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ADB

Energy Trends in Asia: Implications on Just Transition

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Inclusive Energy Transition in South Asia and Beyond
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Outline of Presentation

- Energy Sector's Role in Asia's Journey to Prosperity
- Key Challenges in Asia Pacific Region
- Energy Trilemma in Asia and Future Trend of Energy Sector
- ADB's Energy Sector Operations
- Just Transition Challenges
- ADB's Support
- Final Remarks

Asia's Journey to Prosperity Energy—1950s-1980s

- Large investments starting with hydropower
- Increasing dominance of fossil fuels such as oil and coal
- Electricity generation and transmission, generally operated by state-owned enterprises

Hydropower

- Hydropower was among the first utility-scale power plants in Asian economies, including in Japan (1891); India (1897); Taipei, China (1905); and Nepal (1911).
- Maintained a relatively stable share in Asia's primary energy mix,
- proportion declined slightly only as other fuel sources grew faster

Oil

- Share in electricity generation peaked at 49% in 1973
- With oil crises in the 1970s creating an upward spiral of oil prices, oil use in electricity generation declined
- Coal became more competitive and readily available.

Coal

- The region gravitated from oil toward coal with the region having large coal resources—42% of the world total.

Asia's Journey to Prosperity

Energy—1990s - 2000s

- Asian countries started promoting diversification for electricity generation, including the use of large hydropower and natural gas.

Large hydropower

- Technological progress made large-scale dams more feasible.
- Between 1995 and 2005, hydropower generation in the region increased by 50%.

Solar and wind

- Solar and wind energy began to grow rapidly, though from a very low base.

Natural gas

- Power systems became bigger and natural gas-fired power plants needed to meet both baseload and peaking demand
- Natural gas also used increasingly in industries and households as cleaner fuels.
- From 1995 to 2005, natural gas consumption in the region increased by 92%

Coal

- By 1995, the region's share in global primary energy consumption reached about 27%.
- Coal consumption accounted for 44% of total energy consumption,
- This was higher than the 26% world average.

Asia's Journey to Prosperity

Energy—2010s to date

- Efforts in mainstreaming renewables and energy efficiency.

Coal

- Coal remains a significant component of the region's primary energy mix.
- Growth of coal consumption in the region slowed significantly, to 1.9% annually, on average, from 2010 to 2018 after decades of sustained high growth.

Solar and wind

- Solar and wind electricity generation continues to see massive cost reductions, accelerating solar and wind power installation in the region.
- In 2022, the region had 65% of global solar installed capacity

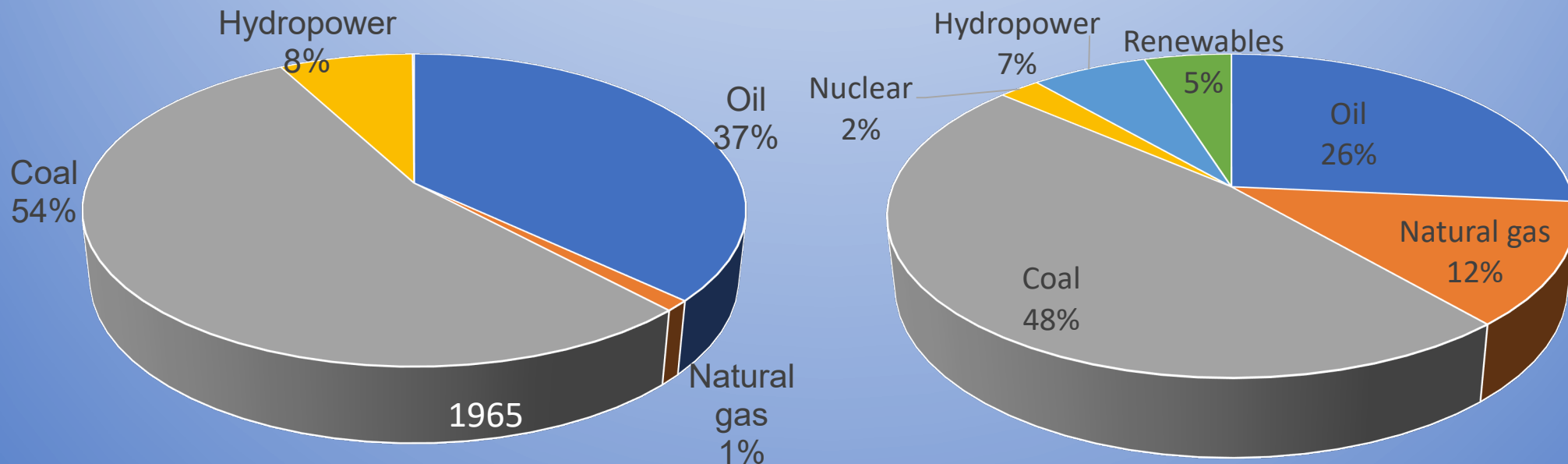
Nuclear

- Japan's Fukushima accident led to the immediate shutdown of all operating nuclear power plants in the country
- Led to a drive for greater energy efficiency, and slowed construction of new nuclear plants in the PRC, India, and other Asian countries

Asia's Primary Energy Consumption

- In Asia and the Pacific, coal is the primary energy source, followed by oil and natural gas, although the region's dependency on fossil fuels decreased somewhat as nuclear and renewable energy grew.

