OFFSHORE WIND ENERGY AUCTIONS

GLOBAL TRENDS AND RECOMMENDATIONS FOR TÜRKİYE

Turkish Wind Energy Congress

7 November 2023

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SHURA Energy Transition Center

- A **transparent** platform working for Türkiye’s energy transition, with Türkiye’s priorities
- stimulating discussion on Türkiye's energy sector
- **among all interested stakeholders**
- providing fact-based, unbiased and independent research and analysis,
- covering technology, economics and policies
- contributing to the debate on Türkiye's energy transition

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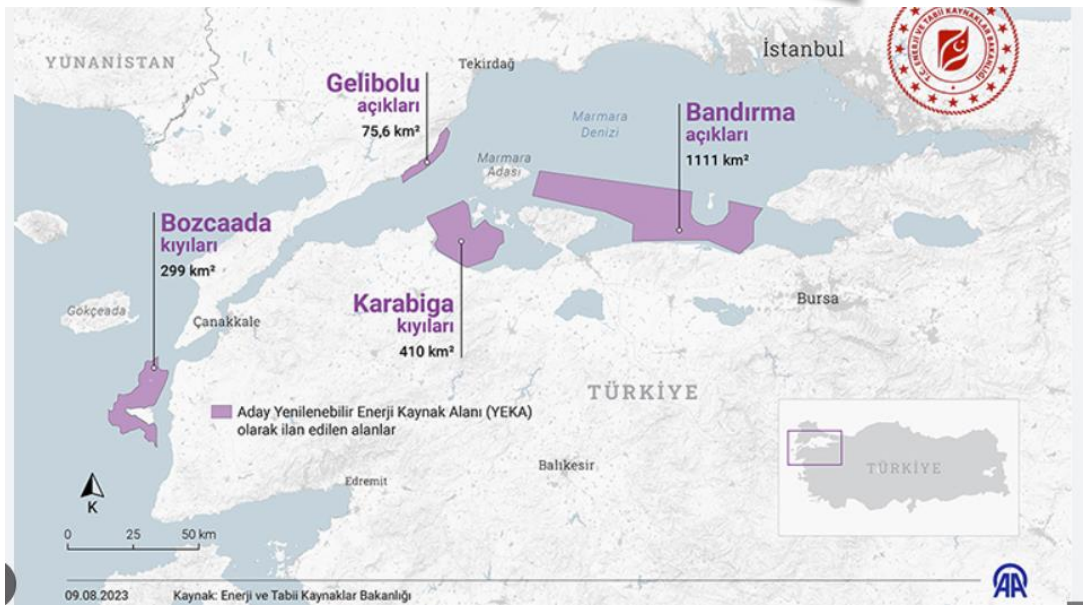
Offshore Wind Energy in Türkiye

- In line with Türkiye's net zero emissions target by 2053, the Ministry of Energy and Natural Resources (MENR) issued National Energy Plan for 2035, which targets a total installed capacity of 29.6 GW of wind energy, including 5 gigawatts (GW) of offshore wind.

- Türkiye will initiate offshore wind energy YEKA (Renewable Energy Resource Area) competitions to assign offshore capacities.

