so far. Indeed, out of the licences granted by the EMRA in 2008, just one was for a geothermal PP of 15 MWe, adding to the licensed underconstruction capacity of 64 MWe.The main reason put forward by our industry contacts regarding the low exploitation ratio of the geothermal resources for electricity generation is the lack of technical expertise in project and reservoir management.

Nevertheless, the latest EIE studies envision a faster growth in this capacity, forecasting its reaching 455 MWe by 2010 and 550 MWe by 2013 MWe with the following assumptions:

Table 6: Projections for geothermal power generation in Turkey

Zone	Temperature (ºC)	2010 Forecast (MWe)	2013 Forecast (MWe)
Denizli-Kızıldere	200-242	75	80
Aydın-Germencik	200-232	100	130
Manisa-Alaşehir-Kavaklıdere	213	10	15
Manisa-Salihli-Göbekli	182	10	15
Çanakkale-Tuzla	174	75	80
Aydın-Salavatlı	171	60	65
Kütahya-Simav	162	30	35
İzmir-Seferihisar	153	30	35
Manisa-Salihli-Caferbey	150	10	20
Aydın-Sultanhisar	145	10	20
Aydın-Yılmazköy	142	10	20
İzmir-Balçova	136	5	5
İzmir-Dikili	130	30	30
	Total	**455**	**550**

Source: www.tbmm.gov.tr

However, it is important to note that the target of 600 MWe by 2023 stated in the new EMSP implies a much slower increase than this projection by EIE with respect to the geothermal power generation capacity.

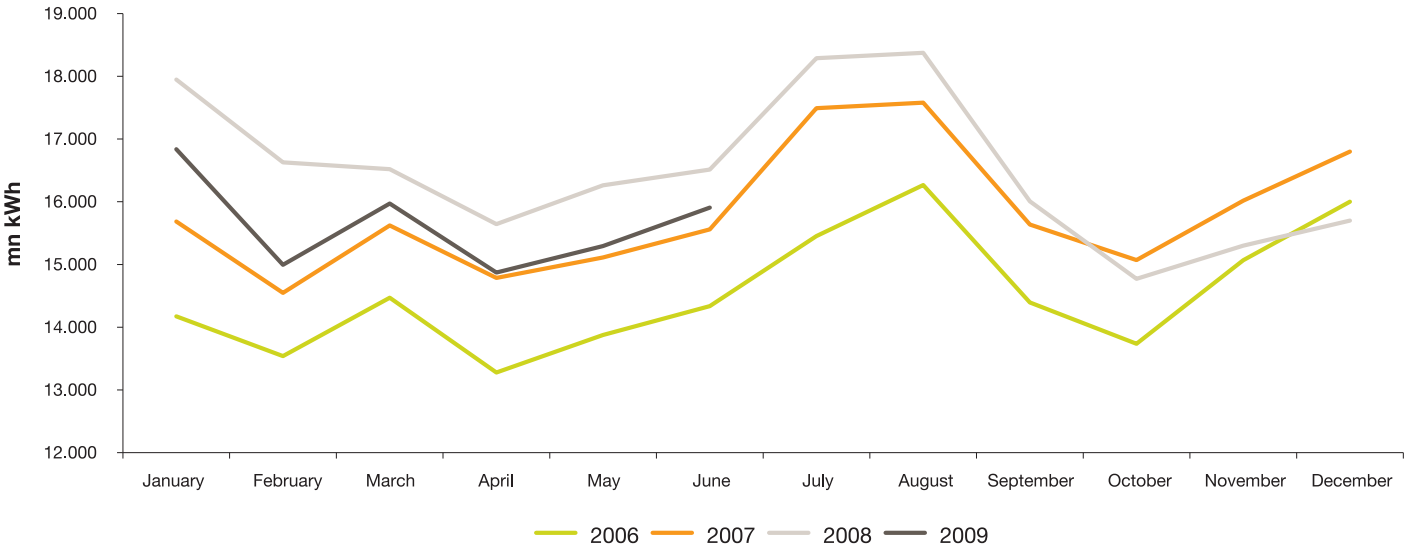
The underlying economics of new power investment is a mix of upfront capital and the earning prospects of the operating environment. In this sense, the question of how the Turkish power generation market will evolve in terms of installed capacity increase mostly hinges on one block of exogenous factors shaped by the credit crunch and one block of endogenous factors defined by institutional evolution and the regulatory environment.

