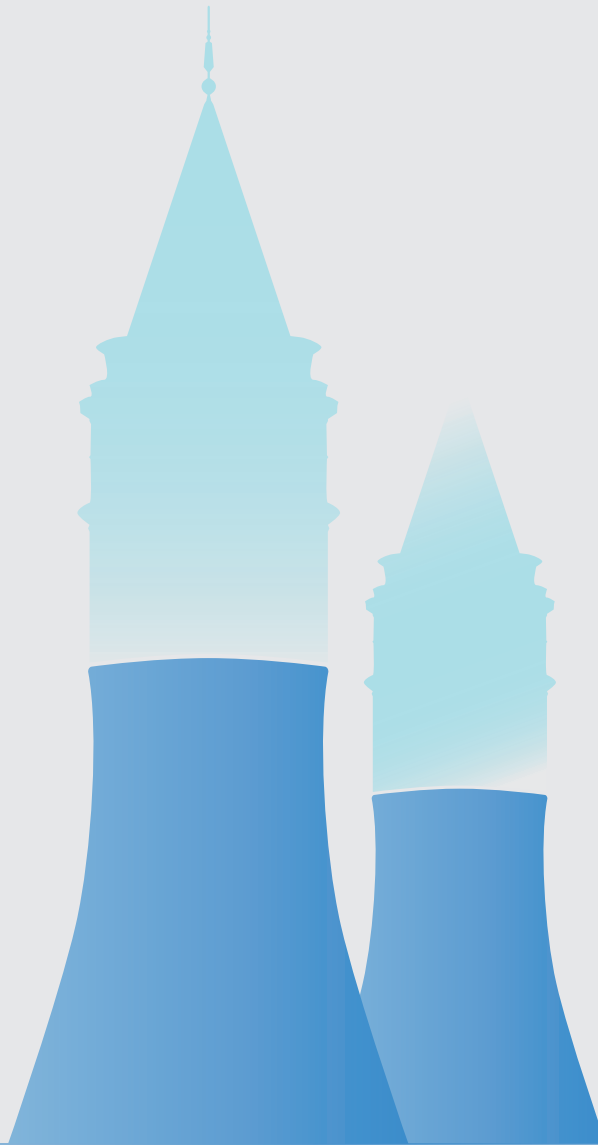


GLOBAL BUSINESS REPORTS

INDUSTRY EXPLORATIONS



TURKEY POWER 2015



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Dear Readers,



Every visitor to Istanbul marvels at the traffic that passes through the Bosphorus, and no ship is more towering than the oil tanker. Whether they are fully laden with Russian or Azeri oil en route to world markets or returning to the Black Sea to pick up more, they make visitors and the city's residents alike feel as though they are a part of the rhythms and flows of the global economy.

Lying at the crossroads of the movements of people, goods, and capital, Turkey has always been well positioned to expand and fortify its domestic power industry by drawing on the prodigious reserves of hydrocarbon resources in Russia, the Caspian Sea, the Persian Gulf, and eastern Mediterranean and transporting them to consuming countries in Europe. Recently, political convulsions in the geography surrounding Turkey, most notably the unrest in the Arab world and in Ukraine, have elevated Turkey's importance not only as an energy conduit but also as a diplomatic power that can help stabilize these conflicts. In Turkey, business and geopolitics are always two sides of the same coin.

Turkey's power industry has experienced tremendous growth since 2004, when the government launched a program to liberalize the sector. Many people we interviewed were pessimistic about the pace and sincerity of this process, but the government has taken some steps to welcome new technologies and, more importantly, new power generation players to the market. As the only growing market for natural gas in Europe, Turkey offers a unique test case for how governments will craft energy generation regimes for the future. Players are making a large amount of forward-looking investments in a wide swath of renewable energies, but natural gas and coal generation will continue to generate the majority of Turkey's power in the medium-term.

We are delighted to present readers with an in-depth account of the latest trends, developments, and technologies burgeoning in Turkey's power industry. By reading the voices and strategies of private companies, the government, and associations in the following pages, you will get a sense not only of the potential for growth but also the dynamism that pervades all levels of the value chain.

We would like to sincerely thank all of our interviewees and the companies, associations, and individuals who were so helpful and hospitable to us during our stay. You made our time in Turkey an unforgettable experience.

JP Stevenson
Project Director and Journalist



Alice Pascoletti
Project Director



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This research has been conducted by
JP Stevenson and Alice Pascoletti.

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Exclusive Interviews

Leading figures from Turkey's power industry discuss geopolitics, market trends, and opportunities, as well as regulatory hurdles and investment challenges.



10, 11, 20, 21, 42, and many more

Editorial Content

Global Business Reports' journalists provide unique insights into Turkey's energy sector by spending months on the ground meeting face-to-face with industry leaders.



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Quantitative Data and Maps

Quantitative data and maps clarify key trends across the value chain as well as the potential sources for Turkey's future energy mix.



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Already a robust producer of hydroelectricity, Turkey contains excellent conditions to harness wind and solar power and will need to make strides to decrease its dependency on foreign-sourced fossil fuels.



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Future Outlook

Turkey lies between major hydrocarbon producers and consumers, including its own growing economy. Companies share their visions for the future of the country's power industry and the global energy system.



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START IT UP INTRODUCING TURKEY AND ITS POWER SECTOR



“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.”

- Sinan Ak,
General Manager,
Zorlu Energy



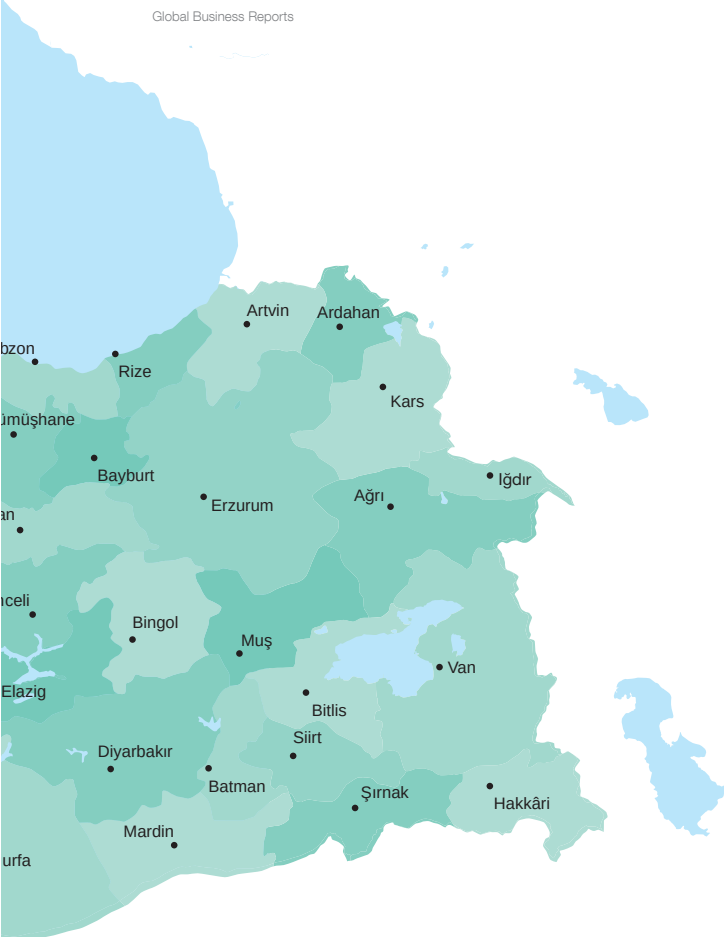
TRANSITIONING TURKEY

A Political and Economic Overview



●●● Turkey never ceases to be in the news these days, either for its domestic politics or more often for the foreign policy crises in one of the eight countries that it borders. The West views Turkey with suspicion and hope, the former when it does not follow its policy wishes and the latter when it imagines the diplomatic and economic potential of partnerships with a country that borders energy-rich Russia and the Middle East. Given these dynamics, foreign countries and investors will continue to seek ways to partner with Turkey.

By many economic indicators, Turkey has made impressive strides since the Justice and Development Party (AKP) came to power in 2002. On the back of average annual real GDP growth of 5% from 2002 to 2012, Turkey is now the world's 16th largest economy, with ambitions to reach the top ten by 2023, the centennial of the Republic. While growth slowed during the global financial crisis, Turkey was not exposed to the same pressures as Europe and the United States and therefore vaulted out of 2009 into 9.2% and 8.8% growth in 2010 and 2011, respectively. Red flags – namely inflation, a sizable current account deficit, and a reliance on foreign investment – dampen economic forecasts and should be monitored. Turkey's reliance on energy is another challenge.



\$15,300

**GDP PER CAPITA
2013**

Source: CIA World Factbook

3.8%

**GDP GROWTH RATE
2013**

Source: CIA World Factbook

TURKEY AT A GLANCE

Source: CIA World Factbook

Population: 81,619,392 (July 2014 est.)

Official Languages: Turkish

Capital: Ankara

Chief of State: Prime Minister Ahmet Davutoğlu (since August 2014)

Growth Domestic Product: \$821.8 billion (2013 est.)

Growth Rate: 3.8% (2013 est.)

GDP per Capita: \$15,300 (2013 est.)

Economic Sector Breakdown: agriculture: 8.9%, industry: 27.3%, services: 63.8% (2013 est.)

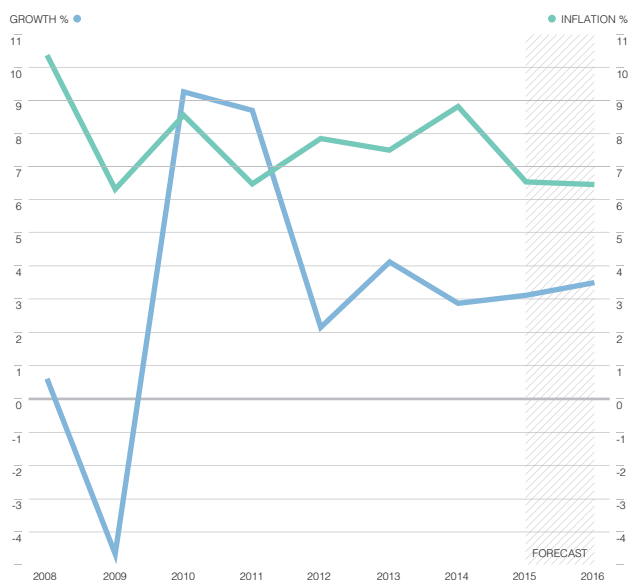
Exports: \$167.6 billion (2013 est.): apparel, foodstuffs, textiles, metal manufactures, transport equipment

Imports: \$242.9 billion (2013 est.): machinery, chemicals, semi-finished goods, fuels, transport equipment

Major International Trade Partners: Germany, Russia, Iran, Iraq, China, United Kingdom, United States, United Arab Emirates, Italy

TURKEY GROWTH VS. INFLATION (2008 TO 2013)

Source: World Bank, International Monetary Fund



The government announced in September 2014 that it would raise electricity prices by 9%. Meanwhile, the Turkish lira continues to fall dramatically against the U.S. dollar.

Politically, the AKP has slowly consolidated power since 2002. The party's power derives from its popular support from the middle and lower classes, which have struggled in the past to reap the benefits of the state under secularist regimes installed through military coups. In no sector has the average Turk benefitted more than in health, as access to insurance and coverage has greatly expanded. At the heart of the AKP's popularity, however, is its charismatic leader, Recep Tayyip Erdoğan. AKP supporters identify with Erdoğan and believe that he champions their economic and social interests. Erdoğan served as Prime Minister from 2003 until 2014 and was elected President in August 2014. His former Foreign Minister, Ahmet Davutoğlu, became Prime Minister. Although no longer in the constitutionally most powerful office, Erdoğan is still the party's leader.

The AKP's ascendancy finally met resistance during the June 2015 parliamentary elections, as the Kurdish-backed Peoples' Democratic Party (HDP) crossed the requisite 10% threshold and entered the Parliament. The other established opposition parties

– the (secularist) Republican People's Party (CHP) and Nationalist Movement Party (MHP) – also maintained enough support to block the AKP's parliamentary majority. Whereas previously Erdoğan sought the Kurdish vote with promises of pushing through a long-awaited set of reforms supporting Kurdish aspirations for greater rights, in the summer of 2015, the Turkish government launched military strikes against the terrorist group PKK, which seems to signal that Erdoğan's outreach to the Kurds is over.

For more than two years, Ankara has prioritized removing Bashar al-Assad from power in Syria and has tacitly supported the so-called the Islamic State (ISIS) by allowing shipments of arms, goods, and people to flow from Turkey into Syria. Turkey appears to have changed its policy and is now participating in strikes against ISIS in Iraq and Syria and has launched a domestic crackdown. It is too early to assess whether these policies are sincere, in light of Turkey's past actions.

The power industry is at the heart of Turkey's foreign and domestic policies, and its future depends as much on sundry geopolitical factors as on the business trends and decisions presented in the following pages. One thing is clear: Turkey will be at the center of the world's key developments in energy for the foreseeable future. •



Dr. Fatih Birol

●●● Chief Economist, Director of Global Energy Economics, and Executive Director (starting September 2015)
INTERNATIONAL ENERGY AGENCY (IEA)

●●● **You have worked at the International Energy Agency (IEA) since 1995 and were appointed in February 2015 to become executive director starting in September 2015, the first time in the history of the Agency that someone was promoted from among its own ranks. How does your appointment speak to the significance of Turkey to the global energy system?**

First, Turkey is a country with has a unique geographic location in the world. The country is surrounded by roughly 70% of the world's oil and natural gas reserves, including Russia, the Caspian Sea region, Iraq, Iran – all Middle East countries in fact – the Mediterranean, and North Africa. Second, Turkey electricity and natural gas markets are growing strongly and have strong growth potential for the future. Third, Turkey is going through an economic transformation, is opening up to liberalization, and has a young and grow-

ing population. So, putting these things together, Turkey has a role to play in regional energy markets, if the decision makers play their cards wisely and in a timely manner. My appointment is not political, but it is important to note first that this is the first time that someone working in the IEA was appointed to the role of executive director. Second, it is the first time again that an executive director has been appointed by the unanimous agreement of all the countries. It is my aim to make the IEA a less political and more technical, professional organization, but also one that is truly international. One of my main priorities will be to expand the IEA's constituency.

The Middle East is going through political convulsions that are likely to continue for the near-term, if not longer. In what ways do these convulsions most concern the IEA?

We have seen major growth in U.S. and Canadian oil production, which is very good news for global energy security; however, we should note that the United States will never be able to replace the Middle East as an oil exporter. Almost all of the oil that the United States produces is consumed at home. So, growth in Middle East production will be needed to meet growing consumption levels in global markets.

My worry today is that the appetite for investment in Middle East oil is very weak, mainly because of geopolitical developments. Investors are rather reluctant to commit capital to new exploration and production and midstream infrastructure, as they do not know what the markets or even the countries will look like in a couple years. Therefore, what is happening today in the major tension points, including Iraq, Syria, and Libya, is leading to a lack of investment appetite in Middle East oil. At the same time, oil production growth in the Middle East will be badly needed to meet future demand growth, especially in Asia.

In Turkey, pledges to liberalize BOTAS, the state organization that controls import licenses for and distribution of natural gas, were made roughly ten years ago, but BOTAS still dominates the market. Does the further development of the Turkish market necessitate the liberalization of BOTAS?

Turkey's gas demand increased very strongly in the last few years. Domestic

natural gas consumption is now roughly 50 billion cubic meters (bcm), which is higher than that of France and many other European countries and will continue to grow in the coming years. However, it is also important to have reasonable price levels and diversification of markets. Therefore, I expect to see further liberalization of the electricity and natural gas markets, which can take any form. It is very difficult to increase the efficiency of the electricity and natural gas markets in the absence of further liberalization.

Specifically, Turkey needs a more robust pipeline network, but private investors have shied away from getting involved in international pipeline schemes. Does the expansion of the pipeline network depend upon BOTAS' liberalization?

There is definitely a need and hope to see more pipelines built that pass through Turkey for many reasons, diversification being chief among them, so we need to mobilize investment. For this to happen, Turkey needs investors with deep pockets and, among other things, liberalization of the markets, so that investments can be mobilized in a timely manner.

Will the Turkish Stream natural gas pipeline project to bring Russian gas to Europe through Turkey be completed, and how does this pipeline affect relations between Russia, Turkey, and Europe?

There are a few projects on today's agenda, including the Trans-Anatolian Natural Gas Pipeline (TANAP), Turkish Stream, and others. TANAP is an excellent project, which provides diversification for consumers, especially in Europe, and makes perfect sense from an economic point of view. It also represents an endorsement of all the key stakeholders, including companies and countries, and is strategic in nature. I hope and expect that the project will materialize soon. As for Turkish Stream, it is far too early to make a judgment.

What development in energy are most people not anticipating in the future?

We have forgotten to some extent the crucial importance of Middle East oil to our daily lives. I hope that when we do remember its importance, it will not be too late or costly. •



Alparslan Bayraktar

Commissioner

**TURKISH ENERGY MARKET
REGULATORY AUTHORITY
(EMRA)**

●●● **Please provide us with an overview of your work within the energy sector, in particular as it pertains to EMRA and ERRA, your two organizations.**

I have been with the Turkish Energy Market Regulatory Authority (EMRA) for the past five years. My term will end in February of 2016. Prior to joining the organization, I worked in the private sector for fifteen years, six of which were spent in the United States. EMRA is an independent regulatory association charged with the governance of Turkey's gas, power and petroleum markets. As EMRA's Commissioner I am responsible for answering questions pertaining to these industries.

In addition to my work with EMRA, I am also the Chairman of the Energy Regulators Regional Association (ERRA), which is an international organization headquartered in Budapest, Hungary that is dedicated to improving national energy regulation, fostering the development of stable and

autonomous energy regulators, improving cooperation among regional energy regulators, and facilitating the exchange of research and best practices among our member countries. Our member nations largely come from Central and Eastern Europe, though we also have members from the Middle East as well as Russia and the United States. We total 32. Collectively almost 1.1 billion people receive energy services through our member regulators.

The level of liberalization is quite disparate across each of these markets and, as a result, the challenges that each member nation faces are different. ERRA is an excellent learning environment: each member country is in a different stage of market development and, consequently, much can be learned through the good and bad practices of each nation. Within this, Turkey stands as a great example to other countries for its successful transformation in power market from a vertically integrated model to unbundled competitive activities.

Regional and global cooperation are crucial for market development. In this regard, regional development is one of our priorities. ERRA's and Turkish G20 Presidency's focus on Africa is a good indication for this, aiming to develop the competency of regional energy regulators.

In entering EMRA from the private sector, what were the key challenges that you faced?

At least immediately, it was difficult to completely understand how the government works. Success in any market requires that an investor understand the dynamics that drive an industry and region. In this regard, mutual understanding between investors and decision makers can ensure success in attracting investments. The government has tried to reduce its import dependency and meet the growing need for energy, which requires substantial domestic and foreign investor participation as well as an expansion in local and renewable resources. Above all, it needs privatization to fulfill market liberalization, and, to attract foreign investors, Turkey must continue to further eliminate any uncertainty and to harmonize the operation of judicial and legislative frameworks.

Turkey's relative lack of regulatory harmony is observed in the many difficulties that those investing in renewable energy

have faced. As a regulatory body, what role should EMRA play in lessening these delays?

The lack of harmony seems to be present in Turkey's regulatory system, leading to these project delays. In the past, considering the very high interests of the investors, we simplified the licensing procedures in order to facilitate the investments and expected that the investors would manage the processes for other necessary permits appropriately. However, a significant portion of investors failed to do that. Actually, their license eased the job for these permits but, naturally, the licenses cannot guarantee a full success. That is basically why, we defined a "pre-license" period and hence ensured that an investor holding a "license" is completely ready to start the construction and operate the project upon completion. Hence, the operation of the project is guaranteed unless the investor fails on its own. However, there is room for further improvement. This, on a conceptual level, can be distilled down to the way in which the three pillars of Turkey's regulatory framework interact: the country's legal, financial, and investment structures. EMRA can play an influential role in this by proactively dealing with the relevant authorities. Also, EMRA should effectively continue to perform its holistic role in realizing investments by ensuring that the licensing and project development process for energy projects is completely transparent thereby allowing easy exchange of information and facilitating decision making.

