

None of offshore YEKA fields is 'worth the effort'

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(Enerji IQ – 28 June 2018) Christian Johannes, Managing Director of the Ankara based consultancy firm re-consult, answered the questions of Enerji IQ in a written interview, after his striking article about the candidate field for offshore wind energy, published in Enerji IQ Bi-Weekly No: 96. Johannes, made substantial commentary on the Turkish wind sector and stressed that the YEKA would better not be the only investment

model in Turkey for wind energy. He also emphasized that executing the grid access tender as "cash per MW" is a lot more efficient than "reduction of feed-in price" for not blocking the market for years.

"In my opinion and based on the detailed research we performed, none of them is 'worth the effort'. The wind speeds are way too low, even in Saroz," said Christian Johannes, while criticizing the recently announced offshore

YEKA wind tender:

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"I personally do not see YEKA potentially providing the expected added value towards creating a sustainable market"

IQ As you well know, Turkey last year significantly changed the investment model in wind and adopted YEKA tenders, in the meantime completing the auctions for the previously taken 2.8 GW capacity. Can you please briefly compare the new YEKA model and the previous auction model from the point of sustainability of Turkey's wind investments?

Bluntly speaking, what you refer to as "previous auction model" is actually the model foreseen by the Energy Market Law and that law is still fully in place; it is just not applied. So the term "previous model" should be replaced with "current, but unfortunately dormant model".

When we look at your term "sustainability", we need to first look at the term "implementation". A law can be designed and passed by parliament with great intentions, but if this law and especially the law's tenor are not adhered to, then the law is useless. The newly published version of the Energy Market Law (6446) in 2013 was highly welcomed by the wind energy sector, since it foresaw an active and predictable market under the leadership of TEİAŞ. TEİAŞ was to dedicate "x" MW of capacity to a variety of provinces every year; the private sector would pre-develop projects by more or less professionally designed wind measurement campaigns and EMRA ensured with by-legislation that license applicants were to obey (or at least be aware of) the Turkish Regulations on Regional Planning. A year later

|| Unfortunately, some of the investor's sites have already been occupied by the YEKA projects. How sustainable can a market be when companies invest literally millions of USD on project pre-development activities just to hear after years of waiting "Sorry, your site was just taken by the YEKA winner"? Or even worse: "Sorry, your site was just taken by a project company whose license was cancelled back in 2008, but now revived"? **||**

all developers were to meet at TEİAŞ, bid in a grid access tender and the winners were to be granted pre-licenses.

Accordingly, TEİAŞ dedicated 3 GW of capacity to all Turkish provinces in 2014, hundreds of companies initiated their wind measurement campaigns and had to wait until 2017 for their grid access tender. According to the regulation, TEİAŞ issued a second bunch of capacity over 2 GW in 2015 and again hundreds of companies followed the call and initiated additional project development activities. These projects were supposed to be tendered in 2016, that date was then postponed to 2017, then to 2018 and lately to 2020, unfortunately.

In the meantime, however the Energy Market Law was changed from "bidding cash against grid access" to "deduction of feed-in price". Furthermore and out of the blue "wind forecasting" with an error margin of just 2 percent was introduced to all operating wind farms and accompanied by heavy penalties if the 2% target was not met.

So, is this implementation of the "previous auction model" leading to a sustainable investment climate? Of course not!

However, it is not the "model" that didn't work, it is the poor implementation of the model because of numerous changes to a variety of laws and relevant regulations. Again Turkey is changing the rules of the game while playing it.

YEKA tops all of the above described. It created serious confusion in the market when it competed with sites that were actually pre-developed for the 2016 tender (2 GW), which was postponed to 2020.

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YEKA is a newly and hasty introduced investment model that was supposed to bring action into the sector: I understand YEKA as a model that was designed to accomplish technology transfer, import wind turbine R&D and manufacturing skills, bypass the

TEİAŞ/EPDK/YEGM bureaucracy, the related inter-organizational deadlock and the chaotic situation of a stalled market in order to attract large scale foreign investors, make mega-projects happen and get closer to the “20GW by 2023” target. Understanding all such good intentions, I personally do not see YEKA potentially providing the expected added value towards creating a sustainable market, since it bears the following drawbacks:

- YEKA actually adds to the unpredictability of the Turkish wind energy market. It misappropriates potential project sites for which developers did yet not even have the chance to bid for; but already spent millions for their development.

