2026 APERC Annual Conference
Session 2. Prospects of Advanced Nuclear Technology Deployment

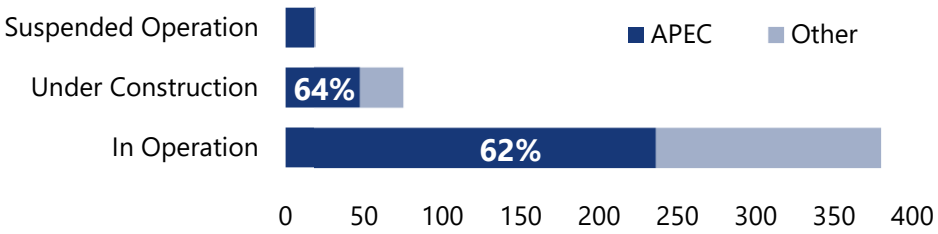
Moderator: Yishan ZHENG

2026.4.23

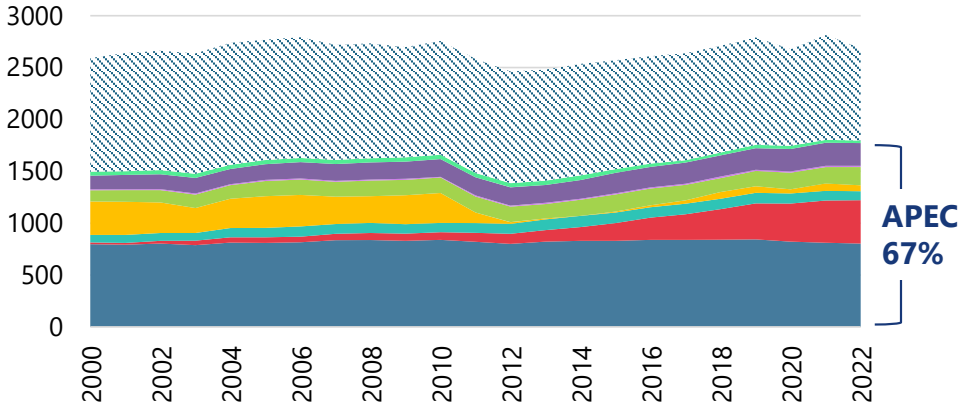
The APEC Region: A Strategic Pillar of the Global Nuclear Landscape

Global

Total Capacity of Operational Reactors, Apr 2026 (GW)



Nuclear Electricity Supplied (TWh)



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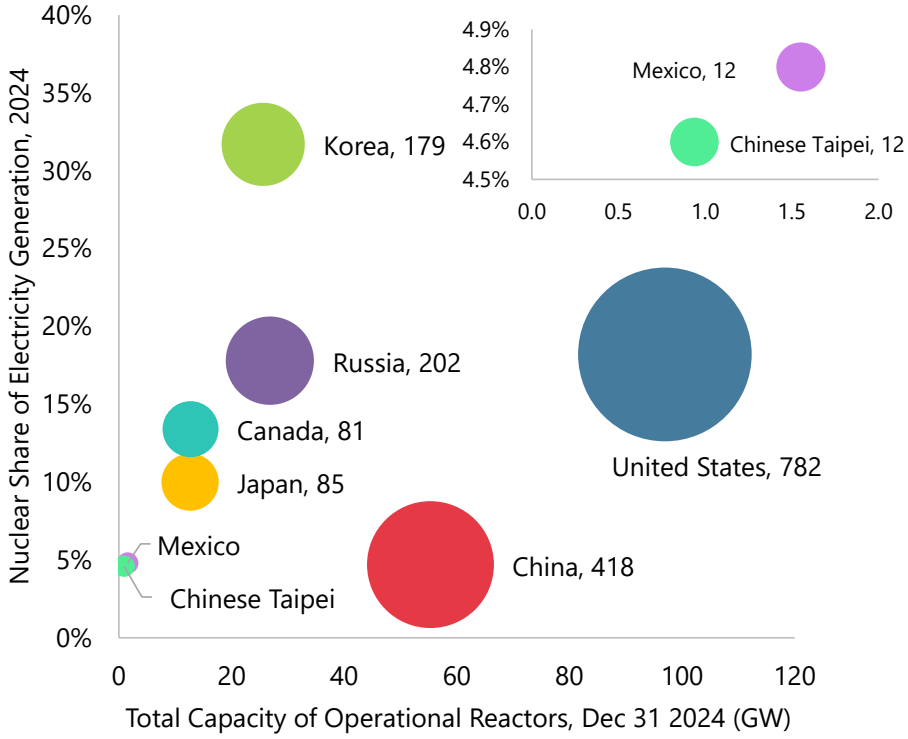
Nuclear Electricity Supplied, 2024 (TWh)