What role will Turkey and EMRA play in the development of near markets?

Turkey strives to become a regional energy hub. Our geopolitical position aids us in this. Turkey has a vast domestic market and rapidly expanding domestic energy needs. Demand and supply are both here. However, the market needs to be liberalized and well functioning, with transparent and cost reflective pricing. Within the gas industry, much still has yet to be achieved, but there is a great opportunity for Turkey within gas, given declining oil prices. As regulators, we have to focus on the domestic market with an emphasis on gas and oil. •

REWIRING THE GRID

The State, the Market, and the State of the Market

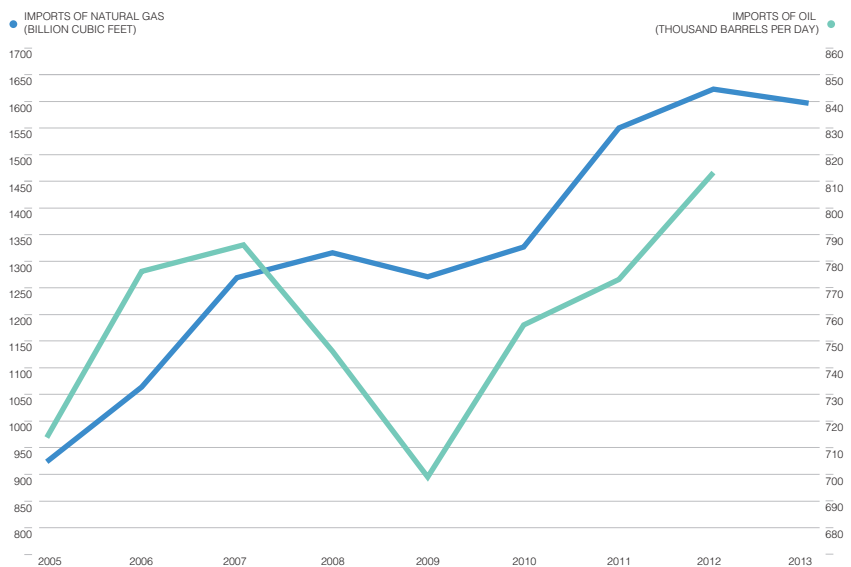
Emerging markets, even those that seek to defy it, are inextricably the product of their past. The role that the legacy of bureaucracy plays in shaping institutional power structures and the way in which cronyism manifests itself are determined by the historical shape of a country. Real junctures in 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 macroeconomic concerns: the dual challenge of possessing one of the world's most rapidly growing consumers of energy while containing little known hydrocarbon resources. Already this dilemma has helped build 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 20,000 megawatts (MW) of wind energy, 600 MW 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

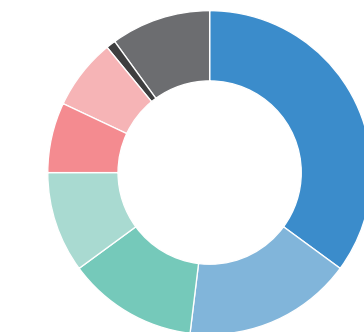
OIL AND NATURAL GAS IMPORTS IN TURKEY (2005 TO 2013)

Source: U.S. Energy Information Administration



TURKEY CRUDE OIL SUPPLY MIX (2012)

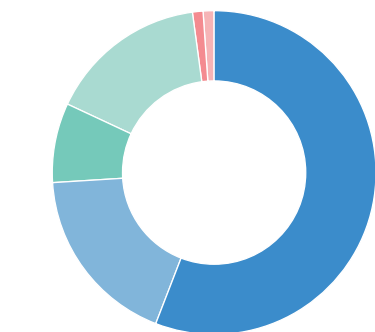
Source: U.S. Energy Information Administration



- Iran
- Iraq
- Saudi Arabia
- Russia
- Kazakhstan
- Africa
- Other
- Turkey

TURKEY NATURAL GAS SUPPLY MIX (2012)

Source: U.S. Energy Information Administration



- Russia
- Iran
- Azerbaijan
- LNG
- Other
- Turkey

Turkey's Energy Market Law, the dynamics underscoring today's Turkish energy sector far predate this, tracing their roots to the first point in modern Turkish history where the country came across another such juncture in its development: the establishment of the Republic of Turkey in 1923 led by Mustafa Kemal Atatürk, the Republic's first president. Atatürk's 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. Public 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 8,900 MW of energy annually and stands as one of the world's largest hydroelectric power projects.

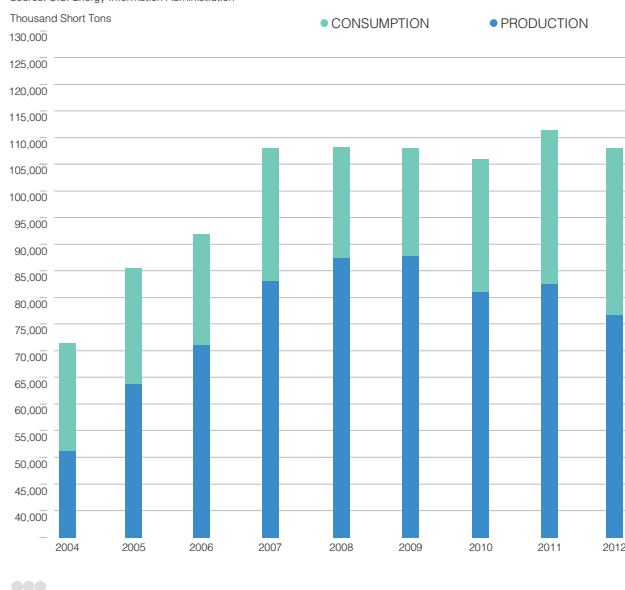
Only in 2004 did privatization begin for the energy sector in earnest. Murat Çolakoğlu, partner at PwC Turkey explained: "The late 1990s were marked by a fundamental need for more energy production facilities. Greenfield investments were needed to address an issue that underscored many Turkish industries: 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 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 said: "Previously, there was a market where the state was the only actor. In 2001, the capacity of electricity generation in Turkey was

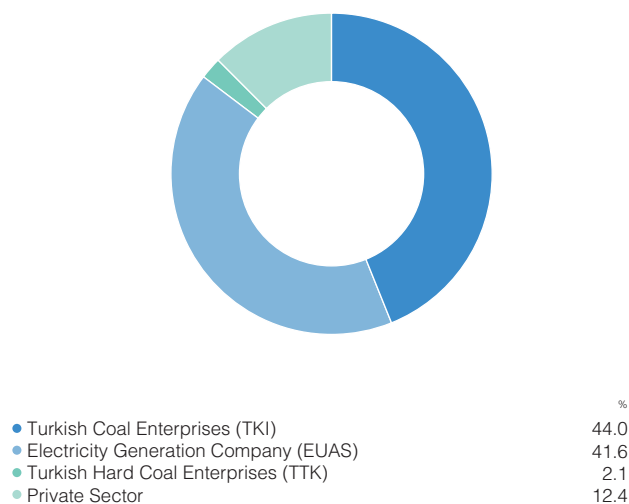
COAL CONSUMPTION AND PRODUCTION IN TURKEY (2004 TO 2012)

Source: U.S. Energy Information Administration



DOMESTIC COAL SUPPLY MARKET SHARE (2011)

Source: Investment Support and Promotion Agency of Turkey



28,000 MW; however, today it is around 70,000 MW. 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 10,215 MW of the country’s total generation capacity. More critically, however, the government continues to also control BOTAŞ, 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, BOTAŞ 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 BOTAŞ in importing natural gas. These companies must sign an agreement with BOTAŞ to transmit their gas as BOTAŞ controls the country’s pipeline network – yet they must also compete with 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

PWC DEAL REVIEW: DEALS FOR REAL

Murat Çolakoglu
Partner, Territory Leader,
Energy Utilities & Mining Industry
PwC Turkey



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 \$5.6 billion compared to \$7.1 billion in 2013. The deals became smaller in size, averaging \$140 million as opposed to \$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 \$5.5 billion.

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 \$2.7 billion, the highest overall deal value of the year, for the bundled package of the Yenikoy (2 x 210 MW) and Kemerkey (3 x 210 MW) 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 150 MW). Local mining company Demir Madencilik, which also supplies hard coal to the plant, placed the highest bid, \$351 million, 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 \$350 million.

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, \$2.5 million 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. 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 (<1 MW) is seemingly more vibrant and might have hosted some deals among the small players, which are not made publicly available. •

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), concurs: "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 an energy market that was better connected, 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. Particular concerns have been the Turkish government's continued role in electricity transmission and the impact that this has held on infrastructure renewal and expansion.



Market liberalization presented our parent company, Bisen 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.

- Mesut Alparslan,
CEO,
Bisen Energy

Image: Bisen Energy



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.

- Mehmet Ali Neyzi,
CEO,
STFA

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 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 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

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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?"

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 BioConstruct, 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 1,000-kilowatts 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.'

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,

Owing to its vertically integrated nature, BOTAŞ 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.

*- Eser Ozdil,
Secretary General,
PETFORM*



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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 backstepped, 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.



Previously, there was a market where the state was the only actor. In 2001, the capacity of electricity generation in Turkey was 28,000 MW; however, today it is around 70,000 MW. This alone proves that the model undertaken in Turkey has been successful.

*- Ahmet Aksu,
President,
Privatization Administration of
the Republic of Turkey*

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 120 gigawatts 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 policy 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 sophis-

ticated, 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 486 MW 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: "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. •



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Mustafa Karahan

Deputy Chairman

ENERJİ TICARETİ DERNEĞİ (ETD), ENERGY TRADERS ASSOCIATION

●●● What led you to establish Enerji Ticareti Derneği (ETD), the Turkish Energy Traders' Association?

ETD, the Energy Traders Association, was founded in 2010 in order to promote a liberal energy market across all segments of the industry without exerting any market influence or taking on a lobbying role. ETD strives to be a union of the voice of Turkey's energy traders to the government on how the industry should be modeled. The starting point was the strategy document produced in 2008, which stated that market liberalization is a goal of the Turkish government. This provided us with the footing we needed.

What strategic initiatives has ETD embarked on?

We have divided ourselves into separate working groups, modeled after the structure employed by the European Federation of Energy Traders (EFET). EFET

supported us through our establishment process. These groups work closely with various government stakeholders and international counterparts to prepare position papers on a number of subjects. The most important initiative that we have taken on is the establishment of an energy exchange, which includes both physical and financial products such as derivatives. We sought to use the European Energy Exchange (EEX) as a model to promote the development of an over-the-counter (OTC) trading market by addressing several regulatory hurdles, including the removal of Turkey's stamp duty. To this end we invited a number of brokers to Turkey to provide ideas about structural reform. Today, we have numerous projects, from reforming the retail market to improving the general market structure. For each project, we position papers to both the government and the industry that can be used as road maps for decision makers.

What strategic initiatives will ETD prioritize in 2015?

ETD's first priority is the removal of the stamp duty on trading, which is largest obstacle to increasing trading volumes. Second, we wish to establish a spot market for gas within the new Turkish Energy Exchange (EPIAS). We recently finalized EPIAS' structuring: private companies will hold 40% of the new energy exchange, with BORSA Istanbul and the TSO each then holding 30%. We hope that the platform itself will be finalized in 2015; however, the structure of the market and the design of its software still need to be finalized, and ETD will be assisting EPIAS.

Turkey has crafted an ambitious set of goals for its energy sector for the centennial of the Republic of Turkey in 2023. Will it realize these goals?

Turkey's goals for its energy sector are an extension of a larger ambition: to stand among the world's ten largest economies by 2023. This will necessitate over \$1 trillion in trading volume and almost \$500 million in exports and will require that the energy sector expand domestic generation by 30,000 megawatts (MW). These goals are far more complicated than simply expanding generation. Turkey will need to renew much of its current production capacity, as many state-owned assets for natural gas and coal are old and inefficient.

Privatization will be difficult considering the condition of these assets and potential lack of financing for energy but also for infrastructure. Though lending in Europe will improve, the U.S. Federal Reserve will tighten its monetary policy.

Turkey is also unlikely to realize its goal of building three nuclear power plants. The first generation of these plants likely will not be established until 2024; in the following decade, we will see around 6,000 MW of nuclear energy.

Are we likely to see these goals realized for other forms of energy production, such as solar, that have generated a large amount of interest during the tendering process?

Turkey faces a dilemma with renewables similar to that faced by Germany. Germany invested heavily in renewables through a feed-in-tariff (FIT), under the assumption that creating an attractive market for renewables through the public financing the extra cost associated with their use, a market for technology would be created that would generate opportunities for German companies. Instead, the FIT ended up financing the expansion of Chinese companies within the market. Spot prices fell and consumer prices increased. Turkey understands this and its ability to create an attractive environment for licensed solar projects may not be as robust as we saw in Germany.

How might we see the trading environment in Turkey evolve in the next five years?

In the next five years, the churn rate is expected to grow to four or five, both in the OTC market and on the exchange. We are likely to see a coupling of the Turkish market with Georgia and later with Iraq and Iran. As a whole, the Turkish energy sector will be characterized by a strong Russian influence in the medium-term. We will also see consolidation of many of the industry's smaller generators, either by the industry's larger players or as part of a trading portfolio. Generally, the number of deals will be greater. Investment banks and financial institutions will play a more active role in commodity trading. •



Önder Karaduman

Chairman of the Board
**ELEKTRİK ÜRETİCİLERİ
DERNEĞİ (EÜD), ENERGY
PRODUCERS ASSOCIATION**

●●● You have served as Chairman of the Board of Turkey's Electricity Producers Association since 2002. What have been your key accomplishments?

Our most important success was to build a corporate and reputable non-governmental organization that strongly represents private sector producers in the energy sector. EÜD grew into an important point of reference for its members, providing constant support, acting as a bridge between the private sector and public authorities, and considering all of the players in the sector. Our opinions and recommendations, as well as the activities that we carried out since the beginning of the liberalization process have helped keep the sector informed. In addition, investments by our members increased the installed capacity of Turkey by over 20,000 megawatts (MW). As of today, our foundation represents 65% of the production companies in the private sector. We will continue to offer significant services to the sector by

growing and getting stronger with every passing year.

What strategic initiatives will EÜD prioritize in 2015?

In 2015, we will emphasize the establishment of EPİAŞ and its corporate structure into an independent and transparent market operator in real terms, like its counterparts in Europe, but also one that includes private sector representation. EPİAŞ will help resolve the most important problems in our sector, namely the lack of price predictability, transparency, and governance. Another priority is to create an Intra-day market. Other priorities include: following up legal processes related to illegal usage costs, which is considered as an important risk factor in the sector, by cooperating with the National Assembly, the Ministry and EPDK; fighting against practices and approaches that undermine a competitive environment in the sector, in particular by taking measures against those stifling sales to free consumers; regulating electricity tariffs in a more transparent and predictable manner by working closely with EPDK; and better managing river basins at hydro-electrical power plants by cooperating with DSİ (State Hydraulic Works) and other related parties to develop basin optimization models.

The Electricity Producer's Association recently released its overview of the energy sector. What were some of your key findings?

When making our observations, we consider the primary priorities, including supply security, source diversification, reduction of external dependence, and use of local and renewable resources. It is a fact that the sector did not achieve sufficient success in these areas. More investments are needed for supply security, while diversification has not improved. External dependence, moreover, continues to increase every year; 48% of total energy demand was met from local production in 1990, but decreased to 28% today. Finally, we are dependent on outside sources for 98% of natural gas consumption, which constitutes 45% of electricity production. This is an unacceptable situation that is unique to Turkey. Turkey is second in Europe and fifth in the world in this regard, with natural gas imports approaching 50 billion cubic meters. Structural reforms are needed to change this irregular table. Neither our domestic coal resources nor renew-

ables are being successfully used to mitigate external dependence.

One of the last public institutions in the energy sector yet to undergo privatization is BOTAS. What role will BOTAS continue to play in Turkey's energy market?

The continued dominance of the public sector over natural gas is a major problem. It is not possible to maintain a healthy electricity market without a system where natural gas prices are freely determined. BOTAS' share in the market must be decreased as soon as possible to improve competition concerning the supply and sale of natural gas. In addition, a natural gas exchange market should be established in coordination with EPİAŞ' electricity market.

The Turkish Government has established ambitious goals for diversifying electricity generation by 2023. Were we to meet in 2023, what would the structure of Turkey's energy matrix look like?

The resource targets set for 2019 in the 2015-2019 Strategic Plan published by the Ministry of Energy and Natural Resources estimate that electricity production from domestic coal will increase to 60 billion kilowatt hours (nearly doubling the current amount), from hydro-electrical to 32,000 MW (currently 23,000 MW), and from solar to 3,000 MW. If these targets are met, dispersion of electricity production resources in 2019 could be as follows: 40% natural gas, 25% coal, 25% hydro-electrical, and 10% other renewables (wind, solar etc.). The share of natural gas in electricity production will still be very high, but if the Akkuyu nuclear power plant is activated by 2023 as planned, the share of natural gas might decrease to 30%.

How realistic are these targets? First of all, it seems impossible to increase domestic coal resources in today's conditions, since domestic coal investments are still not feasible for the private sector. Second, it seems impossible to increase installed wind power to 10,000 MW in five years, and 20,000 MW by 2023, when it is not even 4,000 MW today. A realistic target would be 7,000 MW or 8,000 MW by 2019. The competition process for 600 MW of solar has not been completed, so a reasonable target could be 1,500 MW or 2,000 MW. Finally, it is highly arguable whether the nuclear power plant will be completed by 2023. Natural gas will likely stay above 40% for a long time. ●



AA

Ahmet Aksu & Gunden Peker Çınar

●●●

AA: President

GPÇ: Head of Department

PRIVATIZATION

ADMINISTRATION OF THE REPUBLIC OF TURKEY

●●● Within the energy sector, what have been some of the key successes of the Privatization Administration in creating a more liberal and competitive market in Turkey?

The Privatization Administration (PA) has undertaken the majority of privatizations in the energy sector in Turkey. During the first phase of energy privatizations, we saw the privatization of some petro chemical companies as well as petroleum distribution companies. These were benchmark privatizations, which were completed around year 2006. With the privatization of those companies, we initiated liberalization in the Turkish refinery sector as well. Coming to privatization in the electricity sector, a law was passed in 2001, which stipulated a new, liberal energy market. The model brought about by this new law was based on the idea that new investments stemming from the increasing demand for energy in Turkey would be undertaken by the private sector.

Previously, there was a market where the state was the only actor. In 2001, the capacity of electricity generation in Turkey was 28,000 megawatts (MW); however, today it is around 70,000 MW. This alone proves that the model undertaken in Turkey has been successful.

We call our approach a market friendly one, aiming to achieve open, transparent and competitive privatization processes for each tender process.

Looking at the future of government involvement in the sector, is the legal framework in place to allow for full privatization?

It has been our priority to start privatizations within the electricity sector with distribution. Turkey was divided into 21 separate distribution regions and all of these have been privatized as of 2013. The total proceeds from the electricity distribution privatization have amounted to \$13 billion. Privatization relieves the burden from the state and allows for the reallocation of resources to other areas like health and education. We started the next phase of privatization in the electricity sector—with the privatization of the generation companies—in 2008, but the bulk of the projects came over in 2013. At this point, the proceeds from generation privatization are around \$9.6 billion.

When do you think we will see the privatization of some larger scale hydro projects in Turkey?