- It monopolizes the market. One turbine manufacturer gets the entire cake to feed from and is in a better position to bid low in future YEKA tenders

- It does not necessarily serve the best turbine model for the windiest site in that particular province. No manufacturer has the most efficient turbine for any kind of site. For site “a” manufacturer “x” may have the best performing turbine model but for site “b”, manufacturer “y” may have the best performer. Under YEKA you must stick to one or maybe two turbine models that “kind of” fit all the sites, because the must for local content

paired with a limit of 1 GW allows only for the manufacturing of one or two turbine models in that particular factory to be set-up in Turkey.

What would have led to a sustainable market would have been the strict and timely implementation of the Energy Market Law, coupled with a well thought through and quickly implemented “Feed-in-Tariff (YEKDEM)” and “Local Content Regulation” both timely re-adjusted with changing economics of the wind turbine prices and overall investment costs. If that had happened, we would have had at least 5 GW of licensed projects, among them the projects from the 2014 and 2015 tenders already under construction or even operating.

“Almost none of the tender winners (especially the ones which bid very low and/or negative) from 2017 are yet in a stage where a bank would even listen to them”

IQ Do you expect that the winners of the auctions with negative \$/kWh offers to have difficulties in erecting their projects, as the FX rate hikes and project finance tightens?

Almost none of the tender winners (especially the ones which bid very low and/or negative) from 2017 are yet in a stage where a bank would even listen to them. Only a handful of tender winners with economically meaningful bids are showing progress with their projects. Most of the winners need to add wind measurement masts to their project sites, perform the detailed construction planning, apply for and get granted Planning Permission and have to secure the land... In other words: Get fully licensed by EMRA. That



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will take 2 or 3 more years and by then the FX and project finance issues we have today will hopefully be history and I hope that they will be able to implement their projects.

However; with an average wholesale price of 5,5 \$cent (today!), the power prices in Turkey are already very low. If you bid “-1 cent” you end up with a gross (not guaranteed) income of 4,5 \$cent. You still need to deduct the penalties for wrong forecasting (it is impossible to get it 98% right),

all the (annually not foreseeing changing) grid expenses and other unforeseen costs (such as losses) from this.

When you are then in a non-windy province like Adana or Bartın, Karabük and Zonguldak, you really struggle even to make the project look good on Excel, not to mention look good to a bank. This is independent from the current FX rate hikes and tightened project finance conditions; this just common sense.

“The YEKA provinces shall be published together with the tender specs and 18 months later the tender shall be executed”

IQ Is the YEKA model a safe heaven for Turkey’s renewable energy sector or a model to be improved by modifications for the next tenders? (What steps should be taken to improve YEKA model?)

If YEKA does become the only investment model in Turkey for wind energy (which I hope it will not) the Ministry needs to give the bidders more time for the selection of appropriate project sites and for measuring the wind conditions in a manner that proper Financial and Technical Due Diligences can be prepared. Hence, the YEKA provinces shall be published together with the tender specs and



In the YEKDEM tender you could at least use your pre-developed sites for the second or third tender, in YEKA you cannot, since most grid capacity for the particular province will be occupied with the YEKA projects.



18 months later the tender shall be executed. This would roughly be the same method as already applied in the YEKDEM tenders. However; the YEKA provinces are a “one-time-shot”. Let us assume ten consortiums would select their sites in province “x”, pre-develop these sites, perform their wind measurements and nine out of these consortiums will then lose the tender. Hence nine development

activities and nine wind measurement masts will go to the garbage bin, since there will not be a second YEKA for that particular province. What a waste of resources! In the YEKDEM tender you could at least use your pre-developed sites for the second or third tender; in YEKA you cannot, since most grid capacity for the particular province will be occupied with the YEKA projects.

Spain didn't change the legalities over 20 years and hence created a sustainable market

IQ I understand that you are quite critical towards YEKA. Don't you agree that YEKA is a good model to boost technology transfer and employment in Turkey?