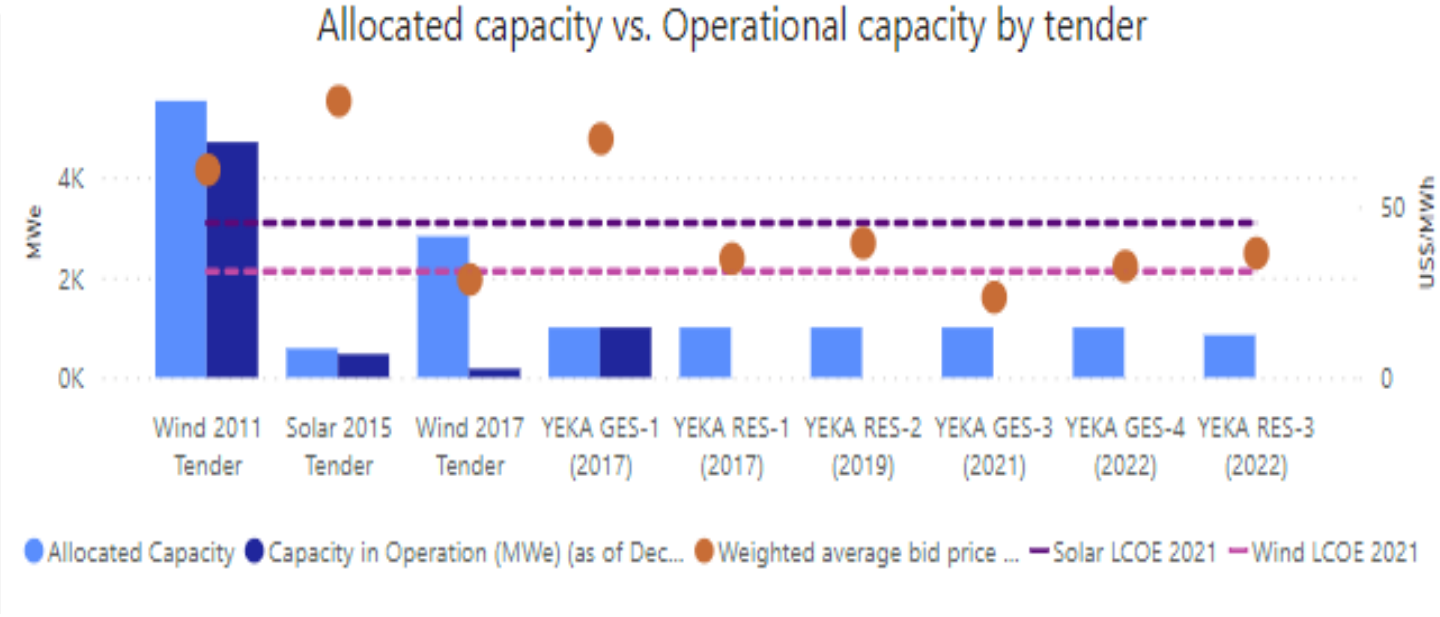
- MENR announced 4 candidate renewable energy resource areas for offshore wind in August 2023.

- SHURA and TWEC (TÜREB) published a study on offshore wind energy auctions to present suggestions on offshore wind auction design in Türkiye through examining international experiences and local and international stakeholder meetings.



Main risks associated with renewable energy auctions in Türkiye

Project realization rates in Türkiye's onshore wind and solar energy auctions



Source: SHURA Database

Main Risks for Türkiye

- Exchange rate and inflation risk
- Difficulties in accessing finance
- Projects that are not well developed (technical and administrative measurements and analyzes are not sufficient)
- Problem of eliminating investors with insufficient technical expertise and financial power
- Failure to implement penalties effectively

Main criteria for offshore wind energy auctions

Technical Capability and Experience: It is critical that investors have the technical capability and experience to build, operate and maintain offshore wind energy facilities.

Financial Capacity: Projects must have the capacity to access large amounts of capital or financing.

Environmental and Social Compliance: Projects should be designed and implemented to meet environmental and social compliance requirements to increase social acceptance of the project and to access finance.

Technological Suitability: It should be ensured that the technologies planned to be used in the projects are up-to-date and cost-effective. If project development processes take too long, the technology may remain outdated and very costly. Thwrfore, management of project development and permit processes is also critical.

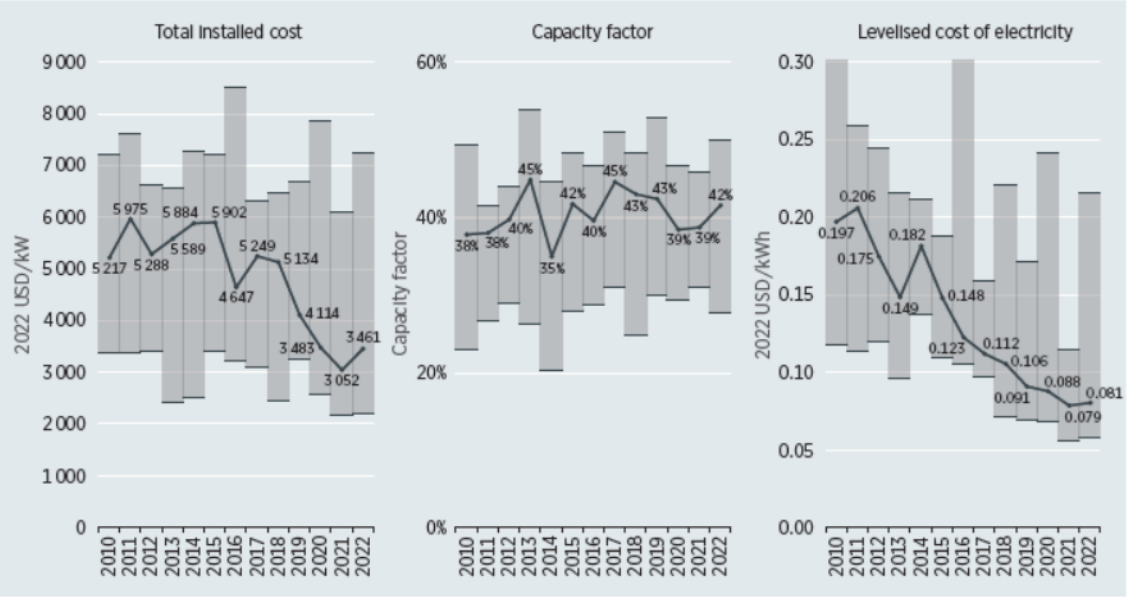
Energy Production Capacity: Projects must have sufficient energy production capacity to achieve the determined targets.