The PA aims to launch some hydro projects in 2015 and 2016, with the aim of 1,400 MW. Our plan is to complete the hydro privatizations with a total capacity of around 6,000 MW. These larger projects will not be subject to privatization in the short-term. Of course, we might reevaluate our decision after finishing the planned hydro portfolio, but it is not on our agenda for the time being. Large-scale hydro projects, such as Atatürk Dam, will remain government-run.

Foreign investors have said that some previously tendered assets were undesirable in terms of potential and required more money to fix to make them functional than the investment. As the administration, how can you position yourself to better attract foreign investors?

Turkey has been attractive for foreign investors thanks to its strong macroeconomic

fundamentals and demographics. Further, the country has a low unemployment rate, solid banking system, dynamic domestic market, excellent infrastructure and improved credit rating.

PA highly respects the principles of transparency and accountability in its privatization processes. There is no general limitation for foreign investors to participate in tenders. We are equidistant to foreign and Turkish investors. Moreover, we design our tender documents to encourage the participation of foreign investors to our tenders. In almost 35% of our closed deals, we have had foreign involvement. The high international standards utilized by PA are also recognized by international organizations like the OECD and the World Bank.

Now, after the first phase of privatization in the distribution sector, we are seeing more foreign investors coming into the scene. For example, a Chinese company through a recent acquisition has acquired a distribution company. We have a population of 80 million with a high growth rate and an increasing demand for energy consumption, which constitutes an exciting point for foreign investors. It is worth underlining that the average energy consumption in Turkey is still well below the world average, which means that there is a valuable margin for growth. As the Turkish energy market becomes more liberalized and matures, market forces will attract more foreign investors.

Do you have a final message for investors?

Overall, the fundamentals of the Turkish energy sector remain strong. In the coming years, there will be more private sector participation and a more mature market where entry is further liberalized and competition is enhanced. The demand for electricity is constantly increasing, as is the share of the private sector in the energy market.

Privatization of the electricity sector was a real success story in the privatization history of Turkey. We have managed to privatize 18 distribution companies with the target to minimize distributional and operational costs. We continue now with the electricity generation privatizations of which we are confident will achieve the same success. •



Ahmet Çanakçı

Industrial Services Business Manager
SGS

●●● What are some of the big projects you have worked on in Turkey's power sector in the past few years?

One big project was working on behalf of EMRA from 2007 to 2010. If you are working in the energy market in Turkey, you need to cooperate with them because of the importance of EMRA. The Turkish natural gas market started privatization in 2001, when it was established by EMRA. They started to build the natural gas distribution network rapidly from 2001 to 2007, and when growth happens that quickly, some things become uncontrolled. In order to regain control, EMRA made the tender; we were one of only two companies to win it. We worked together with another small Turkish company to audit the entire natural gas distribution network in Turkey, looking at both the completed investments, like pipelines, as well as new investments. In three years, we inspected most of the cities in Turkey with teams of 10 experts in dif-

ferent disciplines. One was responsible for the infrastructure, one for customer relations, one for mapping, and one for transactions and billing. The contract ended, but we are in contact with them, as they want to have this kind of inspection again. It is like a checkup. Natural gas is risky due to its characteristics, so it is critical not to have any leakages.

What conclusions did you reach from the first audit?

With reports from so many different cities, it is not possible to make general conclusions. Most of the time, actually, the problems arise when humans enter the equation. For technical things, it is easy: two plus two equals four everywhere. But when you have people buying natural gas and then selling different things, the human factor makes it complicated. The geographical range also makes it difficult to reach general conclusions. For example, in the east of Turkey, the very low temperatures in the winter create one set of problems, while in the west of Turkey, the high summer temperatures create a different set of problems. Every place has a different issue.

Other than EMRA, what are some contracts that you have won?

We started to work with power plants in the middle of 2011. This was based on the reality that the electricity network of Turkey's cities was not connected to the European networks. But in September 2012, Turkey's electricity distribution network was physically connected to Europe's though a connection in Italy. For us, this now means that Turkey's electricity network should be in accordance with European standards, including their specifications for frequency, voltage, amplitudes, everything.

Generally speaking, how compliant are most of Turkey's power generation facilities?

Most are in compliance. Since these plants are produced by manufacturers, it depends on the manufacturer's compliance. For example, if a generator manufacturer's team can adapt itself to Turkish standards, the output of these generators will be in compliance with Turkish standards. Some brands have difficulties adapting to these standards, so we have our experts work onsite with them to make sure that their equipment is in accordance with Turkish

standards. The regulations are in compliance with European ones, making it easy for someone working in Europe to adapt to Turkish regulations. We have to have a much stricter mindset here. In Europe, if something is required, most people will comply. But in Turkey, our mindset is to find shorter, alternative ways.

How competitive is the market?

The competition is strong. I am now in my 10th year in this position, and the competition was much weaker when I started. The competition between these international companies is acceptable, but there are now so many Turkish companies, some of which are very small, with only one or two employees. The major problem for the inspection market—in general, not just for energy—is that the market entry barrier is low, which makes it difficult to differentiate. We try to differentiate by approaching newcomers to the market; we are frequently in touch with large energy investors to understand their needs and requirements. A big advantage for us is our international expertise, which we bring to Turkey, where we can train people and invest in them.

Five years from now, what will SGS' involvement in the Turkish power industry look like?

We already have a place in the power industry. We are a large organization with inertia, which makes it difficult sometimes to react quickly. So, our strategy is to be a good partner for both the investors and the authorities. We want to be able to add value through our international expertise and local assistance. Our main aim is to have a sustainable relationship with all of the investors in the energy market, as well as the authorities. At the end of the day, the investor companies are working for their own profits, but the authorities should be taking care of the national interests, and, as Turkish people, we want to be a partner for this. ●

Olav Peter Hypher & Ayşe Filiz Kolat

●●●

OPH: Country Manager
AFK: Deputy General Manager
STATKRAFT

– because of our insistence on the importance of clean technology.

This said, in entering into Turkey, Statkraft has proven itself to be more risk-tolerant than many other foreign investors. To what does Statkraft attribute this?

AFK: Statkraft has, historically, operated in a number of difficult markets that possess risk, be it sovereign or otherwise. Statkraft has developed projects across Nepal, India, Peru, and Laos. There have been many lessons learned, and through these experiences, we have developed an understanding of how projects must be better planned and how to structure the organizational changes required to accommodate individual market circumstance. This has meant developing an understanding of how issues such as project accessibility can play into project development. Projects within Turkey, for instance, can be as far as five hours removed from the capital. Investors new to emerging markets may be unfamiliar with how this can affect the way in which must approach project development. But, Statkraft, through collective learning, was better prepared to handle these risks that have made many averse to investing, or fail, in Turkish energy.

What lessons specific to Turkey has Statkraft learned through its operations?

AFK: One unique, and challenging, aspect of project development for the Turkish energy sector is a result of land access. Traditionally, Turkey, like many other markets, has used an equivalent of eminent domain to expropriate land for the construction of roads, bridges, and other projects, including hydropower projects. However, the costs associated with exercising this power can be high. The judicial and administrative procedures that one must follow in order to acquire land are neither straightforward nor streamlined. While one might receive a court decision on a parcel of land, those holding rights to these properties can, on occasion, be difficult to find, the consequence of which is that one cannot make payments on time. Additionally, in some instances, a landholder might find that the price offered for their parcel is unsuitable and appeal the case. For this, a new team of experts would be employed to value the land and perhaps give a new price. All of

this complicates the ease with which a feasibility study can be conducted.

What has underscored problems with community relations and have they changed how Statkraft has managed its assets?

OPH: Energy, and project development within the energy sector, is inherently a political, economic, and social matter. The way in which regulators and societies handle the impacts associated with these projects – the ramifications this poses on the local people – has a strong influence on the attractiveness of future projects. These initial projects set a precedent. I will provide two contrasting examples: Norway and Turkey. Norway, at a very early stage, made the decision that a sizeable proportion of the revenue generated through the regulation of energy projects would be dedicated to the specific municipalities where these assets are located. Turkey, alternatively, chose to centralize revenue collection, which makes local communities feel removed from the benefits. Goodwill is not as strong because, though these communities bear the risks, they are, at least directly, detached from the contributions that these projects make to the region. This must change. Hydropower projects in particular have become quite contentious. As Statkraft, we try to preempt the problems by engaging local communities from the earliest stages to help them better understand what our projects will mean to them.

Do you have a final message?

OPH: Within the sector itself, there is optimism. There is this ambition to connect Turkey to Europe, both physically—and to make it possible for cross-border trade—and with regard to emulating European business practices. There are positive signals that the industry is moving in the correct direction. Most of the industry's fundamental issues have been addressed; however, it is undisputable that the sector requires greater transparency and greater levels of cohesiveness between what are, at present, very disjointed regulatory bodies. When one engages a government entity individually, it is apparent that the country's regulators are competent: they possess insight. The largest challenge for the industry, however, is in creating a fluid, well-functioning system of regulation. •

●●● **Statkraft is one of the few foreign enterprises operating within Turkey, and to do so without a local partner. Has this affected how Statkraft has developed its ventures here?**

AFK: Turkey's energy sector is newly liberalized. Many of the problems that we have experienced in structuring Statkraft's ventures in the country must be placed in this context. While we are one of the few foreign firms operating in Turkey, the challenges that we have faced do not stem from our status; instead, they are a product of the myriad problems faced due to the introduction of new legislation and regulatory structures, which have impacted not only Statkraft, but also many other industry participants, irrespective of their shareholder structure.

Statkraft's organizational focus is purely on renewables. Our chief competency is in hydroelectric power projects. As a result, Statkraft has been well received in Turkey



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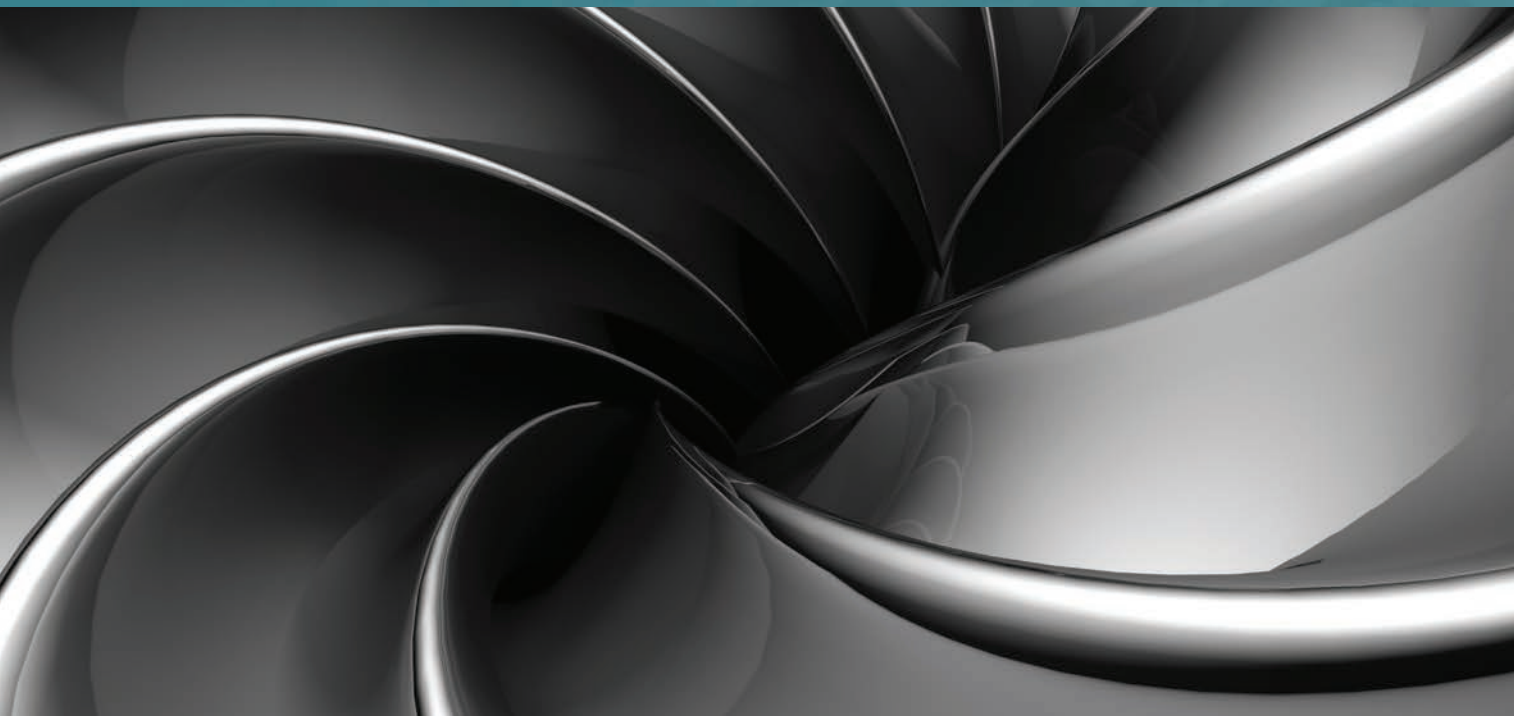
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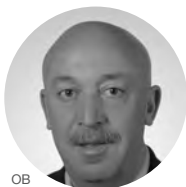




HTA



NC



OB

Hüsnü Turgut Akar, Nuri Ceylan & Okay Baran

●●●

HTA: General Manager

NC: Project Manager

OB: Shareholder

BTE ENERJİ

●●● Can you give a brief background of BTE Enerji?

BTE Enerji was established in 2008 primarily to construct towers for transmission lines. Engineering, contracting and construction are our main functions. We have completed 38 projects since 2008, all of which have been delivered ahead of schedule. The chief philosophy of the company is to get the job done prior to termination or contract completion.

Of the 38 projects on which you have worked, are there any of which you are particularly proud?

Transmission lines typically take three years to complete within Turkey. We were assigned a vast project for a 60-kilometer transmission line running along Northern Turkey and were told to complete this line in one year. Projects within Turkey are not typically completed on time; however, we managed to finish the line within the given framework of time. Manufacturing the

tower is the fundamental aspect of transmission line construction, and this is our specialty.

What projects are in the pipeline for BTE Enerji for 2015?

Since the cost of power construction projects is low in Turkey, the aim of BTE Enerji is to expand our portfolio to projects outside Turkey. We see great potential in external markets. We are currently involved with a project in Georgia that we will be completed by June 2015. We are also investigating opportunities within Africa for our next few projects. We do not like to bite off more than we can chew, which is why we only handle three to four projects at a time. The cost of running even a few days late on project deadlines is very high; we understand our client's needs for a timely delivery. It is because of this that, continually, clients come to us for their projects. We have made a reputation in the market for the haste with which we deliver our projects.

Given your relationship with Baran, a steel manufacturer, what do BTE Enerji's manufacturing facilities comprise in Turkey?

Turkey has a large capacity, standing at 200,000 metric tons (mt) per year. Large companies that produce up to 3,000 mt per month tend to slash prices; they experience economies of scale and their fixed costs are spread over a large output. Galvanizing is also another option. Building a transmission line can be divided into three parts: a third is the tower, a third is the conductor, and a third is workmanship, hardware and fittings. Our manufacturing facilities contribute to BTE Enerji across all levels of our value chain.

Given that BTE Enerji's costs are directly related to the commodity markets, how have your cost structures changed over the years?

Usually, component prices are not so volatile. However, today, aluminum and steel prices are constantly changing. This directly affects our costs for raw materials.

Could you discuss the competitive landscape that BTE Enerji faces in terms of other firms entering the market for transmission lines?

In 2005, there were maybe five companies involved in the construction of transmis-

sion lines and the contracting services related to their installment. However, in the past several years, two of these firms have collapsed. The others seek to create a monopoly within the market. Consequently, competition within the market has been stiff; we are at war with one another, each company striving to drive the other out of the market. Fortunately, this dynamic has recently abated, as the Turkish government changed its regulatory framework. While improving market dynamics, the passage of this law led to over 15 companies entering into the market.

Where do you see BTE Enerji in the next five years?

We are looking to go beyond construction into project design. Our company has the capacity to design towers for transmission lines. We are also hoping to expand our portfolio to projects outside Turkey. Africa is full of opportunities for work. Algeria, for example has a 20 billion dollar budget to upgrade their transmission lines. We seek opportunities like this. Through our history of operations in the Turkish market, we have built a reputation for quality. This is well understood internally and work has begun to garner attention in many external markets. We are well positioned to succeed in these external markets such as Sub-Saharan Africa because of our strengths in the Turkish market.

Do you have a final message for our readers?

Three industries will continue to dominate emerging markets: food, health, and energy. These address the fundamental needs of civilization. It is for this reason that we, as BTE Enerji, are confident that the fundamentals backing the continued growth of our business are strong. ●



Mesut Alparslan

●●●
CEO
BISEN ENERGY

●●● **Bisen Energy has quickly established itself as one of Turkey's most successful energy retailers in the short period of time since market liberalization occurred. Can you provide us with an overview of the history of your organization?**

Bisen Energy is a subsidiary of Bis Energy, a generator: as such, our history dates to 1992, the point in time at which our parent company was first established. At the time of Bis Energy's establishment, the market was in a far different position than it is today. Our ability to establish Bisen Energy is evidence of this. Twenty years ago the market was state-controlled. Over the course of the past two decades, we have seen market liberalization take effect, creating opportunities in fields such as retail energy supply and allowing for the creation of companies such as Bisen Energy to serve these markets.

Bisen Energy was founded in 2011, the

point in time at which it first became clear that we would see liberalization of the retail energy market. We first began commercial operations in June 2013. In the six months following our establishment, we invested heavily in developing the infrastructure required for us to serve our markets: in system development and initiating commercial relations with our first customers on a trial basis. Over this period, we invested approximately 6,5 million Turkish lira in internal development, which would allow us to grow in the mass retail market. Today we serve 21 regions.

What market segments is Bisen Energy targeting in 2015 and what expectations does the company hold for growth within these markets?

From our focus on mass retail, we are now targeting customers that range in size from 500 Turkish lira to 1,500 Turkish lira in monthly energy expenses, which is the segment that is among the most profitable. As a company we plan to continue to focus exclusively on the retail market and within it, small businesses and individual consumers. We will not enter into the wholesale energy market. We currently have 12,500 customers but plan to expand our coverage to 20,000 customers in 2015.

What, on a philosophical level, has underscored Bisen Energy's decision to focus exclusively on the retail market?

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.

Since its establishment, how has Bisen Energy seen the competitive landscape of its industry evolve?

Still to this day, three years since market liberalization in the retail energy market, few other companies have entered into it. Those that have done so have not been very

aggressive in winning market share. An example: Bisen Energy was the first company to begin any sort of promotional campaign. Yet advertisements and promotions are critically important in winning over the retail customer.

How might we see Bisen Energy evolve over the course of the next five years?

Bisen Energy strives to be the market leader within its space of the industry: not just quantitatively, as measured by market share, but also qualitatively through our service standards. We seek to become the widest service provider. Just in the few years in which we have operated, we have established a strong footprint in the Mediterranean and Coastal region. We now seek to expand this.

Do you have a final message for those that will be reading this publication?

Bisen Energy has a strong backbone supporting its further growth in Bis Energy. Bis Energy is one of Turkey's most profitable generators; the company, however, views retail energy supply as being one of the cornerstones of its future growth. Retail customers constitute as much as 40% of Turkey's total energy market. Market liberalization has changed this space of the market drastically. While this space of the market is still subject to further regulatory change as part of the market's maturation process, these alterations will only add further clarity and transparency to existing regulatory structures, facilitating our further development.

To look at what the market and Bisen Energy have achieved in such a short span of time since of liberalization – it is remarkable. Taking a larger perspective, the speed at which we have grown is reflective of the potential that Turkey holds as an energy market. Market liberalization presents opportunity, and Turkey offers some of the best demographics as an energy market globally. This has underscored our success and will equally back the success of others who enter the industry now. ●

Murat Çolakoğlu

●●●

Partner

PwC TURKEY

●●● Please provide us with a historical overview of the development of the Turkish power industry.

