



GLOBAL BUSINESS REPORTS

# Power in Turkey

## Rewiring the grid: the State, the market, and the state of the market

Emerging markets, even those that seek to defy it, are inextricably the product of their past. The role that the legacy of bureaucracy plays in shaping institutional power structures and the way in which cronyism manifests itself are determined by the historical shape of a country. Real junctures in a country's development are rare. Opportunities for a country to decidedly separate itself from the past – to reform, transform and democratize power – do not come often. Turkey, and as an extension of it the country's energy sector, has long stood at one such juncture.

Today, the path which Turkey chooses will determine the country's ability to answer one of its most pressing macro-economic concerns: the dual challenge of possessing one of the world's most rapidly growing energy markets while containing little known hydrocarbon resources. Already this dilemma has built a \$42.9 billion current account deficit. Of equal importance to the current political administration, the path which Turkey chooses at this juncture will also determine to what extent the country is capable of accomplishing its Centennial Goals, one of current Turkish President Recep Tayyip Erdoğan's flagship projects. More ambitious than realistic and stemming from Turkey's larger goal of becoming one of the world's ten largest economies by 2023, these targets for the energy sector include the establishment of 20,000mW of wind energy, 600mW of geothermal energy and the construction and operation of three nuclear power plants within the next eight years. The extent to which Turkey will be able to progress with these projects will be shaped by its ability to reject its past.

Though the modern structure of Turkey's energy market was first formally established in 2001 through the creation of Turkey's Energy Market Law, the dynamics underscoring the Turkish energy sector of today far predate this, tracing their roots to the first point in modern Turkish history where the country came across another such a juncture in its development: the establishment of the Republic of Turkey in 1923 led by Mustafa Kemal Atatürk, the Republic's first president whose theory of social and political governance has dictated the course of the country's growth until now. Advocating a statist approach to economic planning, Atatürk established the political structures that would guide the expansion of Turkish energy: structures that only today are finally being dismantled. Pub-

This report was researched and written by Global Business Reports

Alice Pascoletti and JP Stevenson



Photo courtesy of Zorlu Energy.



lic works established the early rudiments of Turkish energy, constructing many of the country's largest power generation facilities, including the eponymously named Atatürk Dam, which currently generates 8,900mW of energy annually and stands as one of the world's largest hydroelectric power projects.

Only in 2004 did privatization begin for the energy sector in earnest. Murat Çolakoğlu, partner at PriceWaterhouseCoopers explained: "The late 90s were marked by a fundamental need for more energy production facilities. Greenfield investments were needed to address an issue that underscored many Turkish industries: the need for a consistent and secure power supply. This was reflected in strong incentives issued by the central government and the proliferation of build-operate-transfer (BoT) financing models. Later, BoT investments fell out of favor; the burden they placed on the public sector was too heavy to be sustainable. These models were all but completely abandoned ten years ago."

In their place, the state began targeting its most inefficiently operating and cash-hungry assets for privatization. Foremost among these projects was the country's electricity distribution network. Divided into 21 separate distribution regions, Turkey's electricity distribution networks were fully privatized at the end of 2013. Concurrently, the state also began to undertake the privatization of its assets in power generation. Focusing, logically, on its portfolio of natural gas-fired power plants and small-scale hydropower projects instead of its more profitable large-scale hydroelectric power plants, the Privatization Administration commenced privatization of its assets in power generation in 2008.

A decade on, the benefits of this policy are clear. Collectively through the sale of both its assets in distribution and generation the State was able to realize proceeds of over \$20 billion. Liberalization also allowed for generation to rise significantly. Ahmet Aksu, president of the Republic of Turkey's Privatization Administration explains said: "Previously, there was a market where the state was the only actor. In 2001, the capacity of electricity generation in Turkey was 28,000mW; however, today it is around 70,000mW. This alone proves that the model undertaken in Turkey has been successful."

