



# Turkey - Energy Transition during Pandemic Era

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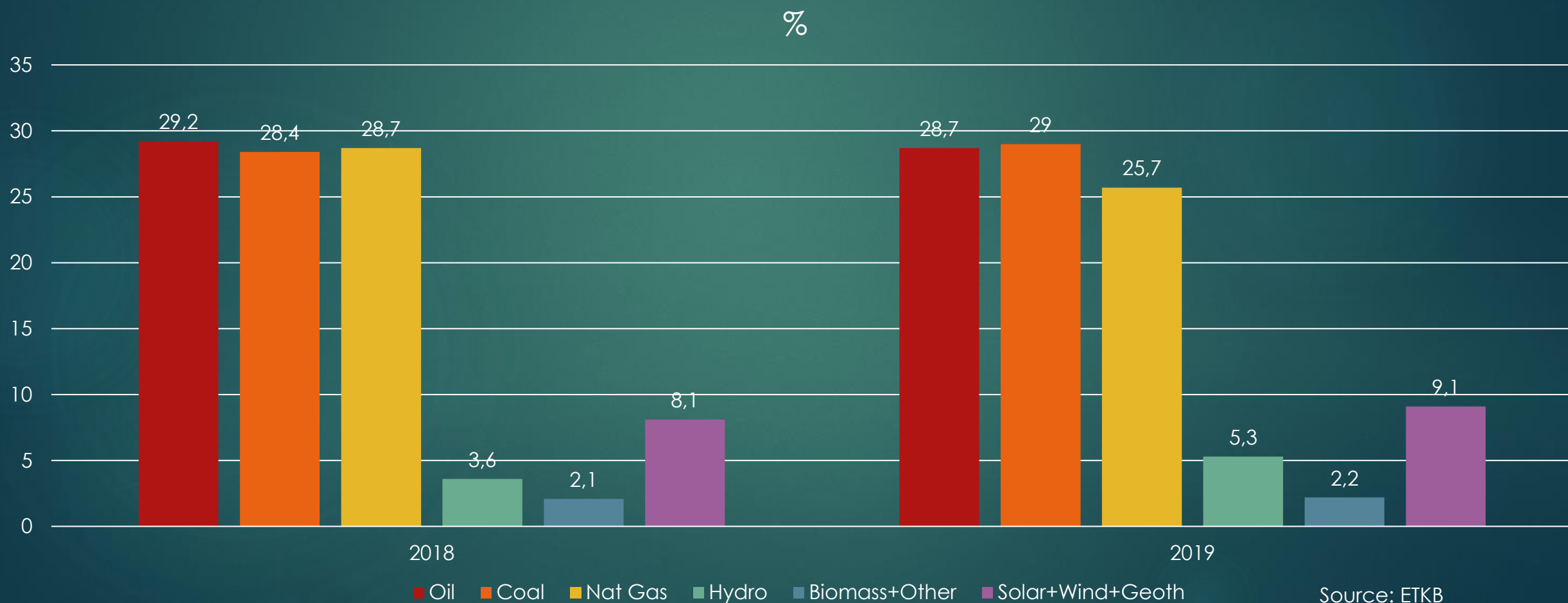
**IENE 25<sup>TH</sup> NATIONAL ENERGY CONFERENCE**  
**“DEVELOPMENT AND ENERGY 2021”**  
**ATHENS, DECEMBER 1-2, 2021**