The late 1990s 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, as they placed too heavy a burden on the public sector to be sustainable and were all but completely abandoned ten years ago.

In the past ten years, Turkey has observed substantial expansion of its energy sector, ushered in by strong local interest in the development of new facilities. In itself a consequence of the expansion of the Turkish economy, in particular within construction, and the appeal of the energy sector for its captive market, these investments led Turkey to its collective current generation of 70 gigawatts.

The Turkish energy sector of today is marked by three interrelated issues: supply security, market liberalization and infrastructure investments.

What role will each of these issues play in the future growth of Turkey's energy sector?

Each of these three issues is strongly correlated with one another. Supply security is required for Turkey to meet its GDP growth targets. Growth of the domestic industry and labor force depends

upon the ability of businesses to secure their energy sources. This must be driven by the private sector, and market liberalization, as the Turkish government under the direction of Minister Yıldız, Minister of Energy and Natural Resources, has made it clear that that the government will contribute no new investments into the sector. Yet energy continues to be a political issue in Turkey. 70% of local production is generated through thermal production, of which 40% to 45% is derived from gas. 98% of Turkey's gas is imported by BOTAŞ. BOTAŞ, a state-run organization and the agency charged with gas distribution, requires further investments, especially in more pumping and balancing stations. The government has made it an ambition to debundle BOTAŞ for both the transmission and operation, yet as of present only 10 billion cubic meters (bcm) of 50 bcm total natural gas have been transferred to the private sector. The private sector, however, if it is to take on the role of state, must also undertake serious investments into infrastructure. Congestion management must be addressed; sufficient transmission facilities are needed to ensure supply security. At present as well, there are too few convertors. Be this is at may, while much work remains in each of these three areas, the Turkish government under Minister Yıldız has been successful in addressing concerns.

The Turkish Government has certainly set ambitious goals for the sector's development through the country's centennial

goals. To what extent do you think the Turkish government will be successful in meeting these commitments?

At the end of April, the 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.

Included among these goals are investments in renewables and nuclear. What role will each of these new areas of investment play in the further electrification of Turkey?

Each form of energy generation is necessary; however, the success of each project in contributing to the growth of Turkey's power generation capacity will be delineated by the area of investment. Turkey is a wind- and sun-rich country. Wind and solar power are important. However, on scale, they are cosmetic, representing solely a small portion of power generation. Nuclear energy holds far greater potential. If 4,000 megawatts can be generated through \$20 billion and it can be done so safely, this cannot be discarded.

On the subject of infrastructure investments, in what areas are new investments most required?

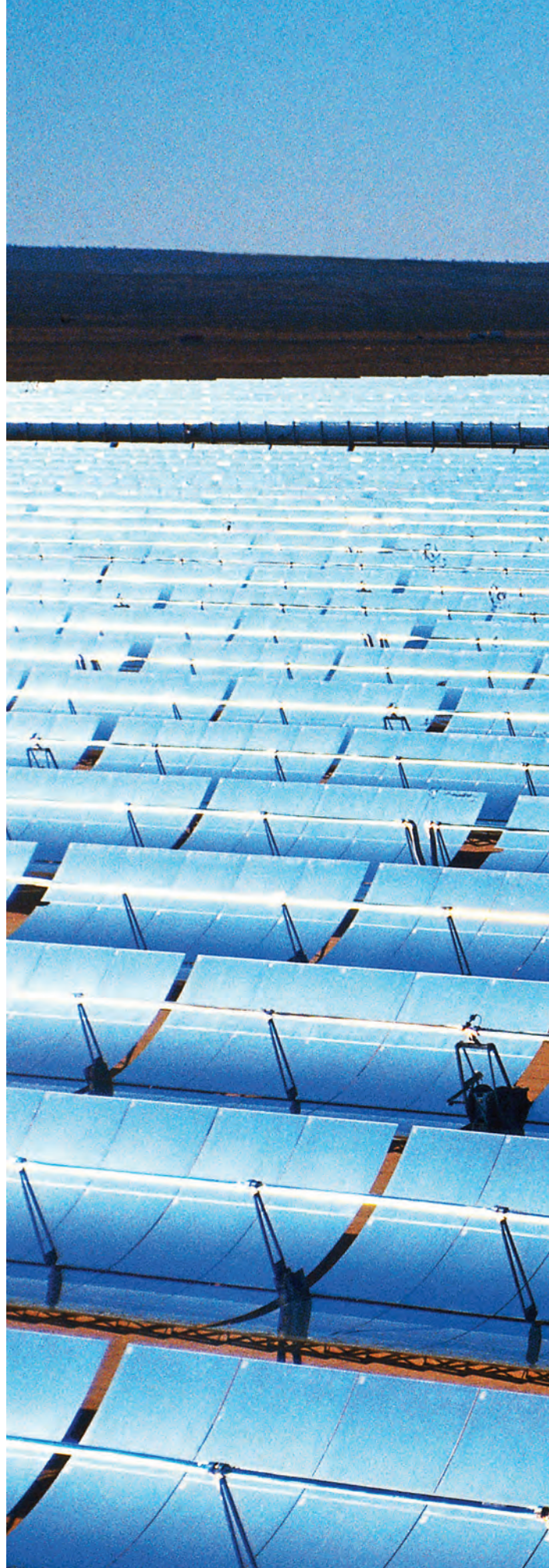
Greater levels of investment need to be made in transmission and gas distribution lines. Transmission lines need renewal. Furthermore, improvements need to be made to current state-owned production facilities. This, however, must be done carefully. Previously when the Turkish government attempted to privatize state-owned production facilities included among those facilities were many old assets, which required greater amounts of capital investment than new, equivalent greenfield facilities would. The specifications of many of these facilities were poorly documented. This detracted from foreign investor interest in the sector.

What might the Turkish power industry look like in five years?

There are many parallels between the Turkish power sector and the telecommunications sector. In 1996, the Turkish telecommunications sector was nascent, far behind that of other developed countries, and lacking in infrastructure. However, when investments were made, Turkey benefitted significantly from the technology used in more mature markets. Telecommunications experienced a large attendant jump in the caliber of local technology, when investments materialized. A similar jump can be expected in the power industry.

What final message might you have for those that will be first exposed to the Turkish power industry through this publication?

Investors must believe in Turkey and its upcoming position in the world. Those that do, and enter now, will benefit substantially from the country's growth. •





Ozan Korkmaz

●●● Partner
APLUS ENERJI

●●● Can you briefly introduce us to APLUS Enerji and the company's role in Turkey's energy sector?

APLUS Enerji offers four different services to the Turkish energy sector. Our primary activity is fundamental market modeling of the energy sectors of both Turkey and neighboring countries. Our Ankara-based subsidiary Enerji Merkezi provides technical consultancy services in the power generation business, providing bankers and owners engineering services, as well as strategic management consultancy services. During the initial privatization period, Enerji Merkezi was awarded as the lender's engineer for almost all the completed privatizations. This gives us the unique opportunity to get an accurate picture of the investments in the supply side of the market. On the demand side, APLUS is the provider of load-forecasting solutions and consultancy for 14 distribution companies and other major retailers. We have combined these posi-

tions with a strong modeling and software development team to build the leading fundamental market model used in the Turkish market. With the software and contacts in the industry we publish reports that provide information on power supply and demand forecasts, prices and industry trends. The software allows companies to store their energy sales and procurement contracts and manage the market exposure risk via a Monte Carlo enhanced fundamental market model. Finally, our consultancy team has deep, hands-on experience with the development and running of smart grid projects.

What metrics do you use when forecasting energy market scenarios?

At the start, we forecast the power demand based on various parameters like temperature, GDP, industrial activity and energy efficiency investment levels. This approach gives us realistic demand forecasts. Secondly, we model the energy supply via our comprehensive database of commissioned and prospective projects in Turkey, which is unique to APLUS. Using the same model, we can also forecast natural gas supply and demand and its possible effect in the power market. APLUS's forecasting accuracy and model detail make it a market leader in Turkey.

What opportunities have emerged from the liberalization of Turkey's energy market?

The most important privatizations in the coming years are those of the large hydropower plants in Turkey, which are being operated inefficiently. The private market players are aware of this potential and are in a better position to model, operate, and benefit from this potential compared to the state-owned subsidiaries, which are currently operating these hydropower plants.

Aside from hydroelectricity, what should investors consider when entering Turkey's energy sector?

There is little demand for additional natural gas-fired power plants in Turkey, similar to the situation in Europe. According to the feasibility studies that APLUS undertook in 2014, newly built natural gas-fired power plants are not profitable. There are a small number of opportunities in natural gas-powered plants, though. We are expecting at least two CCGT plant privatizations, where the plants are old, yet the infrastructure is in

place. If the amount paid for privatization is not too high, the investor can modernize the turbines to increase efficiency with low capital expenditure and reap considerable financial benefits.

Wind energy is relatively young in Turkey, with many plants under construction and the government offering a feed-in tariff of \$73 per megawatt hour (MWh). If the tower and blades are manufactured in Turkey, however, the feed-in tariff increases to \$87/MWh. This should attract international investors, as they can be assured of a fixed income, which is backed by all the market participants. In our opinion, the best opportunity for international investors is Turkish component-based wind energy.

Another exciting opportunity is geothermal. There are roughly ten projects underway and potential for more. Unfortunately, the country has installed a low capacity for solar power (currently 40 MW). There is not a big enough market for solar energy to attract international investors due to legislative problems. However, local investors have an increasing appetite for solar, and total capacity may reach to 1,000 MW in two years.

Turkey is currently a net importer of energy. Do you see this changing in the future?

Turkey will continue to be a net importer of electricity and gas for the foreseeable future, although there have been too many investments into power plants over the last three years, when the electricity capacity rapidly increased from 50 GW to over 70 GW. To put this growth into perspective, it took 85 years to reach 50 GW and only five years to invest another 20 GW. Most of the projects that we are now evaluating are no-go due to environmental reasons or simply being unfeasible. We are in the decreasing phase of the current economic cycle, which is unlikely to change in the next five years. Nonetheless, the wind industry has a bright future in Turkey. The same goes for geothermal energy, which has attractive tariffs at \$105/MWh. Privatizations and consolidations will be the most significant driver of investment in Turkey's electricity sector. •



IA



AB

Irfan Aker & Adil Bacak



IA: Chairman of the Board
AB: General Manager

DOLSAR

••• Could you explain Dolsar's role within the Turkish energy sector?

Dolsar was established in 1971, and the company's intention at the time was to develop water resources and conduct river-based hydro project development. In the 1980s, the market started to diversify and, accordingly, we began to work in several sectors. Today, in addition to the water and land resources development, we are working in segments of the energy industry, including nuclear projects, transportation, buildings, social infrastructure, tunnels, irrigation, sewage, water supply, treatment, pump stations, solid waste, regional development, socio economic studies. Dolsar performs all kinds of services, including master plans, planning, feasibility, final design, technical specifications, tender documents, design enforcement, loan application reports, assistance during tendering stage, construction supervision, commissioning

and training of operation staff. In addition, Dolsar is certified by the Ministry of Environment and Urbanization to prepare environmental impact assessments (EIA). For the last seven to eight years, we have started to provide lenders technical advisory (LTA) services as well as due diligence services to the investors/concession companies. The LTA services are for the projects in which investors are getting loans for the construction and operation of the projects on BOT and PPP models. Our LTA services include energy production projects, transportation projects (including motorways, bridges, ports), hospitals, hotels, business center, shopping mall projects, etc. We are providing engineering and consultancy services for the projects in 11 countries all over the world so far.

Are there any especially notable projects Dolsar has done?

We are lucky because all the projects that we do in Turkey become famous. We did the final design and construction supervision for the Ataturk Dam, which has an installed capacity of 2,400 megawatts (MW). We are providing LTA services for the Gebze-İzmir Motorway Project. We performed the design for the Water Supply Project to the Turkish Republic of Northern Cyprus. We are preparing the report for the Konya Basin Drought Management. We also did the construction supervision and final design for the Karakaya Dam, which has an installed capacity of 1,800 MW. We are currently involved with the Ilisu Dam project, which has a capacity of 1,200 MW. We give supervision services for the Şanlıurfa irrigation tunnels, which comprises two parallel tunnels with a length of 26 kilometers each and a diameter of 7.5 meters. The tunnels have a capacity of 320 cubic meters per second. We are also giving services of feasibility study, final design, and construction supervision for the Dasu Dam in Pakistan, which has an installed capacity of 4,320 MW.

What projects are in the pipeline for Dolsar in 2015?

We are involved in different projects in different countries, such as Pakistan, Georgia, Azerbaijan and India. We have a wide spectrum of services in all fields, so we are busy with design, construction supervision, and due diligence services, inside and outside Turkey.

Are Turkish engineers on par in their technical talent with engineers from European universities, or are there gaps in knowledge?

An engineering student from a highly reputed Turkish university will have thorough knowledge. The biggest gap is that Turkish universities do not link knowledge with the industry, therefore practical experience is lacking when a student graduates from university. From a theoretical point of view, Turkish universities are on par.

What are your views on the Turkish government's Centennial goals for 2023?

For the energy sector, there are two nuclear energy projects in motion. The relevant basing agreements were signed two years ago, and the formation is under the SPV companies. They are progressing into design, organization and mobilization, but the nuclear power plants will take a long time to be finished. Because it is novel for Turkey, we are learning a lot in the process of building both plants. For the small hydro projects, privatization is taking place. There are too many big projects that require financing, and, given that financing sources are limited, they are being postponed. Perhaps the government should spread out the projects over a longer time period. Solar power plants are being developed slowly, but the prices are exorbitant, which leads to the fear that revenues may not cover the investment or costs. Wind farms are being developed quickly, the largest having an installed capacity of 150 MW.

How do you advise clients to handle communities that oppose the building of certain power plants?

Communities tend to be unaware of the realities of the projects. If they are informed of the benefits, they will realize that the advantages outweigh the disadvantages, but some will directly oppose them. The environmental and social impacts should be clearly communicated so that informed decisions can be made without opposition.

Where will Dolsar be in five years?

We will continue with our energy and transportation projects and expand with a variety of projects. We will also have more experience in nuclear engineering. We hope that new generation projects will have new ideas involving technology. •



Kutay Kaleli

President of The Energy Committee
Ankara Chamber of Commerce,
and Founding Partner
ISTRICH CONSULTING

●●● Why did you decide to start offering your services in Turkey?

If one examines the umbrella of investors in Turkey, most come from a business background. Many have not dealt with energy before, which means they do not possess professional expertise. I was working in one such investment company, and looked at the market and saw a need, as numerous professionals required expertise and direction when making investments in energy. Leaving it to professionals is a better solution, which is why I established Istrich.

What is your response to concerns about return on investment (ROI) in energy?

It depends on the project. In Turkey, 10 years for ROI is acceptable. If it is over 10 years, it depends on the appetite of the investor. If we are talking about 12 to 13 years, it becomes unsustainable, but it is

still not decades. I am not talking about the natural gas segment due to the gas prices. Natural gas investments are still unfeasible because of the high raw material prices. However, the other kinds of investments like hydro, wind, solar, and geothermal are investable and feasible in Turkey.

Do you think Turkey is generally moving towards increased investment in renewables?

We should look at the distribution of electricity's base. Roughly 60% to 65% is generated by thermals, including natural gas, lignite, and imported coal, which is a big number. Approximately 40% comes from renewables. That means we are depending on natural gas prices. We should invest in renewables for the sake of the country, as we are still importing a large proportion of natural gas and coal. These are not our natural resources, so this basically means that our financials are going to neighboring countries like Russia and Iran.

Apart from dealing with regulatory bodies like the EMRA on a daily basis, what are some of the challenges in conducting your business?

Dealing with the EMRA is a micro problem. The macro problem is dealing with the bureaucracy. For unlicensed electricity, problems arise with the distribution companies, which are owned by private companies but still functioning as governmental companies after privatization. The biggest problem is that several times we have submitted applications to reduce the bureaucracy. We prepared some legal examples from Europe and the United States, and the bureaucracy will likely be reduced in the coming years.

My opinion is that EMRA is the market regulator, but not the regulatory body. There should be another authority granting applications, such as environmental impact assessments. We submit an application to the Ministry of Environment, which then asks numerous questions to other governmental authorities. This should be approved from one place to simplify the process. For example, once we submitted an application and received no response for six months. EMRA is doing its job well, as are the other governmental authorities, but the problem is that they are slow, and there are multiple approval facets. We simply need to consolidate them to speed up the process.

How do you find your clients?

They find us actually. It depends on one's network; the more people you know, the more jobs you get. This is the motto. And everybody knows everybody in the sector. In 10 years, you can meet almost everyone in the sector: experts in EMRA, experts in the Ministry of Energy, as well as experts in private companies. For example, one of our customers is my former employer. I used to work for them, and now they are our customers. The other ones found us, as they were looking for a consultant, and some people gave them our name. It is easy if one has an established name and reputation. There is trust, and they know that you are going to deliver.

Looking forward in the next five years, what do you imagine to be the scope of the energy industry in Turkey?

First of all, we should examine the energy policy. What we have in the pipeline now is two nuclear power plants in Turkey, one in the north and one in the south. This is good news because everyone who is using electricity should think about utilizing it efficiently. Secondly, we should increase focus on renewables. Every resource, water for example, has to be added to the system to generate electricity. If we finalize these renewable power plants, we can reduce the percentage of natural gas, imported coal, and lignite power plants, and electricity prices would decrease. It would force the industry to work more, which means more manpower. Everything depends on the price of electricity. Another big problem is that in Turkey the growth rate is between 3.5% and 4%, but the electricity consumption growth rate is between 6% and 7%. This will probably create a gap in the next five years, as we will not have the necessary electricity; thus, we need those nuclear plants. Europe is planning to close their nuclear power plants, but Turkey is counting on them. •



Aygen Yayıkoglu

●●●
 Founder and Managing Partner
CRESCENT CAPITAL

●●● Can you briefly introduce us to Crescent Capital and its role within Turkey's financial sector?

Crescent Capital is a sector-focused private equity firm concentrating on energy and infrastructure finance; we are the only energy-focused private equity firm in Turkey. Although we are based in Istanbul, we possess regional coverage throughout Turkey and 20 other countries. The existing fund that we are running is focused on clean energy generation. Our investors are institutional investors, such as EBRD, the European Investment Bank, KfW Group and FMO, which are experienced financiers in the energy sector. When Crescent launched the first private fund for energy in Turkey, these institutions became investors because they saw a good fit for their capital and expertise. The fund is already 70% committed. In 2015, we are looking towards launching new funds and products. While our investors in the fund are mostly

international financial institutions, we work with many private investors at the project level; the range of companies include North American energy funds, Saudi strategic investors, European financial investors, and large and small Turkish project sponsors, developers.

What are some of the main drivers behind the growth of Turkey's electricity sector?

In terms of overall activity, there has been almost \$20 billion invested in Turkey's energy sector since 2009, which represents much of the activity. The sector's installed capacity has reached 65 gigawatts; last year alone, 4,500 megawatts of new capacity was added to the system. A significant portion of the lending done for these projects is through Turkish banks. As a country, Turkey is trying to keep up with the demand for energy driven by its population, industrialization, and urbanization. The long-term average GDP growth is 5%, which has so far translated into higher growth in power production because of the elasticity of electricity demand. The energy infrastructure is also aging and needs replacing.

How would you characterize investor appetite for Turkey's energy sector, especially as the industry has become increasingly privatized?

The private element in Turkey's energy sector is close to 50%; if you include BOTs, then the majority is private. This is a big achievement in a largely state-owned system until a decade ago. The investor appetite is present, as it is from western European utilities. In fact, many large European utilities are already operating in Turkey. Now that there is an increased focus on renewable energy including solar and wind, some smaller and mid-sized developers in Europe are also establishing themselves here.