Considerable successes indeed. Yet to assume that these developments have meant that the state no longer plays a considerable role in the development of the country's energy sector would be incorrect. Ankara remains the energy market's chief director and largest stumbling block. This is observed in the two vestiges of the old regime that remain within Turkey's energy

sector, the most obvious of which is found in the continued presence of the state in generation, transmission, and the country's natural gas market. Through State Hydraulic Works, the Turkish government continues to operate 53 of Turkey's 135 installed hydroelectric power plants, accounting for 10,215mW of the country's total generation capacity. More critically, however, the government continues to also control BOTAS, the organization that holds a monopoly control over Turkey's natural gas market. With over 50% of the Turkish market depending on natural gas-fired power plants for electricity, the success of the Turkish government in transforming its energy market cannot be assessed without understanding the implications that the state's control over the natural gas market has had on the development of the country's energy matrix.

Eser Ozdil, secretary general of PETFORM, an organization involved in petitioning the government with private sector concerns for those involved in the exploration, production, processing, storage and transmission of crude oil and natural gas, explains the implications of that this has held: "Owing to its vertically-integrated nature, BOTAS holds control over 80% of the wholesale market. This is in addition to its position within gas importation – it controls 75% of total imports – and transmission, for which it acts as the country's sole operator.

'The problem that this structure creates is most evident in the case of those that must compete against BOTAS in importing natural gas. These companies must sign an agreement with BOTAS to transmit their gas as BOTAS controls the country's pipeline network – yet they must also compete with



Ahmet Aksu, president of the  
Republic of Turkey's  
Privatization  
Administration

BOTAŞ. This is already an uneven playing field as BOTAŞ also subsidizes gas prices in the domestic market.

‘Those operating pipelines should function independently. All data related to the trade of energy and natural gas should also be made publically available. Otherwise private sector involvement is purely speculative. But in Turkey, unfortunately, our transmission system operators are not independent. We cannot even have a benchmark price for energy and natural gas because the price which BOTAŞ chooses to set, by default, becomes the benchmark price. For Turkey’s energy market to mature, the privatization of BOTAŞ is sine qua non.’

Önder Karaduman, Chairman of the Board at Turkey’s Electricity Producers Association (EÜD), explains concurs that, ‘It is impossible to discuss the state of Turkey’s energy market and claim that it is healthy when natural gas prices are not subject to market forces and not the product of market competition. BOTAŞ must be disassembled.’

One of the most tangible ramifications of Ankara’s continued control of the country’s gas market is exhibited in the country’s inability to translate the changes that have occurred in the global market for hydrocarbons since oil and natural gas prices begin to fall last year into lower prices for natural gas within the domestic market.

Sinan Ak, general manager of Zorlu Energy, one of Turkey’s largest generators and a subsidiary of Zorlu Group which is investing \$8 billion into the establishment of a natural gas pipeline from Israel, explained: ‘As of yet, we have seen little impact between the global pricing situation for oil and gas and the Turkish market, though we expect that this will soon change. Decreases in natural gas prices in many other regions will enable the Turkish government to better negotiate gas contracts with surrounding countries in the near future, especially with Israel, Iraq and Azerbaijan, which seek to expand natural gas usage in Turkey. In tandem with this, we will also see volumes of gas imported into Turkey increase. This event, though, will only occur pending changes to the regulatory framework of Turkey’s energy sector.’

Within a better connected energy market, this would have already occurred. However, the continued presence of the state in the energy market has deterred these

investments, in addition to those in generation. Of particular concern has been the Turkish government’s continued role in electricity transmission and the impact that this has held on infrastructure renewal and expansion.

Elvan Tugsuz Guven, general manager of Çiltuğ, a leader in heavy manufacturing for Turkey’s energy sector which also operates in generation through its subsidiary Tektuğ, explained: ‘When market liberalization first began to occur in Turkey, we held great hope that we would see an increase in greenfield investment, especially for wind power projects. Even following the initial failures of the government during the first tender process it executed for wind licenses in 2007, we believed that we would see the investments in transmission required to facilitate the expansion of these projects made and dismissed the notion that this event indicated the nature of the state’s involvement in the market. Having expanded into the construction of wind towers in anticipation of these investments, Çiltuğ has



Önder Karaduman, chairman of the board, Turkey Electricity Producers Association (EÜD)

been sorely disappointed. ‘TEİAŞ, charged with managing Turkey’s electricity transmission network, ‘has yet to meet their commitments to improving connectivity; our energy infrastructure remains underdeveloped; and many of the targets which the government initially set for correcting this have not been met. In addition, renewable energy investors who made power house and transmission investments on behalf of



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Transmission tower manufactured by BTE Energy. Photo courtesy of BTE Energy.