A - Green financing: Getting harder on all fronts

A drop in demand growth was inevitable

The ongoing financial turmoil will be remembered as one with the deepest impact on electricity demand in Turkey. The picture became gloomy by 4Q08, which ended with 4.4% drop in electricity demand, partly caused by a 12.4% decrease in industrial production. 2009 started with no sign of recovery, and demand had touched the 2007 level by April with a y-o-y decrease of 5.2%. As of May, however, mainly on the back of the slight recovery in capacity utilisation and high summer temperatures, a heading up in demand for electricity was felt, although it is still too premature to talk about a complete recovery.

Figure 13: Monthly electricity consumption in Turkey



Source: TEIAS

Cash is recrowned king!

We see the recent public statements by the Turkish banks, which still prioritise renewable energy financing, by and large agree on a medium-term recovery suggestion. However, they all share a cautionary outlook regarding a possible narrow down in financing. In fact, leverage ratios have already reduced, credit covenants have tightened. Given the cost to banks sourcing longer-term capital, there has emerged a substantial pressure to lend on a shorter-term basis. In addition, banks are increasingly more selective with respect to what module type / brand / technology is used to serve these projects. The flipside of the coin clearly displays factors that may prevent this downward spiral's becoming self-sustaining. The deepening credit crunch has already brought about a clear bifurcation between the 'cash-ready's as strategic winners granted cheaper acquisition opportunities, and the less well-positioned 'cash-needy's' feeling the pressure to either sell their assets or to scale back on growth in 2009. In fact, three deal disclosures are already occupying the Turkish renewable agenda in 2009.

Equally important is the emerging oversupply in the alternative energy equipment manufacturing sector given waning global demand. Not more than a year ago, our market contacts on the wind farm developer front, for instance, were complaining about the two-year plus order books of the turbine manufacturers. In addition, they were struggling to finance the prepayments to their suppliers, amounting up to 30% on order placement. But, as the weak credit markets delay many windfarm projects on the global scale or even make them uneconomic given the high gearing ratio, a more balanced market for turbines may at least result with a reduction in prepayments.

Nevertheless, we assign a small possibility to a significant erosion in turbine prices in the short term, as the manufacturers should first recover from the hit they had from raw material costs. Such an environment obviously will be at the advantage of the cash-readys, who will find it easier to complete their ongoing investments or finance those waiting in the pipelines with more flexible supply contracts.

On the other hand, the attention of multinational players who seek to scale-up their global presence through opportune investments will also be on the domestic companies in need of extra funds. Accordingly, the definition of a strong business model in the Turkish renewable energy market will be revised to *the ability to attract a strong and cash-rich multinational partner*.

As the next step to these partnership transactions, we expect to see a strong horizontal consolidation of small portfolios to become optimum generation baskets to be embedded into vertical integration scenarios.

Table 7: Disclosed renewable energy deals in Turkey (1H09)

Target	Acquirer	Stake	Value	Status / Explanation
Yeşil Enerji	Statkraft (Norway)	95%	n.d	Closed
Borusan Enerji	EnBW	50%	n.d	Closed
Palmet Enerji	Manitoba (Canada)	12,50%	n.d	Closed / Sale of Terasen's share in Palmet

Source: Company disclosures

Bilateral agreements will come to the forefront.

The spot market (aka DUY) was initially established to accommodate imbalances in electricity procurements. The opportunity to reflect hikes in natural gas cost to end-customer prices and lower distribution and transmission charges rendered the DUY market much more popular than the regulated tariff, which had been kept flat until 2008 (Please see Appendix 2 for market structure).

However the bleak outlook in industrial production poses an additional downward risk to electricity volumes traded on the spot market. Such a bearish scenario will result in the private generators' shifting a large share of their supply portfolio to longer-term bilateral power purchase contracts with large industrial customers.

Another driver of this shift by the private players to longer-term contracts would be the TETAS tenders, with the aim at securing long-term electricity supply, such that participants are required to bid price and volume for a period of between one and four years. So far two rounds have been attempted, but both failed due to bids being submitted at a level much higher than the TETAS threshold. The failures, on the one hand reveal the gap between the motives behind the private players' market activities and the state's approach, and on the other urge a stronger communication between the two sides for an efficient market system.

It is a positive step that the new EMSP devotes special emphasis to the provision of required conditions to promote medium and long-term contracts.

B - Regulation: Essential to get it right!

