



Turkish PV defies political ghosts in year of the rooftop

Solar politics | New stats show Turkish solar has swiftly boomed to 6GW despite the national chaos after the 2016 coup attempt. Can the country continue to dodge volatility as it vies to become a 1GW-a-year PV market via a mix of large-scale and net-metering policies? José Rojo investigates

The Brexit referendum and US president Donald Trump's rise to power aside, 2016 may come to be remembered by future history books as the year of another, highly symbolic political upset.

If Istanbul is the millennia-old link between Europe and Asia, the metaphor was put to the test in July four years ago, as soldiers marched along the city's very bridges in a bid to depose Turkish president Recep Tayyip Erdoğan. The military coup, spanning the 15 million-inhabitant metropolis and other major cities, failed and was followed by a crackdown by Erdoğan that saw thousands arrested within weeks. The chaos spilled into the macro-economic

front, sending the Turkish lira into a short-term downwards spiral and fuelling a 1.3% nationwide GDP drop in Q3 2016.

Few markets of those examined by *PV Tech Power* have known such upheaval in recent years and yet Turkish solar appears to have come out unscathed. Historical IRENA stats chart (see Table 1) a surge in installed PV capacity even as Turkey reeled under the coup in 2016 (833MW) and staggered ahead to 2017 (3.4GW) and 2018 (5.06GW). Fast forward to late 2019, and cumulative capacity was said by state grid operator TEIAS to have been approaching 6GW, after 923MW were rolled out over the year. Approached for this story, operators claim annual additions of 1GW are possible going forward.

Turkey's failed coup attempt of July 2016 fuelled fresh currency crises, impacting US-denominated purchases of PV components

According to the Institute for Energy Economics & Financial Analysis (IEEFA), Turkey has every incentive to make sure PV growth comes as quickly as the industry wants. The country, the think tank wrote in a recent paper, faces the risk of a "ballooning" energy trade deficit as it continues to rely on its temperamental currency to fund fossil fuel purchases abroad. The state, IEEFA analysts noted, spent 12% more on coal imports in 2018 – reaching US\$4.4 billion that year – but a depreciating lira means it may not be able to buy enough to sustain its pipeline of new coal.

Turkey, the IEEFA suggested, could curb the coal dependency by seizing on its PV resource of 1.6MWh/kWp, "some



Credit: YP Enerji

of the best” worldwide. To illustrate the untapped nature of Turkish PV, the think tank drew comparisons with Germany; the Northern European state is half the size, features lower irradiation levels – 1.1MWh/kWp – but has installed 50GW where Turkey can only claim 6GW. Urging Ankara to play catch-up, IEEFA remarked: “The beauty of solar power for Turkey is that it exploits one of its most valuable energy assets, where it has a natural advantage.”

The long game of large-scale YEKA growth

Post-coup attempt Turkey may have a sound reason to embrace a multi-gigawatt shift to solar, but does it have a sound plan?

Eren Engur, board member of Turkish solar body GÜNDER, is decidedly upbeat when *PV Tech Power* puts the question to him. “I see 2020 as the start of a sustainable solar market of 1GW per annum,” says Engur, who heads up GÜNDER’s Energy Storage Committee and is also the founder and CEO of consultancy Icarus Energy. “With the upcoming new YEKA schemes [of large-scale tenders], rooftop support, hybrid regulations along with energy storage

and e-mobility support regulations, Turkey can even exceed the expectations.”

Engur predicts the distributed PV segment will dominate in the shorter term, helped along by new net metering incentives. GÜNDER, he notes, believes most of the 800-1,000MW of Turkish solar additions it expects in 2020 will be self-consumption rooftops. Fast forward to 2021, though, and the spotlight may move to large-scale PV growth under the YEKA programme, Engur adds. He points at the upcoming 1GW YEKA solar tender due this spring, which he says will help bolster large-scale PV installations in 2021 and beyond.

Launched in 2016, the so-called YEKA scheme already awarded in 2017 15-year feed-in tariffs (FIT) to a Hanwha Q Cells-Kalyon Enerji consortium, who reaped a winner-takes-all 1GW solar contract. After a further 1GW round was cancelled in January 2019, Ankara’s fresh attempt this year is reported to involve a shift from one to various winners, with contracts divvied up into 100 lots of 10MW capacity each. Noting Turkey’s move away from FIT support, Engur comments: “For the upcoming solar era we’ll be witnessing reverse auctions for GW tenders based on US dollar or euro.”