TEİAŞ, have been disappointed due to long years of connection investment offsetting. Issues associated with transmission continue to detract from the feasibility of investments made into generation as many, especially, in wind, must either undertake the cost of these expansions or otherwise see their ability to supply power to the market limited by poor infrastructure.”

Less obvious but equally powerful, the second vestige of the old regime is observed in the way in which the legacy of the country's bureaucracy has shaped the energy sector's project development and licensing processes.

Dr. Rüçhan Bülent Hamamcı, deputy general manager of Sancak Energy, which currently holds four licenses for wind power projects, explained how the regulatory structures governing licensing as handled by Turkey's Energy Market Regulatory Authority (EMRA) have halted the development of their site in Izmir: “The way in which licenses are administered in Turkey must be restructured. The current licensing

process requires that, in order to even apply, investors must go back and forth between as many as 30 agencies. Yet even once licenses are administered, this does not necessarily guarantee that one has a license to operate. In the case of our project in Izmir, though we have received a license, the development of our project has been halted by the local community. The only recourse we have had is in judicial proceedings. There must be a department within EMRA to handle post-permitting issues. Especially in Izmir, these situations are common. Post-tender support is necessary and EMRA must develop as a coordinating body – otherwise investors will begin to turn away from the energy sector.”

However, perhaps posing a more direct threat to the perceived stability of future investments in Turkey's energy sector has been TEİAŞ and its tender process for licensed projects in renewable energy. Designed to facilitate the development of large-scale renewable projects within Turkey, the system employed by TEİAŞ has been characterized by both poorly developed regulatory structures and erratic market behavior. These problems first became evident in 2007, during the country's first tender for wind energy where few of those that participated in the tender were able to successfully develop projects because of the framework that TEİAŞ had established to govern its bidding process. Though since 2007 the tender process for renewable projects has been restructured, again earlier this year TEİAŞ executed another tender which disconcerted investors, this time in solar.

Gultekin Eranil, general manager of Boydak Energy, a recent participant in TEİAŞ solar tender which plans to expend near \$1 billion by 2017 to build its portfolio of assets in generation, explained: “In calculating the final bid price for our projects, we realized that with our price the project stood at the borderline of our project feasibility according to our company assumptions and expectations. While we feel that we paid a relatively high amount for our project, there were many other participants that paid more, their bid prices for connection rights of 1mW were as higher as cost of 1mW PV Solar Power plant investment The critical question is, these projects can be realized within 2-3 years?”

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The effect of this has been to move investors to focus on unlicensed energy projects, which, though originally intended for cogeneration, have seen their desirability grow owing both to the ease with which they allow investors to enter into energy trading and their appeal as targets for license acquisition.

Muzaffer Yosmaoğlu former general manager of Koç Holding, one of Turkey's largest energy generators and current CEO of Bio-Construct, which has executed the country's largest investments in biomass energy projects, said: "Generation in Turkey can be divided into two categories of projects from a regulatory perspective, licensed and unlicensed projects. This latter category was originally intended for cogeneration; there are no laws governing these unlicensed projects. They stand in a regulatory gray area. Our current problem is rooted in this. Imagine a farm that wishes to develop a 1000kW power project, but only uses 1/20th of this electricity for its own uses. Because it is connected to the grid, they are able to trade the remaining electricity they generate. Licensing is an onerous, time-consuming process – land must be rented, pre-licensing requirements must be met, and then these projects must undergo a public-bidding process, which, at least recently, has been characterized by exorbitant pricing. Unlicensed projects are not subject to any of these conditions. Consequently, a situation has emerged where these projects, because they are subject to little governance, have become more attractive than larger scale licensed projects. An uneven competitive structure has emerged and, as a result, the original intent of these unlicensed projects – cogeneration – has been lost, and with it we have seen a great number of investors enter into the market either as a platform for establishing either energy trading businesses or later selling their license.