Exposure to growth regions will be the key to profit from generation investments…

Despite the recent surge in interest in the Turkish renewable energy market, it would not be totally realistic to relate it to regulatory and legislative effectiveness. In fact, it was achieved despite lags and uncertainties in regulation. In this respect, the root causes for this 'despite' story mostly stem from the side of the multinational investors. In their primary markets, Western Europe and the US, the generation segment is already saturated and thus the focus is now on investing more in transmission and distribution infrastructures.

…the cost of which is shackled to regulation and shareholder pressure.

The investment in question obviously implies high upfront expenditures in a transition market where any single policy change means a material move in the cost of capital. Therefore, in addition to demand growth prospects, the effectively incentivised emergent markets with sustainable and predictable regulatory structures will be the ultimate winners in attracting capital. In other words, the attractiveness of a regulated market depends not only on sustained allowable returns, i.e., manageable market risk, but it also requires regulatory stability with a special focus on a sound and reliable tariff structure.

This has a particular significance for publicly listed multinational utilities, who now feel their shareholders' pressure much stronger than before given the severity of the financial crisis roiling down the stock market. In fact the concern is now more about the return ***of*** capital, than ***on*** capital. This is a concern not only for potential buyers but also for project financing bodies assigning high coefficients to the regulatory risk components in their cost and margin calculations.

At this point the amendment proposal to the feed-in tariff provisions of the Renewables Law, which is currently under consideration at the Turkish Parliament deserves particular attention. This proposal provisions upward adjustment and diversification in the existing fixed feed-in tariff structure. Given the existing mechanisms falling short of providing the private players in the renewable electricity generation market with a viable alternative compared to the spot market, this proposal constitutes a glimmer of hope. However, its effectiveness in attracting more private capital in power plant investments depends on its sustainability and the proper functioning of the payment system.

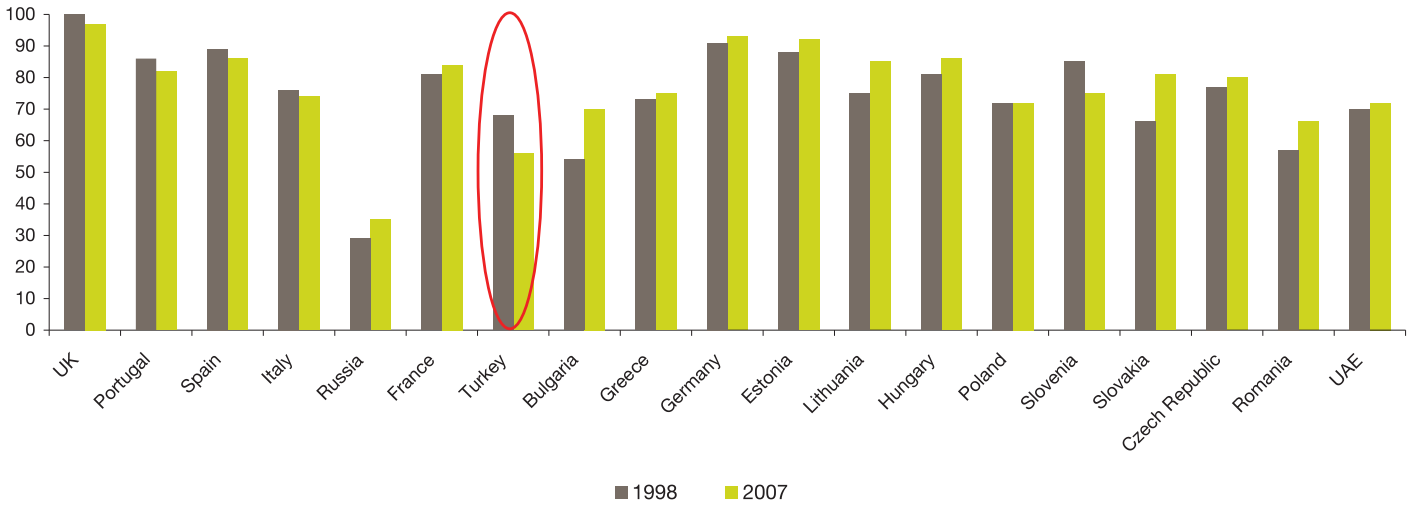
A provision in the new EMSP is encouraging with this respect, in that by the end of this year, all the settlements with the MBSC (the system operator to be responsible for the feed-in payments with the expected ratification of the amendments to the Renewable Law) shall be executed via banks. In addition, both public and private market participants shall keep collateral commensurate with their risk of default.

