

TURKEY ENERGY OUTLOOK | 2020

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Turkey Energy Outlook (TEO) supports a stronger energy future for Turkey with solid recommendations.

WHY THE TEO?



A long-term perspective in a dynamic energy landscape with uncertainties



Policy and technology pathways for a stronger energy future



An independent, participative and exemplary study



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HOW THE TEO WAS DEVELOPED?

- ✓ Building upon energy policy objectives
- ✓ A holistic energy model developed by IICEC
- ✓ Scenario-based approach out to 2040 with a detailed bottom-up accounting of the Turkish energy sector
- ✓ Reflecting different implications of energy policy choices, market progress and technological developments
- ✓ Supported by independent research, quantitative analyses and insights
- ✓ Stakeholder engagement built upon the Government-Industry-Academia *success triangle*



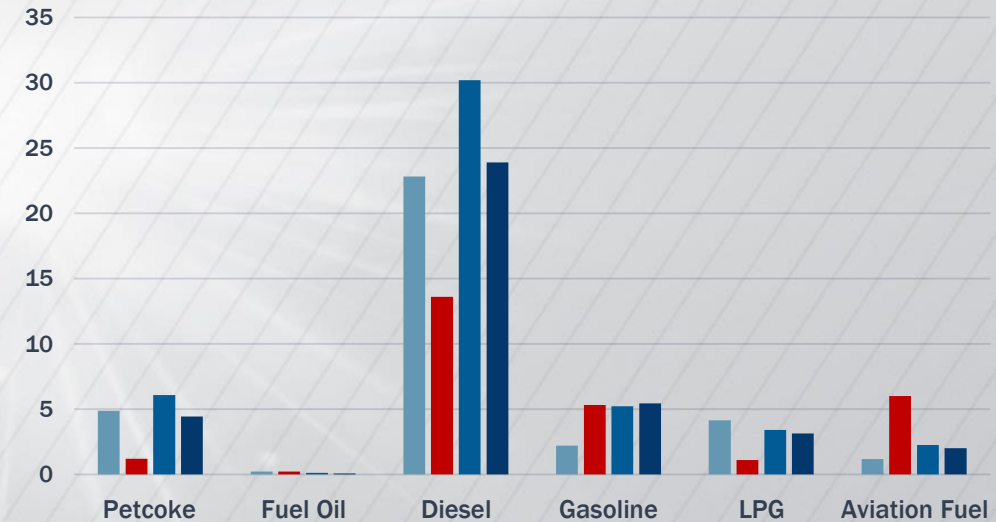


Scenario	Not enough	Enough
Wind & Solar PV	10%	36%
Renewables	44%	58%
Renewables & Nuclear	44%	75%

A stacked bar chart comparing two scenarios: 'Reference Scenario' and 'Alternative Scenario'. The y-axis represents a numerical value from 0 to 200 in increments of 20. Each bar is composed of three segments: a bottom red segment, a middle blue segment, and a top light blue segment. The 'Reference Scenario' bar reaches a total value of approximately 175, while the 'Alternative Scenario' bar reaches a total value of approximately 188.

Scenario	Red Segment (Approx.)	Blue Segment (Approx.)	Light Blue Segment (Approx.)	Total (Approx.)
Reference Scenario	125	15	35	175
Alternative Scenario	128	18	42	188

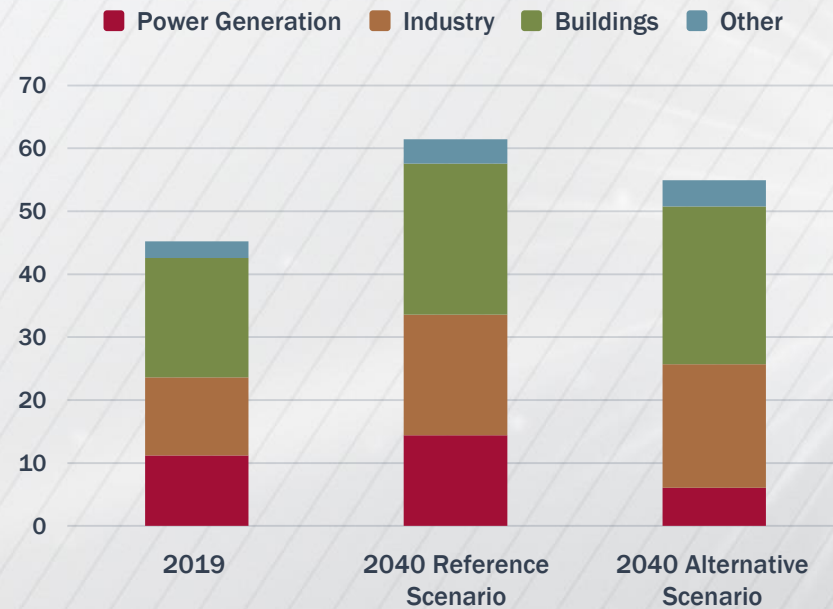
■ 2018 Demand ■ Refinery Production in 2019
■ 2040 Ref. Scenario Demand ■ 2040 Alt. Scenario Demand



