

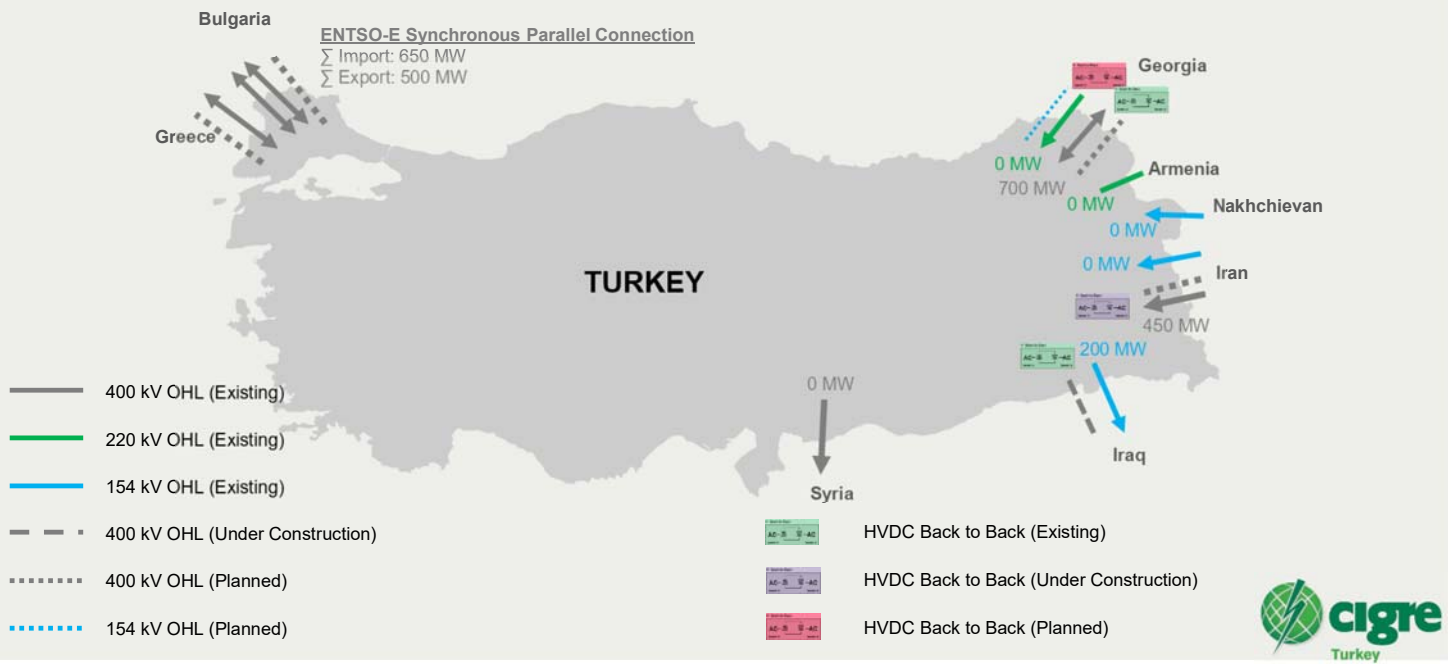
# Electric Power System of Turkey



## Basic Facts (as of 2019)

- Area: 814.578 km<sup>2</sup>
- Population: 83.154.997
- Number of electricity consumers: 44.958.326
- TSO: 1
- DSOs: 21
- Peak load: 45.324 MW
- Failure Index for 400 kV OHL: 0,711
- Failure Index for transformers: 0,158

# Global map of the grid and its interconnections



## Grid Facts & Characteristics (as of 2019)

- Transmission Grid: > 36kV
- Distribution Grid: ≤ 36 kV

### SUBSTATIONS

Voltage (kV)	#
400	173
220	1
154	1.068
66	10
<b>TOTAL</b>	<b>1273(189.172 MVA)</b>

