

# The Evolving Energy Landscape in APEC

**APEC Workshop on Promoting the Application of Artificial Intelligence for Future Energy And Sustainable Development – EWG\_103\_2025A**

16 July 2026

Ms Yasmin Fouladi, Researcher, APERC



# About the *APEC Energy Demand and Supply Outlook 9<sup>th</sup> Edition*

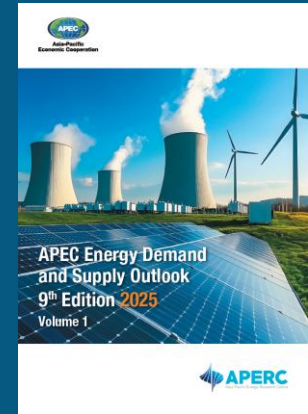
-  A priority task under the APEC Energy Action Programme (1995).
-  Provides insights into future energy demand and supply in APEC economies.
-  Volume 1 covers the APEC region,  
Volume 2 covers 21 APEC economies separately.
-  In the 9<sup>th</sup> edition, projections extend to 2060.

## The Reference Scenario (REF)

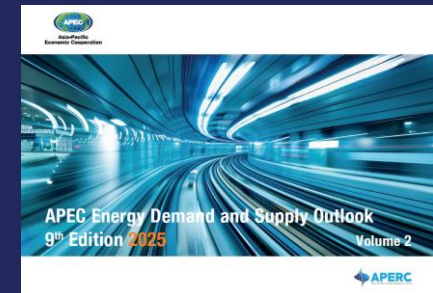
Economy-specific pathways based on **historical trends**, recent developments, and APERC's assumptions about the evolution of the energy system within each APEC economy.

## The Target Scenario (TGT)

A **hypothetical pathway** where each economy **achieves its energy-related policy targets** regardless of implementation costs.

