



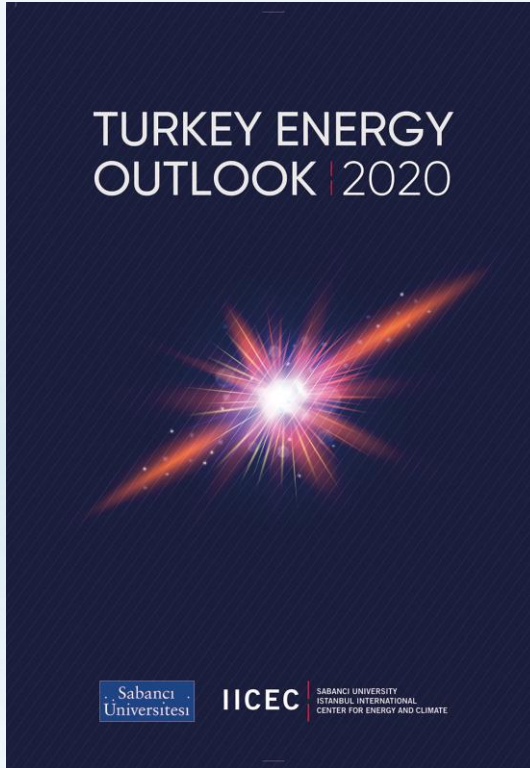
TÜRKİYE RENEWABLE ENERGY OUTLOOK | 2022

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CENTER FOR ENERGY AND CLIMATE

IICEC energy outlook series support a more secure and cleaner energy future.



Türkiye Renewable Energy Outlook (TREO) supports realization of high potential with multiple benefits by presenting solid recommendations.

WHY TREO?

- ✓ Strong global growth in renewable energy.
- ✓ High renewable energy resource potential of Türkiye.
- ✓ Multi-fold opportunities to support a more secure and clean energy future.
- ✓ An independent, participatory and exemplary study.

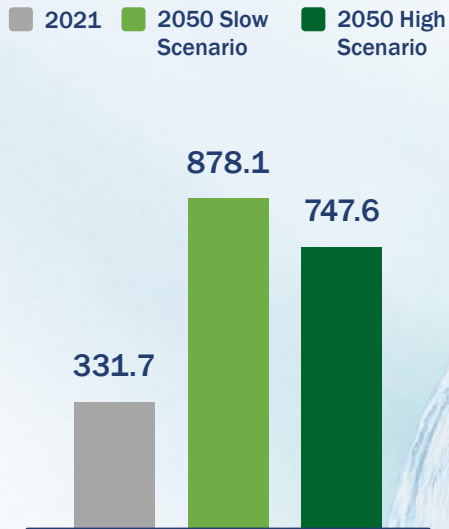
HOW TREO?

- ✓ Turkey Energy Outlook & a holistic energy model by IICEC.
- ✓ A detailed inventory of Türkiye's electricity generation and final energy consuming sectors & scenario analyses.
- ✓ Global & regional orientations, relevant policy choices in Türkiye, impacts of market development and technological advancements.
- ✓ Independent research, quant analyses and perspectives.
- ✓ Stakeholder engagement built upon "Government-Industry-Academia" success triangle.

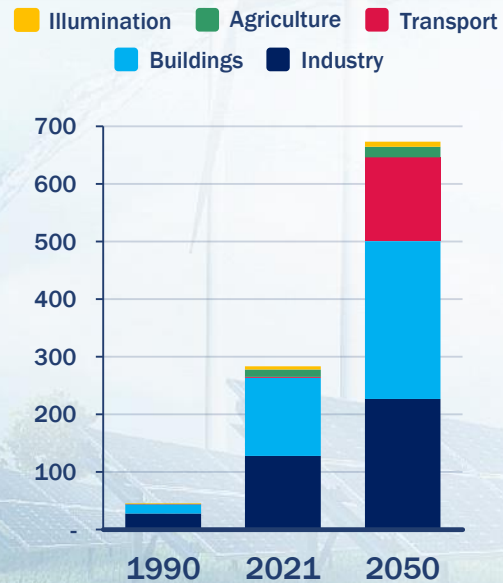


Impacts of different growth and development pathways on energy balances and emissions inventory were assessed under two IICEC scenarios.