'This goes against the country's regulatory structure. Law 6446 bans license-trade. Through EMRA's failure to govern these unlicensed power projects, unlicensed power projects have now become so valuable that many project licenses are now being traded. This, of course, is not only unfair to those that undergo the process to receive project licenses but also directly goes against the country's regulatory framework.'

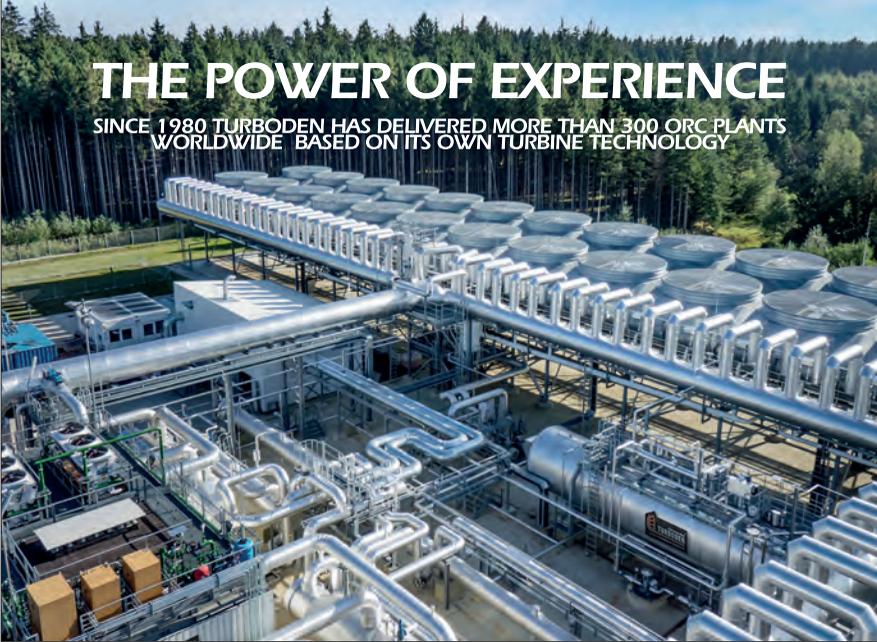
*"A situation has emerged whereby unlicensed projects, because they are subject to little governance, have become more attractive than larger scale licensed projects."*

**- Muzaffer Yosmaoğlu  
former general manager,  
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This issue, notably, has underscored the role which vested interests continue to play in shaping the regulatory structures that govern Turkey's energy sector. Yosmaoğlu, who recently petitioned Turkey's energy regulator for a redress of unlicensed energy projects, explained: "Upon bringing the issues associated with the lack of regulation of unlicensed projects and the attendant conflict that they create with Turkey's legal system to the attention of EMRA, the regulator announced that a requirement would be imposed in line within the legislation governing fossil fuel fire cogeneration, that the proportion of electricity that could be traded would be limited to 40% of total unlicensed production. Later, EMRA back-stepped, issuing a statement stating that the size of these projects did not necessitate a regulatory framework. The rationale driving this: the Minister himself, many of the MPs, several heads of municipalities and figures within EMRA have applied for unlicensed projects."

So why then, in spite of these many challenges, should Turkey attract investors? The answer to this is nuanced and lies in both the fundamentals of Turkey's energy market and the country's political and economic framework.

Turkey is a burgeoning energy market. Dr. Zafer Demircan, the Republic of Turkey's General Director of Energy, said: "Economic expansion, rising per capita income levels, positive demographic trends and the rapid pace of urbanization will continue to drive domestic energy, which is expected to increase around 6% per annum until 2023."

Indeed, Turkey offers a young population – the youngest of any European nation – and a GDP that the government projects will increase by 4% in 2015 and 5% in 2016. Owing to this, the government targets for energy generation to reach 120GW by 2023. This will necessitate a projected \$110 billion of investment into the country's energy sector. With the country currently indulging in several other massive infrastructure projects, a large proportion of this capital must come from foreign markets. The government is thus expected to respond. Beyond this though, the foreign investor must also place the challenges currently faced by the country's energy sector in context. The domestic energy market of ten years ago – state-controlled and highly regulated – was far different from the energy market of today. Issues associated with the country's natural gas market, its transmission system, and the energy sector's licensing and tender process are not symptomatic of a country unsure of the role of private sector participation in its development, but rather the nascence of its new institutional power structures. Should foreign investors seek further reassurance, they need only look to the country's regulatory processes as a whole.