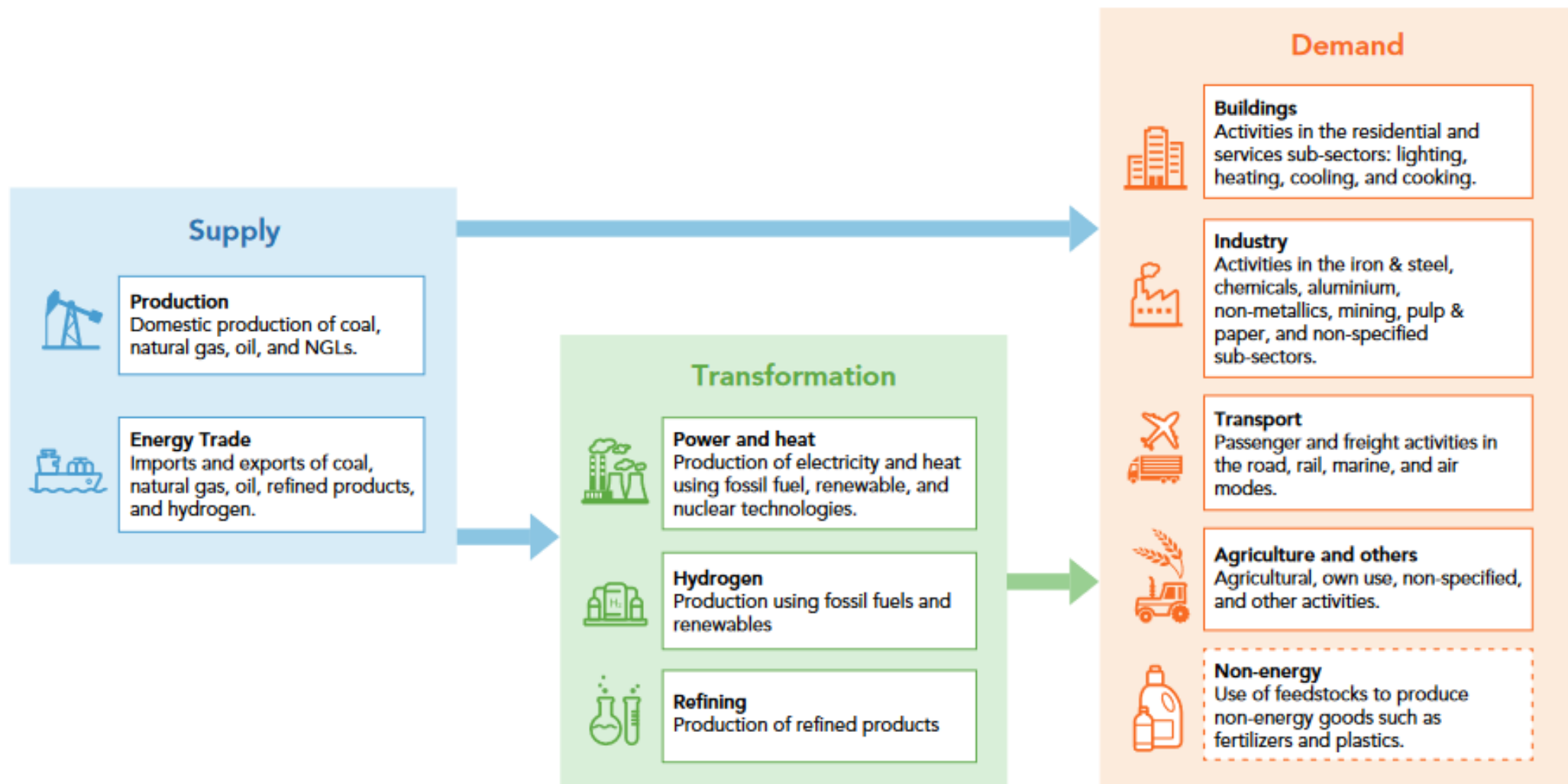


Volume 1 — APEC Region



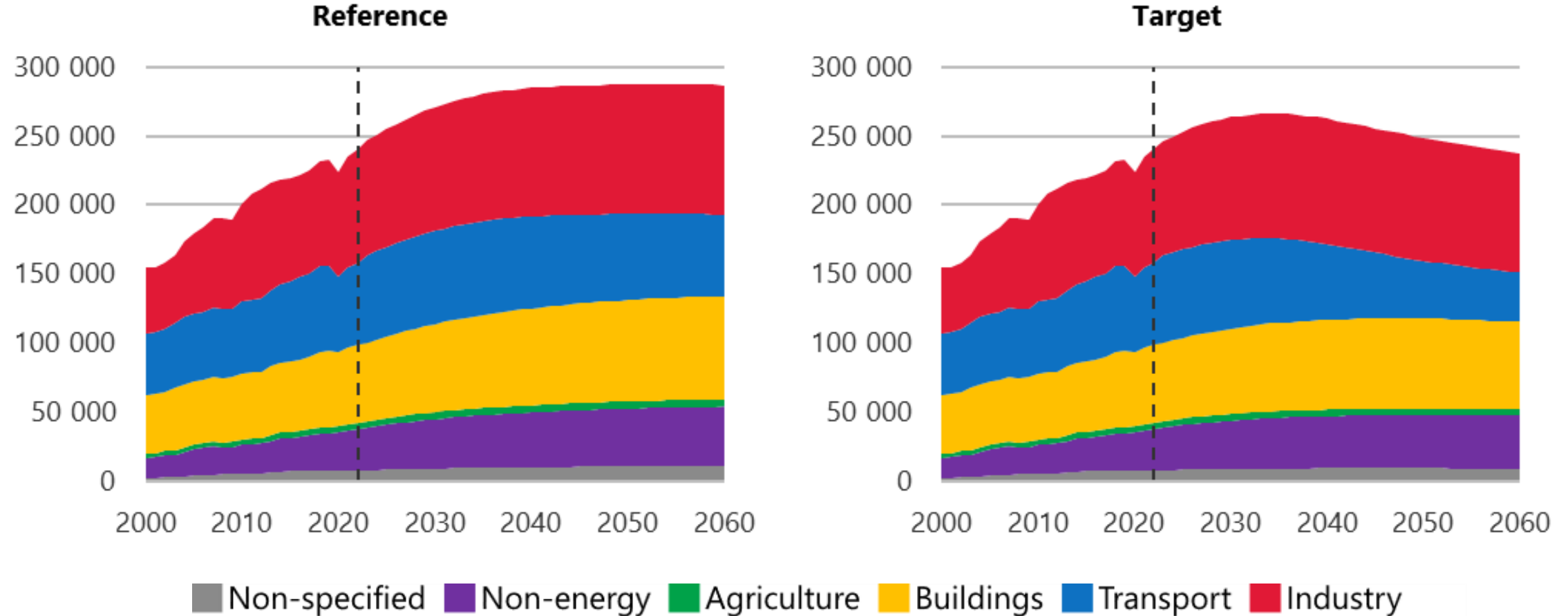
Volume 2 — 21 Economies

# Components of the APEC Energy System



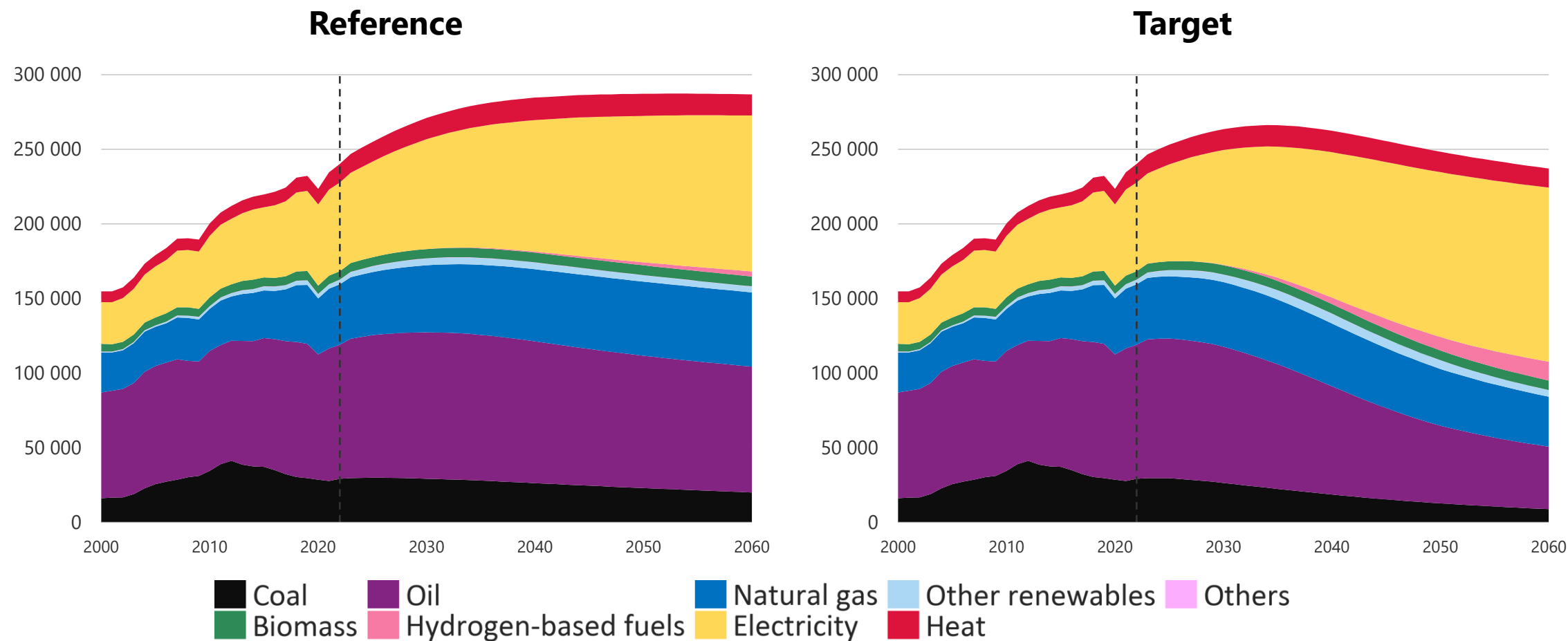
# Total final demand is projected to grow until the 2030s, where it will then either level-off or peak and then decline

APEC total final consumption by end-use sector (PJ)