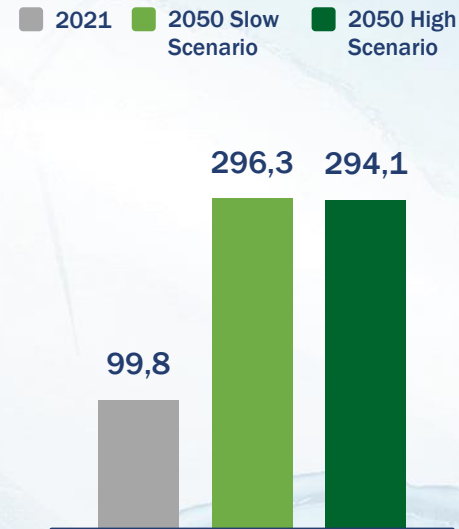
Gross Demand (TWh)



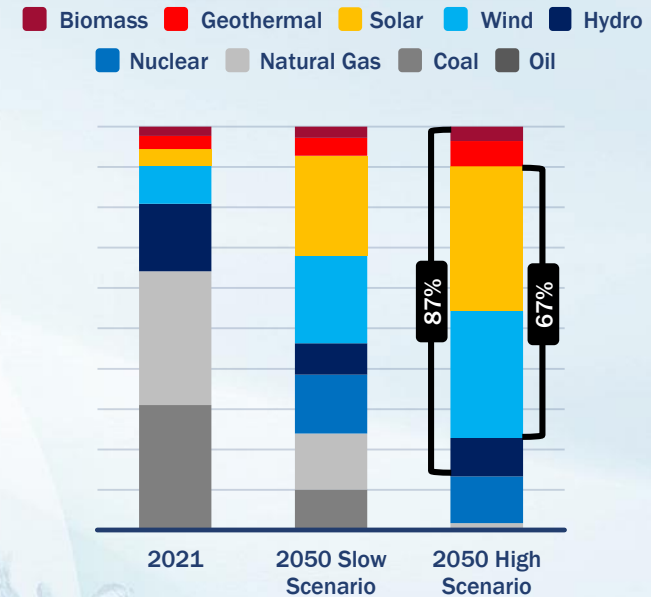
Net Demand in High Scenario (TWh)



Total Installed Capacity (GW)



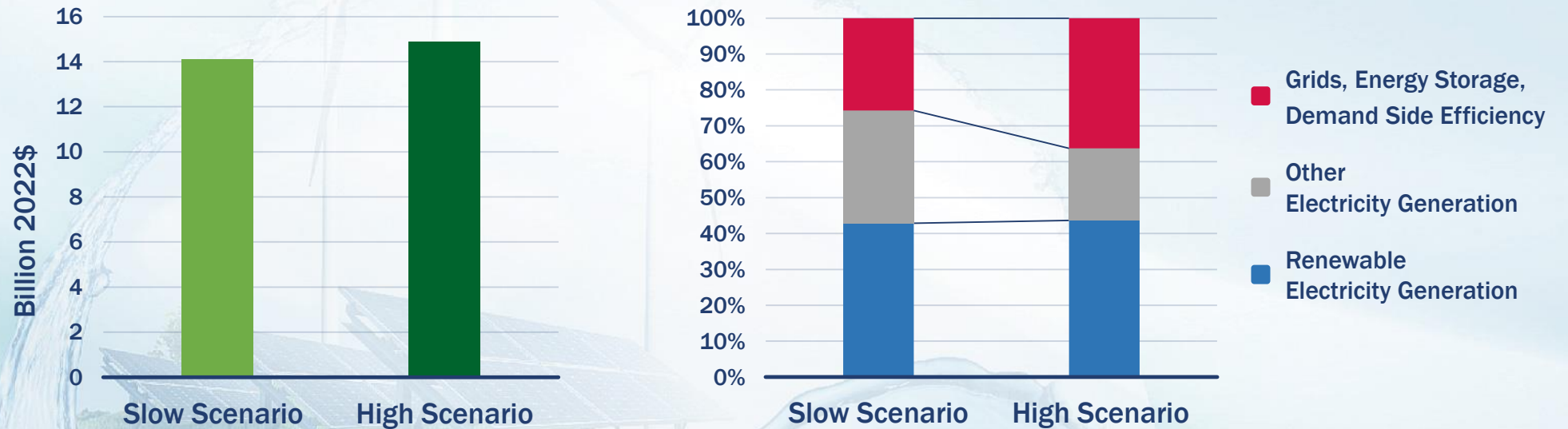
Power Generation Mix (%)



The High Scenario meets the consumption at the same comfort and quality with 15% less demand and can cover around 90% of power generation by 2050 from renewables.