Ferhat Melik, board member at Vis Hydro, explained: "Taken collectively, the legislative climate of Turkey is similar to that of the European Union. The government has justified its position with past performance and there are few inconsistencies to be found in pol-

icy making. Turkey offers no legal or legislative risks but the added benefit of returns found only within emerging markets. That is the beauty of Turkey."

Mehmet Ali Neyzi, CEO, at STFA, one of Turkey's largest distributors of natural gas with significant holdings in generation, confirms: "Turkey has a vast population and low penetration for energy. There is a huge growth potential in electricity and per capita usage of energy. With EMRA regulating the market, we will have more transparency. The energy market is quite sophisticated, so for a foreign investor there is a great incentive to invest in Turkey. Turkey is an emerging market and it is easy to conduct business here as opposed to other developing countries. It is a lucrative market with limited legal and financial restraints."

The beauty of Turkey's energy sector also rests in that quality which has made the sector, at least initially, difficult to navigate: its market liberalization process. The early stages of market liberalization present investors with an opportunity to enter into segments of the market that would otherwise, in more mature markets, possess high barriers to entry. This is observed in the case of retail electricity distribution.

Historically controlled by the Turkish Electricity Distribution Company (TEDAŞ), Turkey's retail electricity market opened to investors through the tender of six distribution companies in 2010, since when several businesses have established themselves in the segment. Among those was Bis Energy, which currently stands as the sector's 6th most profitable business with revenue of £636 million in 2014 through its 486mW of generation capacity and which entered into the retail market through the establishment of its subsidiary, Bisen Energy, in 2011. Underscoring the company's decision to establish Bisen Energy were the lucrative prospects offered by a market just opening.

Mesut Alparslan, CEO of Bisen Energy, explained that, "Market liberalization presented our parent company, Bis Energy, with an opportunity to enter a market at a very early stage in its development. The profits, and lack of competition, offered by the retail electricity market, if compared against the institutional market for energy, are larger. Moreover, retail consumers show far less sensitivity to energy prices than institutional customers. While a discount of 1% might spur an institutional consumer to switch accounts, the grounds upon which energy retailers compete are more solid. The sector also offers, comparatively, far less risk."

This is not to say that the impediments faced by Turkey's energy sector should not be given due consideration. The role that the government plays in addressing these structural issues will determine which path the country takes at its current juncture. Yet in opening its energy markets to investors ten years ago, the country already set its footwork on the path of reform. For this, Turkey demands consideration.



Dr. Zafer Demircan, Republic of Turkey, general director of energy



Mesut Alparslan, CEO, Bisen Energy

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Photovoltaic module supplied by Tekno Ray Solar. Photo courtesy of Tekno Ray Solar.

## Generation

### Interest in renewables drive generation in 2015

Currently standing as Europe's sixth largest economy, Turkey and its demand for electricity have expanded rapidly in tandem with the country's growth. Nearly doubling in the past 12 years, Turkish energy consumption increased from 132.6TWh in 2002 to 255.5TWh in 2014. Since 1990, consumption has grown by 4.6% per annum, a path that the industry looks set to continue on until 2023 through which point in time annualized growth of 5% to 6% is expected. In 2023, Turkey's Ministry of Energy and Natural Resources predicts that total energy consumption could reach as high as 450TWh.

This, of course, has necessitated investments in generation. Commencing with

the introduction of Turkey's Energy Market Law in 2001, which marked the dawn of market liberalization, total installed generation capacity has grown within the country from 31,900mW in 2012 to 69,500mW in 2014. Totalling 6,000mW per annum over the past three years, these investments have been executed almost exclusively by the private sector through expanding the country's network of natural gas power plants and hydroelectric power dams. The story of Turkey's energy sector of today begins herein. Poor in energy resources, Turkey is seeking to correct its heavy dependence on foreign supplies of natural gas and its attendant foreign account deficit through expanding domestic generation of energy through renewable resources. This has been backed by a decline in the desirability of natural gas fire power plants.