Poor regulatory performance is unsettling

EU member states are Turkey's main competitors in attracting investment flow to their renewable energy markets. Their membership obligations to curb CO_2 emissions, and growing dependence on Russian gas are obviously transforming the Eastern European markets into investment-friendly playgrounds for the proliferation of renewable energy options, particularly with the enactment of sound incentives. As discussed before, Turkey also has similar motives to promote the exploitation of its renewable resources. Nevertheless, it should do more to outpace its competitors as its struggle to become a member of the EU is ongoing and therefore it lacks community support in financing and regulatory discipline.

In this sense, although it is not energy-market specific, the World Bank Regulatory Quality Indicator, defining *the ability of the governments to provide sound policies and regulation that enable and promote private sector development and foreign direct investment in strategic sectors*, offers a comparative view.

Figure 14: World Bank Regulatory Quality Indicators (1-100 scale)



Source: World Bank

The deterioration of the regulatory quality in Turkey between 1998-2007 underlines our suggestion regarding the need for sound steps to transform the market into a more investment friendly environment, yielding the ability to offer less uncertainty in an already unsure financial climate.

…in an era when host country reliability matters the most!

The regulatory reliability of the host country is particularly important to provide future investors and their financiers with the right price signals. For instance, as mentioned previously, under a bearish scenario, the share of the bilateral contracts in the private generators' supply portfolio is to increase at the expense of the supply to the spot market. Although the margins would not be expected to be on a par with those hit in the spot market so far, the high level of volatility in such short-term arrangements would render the bilateral contracts with industrial customers more reliable a collateral element in funding. However, given the limited volumes that would be contracted in this way, what really matters is the involvement of larger public buyers, i.e., state entities like TETAS and the distribution companies, in such long-term engagements as reliable counterparties.

The basic difference between the power markets of emerging and developed countries is the former's high level of volatility. This precludes multinational investors from setting targets for market share and profit margin, and therefore blurs future operations. In that respect, the emergence of a market where the margins are determined on the base of longer-term contract arrangements and the market share targets are more visible will constitute an important attraction point for long-term investments prospects. Underlying the seamless operation of long-term contracts are timely payments by state contractors and transparent price escalations in particular.

In this sense, the automatic pricing mechanism in operation to quarterly update the national tariff until the end of the transition period (i.e., 31 December 2012), and the provision of the new EMSP to execute the settlements via banks, together with the pledge of collateral commensurate with the risk of default can be deemed as positive steps (please see Appendix 2 for the market mechanism). However, what really matters still lies with the 'will' to operate an effective liberal market.

Another question is whether licence holders will be able to complete their projects within the proposed timetable. The EMRA has the authority to cancel the licence if the project is not completed within the specified timetable - and cash in the licence holder's bank guarantee letter. However, the licensee may apply for an extension of the deadline in the case of *serious negative economic developments at a domestic or international level that could affect the project's investment process*.

Post-Kyoto means it is time to act!

By recently, and in fact belatedly, ratifying the Kyoto Protocol, Turkey displayed its intention to step in among the decision makers of the post-Kyoto period that will begin in 2013.

In line with the rights and obligations framework to be determined during the United Nations Framework Convention on Climate Change, which will take place in Copenhagen, 07-18 December 2009, such an involvement is expected to provide Turkish power plant owners/operators with the right to engage in the trade of different emission-related financial related products, again after 2012. Please note that currently, Turkish players' activities are limited to the voluntary carbon markets. As of June 2009, the number of the project applications for the Gold Standard by WWF reached 44, nine of which have been approved. 80% of these applications are based on wind-PP projects and the rest is shared among geothermal and small hydro-PP based projects, and waste management projects. The CO2-equivalent units expected to be generated out of these 44 projects is ca. 4 mn tonnes. The trade volumes out of two projects in 2007 and again two projects in 2008 were just 112,000 and 146,000 tonnes, respectively.
In the event of the proliferation of such emission-related financial products, allowing the trade of Turkish output, investors would be provided with a significant financing facility to invest in the Turkish renewable energy market. However, this could prove chaotic unless the necessary effort is expended now to design an effective regulatory mechanism. Given the deepening complexity of commodity trading, such a proactive and systematic step would definitely prove vital and would be preferable to first covering such trading activities under the existing regulation and then trying to fix the potential problems with ad hoc approaches.

