

Power Purchase Agreements ***(The Turkish Experience)***

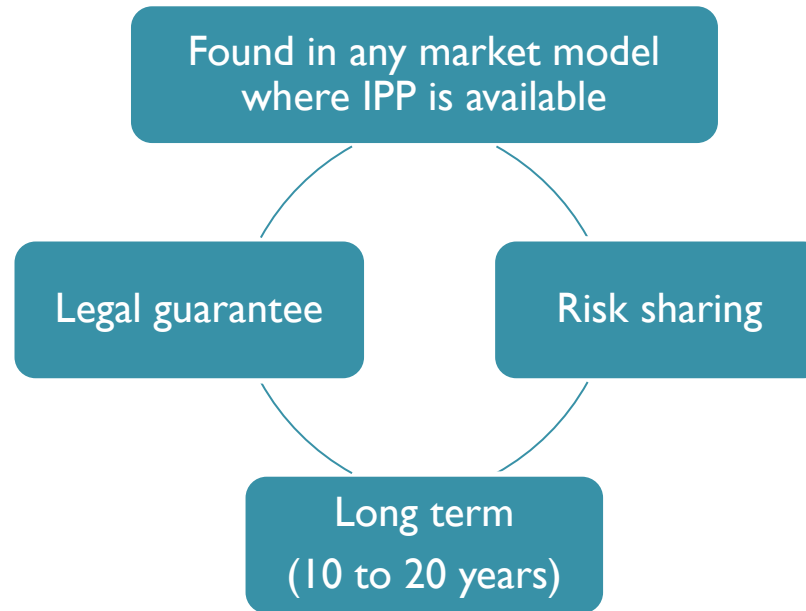
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Presentation plan

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Power purchase agreements (PPAs)

Principles



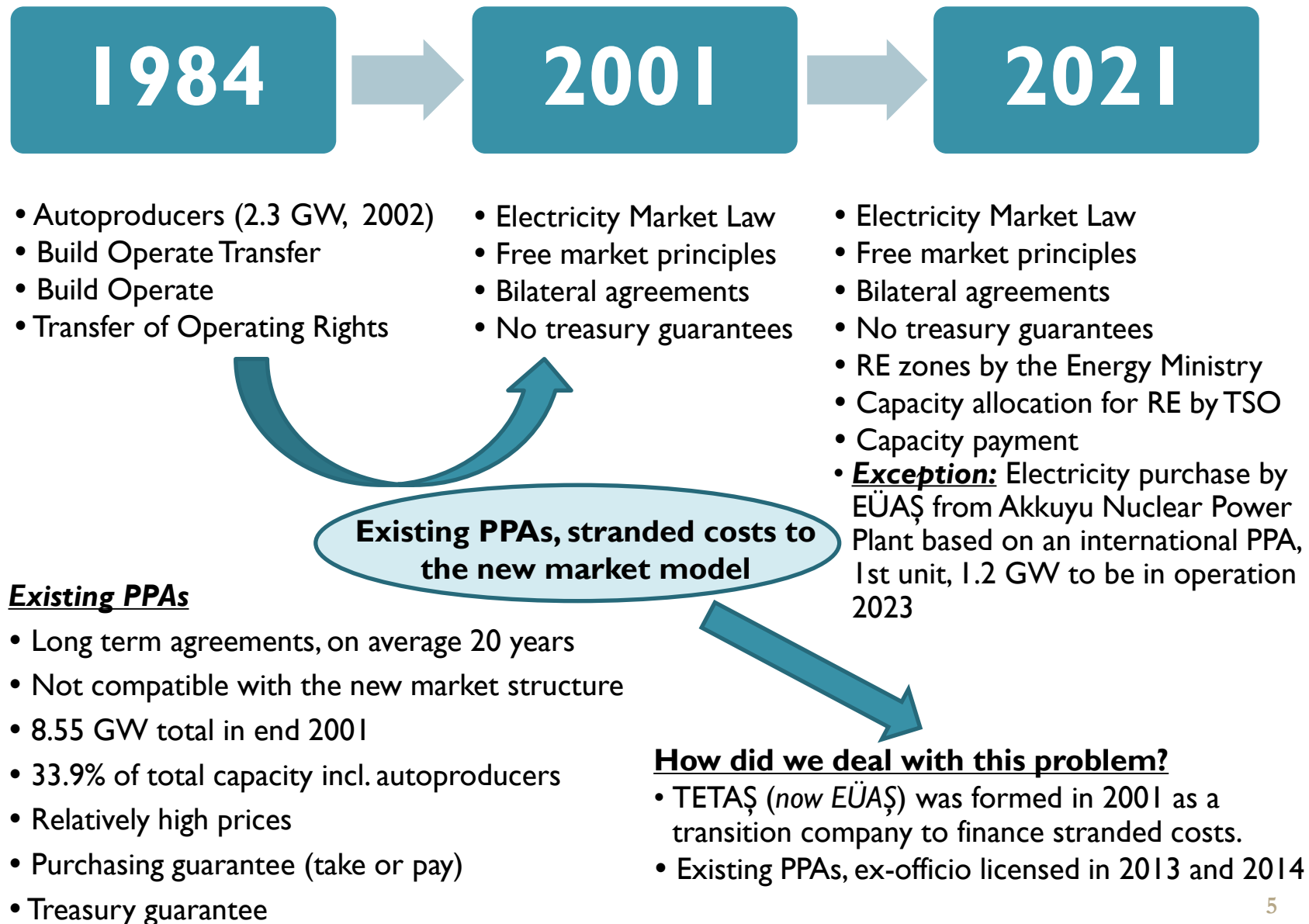
PPAs in current Turkish electricity legislation