What are some of the key opportunities and challenges tied to the rapid growth of Turkey's electricity market?

The opportunities are abundant in Turkey's energy sector, as demand needs to be met with increased supply. One of the main challenges is distribution: nearly the entire sector has been privatized at a cost of billions of dollars, and there is a question of whether that investment will be recovered. Another challenge is that long-term

power purchase agreements (PPAs) are almost non-existent, and deals are based on long-term merchant risk. It is very unusual to invest billions of dollars in a power market that does not secure long-term off-take agreements. This has never been an obstacle to investment in Turkey, but the issue remains how much return investors can generate with price and dispatch uncertainty.

How supportive is Turkey's regulatory framework?

On the one hand, the Turkish government created a strong regulatory environment. From the start, EMRA has been a strong institution with a large budget and many employees. However, the power sector is constantly evolving and new regulations need to be enacted; one of the common complaints in any energy market is that the pace at which change is enacted is too slow. Investors expect quick returns but in the energy sector, it can be many years before an asset is in operation. The Turkish government took a different approach than other countries when they ceased providing long-term PPAs and opted for a low feed-in tariff for renewables. This offered a floor price while letting the free market dictate long-term price. By taking this approach, thousands of megawatts of hydro and wind were installed without additional burden on the government's budget, and soon we will see a wave of solar energy coming on line.

What is your outlook for Crescent Capital?

When we founded Crescent Capital, our goal was to launch the first energy fund in Turkey, which we did. We are now speaking with a range of investors to raise further and larger-scale capital to deploy in Turkey and its regional neighbors, and come up with new pioneer vehicles / products. Much expertise has accumulated in Turkey because of the amount of capacity added to the country's electricity sector: the amount of new capacity that came online last year was greater than the installed capacity of most countries in Africa. In the future, we want to grow regionally and position Crescent as the leading private equity firm with a focus on energy. •



TS



YC

Tarik Serpil & Yucel Cakmur

●●●

TS: Executive Director, Specialties
YC: Power & Utilities

MARSH CONSULTING

●●● Do you think Turkey's ongoing liberalization process is on the right track?

YC: As you know, Turkey was growing at an annual rate of 7% until 2009, but progress since 2009 has slowed. GDP grows at 3.5%, and electricity consumption tends to grow roughly 1.5 times GDP in Turkey, so there is 5% growth in electricity consumption. Looking at the distribution assets, 100% are privatized, and they all buy insurance. When we look at all the new privatization from the terminal side, a significant portion of those completed are now in private hands. They do the handover from government to the private sector, and they need insurance as well. The next cycle is that hydropower assets will be privatized as well, so a significant amount will need to be insured. Also, the landscape is changing in that insurance demand in the energy sector is increasing heavily because of the growth and movement from government to the private sector. Another issue

is that most of the financing is starting to happen because funds are required from international markets.

Essentially, we help optimize an insurance transfer tool for government and lenders. They retain some of the risk, but we buy insurance for them. There is significant need for this. From the privatization and growth perspective, when comparing Turkey to other countries, the process seems to be going well, as there are insurance regulations and new types of investments. We will see some movement in solar, but it will not be a game changer, and there is some progress in wind. In Turkey there has been about 500 megawatts (MW) to 600 MW projects coming online in the past few years every year, reaching 800 MW in 2014. Looking at projections, it will be around 800 MW annual capacity additions going forward. The gas-fired plants are not as profitable as they were projecting five years ago. Electricity prices are not high enough because it is not a fully liberal market yet. We have seen a few projects started in 2013 and 2014, and there are a few in the pipeline without financing yet. From the perspective of MW, coal and gas will still be the number one, until nuclear comes into the mix. Wind, solar, and the other renewables will grow gradually in the coming year, but the capacity development will not be enough to close the gap. In Turkey, there are huge incentives as there are in North America or Europe because some of our plants are inefficient.

Do you think the 30% target for renewables by 2023 is feasible?

YC: It is not easily achievable, if we exclude hydropower. Around the world, green projects are always overestimated, but there is upside too. For example, there is a big potential solar project that the government is talking about in Konya. If government improves regulations and creates a supportive environment, there could be some dramatic changes. However, when we say dramatic, we are talking about 4,000 MW to 5,000 MW by 2023, which is sizeable but still generates only 1/4th of a 4,800-MW nuclear plant planned in Mersin Akkuyu.

Did the 9% increase in energy cost move things in terms of attracting investors?

YC: This only provides short-term benefits, whereas investors need long-term certainty

and upside. We did a survey about expectations with investors around the world. Local and foreign investors in Turkey are much more optimistic than most investors elsewhere. Yes, the expectations of 2009 did not materialize in Turkey, but people are divesting from Brazil and elsewhere, which makes Turkey look relatively good.

Where do you hope to push the company in the next three to four years?

TS: We expect that privatization will continue and will keep chasing these opportunities. We will also see new investments in nuclear and renewables, as well as continued investments in coal-fired and gas-fired as well. There are different types of risks in all power investments. With geothermal, the supply guarantee is certainly not an issue, but it is different because half of the investment is going to finding the hot water. The water is situated 2,000 meters deep, so you never know if it exists until you reach it. If you build a wind turbine, it is relatively not a big issue because you just measure the wind. In geothermal, the biggest risk is the development risk, so the issue that comes in needing to insure the exploration. We are the only broker company in Turkey that is providing this solution to investors. From the insurance point of view, each investment has its own risk. If you are insuring a hydro plant, seasonality comes to mind because three months of the year you do nothing, but in the others you are producing all of your annual revenue. We work with investors, sponsors, and power companies to understand their risk and provide a tailor-made solution to make their investment more successful. •

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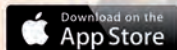
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CURBING CARBON POWER GENERATION IN TURKEY



"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."

- Murat Çolakoğlu,
Partner,
PwC Turkey

GENERATION PROCLAMATION

Bringing Solar, Wind, and Geothermal Generation to Turkey

Journalist: Mungo Smith

●●● 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 132.6 terawatt-hours (TWh) in 2002 to 255.5 TWh 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 450 TWh.

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 31,900 megawatts (MW) in 2001 to 69,500 MW in 2014. Totalling 6,000 MW 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 re-

newable 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 23,600 MW, this will necessitate investment in new fields of energy.

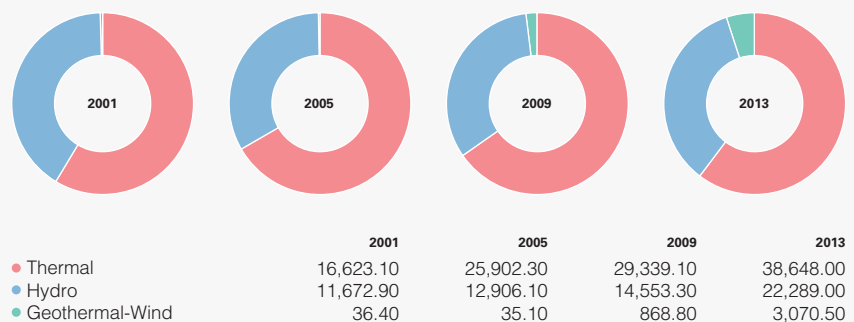
●●

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 MW to 150 MW, raising total production capacity to over 300MW for geothermal, 250 MW for wind and 250 MW for hydro, and total production for Zorlu Energy, including both domestic and international sites, to 1600 MW, with over 800 MW of renewable capacity in Turkey.

- Sinan Ak,
General Manager,
Zorlu Energy

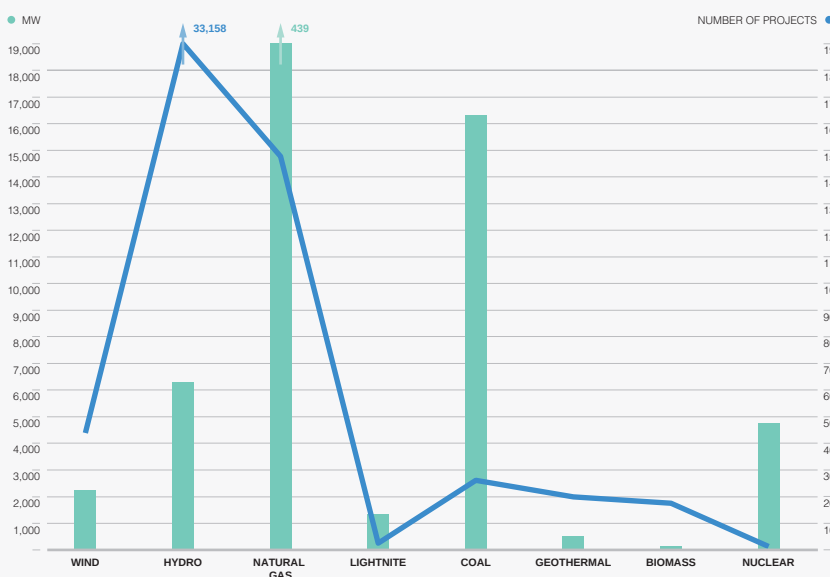
ANNUAL DEVELOPMENT OF TURKEY'S INSTALLED CAPACITY (megawatts)

Source: Turkish Electricity Transmission Company (TEİAŞ)



PROJECTS IN LICENCING PROCESS BY EMRA BY POWER TYPE (2013)

Source: Turkish Electricity Transmission Company (TEİAŞ)



We have great [wind] 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 11,000 MW in project stock.

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

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 3,000 MW 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 600 MW 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 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 32.4 MW, and American thin-film specialist First Solar, who will seek to produce 19 MW. Though those projects that enter into production prior to 2020 will receive a feed-in tariff of \$133/MW, with 3,000 MW 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 3.6 gigawatts (GW), 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 11,000 MW 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 PwC Turkey, 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

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.

*- Ozan Korkmaz,
Partner,
APLUS Enerji*

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 75 GW 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 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 1,600 MW of installed capacity, the Kızıldere Geothermal Power Plant, the largest of the country’s two operating geothermal energy production plants, currently produces 95 MW 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 13.2 MW divided between two units.

Possessing by some estimates as much as much as 4.5 GW 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.

Today we believe that Turkey has strong potential for geothermal energy: scientifically speaking, thousands of MWs. The




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Solar is a relatively new field for Turkey. The recent tender was 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.

*- Mehmet Özenbaş,
Sales and Marketing Manager,
Tekno Ray Solar*



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 MW to 150 MW, raising total production capacity to over 300MW for geothermal, 250 MW for wind and 250 MW for hydro, and total production for Zorlu Energy, including both domestic and international sites, to 1600 MW, with over 800 MW 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. •

Image: BTE Enerji



Sinan Ak

General Manager
ZORLU ENERGY



●●● **The Zorlu Group traces its history to the 1950s, though Zorlu Energy was established in 1993. Could you provide us with a historical perspective on the development of Zorlu Energy?**

Zorlu Energy was formally established in 1993, with the intention of focusing on our internal energy needs. At the time, there was insufficient electricity for factories to operate in Turkey. We entered the energy sector following a government mandate, which required that heavy industry produce its own energy. We entered into generation through two turbines, later expanding our capacity through gas-powered plants.

The growth of Zorlu Energy mirrored the maturation of Turkey's energy framework. As Turkey's energy regulator, EMRA, developed post-privatization, private sector energy production expanded. In 2007, renewables became a more attractive area of energy production; consequently, a corporate decision was made to focus more heavily on this segment, in addition to natural gas and coal. As the profitability of energy production in both natural gas and coal is closely tied to movements within global commodity markets, and as the profitability of gas-powered plants has faded since 2009, this strategy of simultaneously pursuing both gas and coal projects has proven necessary to diversify risk.

Since 2012, Zorlu Energy has invested heavily in expanding the group's holdings in power generation. Could you please provide us with an overview of these investments, in addition to those forthcoming from Zorlu Energy?

Beginning 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. Every year we hope to develop between one to two projects in renewables. Within the next two to three years, we would like to expand production of renewable energy every year by 100 megawatts (MW) to 150 MW, raising total production capacity to over 300 MW for geothermal, 250 MW for wind and 250 MW for hydro, and total production for Zorlu Energy, including both domestic and international sites, to 1600 MW, with over 800 MW of renewable capacity in Turkey. We are thinking about getting into solar power as well. Beyond this, our other projects include investments in coal and gas, as well as an \$8 billion pipeline that the Zorlu Group is executing to bring gas from Israel.

At least immediately, the focus of our investments will be on Turkey, in which we plan to invest \$500 million. We would like to complete as many projects in as short of a period as possible. This is especially important as previously we paid too much for new renewables. We now desire to recycle this equity.

Concurrent to these investments, Zorlu Energy has developed an EPC business. Focused on servicing our own projects, this unit's development was underscored by the problematic nature of working with EPCs in Turkey. While working with domestic EPCs externalizes the risk associated with project development, they are difficult to control, litigation is frequently needed in order to maneuver, and price escalation is common. While operating with cheaper EPCs prevents several of these problems, this also results in the fragmentation of projects between several EPCs, bringing with it inefficiency and decreased cost control. This last point, cost control, is especially critical, as it is necessary to maintain investor interest.

Our EPC group was established three years ago. We currently have four teams. Beginning in 2016, we may expand to six teams, possibly also beginning the development of energy projects external to the group. Most importantly, through the creation of this unit, Zorlu Energy has been able to ensure that its projects are delivered both on time and on budget.

The changes observed in the global oil and gas industry in the past six months are unprecedented. To what extent and how will the current pricing situation impact the Turkish market?

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 the volumes of gas imported into Turkey increase. This event, though, will only occur pending changes to the regulatory framework of Turkey's energy sector.

Two years ago, the Turkish government announced that it would support the development of domestic coal-fired power plants, in part

motivated by a desire to reduce the country's trade deficit. Simultaneously, all incentives for natural gas usage were curtailed. Be this as it may, investments into gas distribution continued, as they had in the preceding eight years. Zorlu Energy stands among those who have backed investments into gas distribution. Specifically, we have invested into gas distribution in Gaziantep and Thrace. We project demand increases, yet the ability of Turkish energy producers to supply these regions with additional energy will depend upon the Turkish government developing new strategies, either in the form of incentives, greater liberalization of the sector, or an improved platform for energy trading. The Turkish government must play an active role in negotiations. While the private sector can finance projects, like with nuclear energy, the government must create a favorable environment for these investments. There is great potential for natural gas in 2015. Yet unless we see the Turkish government actively develop it, new investments will not materialize.

A second concern of many is the comparatively large number of players involved in power generation in Turkey. Is consolidation likely? Otherwise, what implications might this structure have on project finance?

Compared with other mature energy industries, such as England and Germany, the Turkish power generation market is highly fragmented. While in England Germany, six players control 80% of the market, 36 players control this same share in Turkey. Should this problem go uncorrected, we could see a shortage of equity in the market and, additionally, less transparency. Zorlu Energy would like to assist in this, but, owing to the size of its current investments, it is currently unable to undertake any acquisitions.

What strategic initiatives will guide the development of Zorlu Energy over the course of the next five years?

In the next five years, we will target profitability. This, specifically, will involve renewables. In 2017, we would like to begin playing a more active role in market consolidation. In 2018, we seek to begin construction of several major projects. We have a desire to invest in large, billion dollar projects: projects that would enable us to collectively generate between 3,000 MW and 4,000 MW upon their maturity ten years from now. •

Image: Zorlu Energy Group





Selim Güven

●●●
Chief Commercial Officer
AKENERJI

- **Akenerji was established in 1989. Could you please provide us with an overview of both your involvement with the organization and the transformations that Akenerji has undergone in this period of time?**
- I joined Akenerji in 2008, at a time when the firm was transforming in several ways. My first assignment began prior to our merger with our current strategic partner, CEZ. I was initially charged with managing the next phase of business development for our newly structured joint venture: the expansion of our assets in generation, among which was included the development of what would become the flagship project of the merger, the development of Egemer NG CCPP, which is the largest investment in Akenerji's history. In addition, I also handled the post-merger integration for the firm, synchronizing the organizational processes. Culturally and organizationally, Akenerji

underwent a transformation, one that would prove critical to its growth and continued success. Projects went from being viewed mostly from a construction-oriented perspective, which emphasized the technical nature of projects and operational excellence, to one that optimized opportunities through the market point of view and in a consistent way. This transformation was symbolized in the development of Egemer. We were better able to both eliminate operational inefficiencies and enter into new fields with greater clarity. In addition to Egemer, we have ten renewable energy projects, within which we have maintained a heavy focus on hydropower plants (HPPs), and have expanded into trading, which represents one of the most promising potential avenues for Akenerji's continued growth.

The development of EPIAS foreshadows the expansion of trading within the Turkish energy sector, but Akenerji has long been active in this sector. Can you provide us with an overview of your activity?

Following 2006, upon commencement of DUY, spot and bilateral trading began in earnest in Turkey. Predating this, Akenerji had been a proponent of market liberalization and the expansion of energy markets. Akenerji, historically, has been one of Turkey's largest generators of natural gas-fired power. We experienced first-hand the government's non-market-based electricity pricing policy, which forced Akenerji to close its natural gas-fired power plants temporarily in 2006 because the cost of running the plant was higher than the prices.

In addition to its own generation capacity, Akenerji expanded its third party trading capacity between 300 megawatts (MW) and 400 MW. Today, we seek to grow our trading business through working with small generators and hope to more than double our current trading volumes by 2018. This, however, will be checked by the liquidity of these assets and market circumstance, which at least recently has included droughts that have limited the generation capacity of HPPs. This said, we remain active and currently trade through five independent brokers.

One of the greatest limitations in the maturation of the trading market has been the lack of transparency underscoring energy pricing. What specifically will greater market transparency necessitate?

The development of EPIAS is an important step in creating greater transparency and forming a reliable market price, as trading activity currently remains speculative owing to the non-market-based pricing by the state-owned generation company. Akenerji, however, is cautiously optimistic that EPIAS will allow for greater transparency. If EPIAS is to be successfully developed, its board of governors must share a common vision with market participants. Only this will allow for the development of the market trust required to increase liquidity and the number of participants, and, through it, the creation of a derivative exchange that will help industry participant to better hedge risk.

Liberalization and the unbundling of BOTAS must also occur, but privatization of BOTAS is not necessarily required. BOTAS may in fact be better able to negotiate gas prices than numerous individual private sector participants; however, the gas market must be liberalized and BOTAS must be as an organization so as to ensure that the playing field for industry participants remains level.

What key strategic initiatives will Akenerji prioritize in 2015?

2015 will be formative for Akenerji. We have recently completed the operational and commercial optimization of our HPPs. Now, after several years of operating, we have a better understanding of the characteristics of these plants, which should mean that the coming years will be marked by stability in generation and predictability in operation.

2015 is also in part significant because of Egemer CCPP. In 2014, it entered into commercial operation. This year, we will try to better understand both the region in which Egemer is located from the point of grid needs and limitations as well as seasonal demand and supply balance. Built in Hatay, Egemer is expected to benefit from its location at the end of Turkey's energy grid, which should facilitate balancing from a system optimization point of view. Now, in 2015, we seek to better understand the technical and trading capacity of the plant, as well its regional balancing power.

In 2015, we will develop Kemah, a 198-MW hydropower project with a reservoir, which is Akenerji's largest project in renewables. Kemah's feasibility study will soon be completed, from which we will begin to craft its development plan. ●



Elvan Tuğsuz Güven

General Manager
ÇİLTUĞ HOLDİNG

●●● Next year, Çiltuğ will celebrate 45 years of history within the Turkish market. Looking back at the company's growth, what do you feel to be the organization's key milestones?

Our company was established in 1971, originally with the purpose of supplying steam and hot water boilers. Over the years, we have evolved with Turkey's energy needs. In 1974, we first entered manufacturing of steam and hot water boilers, central heating systems, and pressure vessels. We also came to work as a sub-supplier to State Hydraulics Works, which enabled us to work on many of the country's most important hydropower projects. Of note, this included constructing the penstocks and most of the hydro mechanical and electro mechanical steel works used in the construction of Atatürk Dam. This was certainly a milestone for us.

