Concept Note for Session 1, 2026

Policy and Planning Considerations for Integrating Small Modular Reactors (SMRs) with Renewable Energy.

February 26, 2026

Why This Discussion Matters Now?

The evolving policy challenge facing APEC economies in an era of rapid energy transition.

The Moment We Are In: Surging Electricity Demand

According to the *APEC Energy Demand and Supply Outlook*, electricity demand in the region is projected to roughly double by 2050. This exponential growth places unprecedented pressure on existing power systems.

Artificial Intelligence

The explosive growth of AI compute requires massive, uninterrupted base-load power, transforming consumption curves.

Data Centers

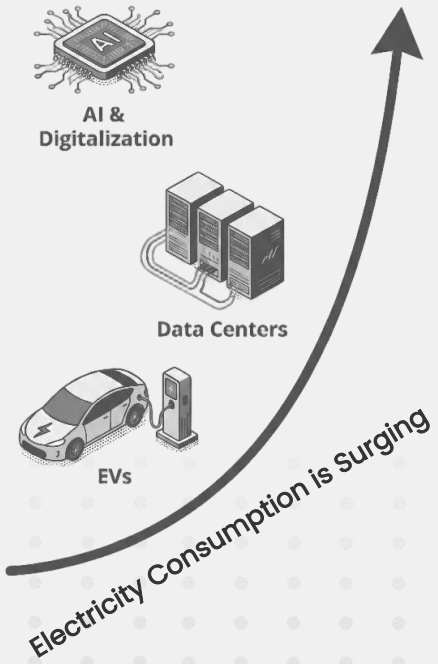
Digital infrastructure is expanding rapidly. These facilities demand 24/7 reliability and cannot tolerate grid intermittency.

Electrification

Broad electrification of transport (EVs) and heavy industry is shifting vast amounts of energy demand directly onto the power grid.

Economic Growth

In developing APEC economies, foundational industrialization and rising living standards continue to drive baseline power needs.



A Shared Policy Dilemma

APEC economies face the common, pressing challenge of balancing the Energy Trilemma amidst rapid deployment of renewable resources.

The Energy Trilemma

Energy Security

Ensuring reliable, uninterrupted power supply and robust grid stability against external shocks.

Affordability

Managing the massive capital transition costs to keep electricity prices accessible for developing growth.

Sustainability

Accelerating the deployment of low-carbon technologies to meet critical international emission targets.

Challenge

Renewable Energy

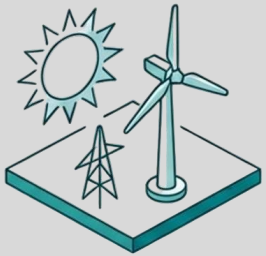
While renewable energy brings clear benefits, its inherent variability and intermittency creates acute system-level challenges.

Fossil Fuels: High Security, but unsustainable. (Carbon Lock-in)

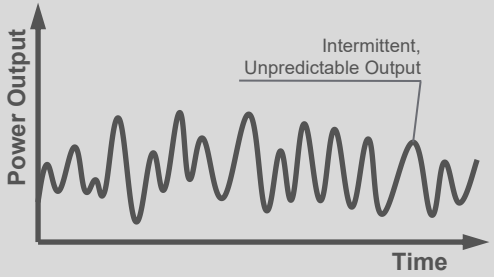
Renewables: High Sustainability, but intermittent. (Lower Security)

SMRs: The Flexible Partner for Renewable Grids

Considering additional low-carbon baseload options to complement renewable, Small Modular Reactors (SMRs) are increasingly mentioned internationally—not as the definitive single solution, but as one potential strategic option under discussion.



Renewable Energy



Low-Carbon:
Maintain sustainability goals while providing baseload

Load-Following:
Capable of ramping power up/down to match renewable variance.

Small Modular Reactors

Modular Design:
Reduce capital risks, shorten construction period, and allow for scalable grid capacity expansion.

Enhanced Safety Features:
Advanced passive safety systems to minimize active human or mechanical intervention.

Siting Flexibility and Land Efficiency:
Smaller size and modular design yields higher energy output per area. Deployed versatilely, including repurposing decommissioned coal plants.