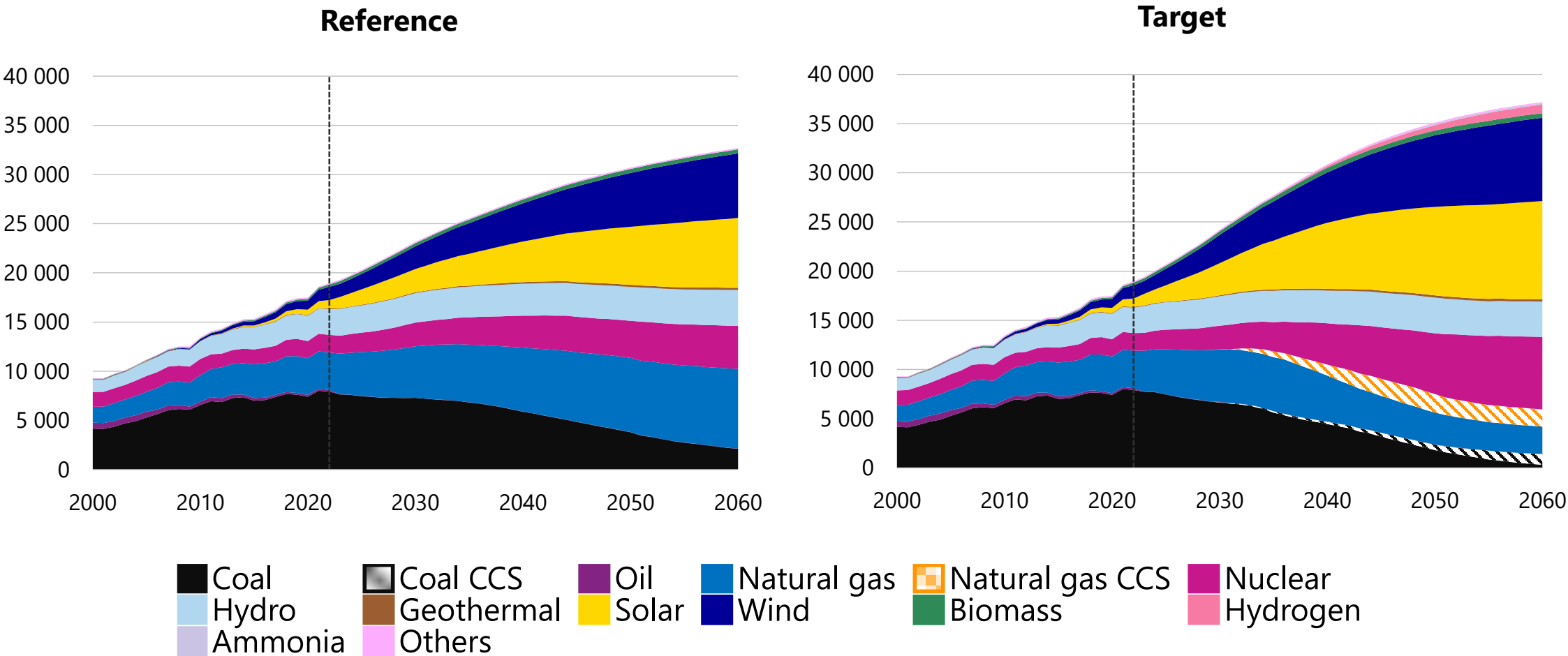
# Fossil fuels are prominent, but electrification increases

APEC total final consumption by fuel (PJ)