- Bilateral agreements, commercial, but a broader term covering PPAs
- Subject to the provisions of private law
- Not subject to EMRA board approval, but with some exceptions to protect eligible consumers with low consumption (annually < 100.000 kWh)

Electricity sector before 2001

- ❶ As electricity is considered a public service, the state has a monopoly in the sector.
- ❷ Following the economic boom of the 1970s, the electricity sector experienced a bottleneck as a result of:
 - Delays in the construction of power plants
 - The insufficient electricity system to meet rising demand
 - Difficulties in obtaining external financing
- ❸ Since the transition to a free market economy in 1980, some regulations have been enacted to allow the private sector to participate in the electricity sector (*in addition to autoproducers*).
 - Build Operate Transfer (*BOT*)
 - Build Operate (*BO*)
 - Transfer of Operating Rights (*ToOR*)

Electricity market from PPA perspective



Market entry modes for power plants

Licensed market participants (excl. OIZs) (May 14, 2021)

Generators	1795
Suppliers	215
Transmission	1
Distribution	21
Market operator	2
Total	> 2000



Licensed Generation

- Renewable Energy Resource Area (RERA)
- RERA sites developed by either the Energy Ministry or private sector
- Others by private sector

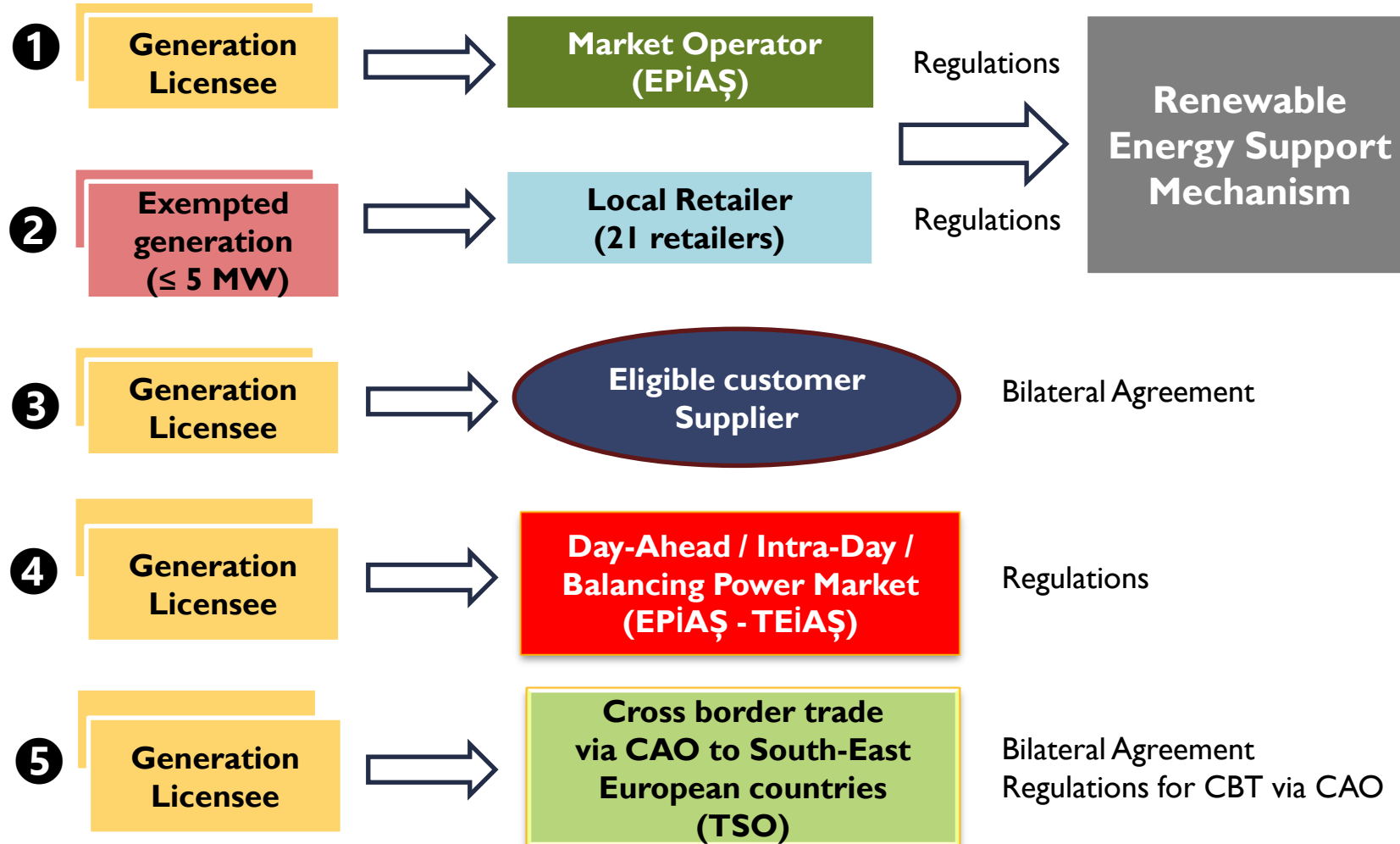
Unlicensed Generation

- Installed capacity ≤ 5 MW
- Excess electricity priced at feed-in tariff

Generation for R & D purposes

- Permission by energy regulator
- Installed capacity ≤ 10 MW
- Universities
- Research institutions
- Electricity sales not allowed

Trade opportunities for generators



- Retail sales contract signed between assigned supplier & non-eligible consumers or consumers within last resort supply.
- The minimum procedures and principles included in retail sales contracts are regulated in consumer services regulation.
- Electricity futures (based on physical delivery) and RE guaranty system will be in operation as of June 1, 2021.
- Supplier can trade in Energy Exchange İstanbul (EPİAŞ) and export/import electricity.

Allocation of connection capacity for RE by TSO

- ① Tender is organised by TSO for multiple applications for the same plant location and/or transformer.
- ② Tender is applied for only wind & solar license applications.
- ③ Tender is based on reduction from feed-in tariff.
- ④ The bids are submitted in closed envelopes.
- ⑤ The capacity is allocated to the lowest bidder.
- ⑥ The winner has the choice to participate in RE support mechanism for 10 years.