### TRANSMISSION LINES

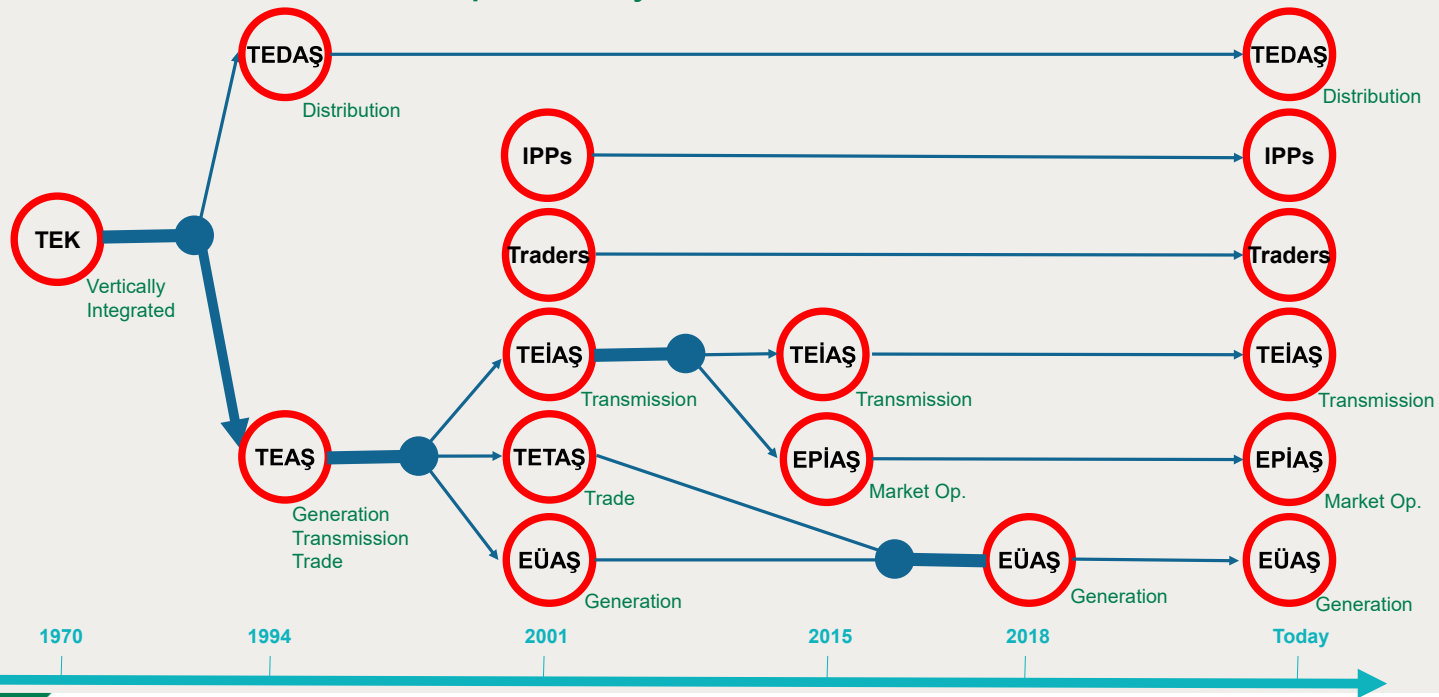
Voltage (kV)	km
400 (OHL)	23.847
220 (OHL)	85
154 (OHL)	45.460
66 (OHL)	10
400 (Underground cable)	48
154 (Underground cable)	429
400 (Subsea cable)	16
<b>TOTAL</b>	<b>70.034</b>

## Information of TSO

- TEIAS (Turkish Electricity Transmission Corporation)
- Sole owner of the transmission grid
- Serving 814.578 km<sup>2</sup>
- <http://www.teias.gov.tr>