A second milestone was our entrance into energy generation in 1996, when the gov-

ernment first began to discuss privatization and had established build-operate-transfer (BoT) agreements as a mechanism for encouraging greater levels of private sector participation. When these ventures were first released, Çiltuğ was the first company to apply, and we set up an energy-production company, Tektuğ Elektrik Üretim A.Ş. However, the terms of these agreements changed during Turkey's economic crisis, when the government realized that it could no longer guarantee the power purchase guarantee price initially stipulated and instead offered potential investors a 49-year lease for energy projects. In spite of the power purchase guarantee cancellation, we chose to still focus on generation, establishing Tektuğ, which continues to be our generation arm. Our company was the first private investor to accept this offer and received a thank you letter from the Ministry of Energy and Natural Resources. Through Tektuğ, we operate seven hydropower plants and one wind power plant, totaling 170 megawatts (MW).

We were the first company to receive a license for wind power production from TEİAŞ through its 2007 wind tender. This project, Sincik WEPP 27.5 MW, started production in January 2014. We have a 55-MW application as well, but were forced to part with this project due to TEİAŞ grid connection fees. During this period, Çiltuğ also entered into wind tower production.

It has been ten years since Turkey started privatization and market liberalization in the energy sector. What have been the government's greatest missteps in managing this evolution?

When market liberalization first began, we held great hope that we would see an increase in greenfield investment, especially for wind power. Even following the initial failures during the first tender process for wind licenses in 2007, we believed that we would see the investments in transmission required to facilitate the expansion of these projects 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 been sorely disappointed. TEİAŞ has yet to meet its commitments to improving connectivity, our energy infrastructure remains underdeveloped, and many of the targets that the government initially set for correct-

ing this have not been met. In addition, renewable investors who made power house and transmission investments on behalf of TEİAŞ have been disappointed due to long years of connection investment offsetting. Issues associated with transmission continue to detract from the feasibility of investments in renewable generation.

In 2015, how will Çiltuğ continue to expand its energy business?

Until now, Çiltuğ has been successfully manufacturing heavy steel structures, high-pressurized vessels such as penstocks, roller gates, radial gates, slide gates, jet flow gates, butterfly valves, distributor pipes, draft tube elbows, spiral case and stay rings for the hydro power industries. As of 2014, Çiltuğ made additional heavy machinery and know-how investment to produce wind towers for the growing wind industry. Going forward, Çiltuğ is gearing its production towards all types of heavy steel equipment, high-pressurized heavy structure, and high-pressured vessel production. With the new machinery and equipment investments along with its well established engineering team and work force, Çiltuğ is ready to become a supplier for the nuclear industry. This is one of the top priorities for the company in the near future, since Turkey is planning to invest in two nuclear power plants.

Tektuğ, our generation business, currently produces 170 MW, which we are seeking to immediately expand to 200 MW. To this end, at present we have a license for one remaining project for 10MW. Aside from this, we have begun to conduct measurements for both April's wind tender and several solar projects as well, though prior to investing in solar, the government must provide a more mature tariff structure. At present, the price offered for solar investments is not attractive enough to warrant the licensing process. If we are to invest, we will focus on unlicensed solar projects, which would be part of our larger goal to expand our holdings within renewable energy by growing hybrid projects between our hydroelectric projects and to develop in solar. ●

Joseph Bonafin

●●●

Sales Manager, Geothermal Applications

TURBODEN

●●● **Turboden's core competency is in producing technological efficiencies for energy generators. Could you please provide us with an overview of how Turboden developed?**

Turboden is among the pioneers in Organic Rankine Cycle (ORC) technology. We trace our roots to the 1960s, when our founder, Professor Mario Gaia first began developing the technology used in our systems today. Turboden was established in the 1980s as a spin-off from the Politecnico University of Milan.

Ten years into establishment marked a turning point for our business. Driven by the regulatory structure in place to encourage the cultivation of biomass energy in several European markets such as Austria and Germany we expanded heavily into these regions. In 2005 the pace of our development quickened: we grew from 10 personnel to over 200. Subsequently, in 2009, we were acquired by American United Technology Corporation; we are now a Mitsubishi Heavy Industries (MHI) company, world leader for geothermal power capacity installed. This led us to expand further, spurred by the synergies we were able to realize through our new organizational structure in particular in fields such as geothermal energy. Today, Turboden, leader of ORC units installed globally, can cover all the possible solutions required by a geothermal developer and can provide the most optimized configuration for that specific resource.

ORC technology has certainly been well received by the global energy sector. On a technical level, how does ORC technology operate?

ORC technology converts thermal power into electricity, and further heat for possible combined heat and power (CHP) uses. This heat can be generated from various sources such as biomass, geothermal and solar energy, in addition to heavy industrial processes such as steel, glass, cement production, or heat recovery from turbogas or diesel

generators. All these sources have temperatures typically ranging from 100 °C to 600 °C.

ORC technology is one of the few ways to exploit certain geothermal water and steam resources as geothermal energy is, in application, low temperature if compared to traditional coal fire and natural gas fire power plants, meaning that for geothermal energy there is a certain proportion of energy that cannot be exploited in any other way but than through ORC technology. Most of our larger projects that are greater than 20 megawatts (MW) are derived from geothermal energy, due to the beneficial project's economy of scale. Within Turkey specifically, we have worked on several projects in the Menderes valley region, south of Izmir, where we showed our clients the ease with which ORC technology is able to make useable geothermal resources even in very shallow depth environments. In the Afyon project we will produce electricity from a 110 °C geothermal field.

What is the scale of the projects in which ORC technology is typically applied?

Through this conversion process, we can generate power ranging from 200 kilowatts to 25 MW. We are now seeking to apply ORC technology to projects that are as large as 100 MW.

Turboden will soon fortify its presence within the Turkish market through expanding its facilities within the country. What market conditions in particular drove this decision and why now?

Turboden was established in Europe but is now seeking to set a

stronger position in Extra EU markets. Our first project in Turkey was a biomass plant that we were awarded in 2010. Following this project there were many others, but recently we have noticed a sharp increase in interest in the development of larger-scale geothermal projects using ORC technology. This is attributable to the growth of the Turkish market for geothermal. In the past six months, we have noticed a great increase of interest in the development of Turkish geothermal projects by foreign investors from even very well established energy markets such as the United States. This in part spurred our decision to expand in Turkey.

We have long been interested in establishing a direct presence within the Turkish market, especially through the establishment of assembly facilities. Our greatest concern though, at least historically, has been intellectual property protection. There are very few countries and companies in the world that have access to ORC technology. We needed to be certain that the processes driving our technology would be protected. Additionally, we needed to ensure that the regulatory structures promoting local manufacturing within Turkey, especially for turbine manufacturing, would prove sufficiently attractive upon maturation. We are now confident that both of these criteria have been met and, as a result, we are now finalizing the establishment of our Turkish office and our first contract through which our client will benefit from Turkey's local content incentive scheme.

This decision, of course, was also predicated upon the country's potential for geothermal. What projections does Turboden hold for the growth of this relatively undeveloped piece of the country's energy matrix?

Today, 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 1,500 MW of geothermal energy realized, both from traditional flash processes and ORC cycles. We expect annualized growth of 200 MW.

What specifically has this meant for the projects that Turboden will work on in 2015?

Turboden is occupied with more than 30

ORC projects in 2015. We are continuously improving our technology, by means of increased efficiency of our proprietary turbines, and standardization. If compared against the present solutions implemented in Turkey, this technology will grant both a greater internal rate of return (IRR) and reliability for power producers.

What will the next five years have in store for the company?

Within Turkey we hope to complete our first large-scale geothermal projects, in the range of 100 MW. We believe that through such an undertaking we will be able to foray our competitive advantage in technology into more mature markets for geothermal energy production such as South East Asia and Americas. Geothermal will represent more than 50% of our turnover in the next years, together with the traditional biomass and heat recovery applications. ●



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www.turboden.com

Şükrü Akkan



General Coordinator

CAKMAKTEPE ENERGY



●●● **Cakmaktepe Energy is a holding company for several business units that operate within the energy sector, in fields including natural gas power generation, energy wholesaling, and geothermal energy exploration. Could you please provide us with an overview of Cakmaktepe Energy?**

Cakmaktepe was formally established in 2006. We initially began generating with 34 megawatts (MW) of natural gas-fired production capacity. At this time, the energy market was in a very different place than today: demand was expanding rapidly and there were few regulations that limited the profitability of generation. The focus of the industry, at that time, was simply on bolstering national production capacity. A “wild west” mentality predominated.

We were encouraged by how lucrative even our 34 MW of generation capacity had been. In 2008, our shareholders decided to expand: first to 100 MW, and then to 200 MW. Later we further expanded to 248 MW, before reaching our current generation capacity of 268 MW. Today, through our 28 engines and two steam turbines, Cakmaktepe Energy is the largest natural gas power generator operating using 34 SG engines.

In its development, Cakmaktepe Energy has sought to enter a number of fields aside from natural gas power generation. Please provide us with an overview of these activities.

In addition to natural gas-fired power generation, Cakmaktepe has also attempted to enter several other fields of generation. The first of these fields was wind energy generation. During the industry’s first wind tender, we were prepared to bid. However, the prices at which licenses came proved to be too great to be economically viable.

Later, Cakmaktepe Energy participated in a geothermal tender, the result of which was the acquisition of a 42-square-kilometer parcel in Akca. We have since completed groundwork on this land, the results of which look promising. Though the Turkish government initially assessed the land’s potential as 5 MW, Cakmaktepe has since discovered that our potential stands at between 40 MW to 60 MW. Beyond this, as on each of the land parcels surrounding that of Cakmaktepe there is already geothermal power generation, we are confident that most of our potential is viable. For this project we now await financing.

The development of Cakmaktepe Energy's geothermal project is expected to require as much as \$50 million. How will this project be financed?

Credit lines have closed for energy projects, for the exception of for few companies that have access to recourse. We expect that these assets, rather than being internally developed, will be acquired. There are just too few options for project finance to make the development of these assets by Cakmaktepe Energy viable.

This change in the country's financial environment has been underscored by a decline in the profitability of natural gas-fired power generation. On a regulatory level, what has led to this shift?

Changes in the profitability, and desirability, of natural gas-fired power generation have been driven by ministerial-level politics. The Turkish government has played a great game with the country's energy sector. In 2006, Turkey experienced electricity shortages; the government sought to end these as quickly as possible, and as such, created an incentive scheme that was attractive for the development of natural gas-fired power plants. Many, Cakmaktepe Energy included, invested in these facilities as a result of this incentive scheme and, as a consequence of these investments, the country's energy shortages ended in 2009. As soon as we saw these shortages end, the incentive structure for natural gas-fired power generation changed. Instead of a seven-year payback period, which was a condition of the original incentive scheme, we found that we to receive our money instead ten years following the development of our facilities.

Today, in meeting with the Minister of Energy and Natural Resources, we have been astounded by his response to our declines in profitabil-

ity. When we initially established ourselves, we did so because the Minister of Energy and Natural Resources at the time had told us to invest: that natural gas power generation will have a place in the future of Turkey's energy matrix. In meeting with Taner Yildiz, the country's current Minister of Energy and Natural Resources, however, he has stated that he cannot be held accountable for the policies, and consequences, of the country's former minister. We have little political recourse.

Has Cakmaktepe Energy observed these inconsistencies in policy in other segments of power generation aside from natural gas?

We have seen the Turkish energy regulator back step in several other instances aside from natural gas power generation. Concurrent to this shift in policy away from encouraging the development of natural gas-fired power plants, the Ministry sought to encourage an expansion in power generation through renewable resources. Heavy emphasis was placed on expanding wind energy generation. Yet the government's initial policy approach to managing the development of these projects showed little foresight. Initially, few requirements for these projects were issued. Later, however, the conditions upon which many had already invested changed. This resulted in many selling their assets. We have seen this in hydroelectric power generation as well. When many began investing in hydroelectric power, there was to be no resource charge; later, we saw the Turkish government claim that water, as a national resource, must be subject to charges. In Turkey's energy sector, there are regulatory inconsistencies across the board. •



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TT



AM

Dr. Tamer Turna & Dr. Alp Malazgirt

●●●

TT: CEO and Member of the Board,
Energy

AM: CEO of Metals and Mining

YILDIRIM GROUP

●●● Can you briefly introduce us to Yildirim Energy Holding, and the group's role and strategy within Turkey's energy sector?

TT: Yildirim Group first showed interest in the Turkish energy sector in 2008 with the idea of building a 500-megawatts (MW), clean coal power station, together with one of Europe's leading power corporations. This project advanced, but the Lehman Brothers crisis halted it. In January 2011, the root of Yildirim Energy Holding (Yildirim Energy) was created, and we started developing greenfield power plants and trying to determine brownfield possibilities in Turkey. As part of our Vision 2023 investment plan, we started by applying for a 200-MW, clean coal-fueled power plant in Elazığ. The project will become one of the most environmentally friendly coal-fired power stations in the world because it combines high quality, clean stone coal firing with circulating fluidized bed

(CFB) technology, which is normally used for hard to burn fuels, such as poor quality lignite or bituminous shale. The outcome of this combination is a process that does not require any flue gas after-treatment; with this combustion process, the large combustion plant's emission regulation of the European Union is already met. The permitting process for it is ongoing.

Further, we acquired the Filiz Power Corp. (a \$2-billion investment), which is a 1.3-gigawatts (GW) plant clean steam coal fuelled and ultra supercritical pulverized coal (USC-PC) technology based high efficient and environmental friendly greenfield power plant project of ours. We completed permitting easily and are targeting to sign the turnkey EPC contract and come to a financial close in 2016. Simultaneously we are gaining progress in the final permits for our Sarıkaya Power Corp. project, which will become a duplication of Filiz Power. Another very important feature is that both plants will be sited at the sea side. This will secure the access to a low temperature cooling water source and lower our steam turbine condensation pressures, thus reaching an incredible plant net efficiency over 45%, similar to plants in Denmark, the Netherlands, Germany, Japan and the United States. Our target is to establish a solid, clean, steam coal fuelled generation fleet to provide competitive, environmental friendly, base load power to Turkey.

We also acquired two combined cycle gas turbine (CCGT) power generation licensee companies, in order to meet the flexible power generation requirement of Turkey. Both plants (Pegai Power Corp. and Rüzgartepe Power Corp.), each sized at 600 MW and with net efficiency of over 60%, will be able to run on and off within 30 minutes, allowing us to provide full load power quickly. These features are paid well in the market and provide back up power security for renewable energy sources (wind, solar and others) within our aimed "mid merit" operation modus. Reliable power that is readily available when needed has become a valuable asset to the markets. Our plan is to go on grid with our CCGTs in 2019 and 2020.

Last year, we acquired a hydropower generation corporation consisting of three plants with a combined 150 MW of installed capacity of run-of-river hydro stations, generating 400 gigawatt-hours of electricity per year. We started generating

and selling electricity with this renewable technology in 2014.

Our next targets are to compile our generation portfolio in Turkey with wind farms and large-sized dam type hydro power plants and in Africa, LATAM and Central Asia with new projects.

Yildirim Energy is betting on the continued use of clean coal in Turkey's energy future. Why is importing more coal to Turkey in the interest of the country?

TT: On the one hand, imported clean coal is a foreign source that increases the account deficit, but due to the low generation cost in Yildirim Energy's designs and sourcing, we will push the low-efficiency, gas-combined cycle plants out of the market. Foreign coal will therefore help eliminate more expensive gas from the market and lower the account deficit.

We are also analyzing domestic lignite coal-based, minemouth power plants. Turkey has 14 billion mt in total reserves of lignite, but 75% of it is of a very low quality, less than 2500 kcal/kg in lower heating value content, which makes it very expensive to harness and uneconomical. The other 25% is higher quality, 2500 to 4000 kcal/kg in lower heating value content, but those individual deposits are too small to warrant building a power station near them. There are also significant social, environmental, and legal challenges to developing high quality lignite power plants, associated with consolidation and expropriation of valuable farming land.

AM: Coal is in Turkey's future, unfortunately, and it bears a cost. We are promising that with increased efficiency and sourcing high-quality coal from our mine in Colombia, there will be less environmental damage. Coal production will be happening in these high calorific-value countries – China is also shutting down – so this high-calorific coal will be in our future, fortunately or unfortunately. ●

Osman Kurdas & Sahnur Agaik

OK: General Manager

SA: CEO

GSD

●●● Can you provide a historical perspective on Turkey's power sector and GSD's growth within the industry?

We started the company in 1987 and entered the power sector in 1997. The first combined cycle power plant established in Turkey was by Ova Electric and Bis Energy. We started out as subcontractors of General Electric, as their automation partner. Interestingly, Ova Electric DCS system was Foxboro, and we represented Foxboro from 1994 until two years ago, when Schneider took over. Although the government controlled the energy sector for a long time, the private sector entered after 1996 and soon Turkey became a world player.

From 1997 to 2010, the preferred power source in Turkey was natural gas, as it is clean, cheap, and easily accessible, and power plants are feasible to build. Over the last four years, however, it became clear that we are too dependent on natural gas,

which is not our own resource, putting us in a disadvantageous position. We are basically a natural gas EPC, which started from an energy project with Nooter/Eriksen end client is Bis Energy. Nooter/Eriksen is the world's number one heat recovery steam generator (HRSG) supplier in St. Louis, United States. It has six or seven active licensees worldwide, and we are one of them. We have a design team that designs the boiler, around which the EPC activity is centered. The rest of it is then designed and pieced together, the central part being the HRSG. We are at an advantage because we have a strong name, but natural gas projects are diminishing nowadays.

How does 2015 look for your project pipeline?

Turkish electrical authorities have always observed a statistical curve, but the curve is changing; in the last four to five years, there has been a decline in electrical consumption in Turkey, thus supply is exceeding demand. Overall, the energy sector for natural gas is not as active.

We typically produce projects in the range of 50 megawatts (MW) to 300 MW. This kind of project falls within the 55% to 56% efficiency range at the maximum, whereas a very big power plant reaches 60% to 61% efficiency. Our company does projects in accordance with our scale. In the future, power generation in Turkey will be crucial. Small, agile power plants will prevail eventually because big power plants come with big drawbacks.

What projects is GSD pursuing in 2015?

We are doing HRSG units for the 240-MW power plant for Georgia. As subcontractors of ÇEAŞ in this project, we are supplying two fairly large boilers. We are doing a 75-MW power plant in Adana, with the first ever Siemens Rolls-Royce machine in Turkey. This aeroderivative turbine is agile, scalable, and can be put off and on like a car. This type of power plant is more adaptable to market conditions, which increases its demand.

How are you positioning yourself to better approach the slowly growing market?

We are designing a boiler for this particular aero-derivative turbine. Until now, aeroderivatives were less than 50 MW, but now there are 60-MW machines that are

more efficient, but still practical. We are designing more powerful boilers that still obey the minimum environmentally compliant load when running at a lower efficiency.

When we will see a more mature market that moves towards these types of smaller, more efficient projects?

Turkey is reaching its hydropower limit, and wind energy is difficult to generate. The government is levying a tax on imported coal, thus promoting local coal. However, local coal is difficult to extract, has social impacts on miners, and has a low kCal content as opposed to imported coal, thus making it less practical to burn for energy. Over the next two to three years, once imported coal and local coal are both eliminated as options for energy, people will return to natural gas. Further, the quality of power within Turkey can be improved so the market will look to energy generating companies.

How technically qualified are the Turkish people in working on such projects?

Turkey has medium and large-sized companies that follow the world standard for the power industry. First, there is good engineering expertise in Turkey even beyond EPCs. Second, Turkish management comes with a lot of experience in handling 600-MW to 700-MW projects. Third, Turkish labor comes at a reasonable price. Consultants from the UK have compared Turkish construction companies to those in Europe, and say that Turkey delivers the same output for a lower input in terms of labor and other costs.