# Primary Energy Mix of Turkey

2018: 143.666 Mill TOE

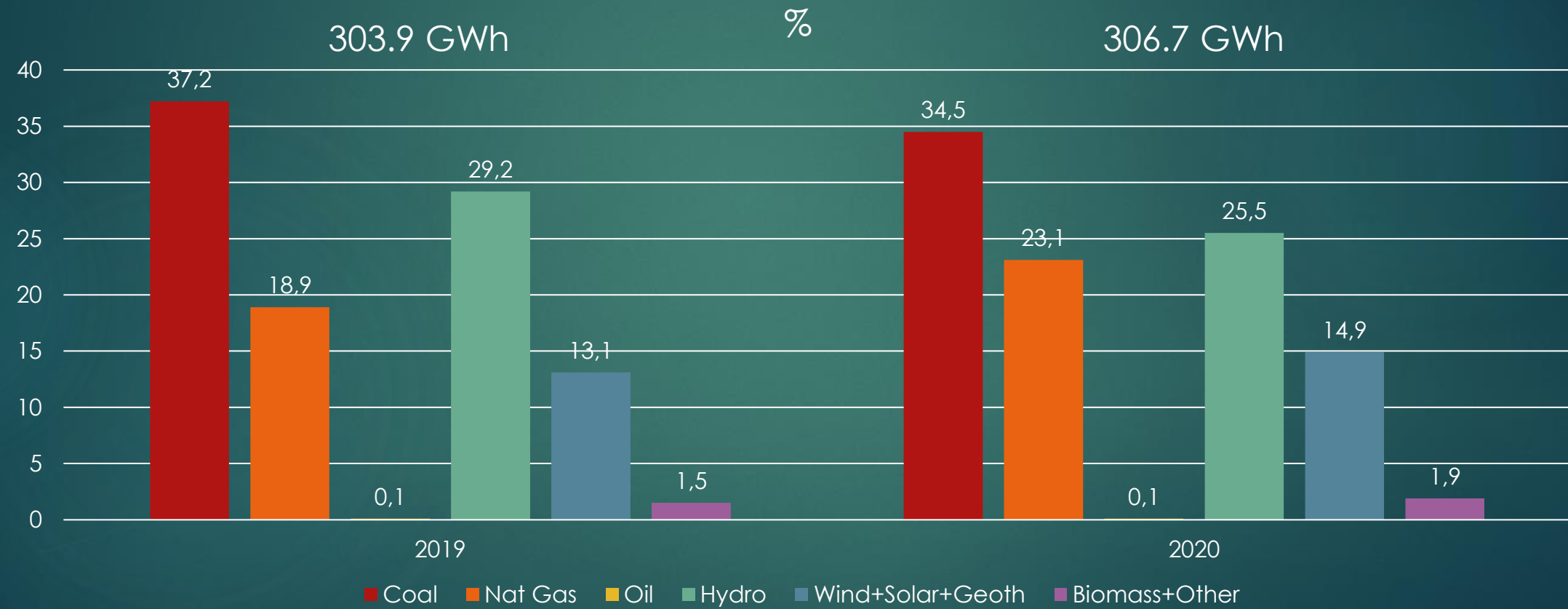
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2019: 144.4 Mill TOE