# Structure of electrical power system



# Operation & Maintenance of TSO



22 Regional Offices

# Dispatching of TSO



1 National Control Centre (Ankara)  
9 Regional Control Centres

# DSOs

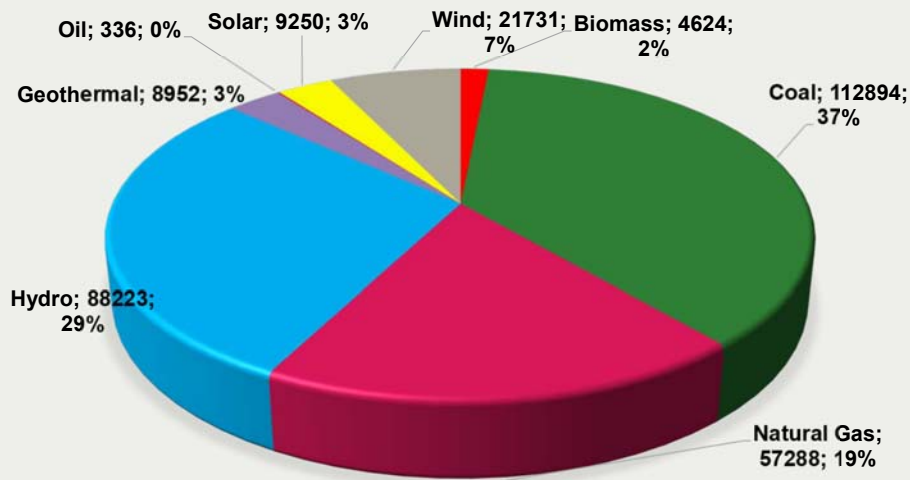


21 Private DSOs  
(Ownership belongs to TEDAS)

## Installed Capacity with reference to Primary Resources (2019)

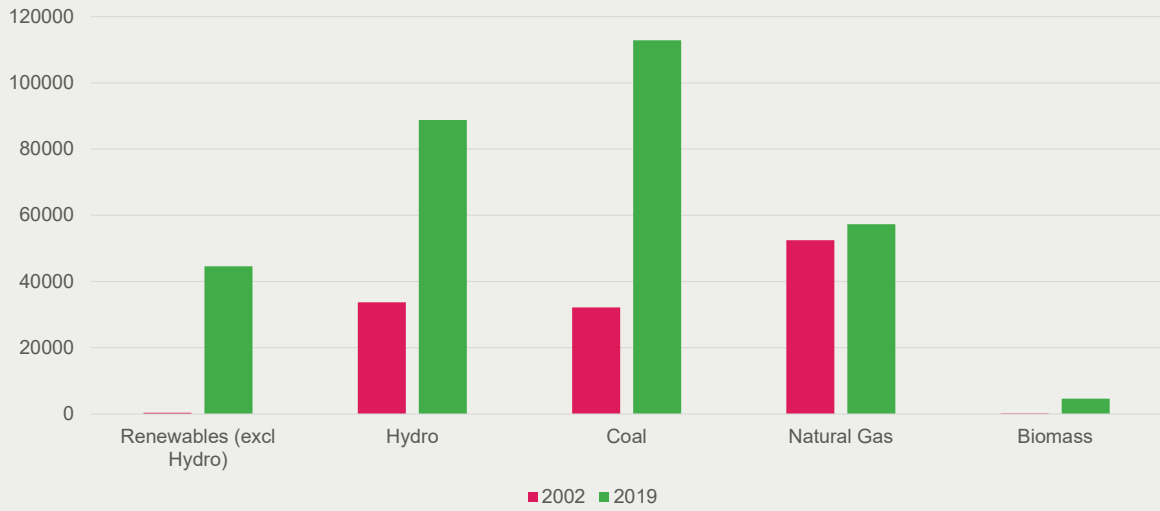
RESOURCES	INSTALLED CAPACITY (MW)	(%)
IMPORT COAL	8.966,85	9,82
COAL+ASPHALTITE	1.215,80	1,33
LIGNITE	10.101,0	11,07
NATURAL GAS	25.904,25	28,38
FUEL OIL	311,68	0,34
SOLID FUEL+LIQUID FUEL	0,00	0,00
LIQUID FUEL+NATURAL GAS	0,00	0,00
BIOMASS	1.163,34	1,27
GEOHERMIC	1.514,67	1,66
HYDRAULIC DAMS	20.642,52	22,62
HYDRAULIC STREAM	7.860,55	8,61
WIND	7.591,17	8,23
SOLAR	7.995,20	6,57
<b>TOTAL</b>	<b>91.267,03</b>	<b>100,00</b>