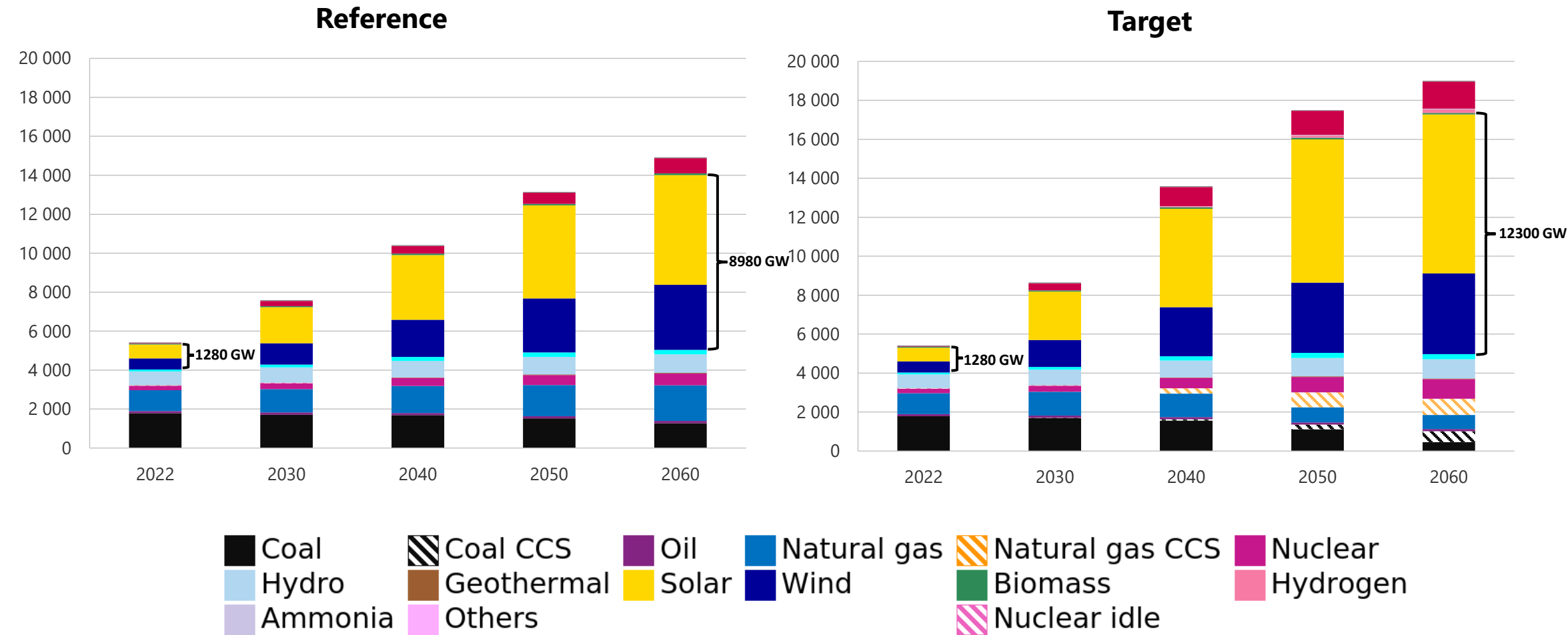
# Electricity generation continues to grow

APEC electricity generation by fuel type (TWh)