Ozan Korkmaz, partner at APLUS, an energy investment and technology consultancy operating within the domestic market said: "At the moment there is little demand for additional natural gas power plants in Turkey, similarly to the situation in Europe. Within the feasibility studies that APLUS has conducted over the course of the past year, we have continually seen that newly constructed natural gas fire power plants are not profitable."

With the country's potential for hydroelectric power generation all but saturated at 23,600mW, this will necessitate investment in new fields of energy.

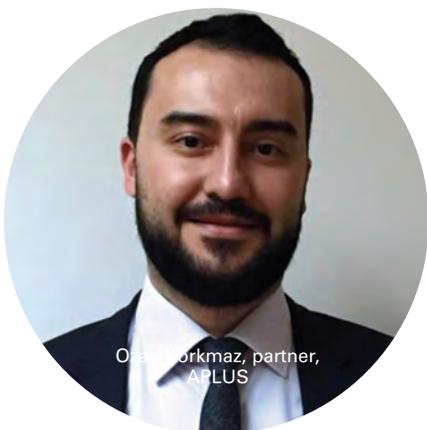
## Solar

Turkey's still dormant solar industry has been the subject of fervent market speculation of late. Sun-rich, the country, in theory, shows tremendous potential for solar energy production. The Turkish government targets raising \$7 billion of investment for the sector over the course of the next years, the product of which, it hopes, will be a minimum of 3,000mW of solar energy production.

Extending from this goal and the Turkish government's larger ambition of meeting 30% of its domestic energy needs through renewable energy generation by 2023, the Turkish Electricity Transmission Company (TEİAŞ) is expected to allocate 600mW of solar energy production licenses in 2015. This will be done through several rounds of license tenders.

Announced in January of this year, the first of these rounds was completed earlier last month. Noted for the exorbitant price paid by winning participants, which for some projects stood at an amount greater than the cost of plant construction, the prices paid for these licenses led to speculation that these investments were driven more by pride than practicality.

Mehmet Ozenbos, the sales and marketing manager of Tekno Ray Solar, a JV between Turkish Tekno, and Italian Enerray, which supplies solar systems to the Turkish market explains that, "Solar is a relatively new field for Turkey. The recent tender was



Ozan Korkmaz, partner,  
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*“We have great wind potential in Turkey; 25% to 30% more than the European average”*

**- Mustafa Serdar Ataseven, president, Turkish Wind Energy Association**



a landmark event; it represented the first time that many would have the opportunity to participate in the sector. This drove many, especially those from outside of the energy industry, to drive up the prices of project licenses, for reasons that to many members of the investment community were unclear. The industry is now left to

wonder after ten years how many of these projects will have actually materialized.” Foreign market participants in the tender included German Belectric, whose projects will have a proposed AP connection capacity of 32.4mW, and American thin-film specialist First Solar, who will seek to produce 19mW. Though those projects that enter into production prior to 2020 will receive a feed-in tariff of \$133/mW, with 3,000mW of solar licenses that have yet to be tendered, in all likelihood, this first round of solar tenders will be the highest prices that the market will see.

**Wind**

Tracing its roots to 2006, when the country established its first swath of wind turbines, wind energy production in Turkey has grown quickly from its recent beginnings. Today, the Turkish Ministry of Energy and Natural Resources estimates current installed generation capacity to stand at 3.6gW, which, owing to Turkey’s climate and position relative to the European market, could grow rapidly.

Mustafa Serdar Ataseven, president of the Turkish Wind Energy Association, noted that, “We have great potential in Turkey, 25% to 30% more than the European average. In Europe, one wind park works at about 2,000 to 2,500 hours per year. In Turkey, our wind parks work more than 3,500 hours per year. In addition, the European market is saturated with wind projects. This has aided us. Our industry target is 20,000 megawatts (mW) by 2023. We have 11,000mW in project stock.

For this the government seeks to attract \$22 billion in new investment by 2023, a large portion of which it could realize through the country’s April wind tender.