Where will GSD be in five years?

We are attempting to diversify and have a subsidiary in the United Kingdom. We also have our own factory to manufacture the boilers and power plants for our projects. This gives us control of delivery times for our own EPCs, as well as a chance to supply to international companies, thus making GSD a designer and a producer. This will give us a chance to cater to international companies. GSD should ideally aim to earn half its revenue internationally. ●





Mustafa Serdar Ataseven



President

TURKISH WIND ENERGY ASSOCIATION

●●● Can you give a brief background of The Turkish Wind Energy Association?

The Turkish Wind Energy Association was established in 1992 by the Energy Ministry. The board is comprised of members from both the government and private sector; of the 11 board members, four are from the government, and seven are from the private sector. We represent more than 90% of players in the Turkish wind sector, with the aim of optimizing wind power's contribution to the Turkish economy. We organize meetings to provide information about wind's potential and opportunities to foreign investors. We are members of both the European Wind Energy Association and the Global Wind Energy Council.

What is the strength of wind energy compared to other renewables in Turkey's energy market?

We have great potential in Turkey, 25% to 30% more than the European average. For

example, 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. When you look at incentives in the wind energy sector, our government is promoting wind energy because we are currently producing half of our energy from natural gas and 25% from outside sources. So the government wants to find alternative energy sources and increase the use of local renewables. Also, Europe is saturated with on-shore wind investments, so European manufacturers and investors are looking for other opportunities. Our industry target is 20,000 megawatts (MW) by 2023. Now, we are at 3,760 MW in operation, with another 1,200 in construction. We have an 11,000-MW project stock on the wind side. With these figures, Turkey is a big market. Beyond Turkey, there are significant opportunities in Africa, Central Asia, and the Balkans. This means that if someone wants to invest in the Turkish wind sector, they can then easily reach these other developing markets, which makes Turkey a good opportunity for investors in wind energy.

Do you think that the current regulatory framework will allow the sector to achieve the 20,000-MW goal by 2023?

We can reach 20,000 MW, but not by 2023. When you look at current regulations and market dynamics, it seems a little difficult to achieve this within the timeline without some new regulations and mechanisms to attract investors. Investors want to invest in the Turkish wind sector. We have 11 turbine manufacturers, who are active in the wind sector now: one from India, one from the United States, two from China, and others from Europe. There are no European countries with 11 turbine manufacturers. They want to invest in Turkey because the figures are feasible and the economy is stable. For example, a lot of financial institutions are active in Turkey. They look at the Turkish energy sector and feel that it is a strong economy because the regulations are mostly stable. The construction permission procedure is too long and complex, which is the main challenge, but it is a minor problem. If we can solve this bottleneck, the sector will progress rapidly.

How is the Ataseven Group involved with the energy industry?

On the energy side, we are developing and investing in wind projects. We have

ongoing projects and are also developing projects all over Turkey. We are ready for the new applications that Energy Market Regulatory Authority will put into effect in April 2015. We were founded in 1991 and continue to be a family-based company. We were mostly dealing with the construction business, but after the 2005 renewable energy law, we entered this market. We now been in the renewable energy sector for almost 10 years, and our team is very experienced. We do most of our development in-house. We had a joint venture with a German company, where experience was exchanged on both sides, but the partner exited in 2011 due to its own position.

How easy is it to do business and be profitable in Turkey's wind energy sector?

Investors look at the return on their investment and how many years it will take to obtain profit. In Turkey, one can get the return on investment in eight to 12 years, whereas in Europe one can wait for up to 20 years. Yes, there are some challenges, but at the end of the day, all investors are making a profit in Turkey's wind energy sector. Because of the complex permission process and bureaucracy, a lot of foreign investors collaborate with Turkish companies. The Turkish company is responsible for obtaining the permissions, and the foreign company is responsible for the technical and financial side of things. When you look at the investor side, many foreign investors and international operators are active in Turkey, which shows that there is a strong energy market. If you look at the past five or six years in the wind sector, we have realized more than 500 MW per year. In 2014 we gained 804 MW, so with new regulations, we can achieve the 2023 target. ●

Gokhan Serdar & Lars Moller

●●●

GS: CFO

LM: Sr. VP, European Operations

TPI COMPOSITES

●●● **TPI Composites is headquartered in Scottsdale, Arizona, but has operated in Turkey since 2012. To begin, could you please provide us with an overview of TPI Composite's global presence?**

Today, TPI Composites stands as one of the world's largest, independent wind blade manufacturers. Globally, we fabricate these blades in four regions: the United States, China, Mexico, and Turkey. In the United States we are also involved in the transportation sector; however, this is outside of the purview of our operations in Turkey. Our presence in Turkey dates to 2012. In late 2011, we entered the Turkish market, originally through a joint venture with a local company. By the end of 2013, we had fully acquired the shares owned by this local company. Today, we operate as the sole proprietor in Turkey through our facilities in Izmir.

Turkey, and Izmir, is of course an attractive market for wind generation, but what specifically led TPI Composites to establish a manufacturing presence within the country rather than supply to the market through one of its other, already established manufacturing centers?

TPI Composites was attracted to Turkey and chose to establish a manufacturing presence within the country for several reasons. The macroeconomic environment of Turkey is attractive, especially for the future of wind generation. Turkey has a current account deficit, to which energy is an important contributor. This has led the Turkish government to focus on developing a regulatory scheme that is attractive for bolstering domestic generation capacity. Within this, the development of renewable energy has been heavily focused on because of the need to also address the impact of traditional forms of energy generation on environmental sustainability and global warming. Within renewable energy, wind generation is one of the most efficient forms of generation. This has collectively led the Turkish government to resolve to, through incentives, strive to realize a significant expansion of wind generation in the country. This of course has meant the development of an incentive scheme that is attractive to those who would manufacturer components used in wind generation locally.

Beyond this though, TPI Composites was

attracted to Izmir for several reasons. The epicenter of wind energy generation in Turkey is in Western Anatolia, specifically within the Izmir and Marmara regions. Our location within Izmir allows us to access these markets, but additionally, our location in Izmir, owing to the city's port, also enables us to easily access near markets, especially several regional markets that we expect that we will see grow quite quickly in wind generation in the coming years. Izmir is the easiest point of access for markets in North Africa and the Middle East because of its proximity to these regions. Proximity is critical when transporting blades that can be as large as nearly 60 meters.

Could you please provide us with an overview of TPI Composites operations as they stand in 2015?

TPI Composites, through its presence in Izmir, is active in the manufacture of wind turbine blades for both domestic and foreign markets, namely, today, the United Kingdom and Finland.

At present, TPI Composites manufactures wind turbine blades for two leading wind turbine original equipment manufacturers. Within our facilities in Izmir, we manufacture two models of wind blades, which we fabricate through six molds. The blades themselves are manufactured from composite materials, mainly fiberglass fabrics infused by resin. A significant portion of our cost of manufacturing is derived from materials and labor, as there is very little automation in manufacturing these blades. As such, we presently employ over 1,000 employees through our local operations.

What strategic initiatives will TPI Composites enact in 2015 to continue its growth?

In 2015, TPI Composites will continue to focus on ramping up its production capacity. •

Christian Johannes



General Manager
RE-CONSULT

●●● What has re-consult been doing in the last five years?

re-consult is a consulting company, independent from developers and manufacturers. We work with investors who are interested in wind farm investment in Turkey and develop wind farm projects on their behalf. Typically, we handle the multiple aspects of setting up a wind project: we select the site for the client, conduct wind measurements, and put together all the necessary documents needed to apply for the license from the Energy Market Regulatory Authority (EMRA). Once the license is approved, we take over the detailed wind farm design, secure all permissions needed, and secure the land, everything that is necessary for the construction and operation of the project. Once the process is complete, the client can start construction of the wind farm. We are also happy to support our clients during construction with aspects such as the commission of turbines.

In terms of the financial aspect of wind projects, we are also active as a bank engineer. The bank comes to us with a project that requires financing and on behalf of the bank we utilize our expertise to screen the project as to whether it is bankable and financeable.

Has the focus on renewables in Turkey translated to growth in the sector?

There has been a strong focus on renewables since 1996. There has always been interest, and Turkey has been famous for being a market of higher potential in this regard. Sadly, it is only just that: potential. At the end of every year, we see a light at the end of the tunnel for the coming year, but usually it starts to rain in the middle of the year. This is because of EMRA, which is unable to effectively regulate the market. Many of the inadequacies come from the fact that legislation changes on a monthly basis – there needs to be more consistency over the long-term. One invests heavily in wind measurements for developing projects, completing applications, and filing for permissions; then once that process is finished, the policy changes, forcing one to spend again to comply with the new legislation, creating waste both financially and in terms of time. It also becomes impossible to re-obtain certain documents in the stipulated timeframe, which EMRA needs to be more mindful of before choosing to change the policy.

What can be done to fix regulatory procedure in Turkey?

There are annual meetings of the Wind Association in November. Many stakeholders are present, including representatives from EMRA. Everybody present says, “If you are going to change something, wait until the end of April 2015. Do not change something two weeks before we have to apply for the license. It already took us half a year to get these application documents ready.” The problem is that one needs opinions from a variety of authorities, and response time in general is slow. One has to wait three to four months to obtain something, so if EMRA makes a change at the last minute, it is impossible to obtain a revised opinion. And if you do not have that, you cannot apply which makes our job in applying for permissions extremely challenging. There needs to be a faster response and consistency of policy in order to enable

applicants to move ahead with projects. This will translate into more investment in Turkey’s wind energy segment: the less onerous the bureaucracy and easier it is to conduct business, the more likely investors are to consider Turkey.

What are the expected rates of returns for successfully developed wind projects?

If one wants to earn profit in Turkey without also owning an electricity distribution company, based solely on generation of wind power, a typical capacity factor of 35% is required in order to obtain an internal rate of return (IRR) of 10%. If you look at the list of operating wind farms, being annually published by EMRA, you can see what wind farms in Turkey produced in the past year. The average capacity factor of the operating wind farms in Turkey is 31%. More than half of them actually lose money or have an IRR that is not friendly to foreign investors. The problem is that the road to operating a wind farm in Turkey is stony and rocky; therefore, many investors—especially foreign ones—eventually lose patience. Yes, there are examples of profit-making farms that operate at 45% capacity, but there are also farms operating at 23% capacity. Like any place, there are some that succeed and some that do not. It ultimately depends on the scope and nature of the project, and financial success is most certainly possible in Turkey’s current wind energy market with the right direction. ●





INTO THE FUTURE PIPELINES, POLITICS, AND THE PLANET



“In the next five years, the churn rate [in the trading environment] is expected to grow to four or five, both in the OTC market and on the exchange. We are likely to see a coupling of the Turkish market with Georgia and later with Iraq and Iran. As a whole, the Turkish energy sector will be characterized by a strong Russian influence in the medium-term. We will also see consolidation of many of the industry’s smaller generators, either by the industry’s larger players or as part of a trading portfolio. Generally, the number of deals will be greater. Investment banks and financial institutions will play a more active role in commodity trading.”

- Mustafa Karahan,
Deputy Chairman,
Enerji Ticareti Derneği (ETD),
Energy Traders Association

TURKISH STREAM AND MARKET LIBERALIZATION

Turkey's Energy Ambitions

Journalist: Agostina Da Cunha

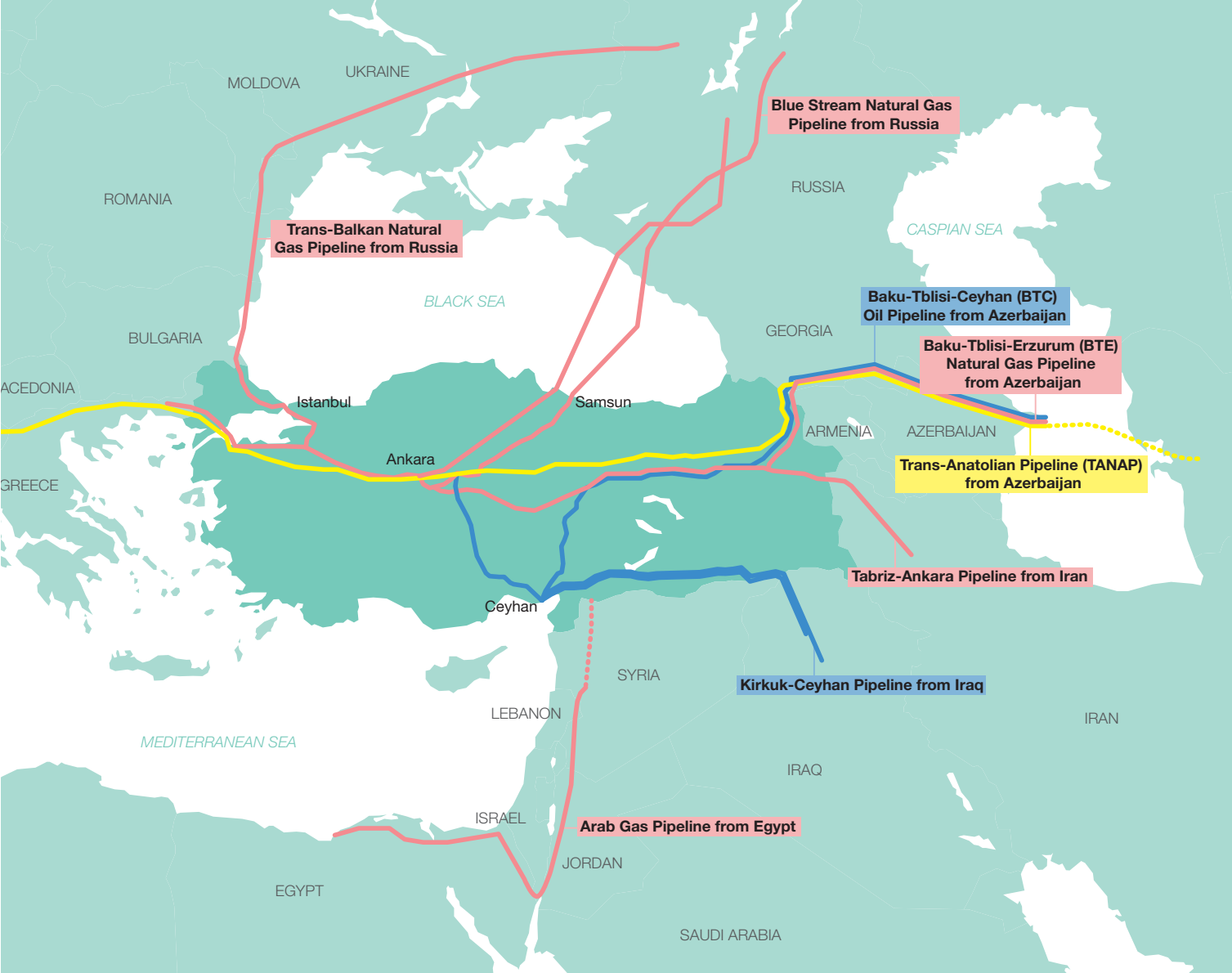
INTERNATIONAL PIPELINES IN TURKEY

LEGEND

- Existing natural gas pipelines
- Pipelines at project, engineering tender or construction phase
- Existing crude oil pipelines
- International natural gas pipeline projects
- Planned international natural gas pipelines

Energy has long been the currency in which regional power is brokered, perhaps nowhere more so than in Europe. Sixty years ago, when Europe was utterly divided during World War II, Turkey, then a fledgling republic lacking in any known hydrocarbon resources, stood largely neutral, a position made possible because it lacked one of the most strategic prizes for the belligerents in the European theater: oil. Instead, when Hitler launched Operation Barbarossa in 1941 and invaded the Soviet Union, attention turned east to Baku, which was the focus of Soviet oil production and offered a potential lifeline to the Third Reich in its quest to procure enough oil to sustain its military campaigns. Turkey, in spite of its strategic geopolitical position, was inconsequential. Far be it from the case today. Turkey is still energy poor but, due south of Crimea, it has seen its relevance – and Ankara's clout – grow rapidly over the past year as a transit state that straddles the geographical and ideological precipices of Europe, the Middle East, and Russia. Turkish Stream, Gazprom's proposed pipeline alternative to the recently cancelled South Stream through Ukraine, could help Russia remain Europe's predominant supplier of natural gas. The pipeline is slated to carry 63 billion cubic meters of gas through the Black Sea to Turkey before then connecting to Southeastern Europe. Geopolitics, though, have overshadowed what could be one of the most interesting macroe-

conomic and political consequences of the project for Turkey: a rewiring of the region's energy framework through Anatolia, and through it, the structural reform of the country's energy sector. To Turkey, the idea of becoming an energy hub has long seemed a pipedream. Hosting one of the world's most quickly expanding electricity markets and one of the world's most import-dependent energy sectors (98% of Turkey's natural gas, which accounts for the lion's share of total power generation, is imported), the aspiration that Turkey might one day become energy self-sufficient remains far out of reach. In fact, the larger effect that Turkish Stream could have on the Turkish energy sector may be in its transformative quality. A state-controlled market until but ten years ago, Turkey's power sector has privatized rapidly; yet BOTAŞ, the state-run organization charged with managing the country's oil and natural gas pipeline network, continues to hold monopoly rights over the import and sale of natural gas. The most immediate consequence of this has been the delayed expansion of one of the most fundamental structures of Turkey's energy industry: its pipeline network. While in the past decade, Turkey has discussed the construction of additional pipelines from numerous locales – Azerbaijan, Iran, Iraq, and Israel – each of these projects has failed to materialize because of the lack of private sector involvement.



On a more fundamental level, Turkey lacks transparency as an energy market, which is a legacy of the state's historical involvement in the market, and is reflected in energy pricing. Obahan Obaoğlu, secretary general of EÜD, the Electricity Producer's Association, said: "Price remains one of the core issues of the sector: the pricing system is very vague and there is a lack of transparency; it is impossible to predict future pricing or to talk about a liberal pricing system at the moment. For this reason, prices are not based on the actual cost of production; they are based on estimates."

For this, Turkish Stream could be a point of inflection, indirectly spurring a reconsideration of the structures that underpin Turkish energy. Though Turkey would only receive transit fees and be unable to re-export Russian gas, the success of a project of Turkish Stream's scale and the continued expansion of domestic energy generation require a mature energy market. The development of technical talent, market transparency, storage facilities, and the ability to forecast prices are necessary for Turkish Stream to succeed. And though non-gas investments in Turkish energy have continued to grow, this has been at the hands of domestic investors. Significant foreign participation has remained limited to two companies operating in generation today: CEZ Group (Czech Republic) and E.ON (Germany), both of which

operate through local partnerships. If the Turkish government wants to realize the estimated \$120 billion that will be required to meet its Centennial Goals for the energy sector in 2023, much of this funding must come from foreign markets. Already domestic investors and financial institutions have reached their financial limit.

Both functionally and symbolically, the death of BOTAŞ – or at least a reconsideration of its role in Turkey's energy sector – would help enable the private sector to play a role in the maturation of the country's gas industry and, perhaps more importantly, bolster much needed foreign investor confidence about investing in Turkish energy. To be clear, this would be an extremely involved process. BOTAŞ is vertically integrated and plays an important role in the pricing of other utilities, making its de-bundling, at least immediately, an unrealistic policy goal. Far more feasible would be the introduction of a more transparent system of energy pricing.