Liberalisation should improve on all fronts.

So far the operational rights of four distribution companies out of 19 have been tendered. Three more, namely the Yeşilırmak, Çoruh and Osmangazi electricity distribution companies, are currently in the tender process. The improvement is rather poor on the generation front, however, since EUAS has only just determined its sell-side advisor to restructure the PP portfolios to be tendered.

It is important to note that multinational players and large domestic groups approach the electricity market with a holistic view to incorporate a vertically integrated business. In this sense, compliance with privatisation schedules on the government's side matters a lot for investment plans in the pipeline in such a foggy environment.

Although the new EMSP's particular reference to the speeding-up of privatisation is appreciated, the ambitious but ambiguous calendar to complete the tenders for the remaining 12 distribution companies 'to a large extent' by the end of 2010 does not alleviate matters. Regarding the completion of unbundling of the distribution, generation and retail activities by 01 January 2013, the EMSP requires EMRA to lay the regulatory groundwork in 2012. However, this leaves very little time for companies to meet the deadline.

24 Appendix 1: Main institutions in the Turkish renewable electricity market

Institution	Respective body	Role / Responsibility
Ministry of Energy and Natural Resources (MENR)	General Directorate of Energy Resources	Planning and coordination of national energy policies
	General Directorate of Electrical Power Resources Survey and Development Administration (EIE) / National Energy Conservation Centre	Research of viable water sources for producing electrical energy.
		Undertaking hydrological studies and geotechnical research
		Execution of engineering services and design studies for dams and HPP projects undertaken by both public and private sector
		Undertaking construction, operational supervision and consultancy services for state-owned HPPs
		Raising awareness of renewable energy resources and energy conservation
Energy Market Regulatory Agency (EMRA)	General Directorate of Electricity Market	Licensing of renewable energy plants and granting of Renewable Energy Resource Certificate (RES Certificate)
TEIAS	General Directorate of Research and Planning	Long-term electricity supply and demand projections
	General Directorate of Transmission Network Operation and Maintenance	Operation of and investments in the national transmission network
	National Load Distribution Centre	Undertaking the physical demand and supply balance
	Market Financial Settlement Centre	Undertaking the financial settlement among the participants of the Market Balancing and Settlement System
TEDAS and Private Distribution Companies	General Directorates responsible for the execution of bilateral contracts and power purchase agreements	Operation of and investments in the respective regional distribution network
State Hydraulic Works (SHW)	General Directorates	Development of national power resources
		Completion of the ongoing construction work of 15 HPPs that will be transferred to EUAS
		Evaluation and approval of private HPP projects
State Planning Organisation (SPO)	General Directorates	Assisting the government and energy policy making bodies via development plans in general and investment plans and projections in particular

Appendix 2: Supply structure in the Turkish electricity market

The Turkish Electricity Market Law and the related legislation provide autoproducers and IPPs with three types of customers:

1. TEDAS and private distribution companies

- direct sales via bilateral contracts

- indirect sales via the spot market *(DUY)*

The electricity spot market in Turkey (aka *DUY* market) has become the main revenue source for independent power producers since its inception in September 2006, following a serious supply crisis. Briefly, it is an open auction market operated by TEIAS, where private generators submit their output and pricing bids for every hour in a month. The main customers of the market are distribution companies and TETAS, acting as a wholesaler. A recent change in spot market regulations allows demand-side participation from October 2009.

The new ESMP aims to restructure MBSC into an independent system operator by the end of 2009. In addition, the current spot market shall be divided into two, a day-ahead market and a real-time spot market. A new regulation shall be released by the end of 2009, and the day-ahead market is expected to start operating in 2011. A forward market, on the other hand shall be set up in the medium term.

2. TETAS via long-term procurement tenders

This scheme would be particularly attractive to renewable electricity generators, mainly because the future output of the plants currently under construction can be tendered in such a way as to provide the project owners with an important collateral source for project financing.