The High Scenario can realize higher renewable energy contribution with a limited increase in investments.

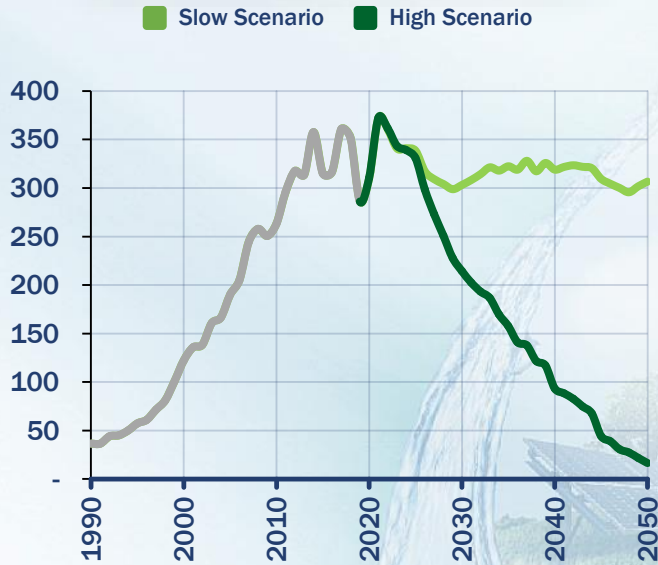
Annual Average Electricity Sector Investment & Breakdown (2022 - 2050, 2022 billion \$, %)



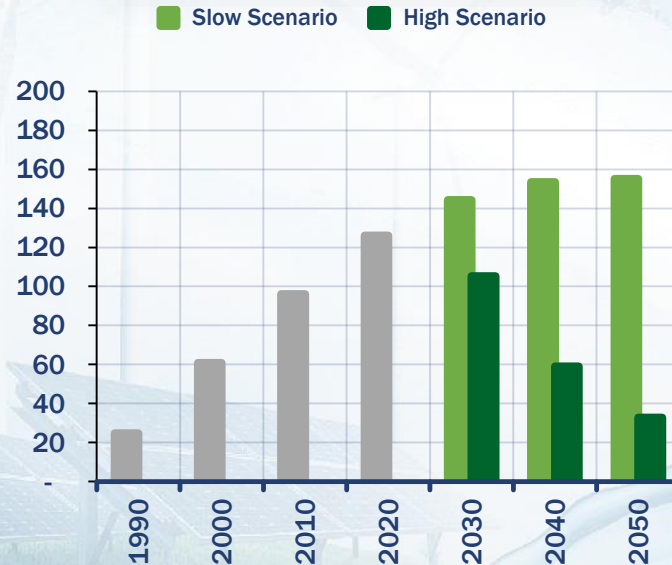
Investment allocation to grids, energy storage and demand side efficiency is critical to support an efficient and renewable energy-driven growth.

Electricity sector emissions peak before 2030 in parallel to the reduction in fossil fuel use in the High Scenario.

Fossil Fuel Import Input
to Electricity Sector (TWh)



GHG Emissions
from Electricity Sector (MtCO₂e)