Competition for RERA by the Energy Ministry

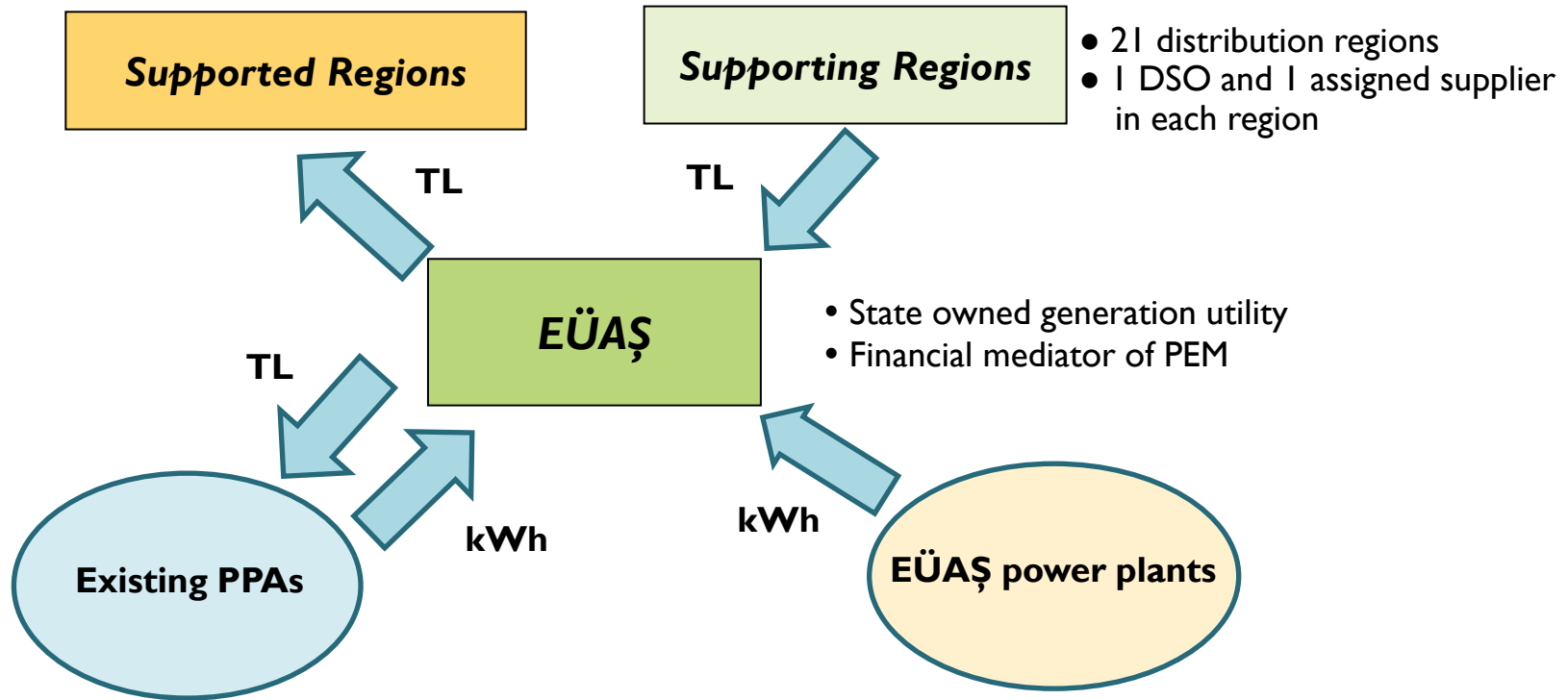
- ① Renewable Energy Resource Areas (RERAs)
- ② By-law prepared by the Ministry of Energy and Natural Resources in 2017
- ③ Connection capacity right and land allocation
- ④ The winner is determined by reverse auctioning based on reduction from a ceiling price.
- ⑤ The ceiling price is set by the Ministry of Energy and Natural Resources.
- ⑥ The ceiling price must not be higher than the total of feed in tariff for electricity and extra premium for the local content.
- ⑦ The bids are submitted in closed envelopes to the Ministry of Energy and Natural Resources. The lowest 5 bid holders continue to submit further bids.
- ⑧ The lowest bid holder is sent to EMRA for provisional licensing.
- ⑨ 3 years of provisional license, 30 years of generation license, purchasing period determined in the specification for tender, 15 years in past examples

Capacity mechanism

- ① Operated by TSO to create sufficient installed power capacity and ensure long-term system security
- ② For this purpose, TSO makes payments to generation license holders within a budget determined annually.
- ③ Payments are determined based on the unit fixed cost components of the power plants in the capacity mechanism and the total installed power on a resource basis.
- ④ The budget for payments is reflected in the transmission tariff of the relevant year.
- ⑤ The criteria for power plants that cannot be included in the mechanism are listed in a specific regulation about capacity mechanism.

Handling existing PPAs

Price Equalisation Mechanism (PEM)



- Uniform national tariff for retail sales
- Regardless of their location, the same subscriber group pays the same price for electricity.
- Cross subsidy among regions with lower and higher losses in compliance with the Law
- Distribution companies & assigned suppliers who get more than their total revenue requirement, are required to transfer the extra amount to EÜAŞ.

Summary and concluding remarks



- ① Before 2001, Turkey relied on models based on electricity purchases from private sector such as BO, BOT, and ToOR.
- ② These models were successful in increasing new power capacities; however, they resulted in stranded costs.
- ③ Turkey has successfully managed the issue of stranded costs over time.
 - Ex officio licenses in 2013 and 2014
 - Price equalisation mechanism & uniform national retail tariff
 - Currently existing PPAs less than 3 GW
 - 3% of total capacity, reduction from 33.9% to 3% (2001-2021)
- ④ This experience has been successfully used by TSO and the Energy Ministry in auctions for RE.
 - Mini RERA, solar, price 2-2.5 UScents/kWh in 2021
 - Large RERA, solar, Karaman, price 6.99 UScents/kWh in 2017
 - Feed-in price for solar 13.3 UScents/kWh (2011-2020)
 - Mini RERA wind planned as well

THANK YOU FOR YOUR KIND ATTENTION

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