Source: IAEA PRIS Database (April 2026), IAEA Nuclear Power Reactors in the World (2025)

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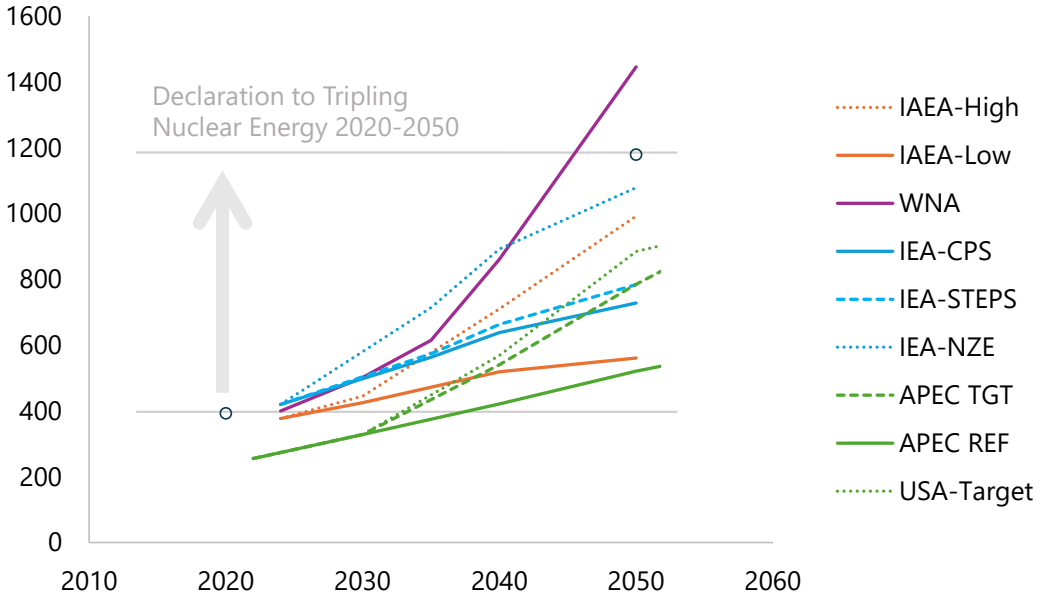
Projected Growth: Nuclear as APEC's Primary Dispatchable Power Source by 2060

Global

Nuclear Power Capacity Projections (GW)



Source: IAEA Energy, Electricity and Nuclear Power Estimates for the Period up to 2050 (2025), WNA World Nuclear Outlook Report (2026), IEA World Energy Outlook (2025), APEC Energy Demand and Supply Outlook 9th Edition (2025)

APEC TGT: A hypothetical pathway where economies achieve energy-related policy targets

Malaysia, Singapore, and Peru are also exploring the introduction of nuclear.

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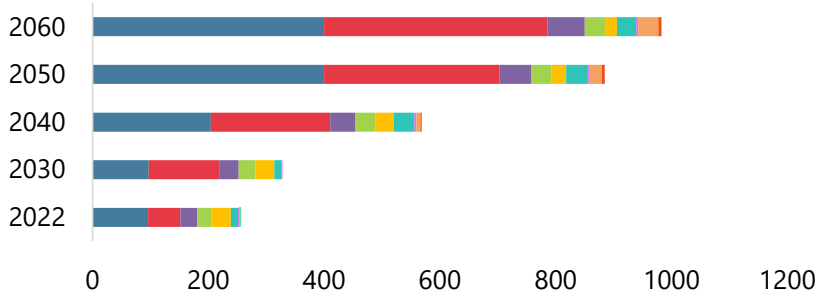
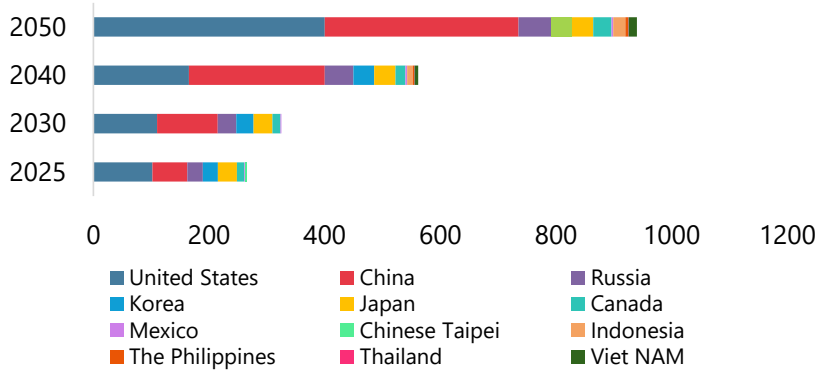
APEC Outlook 9th – USA Target