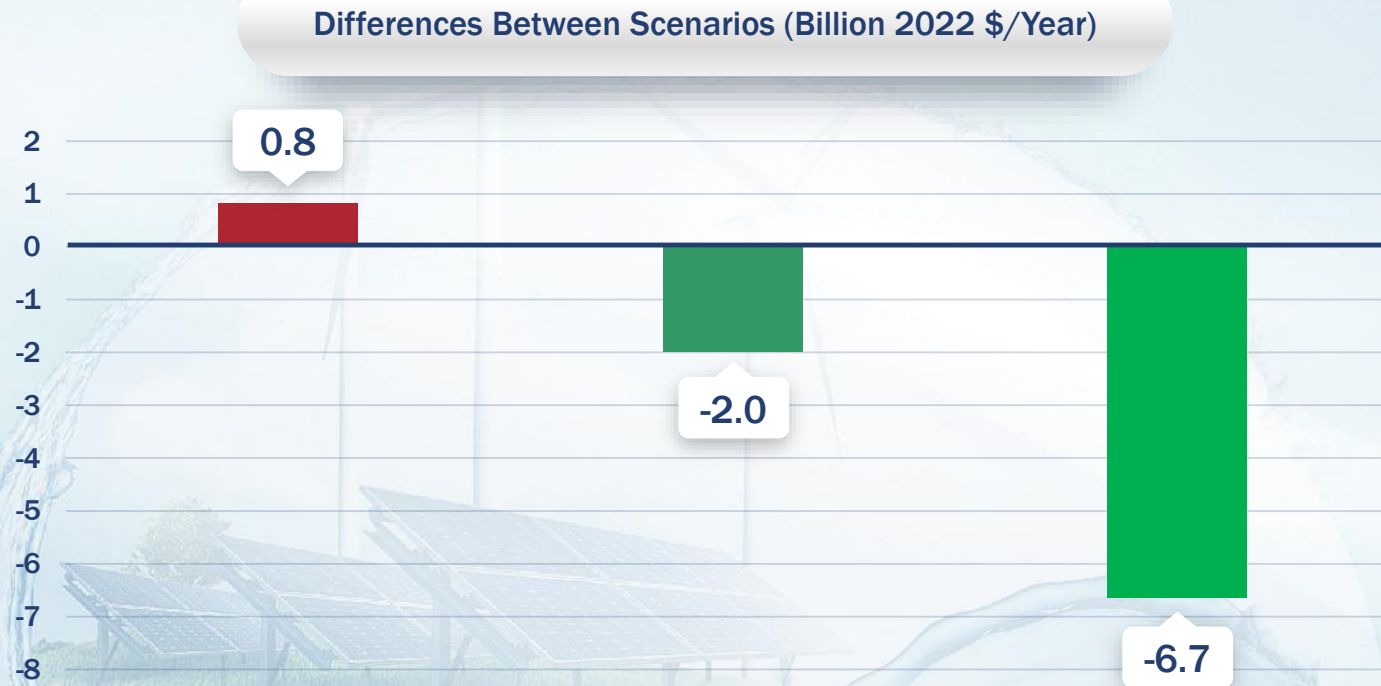


GHG Emissions intensity
in the Power Grid (gCO₂e/kWh)



This development supports a net-zero emissions perspective
and a more secure and cleaner energy future while lowering the fossil fuel imports.

The High Scenario enables greater economic gains over limited additional investment compared to the Slow Scenario.

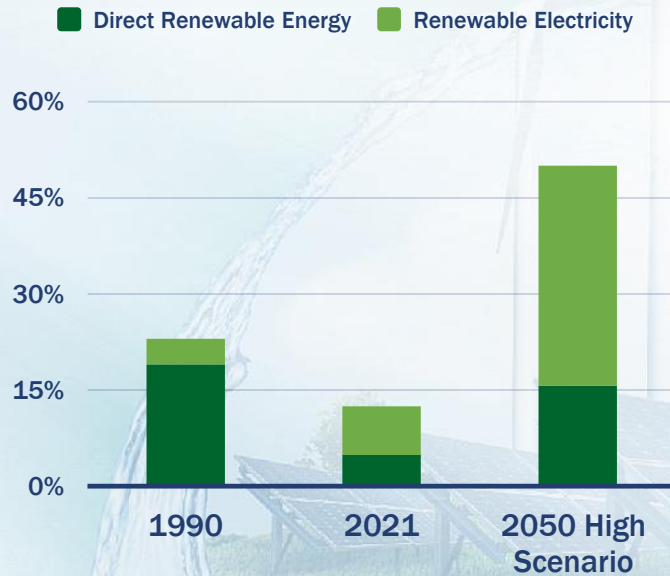


Savings / Investment multiplier is >10 in fossil fuel imports and emissions -elated spending.

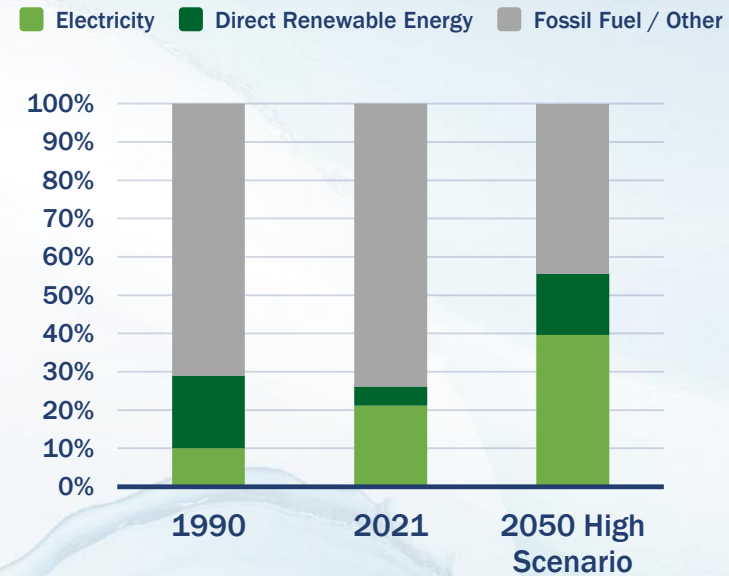
*With IEA APS fuel prices and at 100\$/t carbon price.