No, not necessarily, to put it bluntly. The YEKDEM model, coupled with an increased feed-in tariff for local content will have the same, if not even a higher effect on technology transfer and especially on employment. In fact, this had been the industrial development trend in Turkey in the past years. 6 tower manufacturers, 3 blade manufacturers have invested to Turkey, while generator investments had also been announced by the

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turbine manufacturers in the past years before announcement of YEKA tenders. Ok, you won't get a factory for 1 GW immediately, but if you apply the YEKDEM model and local content formula and tender 2-3 GW every year, you will get all these factories and potential others in 3-4 years and manufacture 10 GW in 5 years. You will create a sustainable market that will breed its own experts over the years and you would hence become a

major player in the wind energy industry that has global potential. I believe this can be interpreted as the “organic growth” of the industry together with its market.

Look at Spain: Today Spain has 23 GW of operating wind farms, several local wind turbine manufacturers and 22.000 direct jobs in the wind energy industry. Why? Because the Spain didn't change the legalities over 20 years and hence created a sustainable market.

Based on the detailed research we performed, none of the candidate fields for offshore YEKA is “worth the effort”

Turkey recently announced candidate fields for offshore YEKA wind tender and you wrote a critical article about the proposed project sites on this. Which of these sites is the best for offshore wind farm tender?

In my opinion and based on the detailed research we performed, none of them are “worth the effort”. The wind speeds are way too low (even in Saroz), the turbines are just 2 km off the beach and hence have a

significantly negative impact on the view and in Gelibolu and Saroz would cause havoc on the people who spent fortunes for their summer beach houses. Since turbines would be located south of the beaches, the locals will suffer from what we call the “disco effect” for most of the day. The turbines would be placed in between the sun and the houses and every 10 seconds you would see a rotor blade shadow on your living room wall. So if YEGM executes the tender with these three

sites, I doubt that the tender winner will find financing for the projects. International banks of a size that can finance such gigantic projects will want the investor to implement their standards on the Environmental and especially Social Impact Assessments and not apply the fairly weak regulations as per the Turkish legislation. YEGM supporting the tender winner, as “the state” won't let these banks waive their strict standards.

None of our sites overlap with any of the sites, proposed by YEGM

IQ From your point of view, which sites are the most appropriate sites for offshore YEKA tender in Turkey?

We spent about 4 months on site selection for offshore project sites around Turkey and kept various state authorities busy with requests for opinions. As a first step we defined areas that are in between 30m and 70m water depth. Once we did that, we got a very very narrow stripe around Turkey. Then we overlaid onto that stripe meso-scale wind data and calibrated these with wind data we collected over the past 13 years. As the third step we plotted shipping routes, telecom cables, pipelines, fishing zones, military training areas and many other obvious constraints onto that strip. Then we deleted all areas that

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promised a capacity factor of less than 45%. The result was 6 project sites with a total capacity of 5.5 GW for the Siemens “SG 8.0-167DD” 8 MW wind turbine. When we applied a rule of “minimum 5km distance to the shore”, we needed to cancel 3 of these project sites and ended up with 4,3 GW (probably) executable offshore wind farms around Turkey.

We also worked on project sites,

using floating turbines. Here we applied water depths ranging from 70m to 800m. Interestingly the stripe didn't get significantly wider. The seas surrounding Turkey are just far too deep. For floating turbines we pre-developed 3 sites with a total capacity of 6 GW, assuming the Siemens “SG 8.0-167DD” 8 MW could also float one day; all sites being in between 6 and 12km off the shoreline. None of our sites overlap with any of the sites, proposed by YEGM.

We need a Master Plan that defines how we can evacuate 15 GW of power from Çanakkale and Balıkesir and transmit it to the consumers in Thrace, İstanbul and İzmir

IQ We understand that YEGM selected the location of these 3 sites mainly in the light of “demand for power in Thrace”. Thrace obviously has a high demand for electricity. Are the sites you pre-developed close to Thrace?