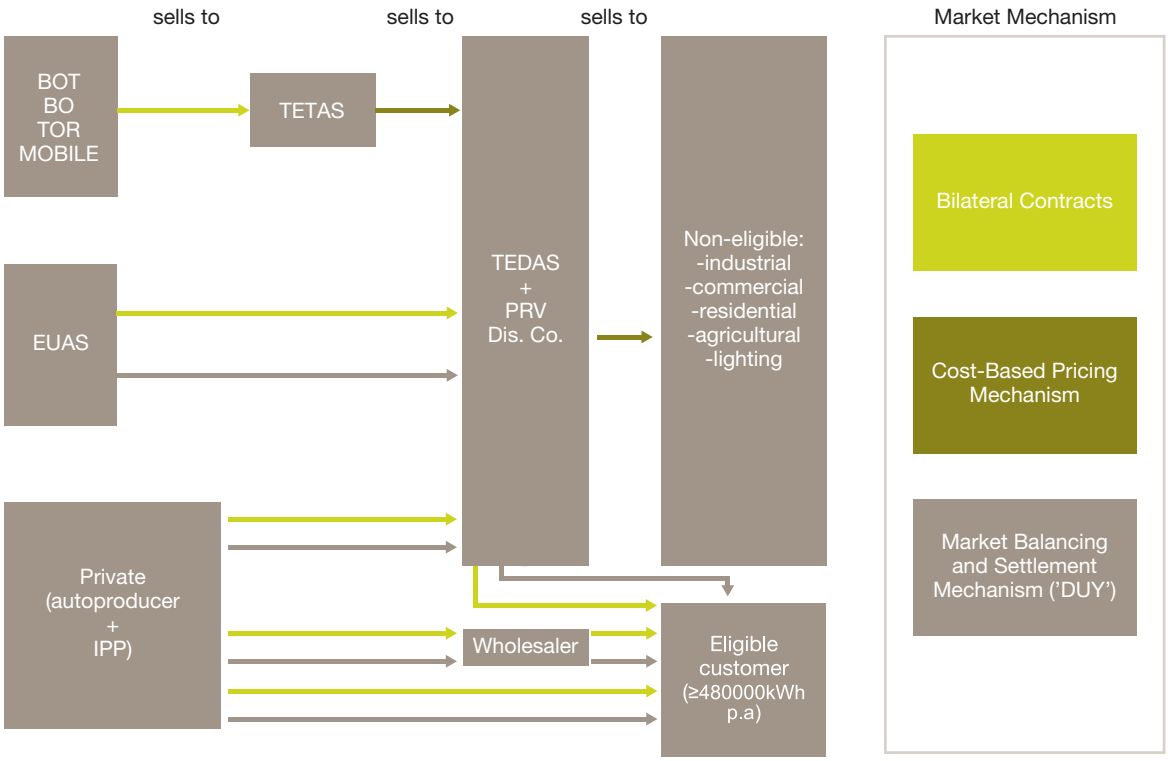
3. Eligible customers (consumption > 480,000 kWh p.a) via long-term bilateral contracts

The new EMSP envisions full eligibility for industrial users by the end of 2011 and for the non-industrial users by the end of 2015.

4. Capacity mechanism

The new EMSP brings a ‘capacity mechanism’ to the Turkish market. To participate in the mechanism, generators shall be required to declare their reliable capacity and issue capacity certificates. The Ministry is to prepare a regulation about how this mechanism will work in practice and implement it before the end of 2009.

Figure 15: Supply structure in Turkish Electricity Market



1Q08	1st quarter of 2008
2Q08	2nd quarter of 2008
3Q08	3rd quarter of 2008
4Q08	4th quarter of 2008
1Q09	1st quarter of 2009
€	Euro
€cent	Euro cents
ADUAS	Ankara Doğal Elektrik A.S
bbl	barrel
bn	billion
BO	Build-Operate
BOT	Build-Operate-Transfer
BOTAS	Petroleum Pipeline Corporation
CAGR	Compound Annual Growth Rate
CEAS	Çukurova Electricity Company
CFPP	Coal Fired Power Plants (lignite, hard coal or imported coal)
CUR	Capacity Utilisation Rate
DSI	General Directorate of State Hydraulic Works
EIB	European Investment Bank
EIE	Electrical Power Resources Survey and Development Administration
EMBSR	Electricity Market Balancing and Settlement Regulation
EML	Electricity Market Law No. 4628
EMLR	Electricity Market Licensing Regulation
EMTR	Electricity Market Tariff Regulation
EMRA	Energy Market Regulatory Authority
EU	European Union
EUAS	Electricity Generation Corporation
GDP	Gross Domestic Product
GenCo	Generation Company
GPP	Geothermal Power Plant
GW	Giga Watt
GWh	Giga Watt Hour
HPP	Hydroelectric Power Plant
IBRD	International Bank of Restructuring and Development
IMF	International Monetary Fund
IPP	Independent Power Producer
kWh	Kilo Watt Hour
MEF	Ministry of Environment and Forestry
MENR	Ministry of Energy and Natural Resources
MFSC	Market Financial Settlement Centre
mn	million
MW	Mega Watt
MWh	Mega Watt Hour
n.a.	not available / not applicable
n.d	not disclosed
NGPP	Natural Gas Fired Power Plant
p.a	per annum
PA	Privatisation Administration
RES Certificate	Renewable Energy Source Certificate
RoW	Rest of the World
SHW	General Directorate of State Hydraulic Works
SPO	State Planning Organisation
T&D	Transmission and Distribution
TEAS	Turkish Electricity Corporation
TEDAS	Turkish Electricity Distribution Corporation
TEIAS	Turkish Electricity Transmission Corporation
TEK	Turkish Electricity Authority
TETAS	Turkish Electricity Wholesale Corporation
TFPP	Thermal Fired Power Plant
TKI	General Directorate of Turkish Coal Enterprises
TL	Turkish Lira
TOR	Transfer of Operating Rights
TPP	Thermal Power Plant
TWh	Terra Watt Hour
UCTE	Union of Coordination for Transmission of Electricity
UNFCC	United Nations Framework Convention on Climate Change
US$	US Dollar
UScent	US Dollar cents
WACC	Weighted Average Cost of Capital
WB	World Bank
WPP	Wind Power Plant