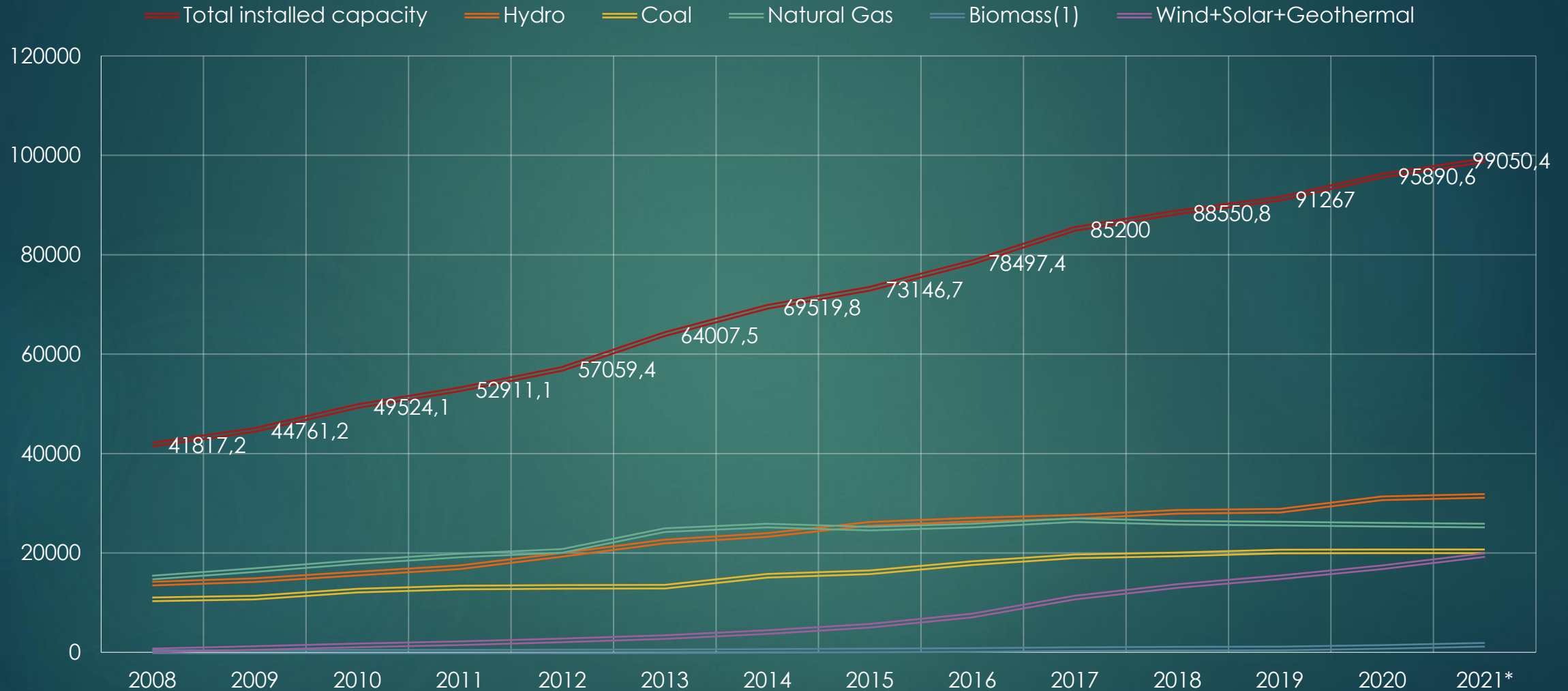


# ENERGY TRANSITION-ELECTRICITY GENERATION

Source: TEİAŞ



# Development of installed capacity



\* As of 31 Oct 2021

# RENEWABLES NEWS OF PANDEMIC ERA

- Successor of YEKDEM feed-in tariff for the next ten years started as of July 1, 2021
- High growth of renewable power capacity in 2020 and in H1 of 2021
- Fifth biggest wind energy equipment producer in Europe
- Regulation on the energy storage systems published in May 2021, licensing started in Oct 2021
- Regulation on hybrid electricity generation published in March 2020, updated in May 2021
- Renewable Energy Guarantees of Origin System YEK-G introduced, June 2021
- 3. Renewable Resource Areas YEKA 1000 MW solar auction for 1000 MW in 74 locations, Apr – May 2021
- Two YEKA solar auctions for 1000+1500 MW and one YEKA wind auction for 2000 MW in 2022.

# NEW YEKDEM FEED-IN TARIFF

Type of Production		Feed-in Tariff (TL/kWh)	Maximum Local Component Bonus (TL/kWh)	Ceiling Price for escalated tariff (USD cent/kWh)	Former YEKDEM Ceiling tariff (USD cent/kWh)
Hydroelectric		0.40	0.08	6.40	9.60
Wind		0.32	0.08	5.10	11.00
Geothermal		0.54	0.08	8.60	13.20
Biomass	Landfill gas etc.	0.32	0.08	5.10	18.90
	Bio methanation	0.54	0.08	8.60	
	Waste incineration	0.50	0.08	8.00	
Solar		0.32	0.08	5.10	20.00 (22.50 CHP)

- Feed-in tariff and local component bonus are subject to quarterly escalation according the producer price index.
- Feed-in tariff is applicable for 10 years, local component bonus is applicable for 5 years.



# RENEWABLES: Hydro

Source:ETKB, EPDK

2023 Target: Full utilization of 140 TWh/a potential ~40.000 MW

2015-2019 Strategic Plan 2019 target: 32.000 MW - 2019-2023 Strategic Plan 2023 target: 32.037 MW

2000: 11.175 MW

2005: 12.906 MW

2010: 15.831 MW

2011: 17.137 MW

2012: 19.609 MW

2013: 22.289 MW

2014: 23.643 MW

2015: 25.868 MW

2016: 26.681 MW

2017: 27.273 MW

2018: 28.291 MW

2019: 28.503 MW

2020: 30.984 MW

2021: 31.469 MW\*



\* As of 31 Oct

# Renewables: Wind

2023 target: 20 GW, Old Strategic Plan 2019 target: 10 GW, Actual Strategic Plan 2023 target: 11.9 GW

2007: 27 MW  
2008: 433 MW  
2009: 800 MW  
2010: 1.329 MW  
2011: 1.729 MW  
2012: 2.261 MW  
2013: 2.760 MW  
2014: 3.630 MW  
2015: 4.365 MW  
2016: 5.751 MW  
2017: 6.516 MW  
2018: 7.005 MW  
2019: 7.591 MW  
2020: 8.832 MW  
2021: 10.253 MW\*



\*As of 31 Oct

- 1. YEKA Wind auction, August 2017 1000 MW: 3,48 \$cent/kWh
- 2. YEKA Wind auction May 2019 4 x 250 MW: 3,53 / 3,69 / 4,00 / 4,56 \$cent/kWh



# Renewables: Geothermal

2023 target: 600 MWe, Old Strategic Plan 2019 target: 1.300 MWe Source:EPDK

2002: 15 MWe

2012: 162,2 MWe  
2013: 310,8 MWe  
2014: 404,9 MWe  
2015: 623,9 MWe  
2016: 820,9 MWe  
2017: 1063,7 MWe  
2018: 1282,5 MWe  
2019: 1514,7 MWe  
2020: 1613,2 MWe  
2021: 1651,2 MWe\*

