

Responding to APEC's rising electricity demand: Outlook and Strategy

Preliminary results, not for public distribution

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Outline

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1. APEC Energy Demand and Supply Outlook – 9th Edition
 2. Expected Growth in Electricity Demand
 3. Increased Reliance on Variable Renewable Energy
 4. Estimating Energy Transition Costs
 5. Designing a Path Forward
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1. APEC Energy Demand and Supply Outlook – 9th Edition

- **Priority task** for APERC since **1996**.
- Provides analyses and **policy insights**
- Energy and emissions **projections for each APEC member economy**.
- **2022 EGEDA data** used as the base year for modeling.
- **Projections** extend to **2060**.
- Release scheduled for **October 2025**.

The Reference scenario (REF)

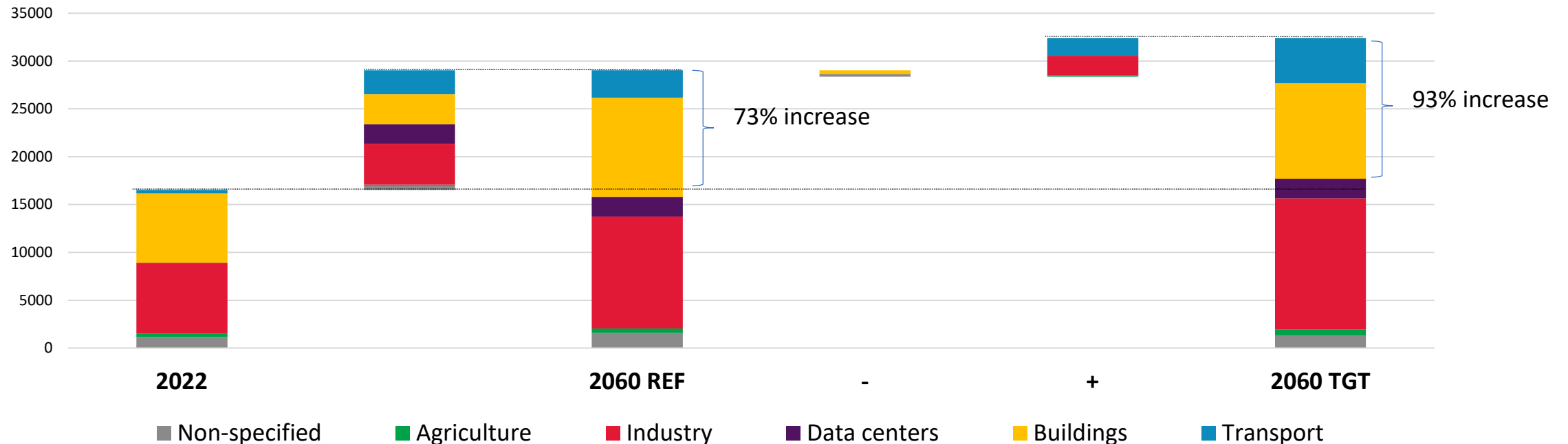
Economy-specific pathways based on **historical trends**, recent developments, and APERC's assumptions about the evolution of the energy system within each APEC economy. REF offers a **baseline to compare with TGT projections**.

The Target scenario (TGT)

A **hypothetical pathway** where each economy **achieves its energy-related policy targets** regardless of cost-effectiveness. When implementation details are lacking, assumptions are inferred from the targets themselves or emissions-related goals..

2. Strong growth in electricity demand in REF and TGT (**preliminary**)

APEC electricity consumption by end-use sectors (TWh)