Earlier this year EPDK, Turkey's energy regulator, finalized the establishment of EPIAS, Turkey's new energy trading platform. This represents an important step in market liberalization for Turkey. However, what will come both in the lead up to and the immediate wake of Turkish Stream could very well determine Turkey's ability to realize its energy ambitions. •



Dario Dilucia La Perna

Energy Technical Manager
MWH GLOBAL

Chief Engineer
TURSEFF

●●● **TurSEFF is an extension of the European Bank of Reconstruction and Development. Could you please provide us with an overview of the program since its establishment in 2010?**

TurSEFF (Turkey Sustainable Energy Financing Facility) is a credit line program designed by the European Bank of Reconstruction and Development (EBRD) under the Sustainable Energy Initiative umbrella and is supported by the European Union (EU) and Climate Investment Funds (CTF). MWH Global was appointed by EBRD to implement the program and establish its framework through developing a network among local financial institutions, suppliers and manufacturers of efficient equipment and small and medium-sized enterprises (SMEs) eager to invest in energy efficiency and renewable energy projects. In function, we act as project consultants of EBRD, a type of service that MWH has significant

know-how and experience with. Next to TurSEFF, MWH leads the implementation of three other major EBRD programs in the region: MidSEFF, for medium-sized investments in renewable energy and energy efficiency, and more recently TurEEFF (for energy efficiency investments for private home owners and housing corporations) and EgyptSEFF, a similar program for the Egyptian market.

Apart from the EBRD programs, MWH provides engineering, technical and financial consulting services to private and public banks in Turkey to support the management of their energy portfolio, expand their pipeline on energy efficiency and renewable energy, as well as provide project assessment reports and reporting on all the disbursements. As Turkey is largely dependent on imported energy, government has launched a massive initiative to decrease this dependency and promote EE and RE investments, where MWH brings in substantial experience to assist the banks in providing suitable funding to companies that want to invest in this area.

The first phase of TurSEFF was completed at the end of 2012 and \$260 million was disbursed. We are now in the midst of the second phase of the program, which started in June 2013 and should be completed by the end of 2016. TurSEFF's major stakeholders include EBRD, EU and CTF as donors, the local financial institutions that serve as locker banks charged with disbursing the loans to the final users, and the final users receiving the loans from the bank. The project applicants must be SMEs, which require great financial and technical support.

TurSEFF's loan size is capped at five million euros. The terms of project loans are not fixed but determined on a case-to-case basis. As project consultants, we cannot interfere in negotiations. We work closely with project applicants and local banks through development, but are later assisted by a third-party hired by EBRD that verifies that the project has been implemented according to the required criteria and that the money disbursed is well spent.

How has TurSEFF evolved between the two phases of its implementation in Turkey?

In the TurSEFF's first phase local banks financed many energy efficiency projects mostly related with insulation, improve-

ment of heating system, cogeneration and process machine replacement; with regard to the renewable energy projects, local banks financed mostly hydro power plants, wind and biogas/biomass.

The second phase of the program has been quite different, especially with regard to the renewable energy mix of projects financed. The photovoltaic (PV) projects are literally replacing the hydropower plants due to both the PV market boom and the slow-down of hydropower technology. The latter is mainly caused by the high exploitation of water sources in Turkey and the increasing environmental and social impacts of the new plants. In fact, the few hydropower projects received from banks during the second phase have been rejected due to risky environmental and social impact. With regard to PV projects, the great majority is targeted towards the sale of electricity to the grid rather than for self-consumption. This is mostly due to the better financial performance provided by the Feed-In-Tariff (given in U.S. dollars) compared to the electricity tariff (paid in Turkish lira currency).

The PV projects financed under TurSEFF all fall within the un-licensed segment of the PV market. Indeed, investments required for unlicensed projects are usually much lower than those for licensed projects, therefore more in line with the financial structure of TurSEFF, and the administrative path for un-licensed projects is much less painful than licensed projects. During the second phase, the number of landfill gas projects has been also increasing compared to the first phase and we expect to finance many other of these plants which are very important for Turkey helping to meet both the renewable energy targets and improving the waste management, which is a huge problem in Turkey.

For TurSEFF's current round of financing, what proportion of total funds has now been dispersed?

Thus far local banks have given around 100 million euros in TurSEFF's second phase. The overall target has recently increased to 240 million euros. We hope to disburse the remainder of these funds within the next year and a half, which is challenging given increased market competition. ●

Prof. Dr. Volkan Ş. Ediger

Chairman

**ENERGY AND CLIMATE
CHANGE FOUNDATION (ENİVA)**

sions and in terms of thought leadership, and find solutions.

How successful have you been in achieving this goal?

We could have produced stronger results with greater funding. Since not many books conducting their own scientific study on climate change exist in Turkey, I published a book in 2013 compiling all the studies that have been conducted in Turkey. I have also organized workshops and energy efficiency brain storming conferences, and conducted activities in high schools about energy efficiency.

In 2015, what initiatives does the Energy and Climate Change Foundation plan to execute?

Eniva is working on a project with other European colleagues. We hope to receive funding as an EU project, so we can execute our plans.

How plausible is the Turkish government's goal of increasing energy efficiency by reducing 20% of energy consumption by 2023?

The government's goal is for Turkey to become one of the ten largest economies in the world by 2023. While it is motivating to have ambitious targets, this is almost impossible. In order to become one of the largest economies, we would have to increase GDP by 8% to 10% each year. We also would have to increase our energy consumption to be able to cope with this level of economic development. In terms of the energy goals, it is more important to use energy more efficiently than reduce consumption. Energy efficiency of economies is measured by energy intensity, which is how much energy used to support one unit of GDP. So we have to learn how to make more money by using less energy. Today, natural gas is commonly used because of its several advantages. It is cleaner and easier to use than other fossil fuels. However, China has been the number one energy consumer in the world since 2009 and uses coal. This was momentous for Turkey because its most rife resource is coal. I encourage governments to use clean coal technology because the ramifications are not as detrimental to the environment. The only way for Turkey to achieve its goal by 2023 is to use its most domestic resources in a clean way, including renewable energy.

Beyond this, what potential do renewables hold for Turkey?

We have great hydropower energy potential. Unfortunately, it is considered harmful to use the large water sources due to consequent changes in the ecosystem and interruption of water supply to villages. Our wind energy capacity is growing at a steep rate too. A balance must be found between the economy and the environment by using different type of energy sources.

How strong is the commitment from the private sector to develop clean coal technology?

Safety, environment-friendly, and sustainability should be the three chief aspects of Turkish energy policy. The new coal plants are using clean coal technology for the most part. However, the government plays a more influential role in the implementation of the technology than the private sector.

What initiatives should the current political administration approve?

Law 5627, passed in 2007 to promote energy efficiency, was an excellent decision, but its implementation was poor. The success of energy efficiency initiatives should be examined by measuring energy intensity. Upward rising energy intensity signifies a developing economy. The peak suggests that a country is ready to decrease energy use by several energy efficiency measures. Following that, a developed country should have a downward-sloping energy intensity graph. As Turkey is a developing economy, our energy intensity is on the rise. In order to become energy efficient, an economy must change structurally, and the focus should be on the services sector rather than on industry. Within industry, there must be a shift towards less energy intensive industries. However, the biggest consumers in Turkey today are the energy intensive companies.

Do you have a final message for readers?

My message is sustainability. People must understand what sustainability entails; it is not the continuation of an enterprise, but rather taking into account the future and thinking collectively rather than individually. With regard to energy efficiency, it should be implemented across all industries and not limited to consumers. ●

●●● **What led to the establishment of the Energy and Climate Change Foundation?**

The Energy and Climate Change Foundation was established in Ankara. My colleagues and I always discussed the problems with Turkish energy systems, with efficiency and productivity being significant challenges. We are losing energy in many ways; further, we rely on importing 75% of our total energy consumption, producing only the remaining 25%. This contributes considerably to our foreign deficit. The only way to decrease our imports is by producing more, given that electricity and primary energy consumption are increasing at the average rate of 8% per year and 5%, respectively. Efficiency and productivity are crucial to increase energy production and keep up with rising consumption. We created the Energy and Climate Change Foundation to increase awareness of these issues, write reports, contribute to discus-

Muzaffer Yosmaoğlu

●●● (former GM, Entek Koç Holding)

CEO
BIOCONSTRUCT

been undertaken. Then, they 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 and 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.

These unlicensed projects should be eligible to sell their electricity within spot markets, but legislation must be passed to limit this traded volume to a certain proportion of the amount of electricity that these projects were originally intended to generate.

Upon bringing this issue to the attention of EMRA, the regulator announced that such 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 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.

This goes against the country's regulatory structure, as Law 6446 bans license trading. Through EMRA's failure to govern these unlicensed projects, they 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 contravenes the country's regulatory framework.

Investors into Turkey's energy sector have followed certain fashions. Ten years ago it was considered fashionable to invest in natural gas. Later, investors pursued hydroelectric power projects, then wind, and now coal and solar. You can be sure it will then be gas again, especially to capture the peak load.

Privatization has occurred relatively rapidly within Turkey over the course of the past ten years. What do you view as being the greatest policy successes and failures of privatization?

The process that Turkey has undergone in the past ten years has gone against the soul of the country's privatization law, which

was first established in 1984. Originally there were two rationales for privatization: first, wealth democratization, and second, the need for a smaller state. In 2002, the previous government established a calendar for the privatization of assets involved in energy distribution and generation. This original schedule was altered by the current administration: though distribution companies have been privatized and localized power tariffs are set to be established, there has only been partial privatization of those state companies involved in power generation.

The state continues to have a large presence in hydroelectric power generation. Many of these plants, built in the 1960s and 1970s, have completely amortized their depreciation. Today, their cost of production is extremely low, the largest proportion of cost of a hydroelectric power project being depreciation. Given this, the government has chosen to retain them. If it were to privatize them, many of its other holdings in generation, for example, its collection of natural gas-fired power plants, would comparatively be unable to compete against the market price at which these hydroelectric plants would supply electricity. Hydroelectric power plays too great of a role in dictating the market price of electricity for this to happen.

What are your thoughts about the power cut experienced on March 31st of this year?

This was bound to happen, as power production has not been developed with long-term planning. In Germany, for instance, the total power produced in 2014 has been 610 terawatts per hour, of which only 25.8% is from renewables, and the remaining is from lignite, hard coal, gas, and nuclear. You cannot supply fully trustable power by means of renewable energy only. At the day of the incident all power in Turkey was being produced by hydro (at almost full capacity) and coal. A failure at one large coal-fired power plant was disastrous because there was no back up, as almost all gas-fired plants were shut down due to low prices. Gas plants are indispensable, and we have to pay for the extra cost to make them ready for hot start. •

●●● **Muzaffer, you are a noted critic of the regulatory framework governing energy project licensing in Turkey. What dynamics has the lack of regulation for unlicensed power projects in Turkey led to?**

Generation in Turkey can be divided into two categories from a regulatory perspective, licensed and unlicensed projects. This latter category was originally intended for co-generation projects to compensate for their extra, uncontrolled production; there are no laws governing these unlicensed projects. Our current problem is rooted in this. Imagine a farm that wishes to develop a 1000-kilowatts power project, but only uses 1/20th of this electricity for its own uses. Because it is connected to the grid, it can trade the remaining electricity that it generates. The problem with these projects lies therein: licensing is onerous and time-consuming, land must be rented or bought, and a period of measurement must



Mehmet Ali
Neyzi

●●●
CEO
STFA

●●● **Can you provide an overview of how STFA's energy business developed?**

STFA is one of Turkey's largest construction firms, and, recently, Turkey's second largest distributor of natural gas. The shareholders of the company have been in the construction business for 77 years, and wanted to establish a base in Turkey as the bulk of the construction business occurs in the Middle East. At the same time, Turkey was trying to privatize natural gas networks in the cities and held tenders for each city starting in 2002. STFA decided to enter this industry and was successful. We have received distribution licenses for ten cities and have been building our network since.

What are the implications of Partners Group partial acquisition of 30% of STFA's shares on a strategic and functional level for the company?

We were looking for partners to grow our business and found Partners Group. This is Partners Group's first project in Turkey, and we have market expertise. Partners Group fits well with our company because they fund long-term projects, as opposed to short-term investors such as hedge funds. With this partnership, we hope to grow exponentially, though acquisitions.

What are some business strategies and projects in the pipeline for 2015?

Within the energy field, natural gas is our core. We are looking to expand into other fields of energy. We have participated in open tenders for energy in Ankara, and with Partners Group's help in funding our initiatives, we hope to expand into Istanbul through the privatization of IGDAS. We are targeting other cities in addition to Istanbul.

Within the next two to three years, by how much do you hope to grow STFA's current 800,000 subscriptions?

Istanbul has five million subscribers, which would be our upper limit. Gas import and supply are also fundamental pieces of our business model. At the moment, we are also involved in wholesale trading, which means we can buy gas from importers such as Shell and then sell this gas to power plants, the market and other gas distribution companies. Once the market is more liberalized and transparent, we hope to start importing gas directly.

When are you expecting the tender for Istanbul to be opened?

We expect the tender to take place around September, after the elections.

What initiatives is STFA taking for renewables?

We are working towards wind and solar energy. Wind is showing stronger potential for development than solar, so within wind we have been developing our license for 120 megawatts (MW). This project is a 50-50 partnership with RES, an experienced renewable energy company from the UK. Within solar, we have a close relationship with Yingli for photovoltaic (PV) panels and are offering EPC services to solar investors. We completed two such projects last year and hope to complete two larger ones this year. The group is also looking at investing in a solar PV plant.

What are your views on hydropower?

There is potential. Hydropower should be privatized in order to build big, efficient plants. STFA is not planning to venture into hydropower because it is already involved with natural gas, wind and solar.

What were the successes and failures of the Turkish government in privatization over the last ten years?

The whole oil industry, including gasoline, is completely private. There is complete transparency within import, export and distribution. Further, the government is levying a 60% tax on fuel, and the oil industry is still flourishing. This implies that privatization is successful, and it is a win-win proposition for the government and the private sector. The same should occur for natural gas and coal. Once it is privatized, the government can tax gas/coal and benefit along with the market.

What would STFA's energy division look like in five years?

We hope to have two million subscribers in gas. We plan to offer our gas subscribers electricity as well. Within wind and solar, we aim to have 300 MW of generation capacity.

Do you have a final message for readers?

Turkey has a vast population and low penetration for energy. There is 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. ●

“Turkey strives to become a regional energy hub. Our geopolitical position aids us in this. Turkey has a vast domestic market and rapidly expanding domestic energy needs. Demand and supply are both here. However, the market needs to be liberalized and well functioning, with transparent and cost reflective pricing. This has almost fully been attained within the power industry. Within the gas industry, much still has yet to be achieved. Be this as it may, there is a great opportunity for Turkey within gas, given declining oil prices. As regulators, we have to focus on the domestic market with an emphasis on gas and oil. Our position as a nation, and energy market, will play an important role in developing this.”

- Alparslan Bayraktar, Commissioner,
EMRA

“Within the sector itself, there is optimism. There is this ambition to connect Turkey to Europe, both physically—to make it possible for cross-border trade—and with regard to emulating European business practices. There are positive signals that the industry is moving in the correct direction. Most of the industry’s fundamental issues have been addressed; however, it is undisputable that the sector requires greater transparency and greater levels of cohesiveness between what are, at present, very disjointed regulatory bodies. When one engages a government entity individually, it is apparent that the country’s regulators are competent: they possess insight. The largest challenge for the industry, however, is found in creating a fluid, well-functioning system of regulation. A failure to do so will only slow the industry down.”

- Olav Peter Hypher, Country Manager,
Statkraft

“Turkey will continue to be a net importer of electricity and gas for the foreseeable future although there have been too many investments into power plants over the last three years, when the electricity capacity rapidly increased from 50 GW to over 70 GW. To put this growth into perspective, it took 85 years to reach 50 GW and only five years to invest another 20 GW. Most of the projects we are now evaluating are no-go due to environmental reasons or simply being unfeasible. We are in the decreasing phase of the current economic cycle, which is unlikely to change in the next five years. Nonetheless, the wind industry has a bright future in Turkey. The same goes for geothermal energy, which has attractive tariffs at \$105/MWh. Privatizations and consolidations will be the most significant driver of investment in Turkey’s electricity sector.”

- Ozan Korkmaz, Partner,
APLUS Enerji

“Schneider Electric, formally, has operated in Turkey for more than 20 years. In the beginning, our core activity was focused on electrical distribution specifically through the supply of low- and medium-voltage electrical distribution solutions and industrial automation. Following a series of acquisitions, we entered into several new fields, including building management systems, uninterruptable power systems, data center solutions, energy infrastructure solutions, and, of course, energy efficiency services. Schneider Electric Turkey is a certified Energy Service Company (ESCO, locally named after “EVD”). Four years ago we have been authorized for both building and industrial sectors by General Directorate of Renewable Energy (YEGM), which is connected to Ministry of Energy and Natural Resources (ETKB). Through the EVD license we have been able to work closely with the Turkish market in the field of energy efficiency.”

- Cihan Karamık, Director of Public Affairs & Influence Strategy,
Schneider Electric

“We work with many energy companies – over 120 total. For example, we signed an agreement with GE Global, and we are working with them now on all aspects of their energy strategy: from water distillation, to oil recovery, to steam processing for electricity production. We have some other global organizations in Europe, as well some companies from the US with whom we share our technology to further develop smart units and materials. The international market is much bigger for us than the Turkish market. Solar in Turkey has been slow to pick up, but it is definitely coming now. We have a bright future here in Turkey. In a couple years, I think the players will realize that hybridizing traditional modes of energy production with solar is both strategic and smart business.”

- Serdar Erturan, General Manager and Board Member,
Greenway CSP



“Turkey has the potential to manufacture components for the solar industry, but the larger question that must be asked is if it is possible to do so competitively against China. This is a larger problem that Turkey’s energy sector faces. Though the Turkish government provides local content incentives for those using Turkish manufactured equipment for both wind and solar projects, the tariff mechanism is not attractive enough so as to justify investing in the development of turbines and generators. The Turkish government must closely evaluate whether its desire is to enter purely into the generation of renewable energy or also to expand into equipment manufacturing for these projects. Should the latter be the case, greater incentives are required to draw foreign investment and know-how.

- Elvan Tugsuz Guven, General Manager,
Çiltuğ Holding



“Montel-Foreks Online will become a must-have in the energy market in the upcoming years. The implementation of the intra-day market will bring with it a need for quicker and more detailed data. Montel-Foreks in this sense will provide all the variables of the market ranging from OTC prices to weather data with an emphasis on speed and accuracy. As a company policy, we stand close to everyone, but we do not adopt anyone’s strategy. Therefore, as the players and the system itself change over the years, we will adapt and keep serving our customers in the best way possible.”

- Esra Berkol, Project Manager, and Nazlı Naseh, Energy Editor,
Montel-Foreks



“If one is to look to the past, Turkey has succeeded in many transformations, especially if compared against many of our neighbors in Eastern Europe. Our market system has evolved, as have the regulatory structures governing the industry – greatly. Turkey’s promise and challenge is rooted in the attribute that sets it apart from these other regional energy markets: our size. The Turkish market energy stands as large as the entirety of Southeastern Europe. It is therefore because of this that the changes made to the industry have such a far-reaching effect: these changes compound. It is also therefore because of this that it is of such importance that the Turkish government chooses the right approach in developing the country’s energy market: for the ability of Turkey to fortify its production base, and through this, the economy. Though we predict several years of energy surplus, in 2018 this will change. Investments made in this current period, when much from a regulatory perspective remains in flux, will determine our ability as a country to meet our ambitions. Regulators would do best to tread lightly on the sector.”

- Cem Asik, General Manager,
Sanko



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EDITORIAL AND MANAGEMENT TEAM

Project Director & Journalist: JP Stevenson (jpstevenson@gbreports.com)

Project Director: Alice Pascoletti (apascoletti@gbreports.com)

Executive Editor: John Bowlus (jbowlus@gbreports.com)

Graphic Designer: Gonzalo Da Cunha (gdc@d-signa.com)

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Additional copies of this book can be ordered through Elif Ozturk (elif@gbreports.com).



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emra.org.tr

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Elektrik Üreticileri Derneği (EÜD), Energy Producers Association

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