WNA Outlook Report



Diversification: Expanding Reactor Technologies and Applications

Mainstream

Figure 1.6 Processes used in reactors under construction

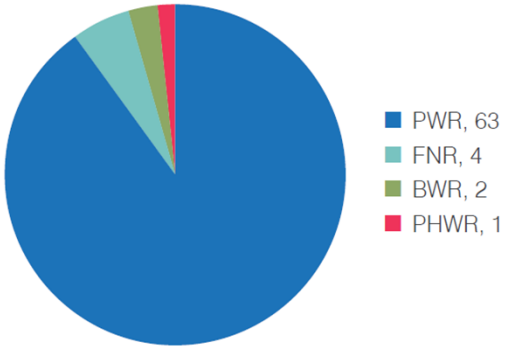
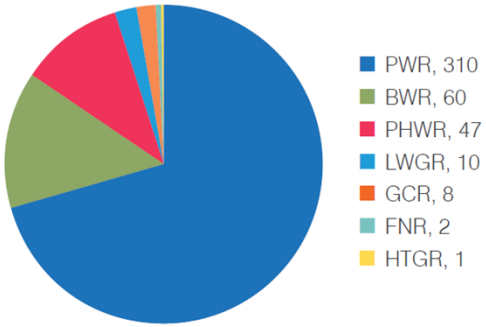


Figure 1.3 Operable reactors by process type (number of reactors)

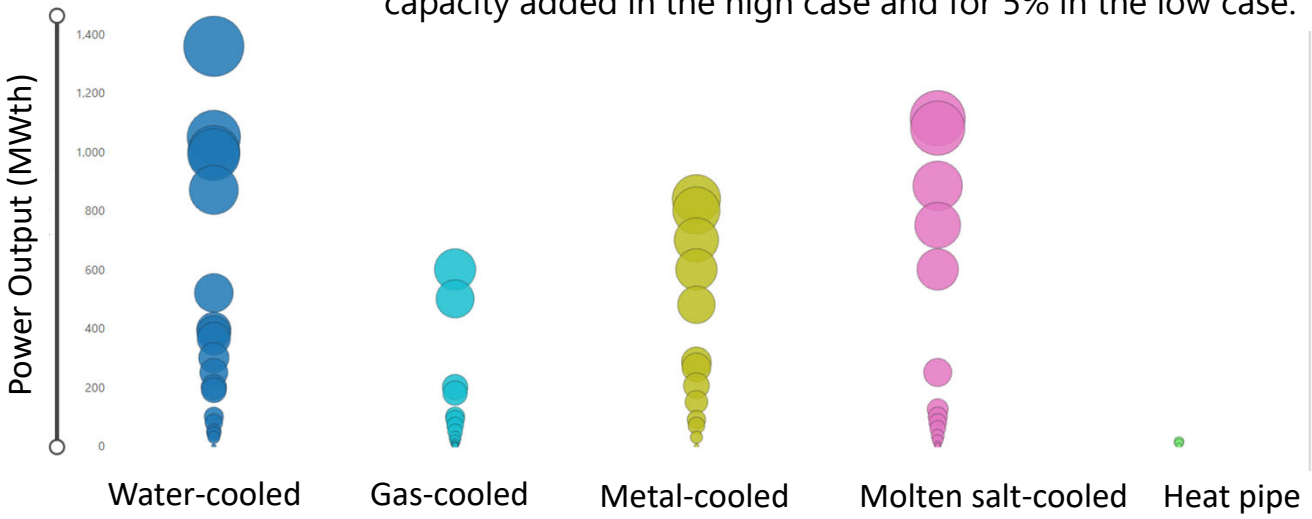


Source: World Nuclear Association Reactor Database

Innovation

SMR	Generation IV	Non-electric applications	Advanced fuel cycle	Nuclear fusion
• Flexibility • Low initial capital	• Enhanced safety • Improved fuel utilization	• Process heat • Hydrogen production	• Fuel sustainability • Waste reduction	• Ultimate energy source?

SMR concepts:



IAEA: "**SMRs** are projected to account for 24% of the new capacity added in the high case and for 5% in the low case."