Murat Çolakoğlu, partner at PriceWaterhouseCoopers, said: “At the end of April, the Turkish government will embark on the selection process for what will be the country’s largest volume renewable tender. Executed by EMRA, this tender has proven to be very attractive. Over 600 companies have invested in the bid process, for which they were required to conduct basic engineering, including the construction of towers for the purpose of making measurements related to weather and wind-power. In part developed to preempt license-sellers, additional pre-requisites include letters of guarantee, letters of commitment, and the satisfaction of a pre-licensing process. Following the selection process, EMRA will require winning bidders to proceed with project administration, including providing capital commitments and guarantees as well as detailed engineering studies.”

To some, especially early participants in the market, this may come as a surprise. Famously, in 2007, during TEİAŞ’ first wind license tender, the country received over



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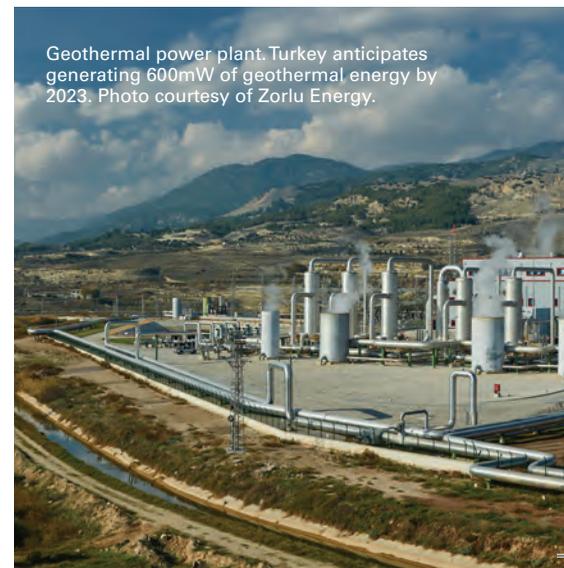
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Geothermal power plant. Turkey anticipates generating 600mW of geothermal energy by 2023. Photo courtesy of Zorlu Energy.

75gW of license applications in one day, owing to few limitations imposed on license applicants, the result of which was what many in the industry have come to refer to as a Gregorian knot of investments. Though many projects received licenses, all but a few of these projects were unfeasible. Consequently, many license winners, unable to receive project financing, were forced to return their licenses.

While in response to this, EMRA, Turkey's energy market regulator, has developed a stringent pre-licensing application process, with over 600 applications it is unclear how many of these projects the industry may see materialize. However, should the country's wind tender process resemble the recent solar license auction, participants will be aided by a feed-in tariff structure which will grant \$73/mWh. Of additional benefit to some, wind power projects developed using locally manufactured towers and blades will be eligible for an additional feed-in tariff, which would bring the market price of their energy to \$87/mWh.

## Geothermal

Representing a far smaller portion of Turkey's energy matrix than wind or even solar, geothermal energy is a new frontier for Turkish energy, a frontier that could, within the coming eight years, come to play a greater role in power generation than previously anticipated. This is rooted in both Turkey's still fledgling potential for these projects and the introduction of new technology which will enable Turkish energy generators to better use existing resources.

Though geothermal energy exploration first began in Turkey in the 1960s, the country's first geothermal facility, the Kızıldere



# PwC Deal Review: Deals for real

**Murat Çolakoğlu, partner, PwC Turkey, energy utilities & mining industry territory leader**

With 40 deals, 2014 was on par with 2013 in terms of deal numbers. On the other hand, it was a much slower year than 2013 in terms of deal value; the total deal value in 2014 was USD 5.6 billion compared to USD 7.1 billion in 2013. The deals became smaller in size, averaging USD 140 million as opposed to USD 176 million in 2013.

34 deals took place in the utilities segment. The privatization of thermal coal power plants and the associated mines made up most of the total utilities deal value. A few novelties were the private deals involving thermal power generation assets and also a share sale in a natural gas distribution portfolio.

## Utilities led

Utilities retained their lead in the energy deals landscape in 2014 with 34 deals amounting to USD 5.5bn.