International Examples
Problems in offshore wind tenders

- Regulatory uncertainty
- Unclarity in the definition of land use rights in the sea
- Long permit periods, esp. regarding environmental impact assessments (EIA)
- Poor grid infrastructure
- Definition of PPA prices without considering updated wind energy costs (as the increasing offshore energy costs in 2021-22 are not reflected in the ceiling prices, 2023 offshore auction in UK has not received any applications)
- Indexation of PPA prices without considering updated wind energy costs (In the UK, Vattenfall has halted work on its 1.4 GW Norfolk project; because the government escalated prices only according to the retail price index and not according to the actual increase in costs. Similarly, Orsted, a Danish offshore wind power plant developer in the USA, announced that they are preparing to withdraw from the projects if the US government does not guarantee more support.)

Development of offshore wind energy costs (2010-2022)

Figure 4.1 Global weighted average and range of total installed costs, capacity factors and LCOE for offshore wind, 2010-2022

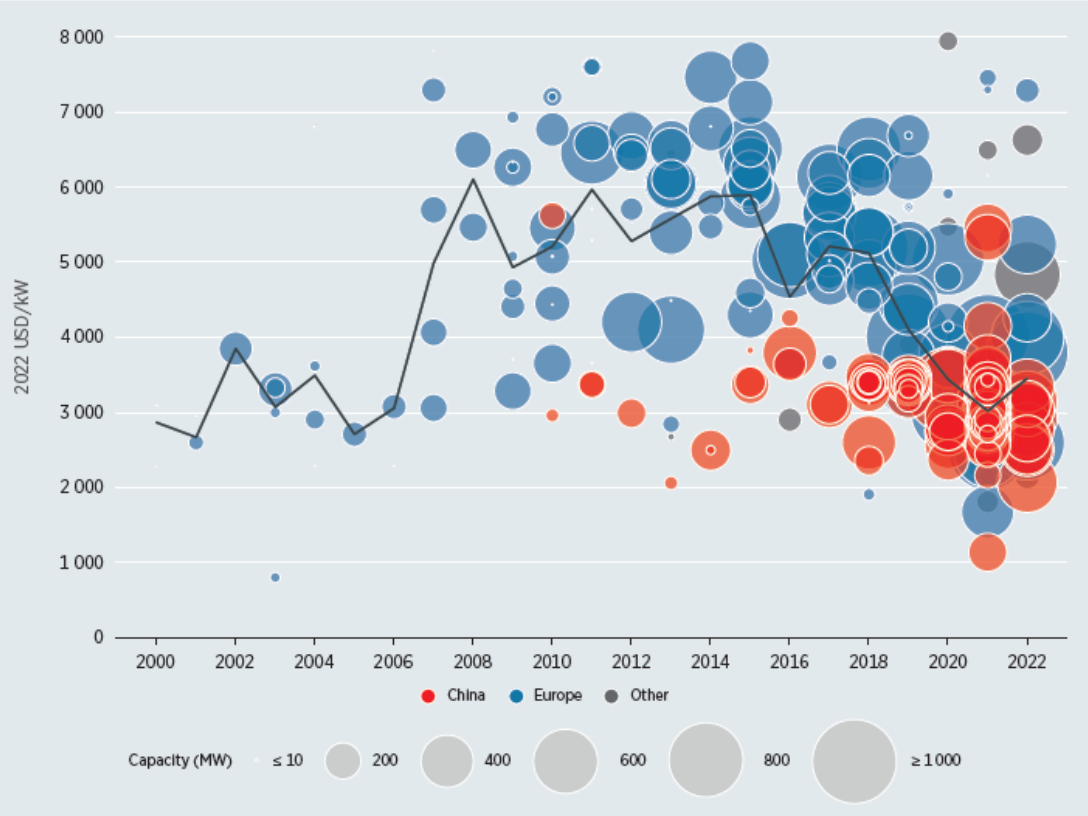


IRENA ,2023

- Between 2010-2022,
  - the global weighted average cost of electricity (LCOE) of offshore wind declined by 59%.
  - global weighted average total installed costs fellby 34%
  - Global cumulative installed capacity of offshore wind increased more than twenty-fold from 3.1 GW to 63,2 GW
- Improvements in technology-including larger turbines and longer blades with higher hub heights along with access to better wind resources as fixed-bottom foundations improved and wind farms moved further from shore, resulted in an increase in global weighted average capacity factor.
- LCOE reductions are driven by technology improvements and growing maturity of the industry.