# Energy Production with reference to Primary Resources (2019)

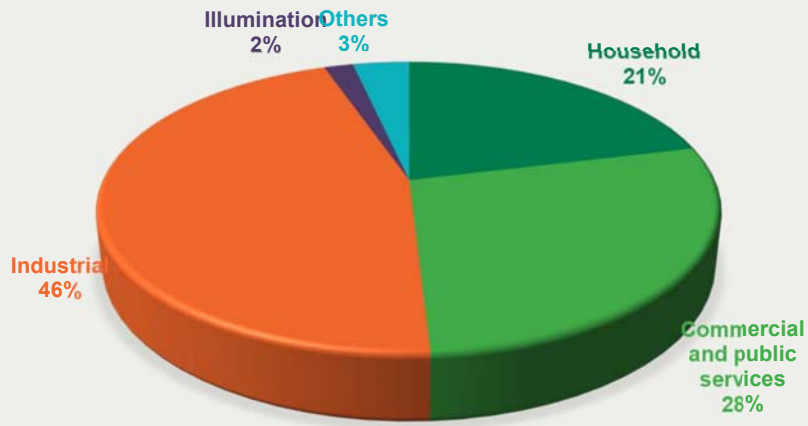


TOTAL: 303.897,6 GWh

## Development of Generation (GWh)



## Consumption per Customer Groups (2018)

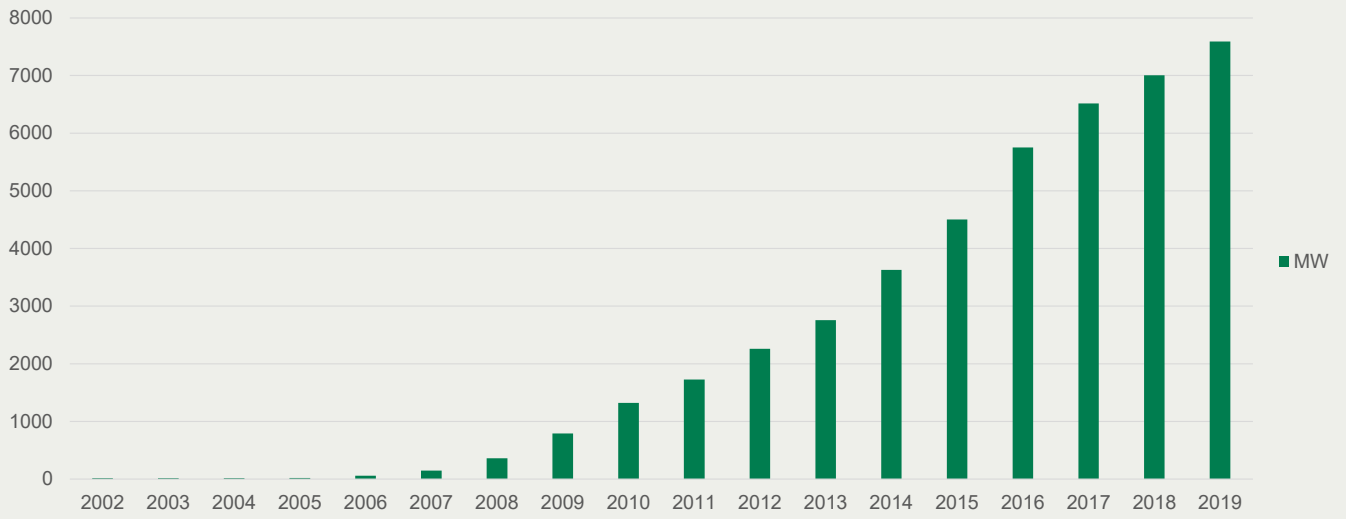


Total Net Consumption: 258.232,2 GWh

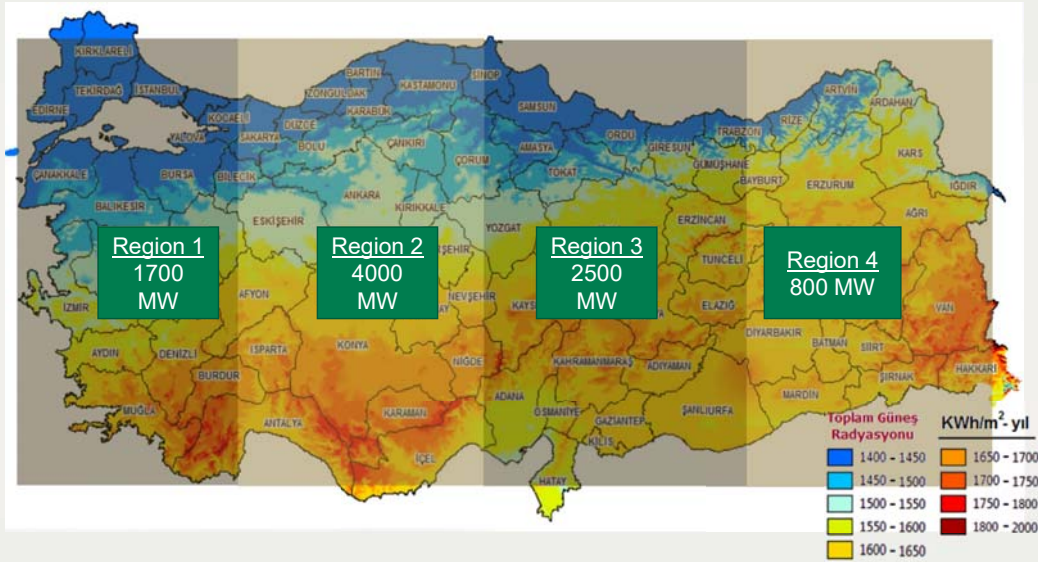
## Location of Wind PPs (Sept 2020)