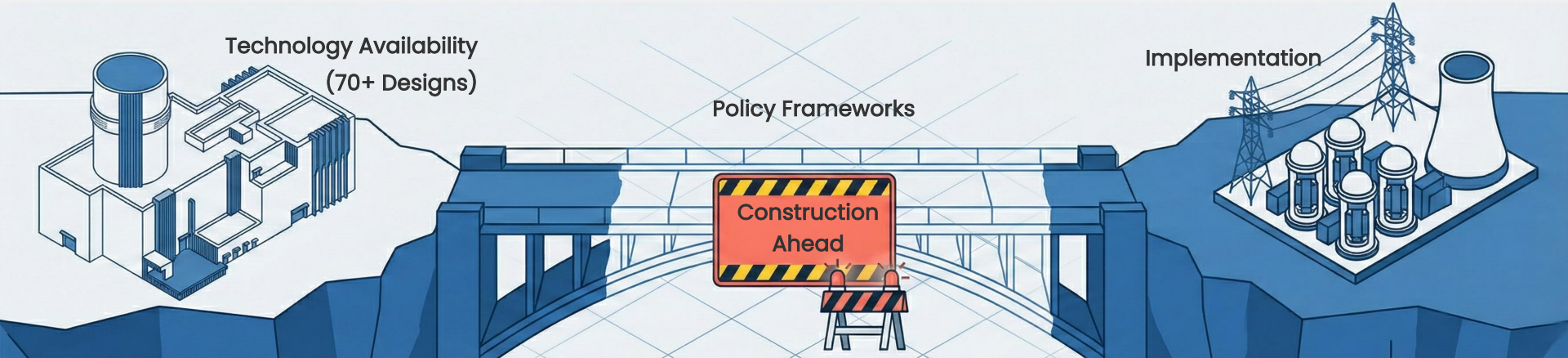
The Real Gap: Readiness, Not Technology

What Exists Today

Technologies and advanced engineering concepts already exist at the global level. Innovative low-carbon baseload options, including various modular designs, are actively in development or early deployment phases worldwide.

What Is Missing

There is a critical lack of clear policy pathways, institutional readiness, and comparative understanding across diverse economy contexts. Without early-stage guidance, economies may delay decisions or rely longer on fossil fuels for system stability.



What This Project Proposes?

Moving from high-level discussion to tangible policy and planning readiness.

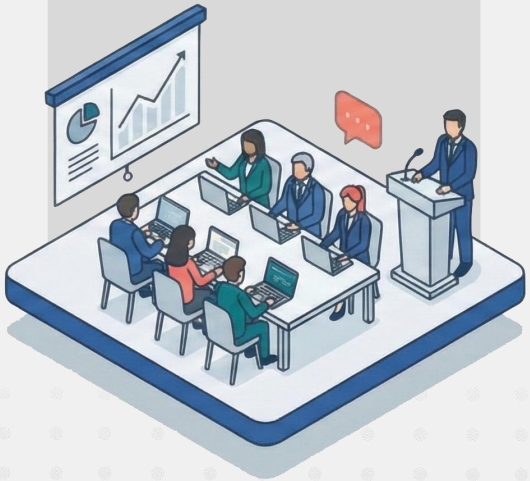
Project Objective: Bridging the Knowledge Gap

To support APEC economies-particularly developing onesw-in strengthening readiness to consider SMRs as part of long-term transition planning.

Comparative Research

Reviewing international experience and best practices

Capacity Building



Knowledge-sharing Workshop for policymakers and regulators

Practical Guidebook

A manual for policy & planning, regulation and financing

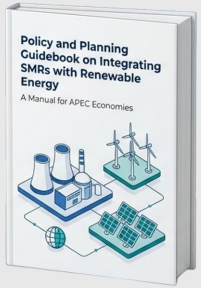
Defining the Scope: Neutrality and Capacity Building

What This Project Is ✔

- A Policy analysis and planning tool.
- Focused on ‘decision readiness’ and institutional capacity.
- Consistent with IAEA safety, security, and safeguards guidance.
- A mechanism for regional knowledge exchange.

What This Project Is Not ✖

- Promotion of SMR deployment or commercial sales.
- Site selection for specific economies.
- Preparation of investment-ready commercial projects.
- A shift away from renewable energy targets.



Policy and Planning Guidebook on Integrating Small Modular Reactors with Renewable Energy

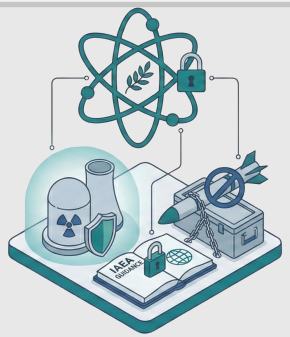
Policy Preparation
Regulatory frameworks and safety standards.

System Integration
Technical criteria for SMR-Renewables grids.

Human Resources
Training needs and workforce development.

Financing
Economic options for capital-intensive projects.

Strategic Alignment: Supporting Resilient Development



International Atomic Energy Agency

Consistent with international safety, security, and non-proliferation guidance.

Putrajaya Vision 2040

Driver of "Strong, Balanced, Secure, Sustainable and Inclusive Growth”

Lima Consensus 2024

Directly supports "Sustainable Growth for Resilient Development"

Regional Priorities

APEC Peru 2024
"Sustainable Growth"

APEC Korea 2025
"Building a Sustainable Tomorrow".

Target: Supporting a just transition by preventing carbon lock-in while ensuring grid reliability.

Who Will Benefit?

Strategic alignment for key stakeholders in the energy transition.

Delivering Value Across The Energy Ecosystem

Policymaker Regulator

Need a strategic guidebook and policy-oriented analysis for evidence-based decision-making and regulatory preparation.

Grid Operator Utility Company

Need practical insights into system-level integration criteria for SMR-Renewable energy systems during the transition away from coal-fired power generation.

Private Sector Research Institute

Need clear understanding of planning considerations and high-level financing concepts to support informed engagement.

Thanks!

We welcome APEC economies to co-sponsor and participate in the survey and workshop, Supporting informed decision-making for a secure, low-carbon tomorrow.

Project Overseer:

Mr. LI Yuan
Email: liyuan09@spic.com.cn

JOIN US