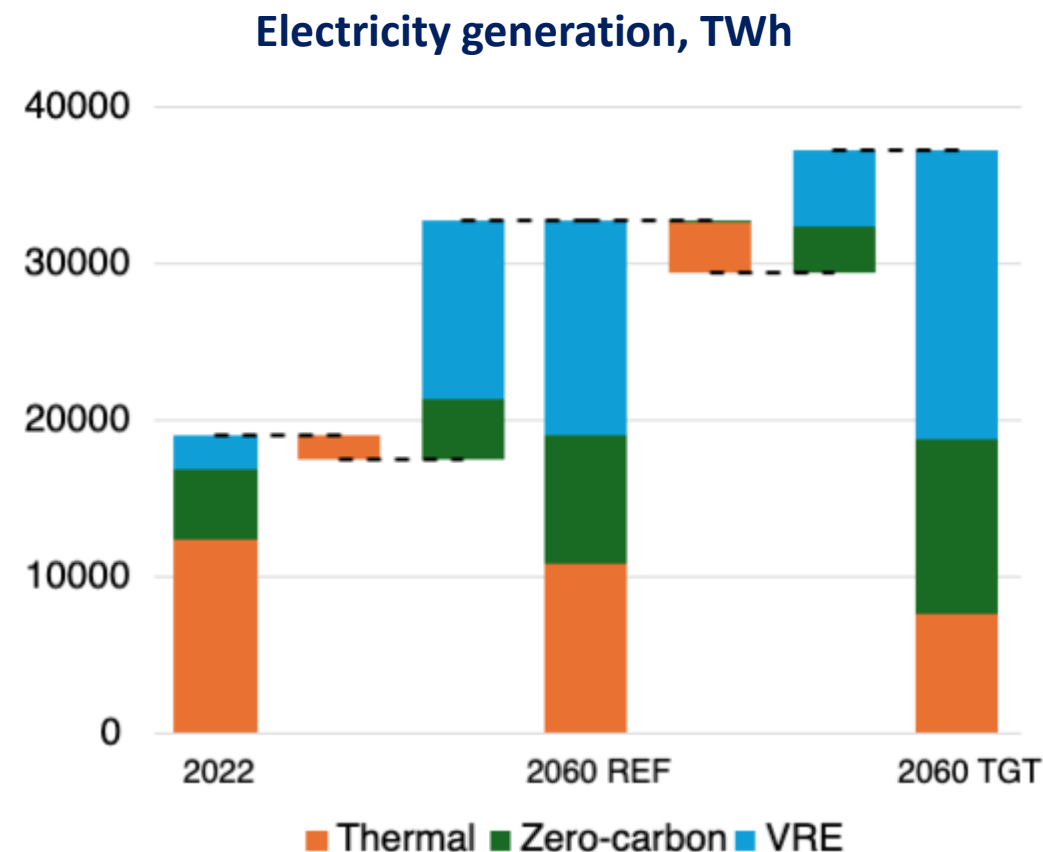


Sources: APEC statistics (EGEDA), APERC analysis

- Electricity demand in APEC is projected to grow by **73% in REF** and by **93% in TGT** by 2060.
- Industry** and **buildings** account for 40% and 36% of demand in 2060 in REF; 42% and 31% in TGT.
- The increased electricity consumption in TGT relative to REF is equally divided between industry and transport.