28 Figures and Tables

References

1. www.teias.gov.tr
2. www.tedas.gov.tr
3. www.tetas.gov.tr
4. www.epdk.gov.tr
5. www.yased.org.tr
6. www.oib.gov.tr
7. www.dpt.gov.tr
8. www.ressiad.org.tr
9. www.eie.gov.tr
10. www.ruzgarenerjisibirligi.org.tr
11. www.kfw.com.de
12. www.wb.org
13. www.eib.org
14. www.cdmgoldstandard.org
15. Standard Unlu Securities Research Reports by Alen Bebiroğlu

Contact our Energy, Utilities & Mining core team

Faruk Sabuncu
Partner, Energy, Utilities & Mining Leader
Telephone: (90) 212 326 6082
Email: faruk.sabuncu@tr.pwc.com

Orhan Cem
Partner, Advisory Services Leader
Telephone: (90) 212 376 5302
Email: orhan.cem@tr.pwc.com

Engin Alioğlu
Partner, Transactions
Telephone: (90) 212 376 5304
Email: engin.alioglu@tr.pwc.com

Murat Çolakoğlu
Partner, Tax Services
Telephone: (90) 212 326 6434
Email: murat.colakoglu@tr.pwc.com

Ediz Günsel
Partner, Assurance Services
Telephone: (90) 212 326 6067
Email: ediz.gunsel@tr.pwc.com

Fulya İlbey
Energy Expert
Telephone: (90) 212 376 5364
Email: fulya.ilbey@tr.pwc.com

PricewaterhouseCoopers provides industry-focused assurance, tax and advisory services to build public trust and enhance value for its clients and their stakeholders. More than 155,000 people in 153 countries work collaboratively using connected thinking to develop fresh perspectives and practical advice.

PricewaterhouseCoopers, operating in Turkey since 1981, consists of five offices; in İstanbul (2), in Ankara, in Bursa and in İzmir, with 31 partners and 1,100 professional staff.

S. Seba Cad. No:48
BJK Plaza,
B Blok Kat 9 Akaretler
34357 Beşiktaş - İstanbul
Tel: (90) (212) 326 6060
Fax: (90) (212) 326 6050

Büyükdere Cad.
No:100/102
Maya Akar Center B Blok
34394 Gayrettepe - İstanbul
Tel: (90) (212) 355 5858
Fax: (90) (212) 355 5850

Atatürk Bulvarı
Celal Bayar İş Merkezi No:211/18
06680 Kavaklıdere - Ankara
Tel: (90) (312) 457 4545
Fax: (90) (312) 457 4550

Hürriyet Bulvarı No:4/1
Kavala Plaza, Kat 6
35210 Alsancak - İzmir
Tel: (90) (232) 497 7070
Fax: (90) (232) 497 7050

Y. Yalova Yolu 4. km
No:424 Buttim Plaza,
Kat 9 D:1622
16250 Osmangazi - Bursa
Tel: (90) (224) 270 2929
Fax: (90) (224) 270 2930

www.pwc.com/tr/renewables