There are offshore sites around Turkey with quite feasible wind conditions. Based on our studies, we don't see Turkey's offshore potential as 35 GW (as stated by EWEA's CEO Giles Dickson), but still something around 10 GW. If you want to harness this potential and attract investors, you need to show that you have a vision. I have serious

respect to Turkey's GAP Project as an example to the vision. Back in the 1980ies huge hydro power plants in East Turkey were connected to Konya, Ankara and İstanbul by means of two 380 kV power lines. There was and still is no huge power demand in the GAP region, so the power is produced there and is being transmitted to the consumers in West Turkey. We need the same vision for wind energy. The sector knows that Çanakkale and Balıkesir are the windiest areas in Turkey, but there is not sufficient demand in these provinces to “digest” let us say 15 GW. This is valid for onshore as well as offshore wind projects.

We need a Master Plan that defines how

we can evacuate 15 GW of power from Çanakkale and Balıkesir and transmit it to the consumers in Thrace, İstanbul and İzmir. Part of such a plan has recently been implemented by TEİAŞ's Çanakkale sub-sea transmission links between South Marmara and Thrace. However, this seems not enough for the transmission of all local wind generation to high-consumption nodes. Germany is doing this as we speak. The offshore potential is in the North Sea and the consumers are in South Germany. Huge transmission lines are being built in order to bring the offshore electricity all the way down to Munich. It works. For both offshore and onshore wind energy we need “fist, not fingers”.

Executing the grid access tender as “cash per MW” is a lot more efficient than “reduction of feed-in price”

IQ You are one of the most experienced consultants in Turkish wind sector and aware of all market dynamics since mid 1990s. What would be the 3 – or 5 – changes in the market's history, if you had a magic stick in your hand?

Well, first and foremost I would have welcomed if the wind energy related articles in the Energy Market Law from 2013 had not been changed. Executing the grid access tender as “cash per MW” is a lot more efficient than “reduction of feed-in price”. If you have to pay cash right after the tender you show that you have the funds to execute the project and are not a “speculator”. If you bid on reducing the feed-in price, you postpone the problem and block the market for years. A company that bids e.g. a negative price may develop the project up to the stage of “ready for construction. That takes 2 years, maybe 3 with all time-extensions they may get from EMRA. Then they find out that they cannot find financing for their project, but make use of the 2-4 years of construction time and in the meantime try to sell their license. In other words: Bidding too low equals blocking the capacity dedicated to a specific province for up to six years.

This leads to my second magic-stick

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“ Currently we have around 3,2 GW of granted production licenses. Most of them were granted in 2011, some of them even before. Why are these not operating projects? We are in 2018! **”**

change: Currently we have around 3,2 GW of granted production licenses. Most of them were granted in 2011, some of them even before. Why are these not operating projects? We are in 2018! Latest by 2016 all of these projects should have been operating. I would have wished that EMRA fined regulatory means cancel all these non-performers and applied the heavy penalties, as foreseen by the law/license regulation. EMRA tried this in 2015, lost most of the court cases after and we still have at least 2,5 GW of these non-performers in the market. If EMRA loses these court cases, then the jinx is on the not properly developed legislation. If EMRA had the chance to do its job properly, the market would have been cleaned of all speculators years ago.

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Since 2012 the permission for setting up a wind measurement mast on forestry land needs the final signature of the Prime Minister. This “small” change literally created havoc in the wind energy sector. Many project sites are located fully on forestry land and it takes up to 1,5 years to get permission for the erection

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of a met-mast. As a result, license applicants measure the wind on a nearby privately owned land plot that does not represent the wind conditions of the project site, over- or underbid at the grid access tender and get licensed for a project that will not perform as expected. A similar problem is the Pasture Law and its related regulation. The pasture law has been changed numerous times over the past 15 years and allows all kind of activities on pasture land (even drilling for oil), just the erection of a wind measurement mast is not foreseen. Hence, you cannot erect a wind measurement mast on pastureland.

In German we say “Too many cooks spoil the broth”. I would have welcomed if the wind energy related provisions in the Energy Market Law and the Renewable Energy Law were strictly adhered to and implemented in the bylaws by ALL market players in a market-supporting manner: Changes in the legislation every 3 months and decisions that come out of the blue do not provide for a moderate but constant growth of the sector.