## Development of Wind PPs (Installed Capacity)



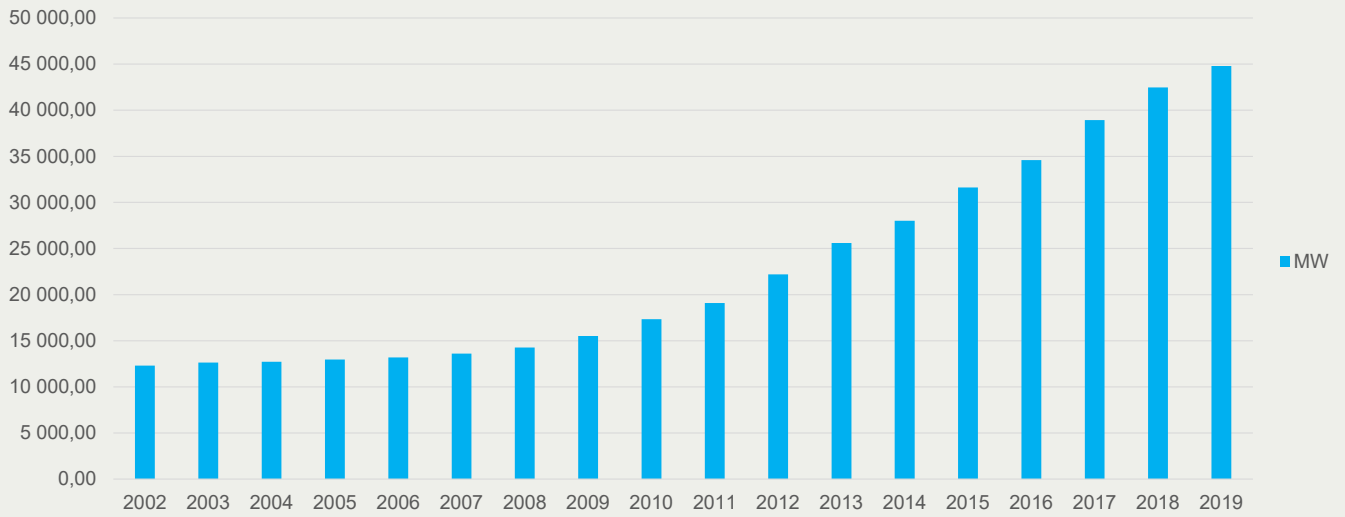
# Location of Solar PPs (Existing+Permitted)