Source: NEA SMR Digital Dashboard (April 2026)

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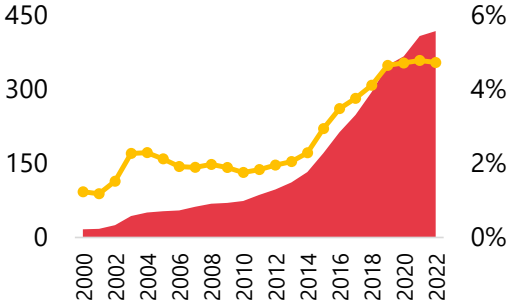
Regional Leadership: China's Advancements in Construction and Deployment

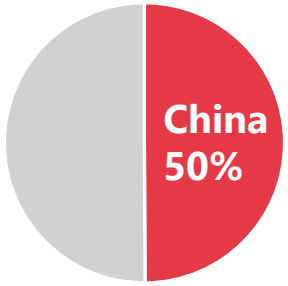
Nuclear construction

China's nuclear generation (TWh) and share in total generation



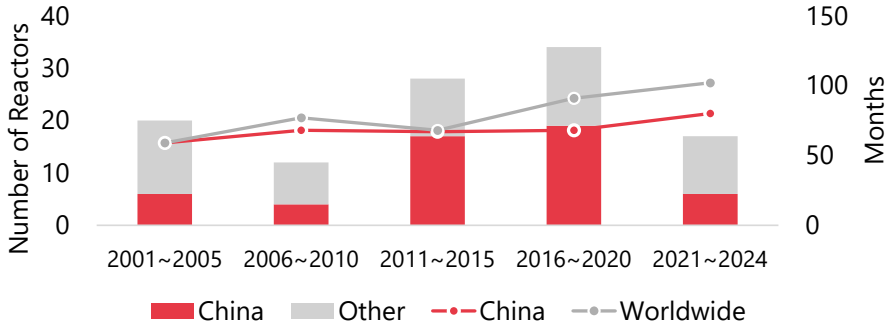
Source: APEC EGEDA Dataset (2025)

Nuclear power reactors under construction worldwide, 2026



Source: IAEA PRIS Database (April 2026)

Number of new raectors connected to the grid (bar) and median construction time in months (line)



Source: IAEA Nuclear Power Reactors in the World (2025)

Advanced technology

- **Gen III PWR**

HPR1000	CAP1400	AP1000 (USA)	EPR (France)	VVER-1000 (Russia)

- **SMR & Advanced Reactors**

LWR	Land based: ACP100 demonstration project under construction Marine based: ACPR50S, ACP100S, ACP25S
HTGR	200 MWe HTR-PM: commercial operation 2023 660 MWe HTR-PM600S coupled with HPR1000 for industrial heat supply
FBR	Two CFR600 demonstration reactors constructed
MSR	2 MWt experimental thorium MSR in operation

- **Nuclear Fusion**

HL-3 Tokamak	EAST Tokamak	Key technologies
• 10^8 ℃, 1.6 MA • Designed for D-T fusion reaction	• 1066 s H-mode • Superconducting	• Tritium • Material

Navigating Complexity: Key Challenges and Uncertainties

Highlighted in the 9th APEC Outlook

- **Intensive Resource Requirements:** High upfront capital costs, long permitting lead times, human capital, and the necessity of specialized infrastructure and supply chains.
- **Public acceptance** remains a key requirement

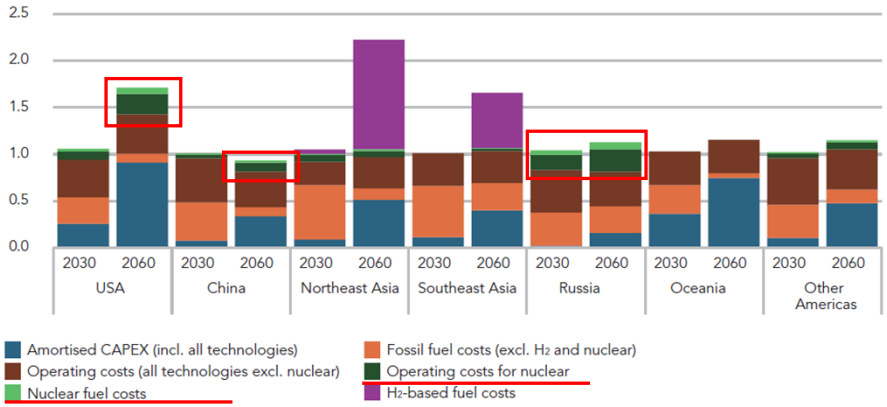
Divergent Regional Dynamics

- **Developed Economies:** Addressing the legacy of long-term suspensions in new builds and managing the transition for aging operational fleets.
- **Emerging Economies:** Compressed timeframes for contract procurement and the need to verify the safety and economic viability of new technologies.

Economic & Systemic Uncertainties

- **Financial risks:** potential construction delays, cost overruns of nuclear projects, as well as market volatility

Figure 6.5: Cost of generating electricity relative to 2025 (2025 cost = 1.00) in the power sector in TGT



Source: APEC Energy Demand and Supply Outlook 9th Edition (2025)

- **Grid Integration:** Navigating the technical and economic implications of operating nuclear plants within power systems with high Variable Renewable Energy penetration.

Thank you.

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