With caveats, the bright outlook is echoed by Levent Yıldız, general manager of solar developer YP Enerji. The Ankara-based firm – with rooftop arrays and 1-10MW ground-mounted projects under its belt – has witnessed the solar growth fluctuations of the past years in Turkey, from the steady roll-out before 2017 to the boom and contraction sequence that followed. Yıldız notes, however, that the country more or less achieved its optimistic PV installation goals and offers today, despite the recent volatility, a “consistently” reliable economic and legislative framework for investors.

Investors come on board despite currency chaos

Industry confidence and world-class solar resources will be no good to Turkey’s 1GW-a-year ambitions if it cannot attract financiers in their droves. As Turkish energy finance specialist Seyran Hatipoğlu writes, the current interaction between bankers and PV developers is not challenge-free even if it has gone from its beginnings of squabbles to today’s far deeper mutual understanding.

In a piece she recently penned for PV association GÜNDER, Hatipoğlu

notes it was FIT support that triggered the first wave of solar financing in Turkey; a conversation between keen but inexperienced actors that saw negotiations abandoned and transactions structured unsoundly. Happily for Turkish solar, Hatipoğlu adds, specialised training and the familiarity that comes with time brought together both sides of the developer-financier divide. “They started to understand each other, understand their task and started to meet on common ground,” the finance expert remembers.

Like so much else in the Turkish economy, conversations on solar project financing were likely temporarily set aside by the foiled coup d’état of 2016, with tanks taking to the streets as an entire nation looked on. Whether the ensuing political tumult crippled solar investment remains a topic of debate for the industry. Writing for a *SolarPower Europe* report last year, GÜNDER secretary-general Esen Erkan linked Turkey’s “dramatic” slowdown of PV roll-out in 2018 to the “severe financial crisis” and “missing political support” that followed the coup attempt.

Months after Erkan’s grim assessment, the solar association’s reading of the macro-economic backdrop appears to have brightened. Quizzed by *PV Tech Power* in 2020, GÜNDER board member Engur brushes aside the talk of links between Turkey’s financial crisis and its more muted solar installation volumes in 2018. The slowdown, he says, was not driven by political and financial hurdles but rather the fact that deployments stayed within the 6GW the government had set aside. The interest from local and foreign investors in these PV projects has been “great” all along, Engur adds.

Whether caused by the 2016 events or otherwise, struggles around solar finance have not gone away in Turkey. Finance expert Hatipoğlu notes that the phrase “project financing is not available” is one she continues to hear, albeit less frequently than before, from market players. Ask the market players themselves and it quickly emerges the worry was never the military uprising itself but another, more insidious problem the coup exacerbated: the repeated lira crises that saw the currency fall 30% against the US dollar in 2018 alone, as a Turkey-US trade war raged on.

Asked about the key financing challenges for Turkish solar, YP Enerji’s

2015 [1]	2016 [1]	2017 [1]	2018 [1]	2019 [2]	2020 [3]
249MW	833MW	3.4GW	5.06GW	6GW	6.8-7GW

Table 1. The past and future of Turkey’s solar ambitions – cumulative installed capacity over the years. Sources: [1] historical figures until 2019, International Renewable Energy Agency (IRENA); [2] cumulative volumes by late 2019, TEIAS; [3] forecast for 2020, GÜNDER

Yildiz points out that upfront project costs – steel, copper, PV module semi-products, inverters and so forth – tend to rely on the US dollar. The dependence means, he says, a stable interaction between the US and Turkish currencies and reasonable levels of inflation are both paramount to developers. He accepts that the protection of national interests must guide the government's hand but urges Ankara to take into account the dynamics of the energy sector, adding: "Turkey has to act rationally in this context."

Net-metering bonanza as rooftop year beckons

Those searching for the spot where Turkish PV's next chapter will be written would do well to look up. The same rooftops that witnessed the rise and fall of the Roman, Byzantium and Ottoman empires are, it turns out, where local operators feel Turkish solar will grow next. YP Enerji's Yıldız echoes GÜNDER's prediction of a rooftop-dominated 2020 for the industry. "We observe an especially strong acceleration in the industrial rooftop market," he tells *PV Tech Power*. "The reason is that while the installation costs decrease, the retail sales prices in electricity increase."