Contribution of renewable energy to total final energy consumption increases by more than 4 times in the High Scenario.

Renewable Energy Contribution in Total Final Energy



Breakdown of Total Final Energy Demand by Sources



Around 60% of final energy demand can become fossil-fuel free by realizing opportunities in clean electrification, renewable energy and energy efficiency.

TREO presents critical development areas and opportunities to realize the high potential and multiple benefits.

Government

**SUCCESS
TRIANGLE**



Industry

Academia

- ✓ Policy Targets & Road Maps
- ✓ Energy Markets & Investments
- ✓ Electricity Networks
- ✓ Holistic Efficiency & Digitalization
- ✓ Clean Energy Technologies
- ✓ Final Energy Consumption
- ✓ Human Resources & Entrepreneurship



7 IICEC
RECOMMENDATIONS

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2050

>250 GW

Developing roadmaps for resources, technologies, and sectors to achieve over 250 GW of total renewable energy installed capacity, with a more than 85% renewable energy contribution in power generation and a 50% renewable energy contribution in final energy demand by 2050.

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RECOMMENDATIONS

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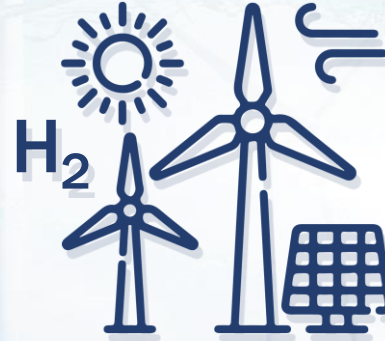
Ensuring an efficient, cost-reflective, and more predictable electricity market and developing sustainable investment and financing models to enable strong growth in the project portfolio.

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RECOMMENDATIONS



Strengthening the capacity and flexibility of the networks that form the backbone of the electricity system with technology-oriented investments supported by long-term dynamic planning.

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RECOMMENDATIONS



Continuing efforts to develop wind and solar technologies in a way that supports the sustainability of supply chains and supports Türkiye becoming a regional clean energy technologies production base while also advancing developments in energy storage and green hydrogen-production technologies.

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RECOMMENDATIONS



In addition to clean electrification, increasing the direct contribution of renewable energy at least threefold in buildings, industry, transport, and other energy-consuming sectors to support energy security and a clean energy transition.

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RECOMMENDATIONS



Turning the growth in the renewable energy ecosystem into high value-added opportunities by utilizing energy efficiency potential and digitalization solutions across the value chain.

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RECOMMENDATIONS



Developing qualified human resources and a talent pool together with an entrepreneurship ecosystem that supports strong, sustainable, and competitive growth in renewable energy.

**7 IICEC
RECOMMENDATIONS**

- 1** Developing roadmaps for resources, technologies, and sectors to achieve over 250 GW of total renewable energy installed capacity, with a more than 85% renewable energy contribution in power generation and a 50% renewable energy contribution in final energy demand by 2050.
- 2** Ensuring an efficient, cost-reflective, and more predictable electricity market and developing sustainable investment and financing models to enable strong growth in the project portfolio.
- 3** Strengthening the capacity and flexibility of the networks that form the backbone of the electricity system with technology-oriented investments supported by long-term dynamic planning.
- 4** Continuing efforts to develop wind and solar technologies in a way that supports the sustainability of supply chains and supports Türkiye becoming a regional clean energy technologies production base while also advancing developments in energy storage and green hydrogen-production technologies.
- 5** In addition to clean electrification, increasing the direct contribution of renewable energy at least threefold in buildings, industry, transport, and other energy-consuming sectors to support energy security and a clean energy transition.
- 6** Turning the growth in the renewable energy ecosystem into high value-added opportunities by utilizing energy efficiency potential and digitalization solutions across the value chain.
- 7** Developing qualified human resources and a talent pool together with an entrepreneurship ecosystem that supports strong, sustainable, and competitive growth in renewable energy.

With
Executive Summary
in English

TÜRKİYE YENİLENEBİLİR ENERJİ GÖRÜNÜMÜ | 2022



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