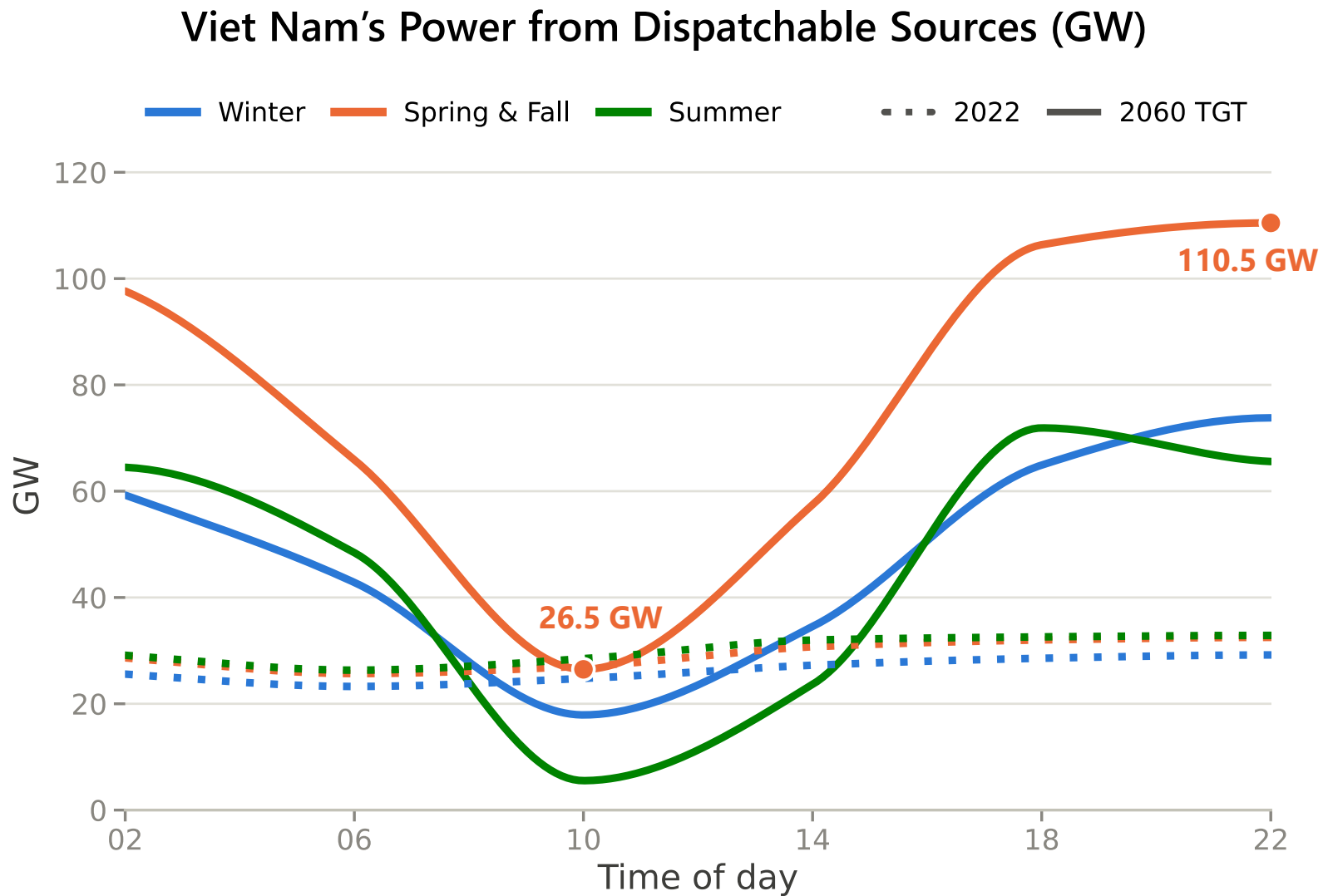


# Variable renewable energy capacity expands in both scenarios

APEC generation capacity by fuel type (GW)



# More variable renewables require greater system flexibility



# The APEC Energy Outlook points to a more complex energy system—one where AI can play an important role

## What the APEC Energy Outlook tells us

## How AI can help



**Energy demand increases then levels off or declines**



Improve energy efficiency through smart buildings and industrial optimisation.



**Electrification accelerates**



Improve load forecasting and demand response to better manage changing electricity demand.



**Variable renewable energy expands**



Forecast solar and wind generation potential, optimise storage, and improve renewable integration.



**Greater system flexibility is needed**



Support real-time grid balancing, dispatch, and congestion management.



**Power systems become increasingly complex**



Enhance system monitoring, predictive maintenance, and operational decision-making.

# Realising AI's potential across APEC energy systems

*Successfully integrating AI into future energy systems requires coordinated action across technology, policy, investment, and people.*



## Technical Foundations

- High-quality energy data
- Digitalised energy infrastructure
- Secure and interoperable systems



## Policy & Governance

- Standards and regulations
- Data governance
- Trustworthy AI



## Investment & Innovation

- Financing digital infrastructure
- Public–private partnerships
- AI innovation and deployment



## Capacity & Collaboration

- Workforce skills
- Knowledge-sharing
- Regional cooperation across APEC

# Summary



**1**

**The APEC energy system is becoming increasingly electrified and renewable.**



**2**

**Managing the energy transition will require greater system flexibility and resilience.**



**3**

**AI can help manage the increasing complexity of future energy systems, but realising its full potential will require coordinated action across technology, policy, investment, and capacity building.**

# Thank you for your kind attention.

<https://aperc.or.jp>