It helps, of course, that financiers seem to be growing an appetite for the segment. As finance expert Hatipoğlu writes for GÜNDER, the market has evolved in recent years and developed a well-established framework specifically for rooftop PV funding. In previous years, Hatipoğlu notes, the feeling was that solar on buildings would take off as a segment in 2019. Perhaps aware of the prediction, the government chose last year to launch a net metering scheme aimed at domestic installations of rooftop PV.

The IEEFA expects this new avenue of state support to achieve much. Last December, the think tank authored a paper on the new incentives, which will offer electricity bill discounts to PV-equipped homes in return for the power they inject into the grid. A novelty versus earlier schemes – export and demand will be netted monthly, where before it was hourly – will majorly improve the economics of rooftop PV, the IEEFA said. Consumers will take 11 years to recoup investment costs (seven years in 2025, four-and-half years in 2030) where before they took 16, the think tank added.

Turkey, the IEEFA continued, could however aim even higher if it combines

the new net metering scheme with other conducive policies. According to the think tank, Ankara could unlock seven-year payback periods for rooftop already today – plus two-year paybacks by 2030 – if it scraps VAT on solar systems, removes the fixed fee it charges for project approvals, subsidises solar loans and ramps up net metering support to the level seen in Western Europe. On this last front, the IEEFA noted the higher export tariffs Germany, Norway and the UK offer or will soon offer.

"The Turkish people, the government, the associations and all other solar advocates – we believed with passion for the last 12 years and as a result Turkey installed 6GW of PV in three years. And we're just beginning"

Provided it gets the policy recipe right, how far can Turkey realistically take its distributed solar segment? The potential is vast, if industry forecasts are to be believed. In her contribution to the SolarPower Europe report last year, GÜNDER's Erkan claimed Turkey could roll out 46GW of rooftop PV capacity – split between homes (23GW), commercial and industrial locations (21GW) and public buildings (2GW) – if it installs arrays on around a third of its rooftop surface. According to state agency TEIAS, Erkan said, 6.5GW could be added now without the need for grid upgrades.

Turkey's just getting started

Not everyone has believed all along that Turkey will be able to translate theoretical solar strengths into sustained installation growth. In January 2019, analysts at Fitch Solutions struck a sombre tone as they assessed Turkey's renewables prospects for this year and next. "We forecast wind and solar capacity additions growth in Turkey to slow over 2019/2020, as a number of projects will face delays amid the country's challenging economic environment," said a note from the firm, amid predictions that raising project finance would be "challenging" after years of currency swings.

PV players reading the bleak forecasts

may find solace in the fact that Turkey's macro-economic outlook appears to have brightened in the year since Fitch's note was published. The World Bank now expects GDP growth to bounce back to 3% in 2020, driven by reinvigorated private spending, further climbing to 4% in 2021. There seems to be little room for complacency, however. As analysts told trade outlet Global Capital last December, Turkey's reliance on so-called bad loans in foreign currency have seen corporate debt soar since the lira crisis flared anew in recent years.

The optimism of PV players, including GÜNDER's Engur, does not blind them to the inevitability of challenges. "Every report predicts the success story of Turkish solar will continue, but we need to build our strategies to do it in a sustainable and impeccable way," he says. For his part, YP Enerji's Yıldız does believe Turkey has, like others in Europe, a PPA future ahead – the firm is in talks to sign its own deals – but expects the shift will take longer, as the country risks are higher. The government, he says, could help persuade wary investors by enacting PPA-friendly legislation.

In addition, Turkey cannot escape from an energy transition question all countries with gigawatt-scale solar ambitions are currently confronting, that of how to bring about an energy storage boom. GÜNDER's Engur says the state is already busy working on workshops and pilot schemes, from 100MWh this year to 300-450MWh every year afterwards. According to him, the roll-out of batteries on commercial and residential self-consumption systems is now a reality. If power prices continue rising and the support schemes go ahead, Turkey will be a "big storage market" going forward, he argues.

Caveats aside, those approached for this feature believe Turkey has what it takes to outrun its political ghosts and cross the metaphorical bridge into an era of rapid, durable solar growth. GÜNDER's Engur cites a quote oft-attributed to Microsoft founder Bill Gates – "expectations are a form of first-class truth: if people believe it, it's true" – to underpin his faith in Turkey's potential. "The Turkish people, the government, the associations and all other solar advocates – we believed with passion for the last 12 years and as a result Turkey installed 6GW of PV in three years," he says. "And we're just beginning". ■