\* As of 31 Oct



Largest installed capacity in Europe and fourth largest in the world

# Renewables: Solar

2023 Target: n/a, Strategic Plan 2019 Target: 3 GW, Actual Strategic Plan 2023 target: 10 GW

2014: 40,2 MW  
2015: 248,8 MW  
2016: 832,5 MW  
2017: 3.420,7 MW  
2018: 4.662,9 MW  
2019: 5.995,2 MW  
2020: 6.667,4 MW  
2021: 7.658,6 MW\*

\* As of 31 Oct



- 1. YEKA auction March 2017 1000 MW: 69,9 \$/MWh
- 2. YEKA auction Jan 2019 canceled
- 3. YEKA mini auctions 2021 1000 MW: 0,18 – 0.32 TL/kWh



# Renewables: Biomass

2023 Target: n/a, Strategic Plan 2019 Target: 700 MW

2007: 43 MW  
2008: 60 MW  
2009: 87 MW  
2010: 107 MW  
2011: 126 MW  
2012: 169 MW  
2013: 235 MW  
2014: 299 MW  
2015: 370 MW  
2016: 496 MW  
2017: 642 MW  
2018: 739 MW  
2019: 802 MW  
2020: 1116 MW  
2021: 1524 MW\*

\* As of 31 Oct





# Nuclear News of Pandemic Era

Source: Akkuyu Nükleer A.Ş. MENR

**Akkuyu Nuclear Power Plant** NPP 2006 (3+ VVER-1200), 4x1200 MW

Apr 2018: Ground-breaking ceremony of UNIT 1

Jul 2019: Core catcher of UNIT 1 delivered to construction site

Apr 2020 : Ground-breaking ceremony of UNIT 2

Jul 2020 : Second tier of internal containment shell of UNIT 1 installed

Aug 2020: Core catcher of UNIT 2 delivered to construction site

Sep 2020 :The reactor pressure vessel dry shielding installed at UNIT 1

Oct 2020: Four steam generators for UNIT 1 delivered

Nov 2020: The reactor pressure vessel for UNIT 1 delivered

Dec 2020: Core catcher vessel for UNIT 2 installed

## Recent Progress in 2021

UNIT 1: Apr 2021: The rotor of the HP and IP cylinder delivered

Jun 2021: Reactor pressure vessel installed

Jun 2021: Third tier of internal containment shell installed

UNIT 2: Mar 2021: Cantilever truss installed

Sep 2021: Second tier of internal containment shell installed

Sep 2021: Main elements of reactor shaft installed

Unit 3: Mar 2021: Construction start



Source: Anadolu Ajansı

# ELECTRIC CAR NEWS OF PANDEMIC ERA

- Indigenous Turkish electric car TOGG: Ground-breaking ceremony July 2020, Roll out of first car late 2022
- Ford plans the roll out of all-electric commercial vehicles from its Gölcük factory in 2022,
- Turkish electric bus manufacturers Karsan, Temsa export to European markets, Otokar on road-show

Years	Electric	Hybrid	Total*
2015	119	106	225
2016	44	950	994
2017	77	4,451	4,528
2018	155	3,876	4,031
2019	222	11,015	11,237
2020	844	16,941	10,049
2021**	894	11.851	12,745

(Source: TEHAD)

\* Excluding direct imports of individuals

\*\* As of June 30, 2021



Source: wrightcoating.com



# ELECTRIC VEHICLE CHARGING STATIONS

(excluding private charging Stations)

2011: 15 → 2019: ~ 600 → 2020: ~ 2,000

Infrastructure is growing fast in metropolitan areas, 6 companies investing in charging stations



# Energy Exchange Istanbul News of Pandemic Era

## EXIST Energy Exchange Istanbul

Established in March 2015, fourth largest Energy Exchange in Europe

### **Electricity market operations:**

- Day ahead market,
- Intra-day market,
- Balancing market,
- Market registration process,
- Market Settlement
- Power Futures Market transactions started, 1 June 2021
- Organized Renewable Energy Certificates YEK-G Market, 1 June 2021

### **Natural gas market:**

- 1 Sept 2018: Organized Natural Gas Market has started
- 1 June 2020: Natural Gas Market Weekly Products launched
- 1 Oct 2021: Natural Gas Futures Market launched, monthly, quarterly and yearly contracts



# ARE WE ON THE RIGHT TRACK?

Devastating floods and wildfires of summer 2021



Source: haberler.com.tr



Source: habertürk.com.tr

Climate adaptation measures in Southeast Europe need to be reinforced



# Thank you

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