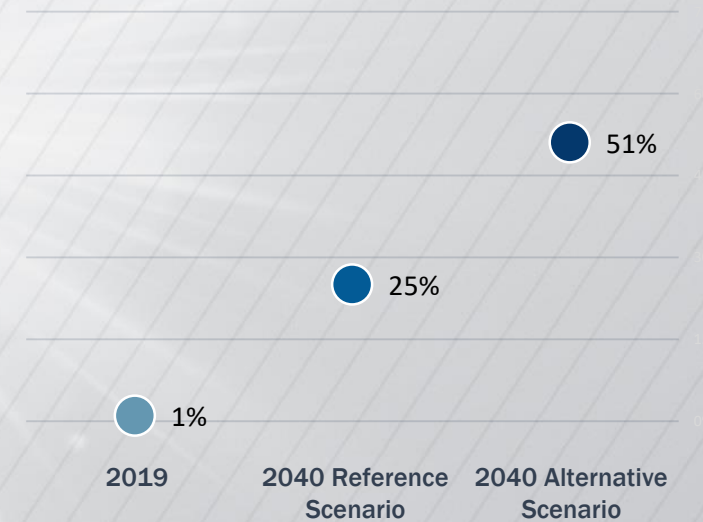
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Gasification continues in all non-power sectors backed by increasing domestic gas production with multiple benefits.

Natural Gas Demand by Sector and Scenario (bcm/yr.)



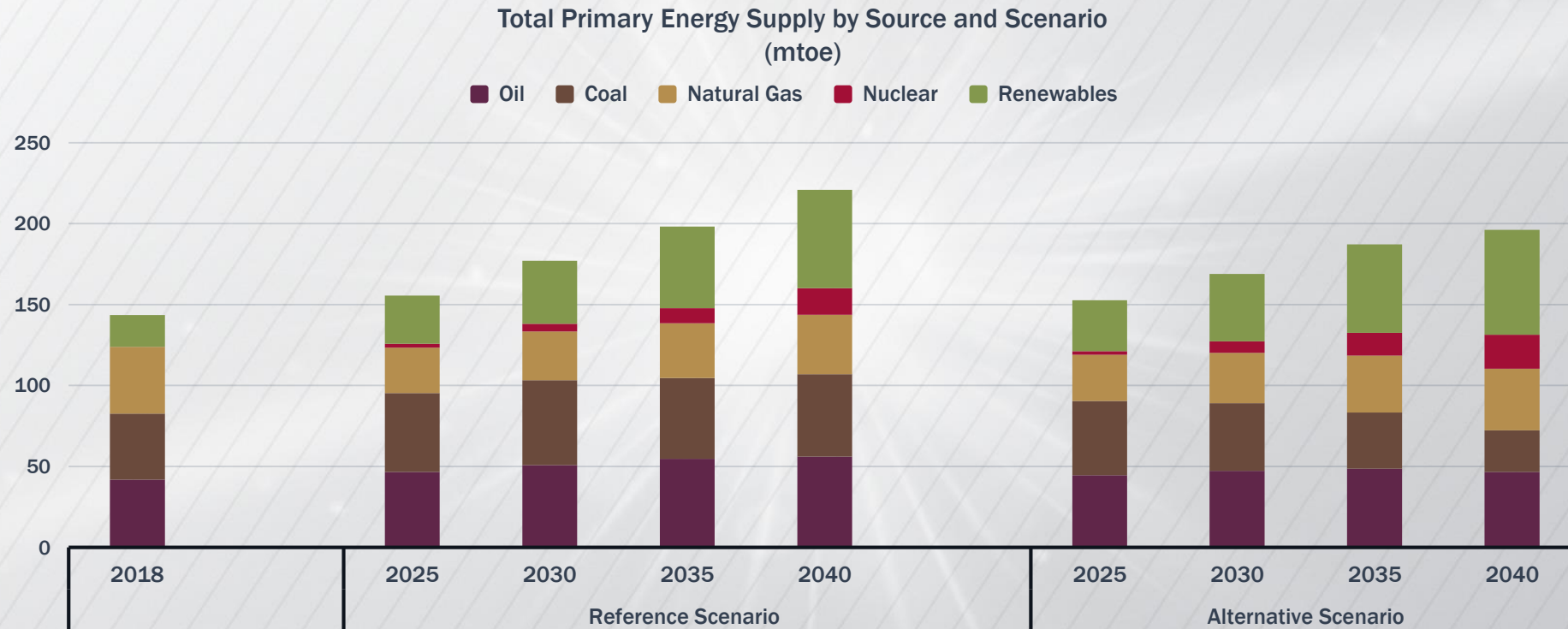
Self Sufficiency in Natural Gas Supply (%)