Development of offshore wind energy costs (2010-2022)

Figure 4.5 Project and global weighted average total installed costs for offshore wind, 2000-2022



LCOE for offshore wind energy projects in Europe increased by 18% in 2021-22. Reasons for the increase:

- the proliferation of deep sea and offshore project areas,
- increased project development, engineering and permit costs of more complex projects,
- increased commodity and freight prices after the pandemic,
- Problems in cabling and logistics - inadequacy of assembly vessels.

Increasing CAPEX prevents offshore wind energy project investors from starting construction and causes delays in the implementation of the project.

International best practices

- It is essential that tenders provide the necessary balance to determine a rational price level that, guarantees the most suitable price for consumer while providing access to financing for the investor. Therefore, price should not be the only criteria. Besides the price, it is extremely important to determine the technical and financial eligibility of the applicants and to examine whether the projects are well developed. In this regard, multi-criteria competitions (technical evaluation, environmental and social impact analysis, contract and financial conditions, etc.) are applied rather than competitions where the only criterion is price – (France, Denmark)
- In order to reduce the risks of potential project developers met-ocean analyses, seabed surveys and preliminary EIA, can be carried out by the administration (Japan, Netherlands).
- Seabed use can be allocated to investors without any cost as part of the tendering and permitting process (Denmark)
- Definition and indexation of PPA prices by taking into account current costs
- Public undertaking/public support of the grid connection (Netherlands, Denmark, France)
- Effective use of penalties: Efficient penalty mechanisms are deterrent factors for project cancellations and delays. If the investors cannot realize the project, penalties are applied such as the reduction of the PPA price, liquidation of letters of guarantee, banning the relevant investor from tenders for a certain period to cover the penalties to public (England, Netherlands).

Suggestions for successful YEKA offshore wind auctions in Türkiye

- Met-ocean (meteorological and oceanographic) analyzes and seabed measurements should be completed by the administration and shared with investors in order to attract investors, decrease investor risks and receive realistic bids.
- Offshore wind energy investments require strong financial power, technical experience and serious engineering capability. Therefore, minimum technical and financial qualifications should be carefully determined to ensure that investors have the appropriate technical and financial competence to realize the projects. In this regard, the selection process may include a multi-criteria evaluation that includes technical and financial elements as well as price.
- Considering the different geographical conditions in Türkiye's seas, it is important to choose a technology- and region-specific tender approach.
- It is critical that projects are designed and implemented with attention to environmental and social compliance to access international finance and ECA loans.
- PPA prices should be determined in a competitive environment and protected against exchange rate and inflation risks. For this aim:
  - PPA prices may be defined in hard currencies (EUR or USD)
  - If it is decided to implement it in Turkish Lira (TL), it will be important to apply a foreign currency-based escalation formula or to set a minimum foreign exchange-based floor price protection
  - Defining the ceiling price in a way that will help participants access financing for the risks they will take and provide a reasonable financial return will be important
  - PPA prices should be indexed by taking into account inflation and commodity prices

Suggestions for successful YEKA offshore wind auctions in Türkiye

- In case auctions include local content requirement, mandatory local content rate should allow investors to use ECA loans, and a sufficient amount of capacity should be allocated regularly within a predetermined calendar to attract equipment manufacturers to Turkey.
- Grid connection: Establishing the grid connection by the public can reduce the risk of investors, increase the participation rate in the tender and reduce the prices of energy supply agreements. On the other hand, it is extremely important that the grid connection is established at the same pace as the power plant investment. Significant losses may occur if the installation of energy transmission lines or power plants is delayed. If the connection facility is made by the investor, this coordination risk can be eliminated. However, the number of companies that can technically establish the necessary connection for offshore wind power plants in Turkey is limited. In a model where the grid connection facility is undertaken by the investor, it is recommended that the investors have the necessary technical and financial competence to be evaluated and guaranteed with pre-qualification criteria.
- A public tender calendar and road map should be created for the targeted offshore wind energy capacity.
- Bidding period should be sufficient for project developers to complete their preparations.
- An open tender approach should be adopted to increase transparency and competition.
- PPA should be long and stable. For Turkey, it is recommended that this period be determined between 15 and 20 years.
- Permit processes should be standardized and a coordination center should be established to shorten permit periods.
- Penalties must be carefully designed and effectively implemented. Penalties should be deterrent for the smooth progress of the tender process and the implementation of the projects.

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