3. Electricity generation transitions to increased reliance on solar, wind, nuclear and hydro (**preliminary**)

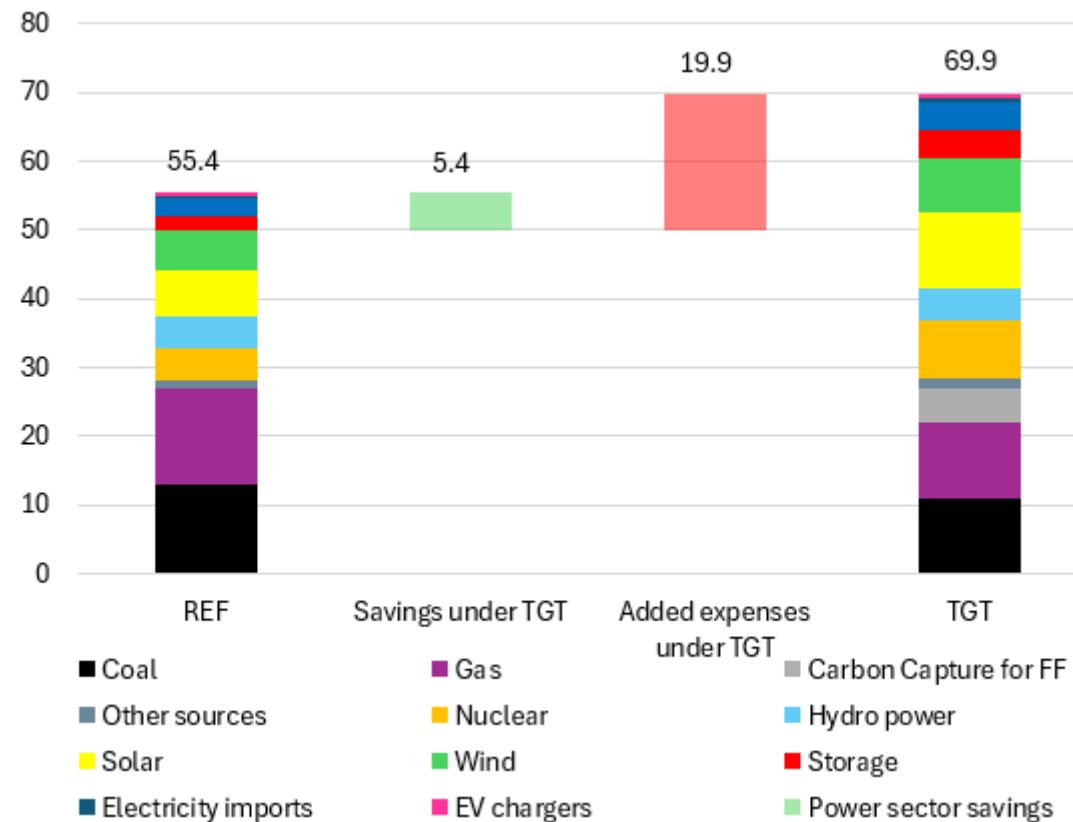
- **Wind and solar** generation grows sixfold, increasing its share from 12% in 2022 to **42% in REF** and **50% in TGT** by 2060, and is projected to meet all additional electricity demand after 2040.
- The share of **dispatchable** thermal and zero-carbon generation declines from **88%** in 2022 to **58% in REF** and **50% in TGT** by 2060, reflecting the rapid growth of variable renewable energy (VRE) sources.
- In absolute terms, dispatchable generation will grow slightly, but shifts toward zero-carbon sources, such as nuclear and hydro.



4. Power costs will be substantial (**preliminary**)

- Total costs are **55 trillion USD in REF**, and rise to **70 trillion USD in TGT**. This corresponds to **1.0%** and 1.3%, respectively.
- In TGT, there are **5.4 trillion USD** in savings from reduced operational costs as economies consume less fossil fuel.
- These savings are more than offset by the **added capital costs** of renewable and low carbon technology investment.

Costs for power systems in REF and TGT, 2025 to 2060 (trillion USD, undiscounted)



Note: The USA cost estimates in TGT are based on policies in place as of January 1, 2025.

5. Designing a Path Forward

- APEC Electricity demand is projected to grow **73% in REF** and **93% in TGT** by 2060.
- APEC economies will increasingly rely on variable renewable energy (VRE). By 2060, the solar plus wind share will be **42% in REF** and **50% in TGT**.
- Increasing VRE creates **grid reliability challenges**. Economies will need to maintain dispatchable generation capacity even as the capacity factor for those plants declines.
- The transition will be expensive. From 2025 - 2060, the total APEC cost in the power sector will be **55 and 70 trillion USD in REF and TGT**, respectively. These costs are equivalent to **1.0 % and 1.3% of projected GDP**.
- Each economy needs its own pathway based on its unique resources, geography, and outlook for growth.
- Despite the differences, **fostering cooperation** across the APEC region is **beneficial**.
 - **Sharing knowledge and best practices** across APEC economies can support a sustainable, reliable, and affordable transition.
 - **Facilitating trade** in clean energy, technologies, and equipment can reduce costs and strengthen resilient supply chains.

Thank you

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