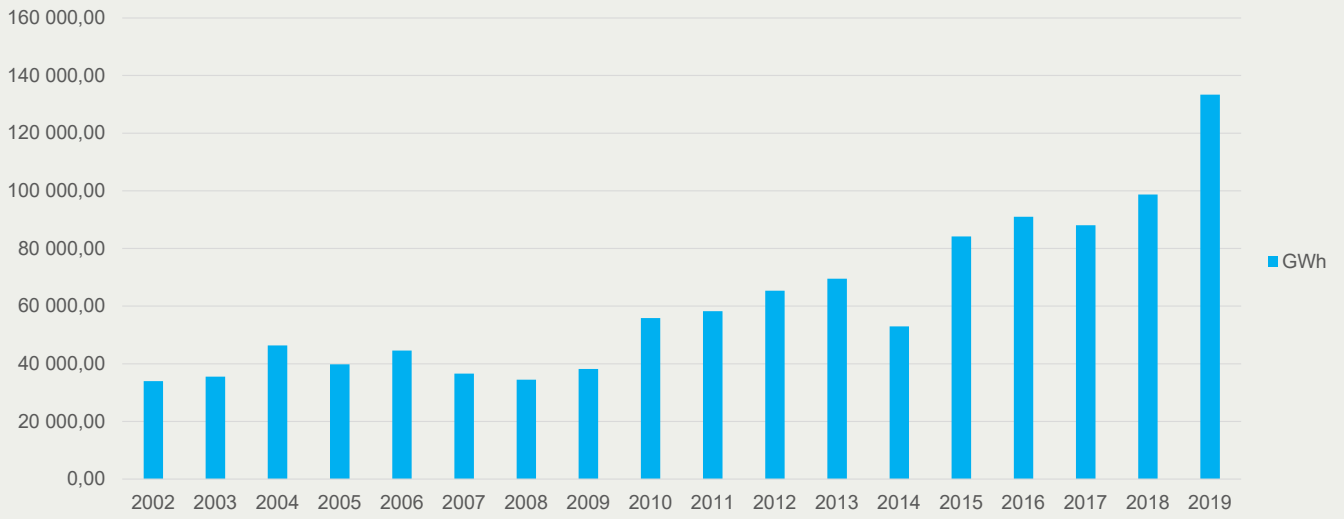
## Development of Solar PPs (Installed Capacity)



## Development of RES PPs (Installed Capacity)



## Development of RES PPs (Generation)



## Price trend for consumers

	2017		2018		2019	
	Second Half (Kuruş/kWh)	First Half (Kuruş/kWh)	Second Half (Kuruş/kWh)	First Half (Kuruş/kWh)	Second Half (Kuruş/kWh)	First Half (Kuruş/kWh)
Industry	26,3	30,2	44,1	48,1		
Household	41,3	45	55,2	53,8		

# Milestones of Turkish Electricity Market

**2001**

- Electricity Market Law numbered 4628 was published.

**2006**

- Market Financial Settlement Center (PMUM) at TEIAS started to operate the balancing mechanism.
- Imbalances started to be settled as night, day and peak time period.

**2009**

- Balancing and Settlement Regulation was published on 1st December of 2009.
- Day Ahead Planning was being used for day ahead trading and balancing activities.
- Balancing Power Market is being used for real-time balancing. Imbalances started to be settled hourly.

**2011**

- Day Ahead Market came in to force on 1st December of 2011
- Daily advance payments, collateral mechanism and renewable energy resources support mechanism started to be implemented.

**2013**

- Electricity Market Law numbered 6446 was published. Law numbered 4628 was renamed as "Law on the organization and duties of Energy Market Regulatory Authority"

**2015**

- In accordance with the Electricity Market Law, a new liberal company called EPIAŞ (Electricity Markets Operating Incorporate Company) which will operate day ahead market, intraday market and settlement of these markets, was established.
- EPIAŞ started to operations in **1st of September 2015**. After this date TEIAS is responsible only balancing of power market.

## Power Balance (2019)

	GWh
Generation	303.897,56
Consumption	303.320,40
Import	2.211,51
Export	2.788,67
Transmission losses	5.585,21

## Energy exchanges with neighbours (2019)

Country Interconnector	Import (GWh)	Export (GWh)
<b>Bulgaria</b>	1.960,6	120,7
Maritsa East 3-Hamitabat 1		
Maritsa East 3-Hamitabat 2		
<b>Greece</b>	3,9	2.667,8
Nea Santa-Babaeski		
<b>Georgia</b>	----	----
Hopa-Batum		
<b>Georgia</b>	247,0	0,2
Borçka-Ahiska		
<b>Iran</b>	----	----
Khoy-Başkale		
<b>Iran</b>	----	----
Doğubayazıt-Bazargan		
<b>Nahcivan</b>	----	----
Iğdır-Babek		
<b>Syria</b>	----	----
Birecik-Halep		
<b>Armenia</b>	----	----
Kars-Gumri		
<b>Iraq</b>	----	----
Karkey-Zakho		

# Specific Aspects of Turkish Electricity Market

- Market Operator (EPIAS)
  - <http://epias.com.tr>
  - Day-Ahead Market
  - Intraday Market
  - Transparency Platform
    - <https://seffaflik.epias.com.tr/transparency/index.xhtml>
- Transmission System Operator (TEIAS)
  - Real-time Balancing Market
  - Ancillary Services Market