Global and regional gas market dynamics, Turkey's enhancing infrastructure, expiry calendar of existing import contracts and the recent gas discovery will all be supportive for a more competitive gas market.



The energy supply mix transforms into a more diversified and sustainable structure limiting energy imports and carbon footprint.



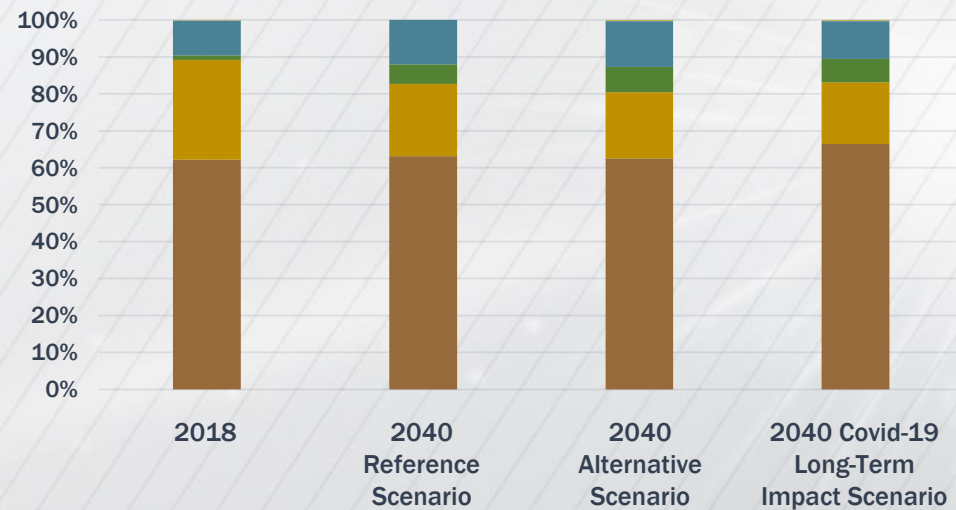
Energy supply shifts to a less carbon intensive and import dependent pattern as a result of increasing nuclear, renewables and energy efficiency, sustained E&P, and wider localization.



- Renewables and energy storage
- Nuclear power including the SMRs
- Electric vehicles
- Carbon capture from air
- Hydrogen production from local coal via CCUS
- Hydrogen in transportation and industrial sectors
- Advanced data analytics and digitalization




■ LDVs
 ■ Intercity Buses & Minibuses
 ■ Intercity Rail
 ■ Aviation
 ■ Intercity Marine



Fuel	Change in CO2 emissions (g/kWh)
Jet Fuel	-0.5
Diesel	-0.2
Gasoline	0.3
LPG	0.1



05  Strong policy initiatives, market based and innovative financing and business models to exploit the energy efficiency potential in buildings and industries.

10  Increased innovation, R&D and manufacturing of advanced energy technologies.



10 TEO Recommendations for a more secure, efficient, competitive, technology-oriented and sustainable energy future.

01

An attractive investment framework to mobilize investments for meeting increasing demand for modern energy services while achieving a more secure, efficient and sustainable energy future.



02

Faster progress towards competitive power and natural gas markets and wider private sector participation with cost-reflective energy prices while addressing the social dimension.



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03

Increased renewable and nuclear power with more flexibility in the power grid including demand side services.



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04

Increased energy and fuel efficiency across all sectors supported by fuel shifts towards further electrification and larger use of renewable energy.



05

Strong policy initiatives, market based and innovative financing and business models to exploit the energy efficiency potential in buildings and industries.



06

Faster uptake of electric vehicles and Turkey's recharging infrastructure and faster retirement of older, inefficient and polluting transportation vehicles.



Increased modal shifts from energy and oil intensive road to rail and marine as well as a data-driven urban transportation planning structure to ensure effective public transit capital investments and measures to discourage private automobile travel.



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08

Sustained exploration and production (E&P) efforts and investments to discover and produce more domestic oil and gas.



Increased uptake of digitalization and advanced data analytics along the energy supply and demand chain.




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