Privatization tenders were completed for six thermal power plant assets, together with the operational rights for the feeding mines. These were met with a weak response from both foreign and local players alike. With vertical integration in mind, IC ICTAS Holding, which holds electricity distribution and supply licenses in the Thrace region, offered USD 2.7bn, the highest overall deal value of the year, for the bundled package of the Yenikoy (2 x 210mW) and Kemer koy (3 x 210mW) lignite power plants.

A different vertical integration story was aborted due to lack of financing in the case of the Catalagzi coal power plant (2 x 150mW). Local mining company Demir Madencilik, which also supplies hard coal to the plant, placed the highest bid, USD 351m, for a potential vertical integration. However, due to failure to finance by the deadline, the Privatization Administration passed the tender award to the second highest bidder, Elsan Elektrik, which offered USD 350m.

Continuing with the state hydro power plants, the operational rights of 10 were transferred to the private sector, again all



to local bidders. They received surprisingly high bids, USD 2.5m per mW on average, despite their small sizes. This once again underlined the fact that acquisition of these operating assets is still more favorable than licensing of greenfield investments.

The rest of the deals in power generation involved renewable energy assets. The acquisition of a 45% share in Polat Enerji by the Canadian Public Sector Pension Fund (PSP-Canada's largest) was significant. Accordingly, we assume that the 10-year feed-in tariff system must have proven reliable to such a large pension fund seeking a steady income. On the other hand, the regulatory enforcement in the wind market threatening the inactive players with license cancellation did not ignite many transactions or much consolidation in order to create resources to go ahead with projects.

The launch of the long-awaited licensing tenders in the solar power segment failed to end in a deal rush. We believe that this was due to the unreasonably high differential between the per-mW bids, which went beyond what could be compensated for by the feed-in-tariff and added to uncertainty about profitability.

Having said that, the unlicensed solar power market (<1mW) is seemingly more vibrant and might have hosted some deals among the small players, which are not made publicly available. •

Geothermal Power Plant, entered into generation in the 1980s. Today owned by Zorlu Energy, one of Turkey's largest generators, which, in the next three years will grow its total energy portfolio to include 1,600mW of installed capacity, the Kızildere Geothermal Power Plant, the largest of the country's two operating geothermal energy production plants, currently produces 95mW of energy. Commissioned in 2013, the Gümüşköy Geothermal Power Plant is Turkey's second geothermal generation facility and is owned by BM Geothermal Power, a subsidiary of BM Holding, and has total installed generation capacity of 13.2mW divided between two units.

Possessing by some estimates as much as 4.5gW of theoretical potential, geothermal in Turkey, and interest in it, is on the rise.

Joseph Bonafin, sales manager for geothermal application at Turboden, a pioneer in the field of Organic Rankine Cycle (ORC) technology which enables its user to exploit otherwise unusable geothermal and steam resources, said: "Recently we have noticed a sharp increase in interest in the development of larger scale geothermal projects using ORC technology in Turkey, marked by the entrance of outside investors from even very well established energy markets such as the United States. This, I believe, is attributable to the maturation of the Turkish market for geothermal.



Sinan Ak, general manager, Zorlu Energy

Today we believe that Turkey has strong potential for geothermal energy: scientifically speaking, thousands of mW. The ability of the country to transform this potential into generation, however, will be checked by both the resources available domestically and the readiness of the market. For these reasons we expect that by 2020 we will see 1,500mW of geothermal energy realized, both from traditional flash processes and ORC cycles.

We expect annualized growth of 200mW."

Among those to invest in the development of geothermal energy include Zorlu Energy. Sinan Ak, general manager of Zorlu Energy, explained: "In 2012 Zorlu Energy embarked on a new investment regime. In the last two years this has resulted in two projects: a wind project in Pakistan and a geothermal project in Turkey. Within the next two to three years, we would like to expand production of renewable energy every year by 100-150mW, raising total production capacity to over 300mW for geothermal, 250mW for wind and 250mW for hydro, and total production for Zorlu Energy, including both domestic and international sites, to 1600mW, with over 800mW of renewable capacity in Turkey." Should others aside from Zorlu begin to eye these projects, Turkey could see geothermal energy production play a far greater role in domestic energy production than previously expected. •



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