Primary energy consumption in Asia, 1965 and 2020



Sources: BP. 2021. BP Statistical Review of World Energy 2020; and World Bank. World Development Indicators.

Electricity Generation and Use

- Over the past 5 decades, Asia and the Pacific made steady progress in providing residential electricity.

1970s: In developing Asia, electrification rate was less than 15% in rural areas.

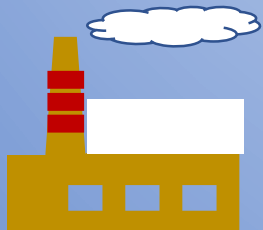


2000s: Electrification rate was at 67% (both rural and urban).



2019: Electrification rate was at 96% overall.

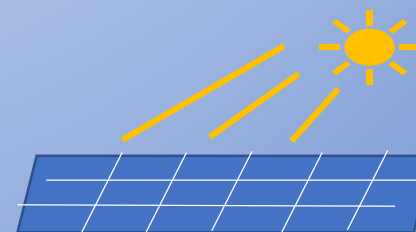
- ❖ Electricity development in the region can be categorized into three distinct periods of evolution.



1950s–1980s:
From hydropower to the increasing dominance of coal in electricity generation



1990s–2000s: Promoting energy diversification with large hydropower and natural gas

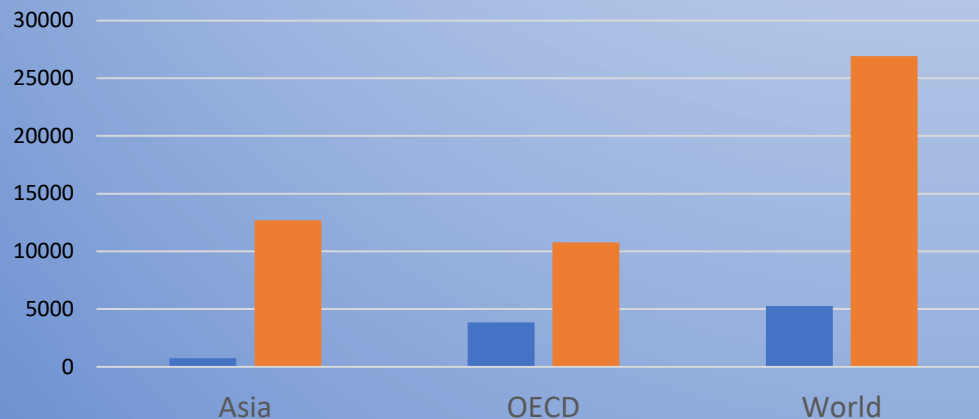


2010s to present:
Mainstreaming renewables and energy efficiency

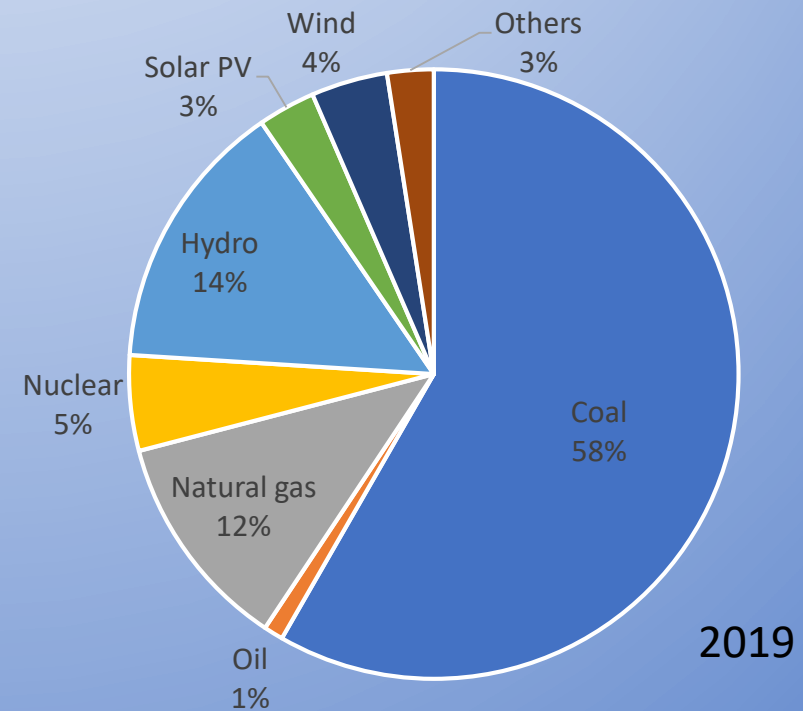
Electricity Generation and Use

- From 1971 to 2020, electricity generation increased 16.5 times in Asia and the Pacific compared to a fivefold increase globally. Electricity generation mix in Asia remained dominated by coal, followed by hydropower and gas.

Total electricity generation
1971 and 2020 (TWh)

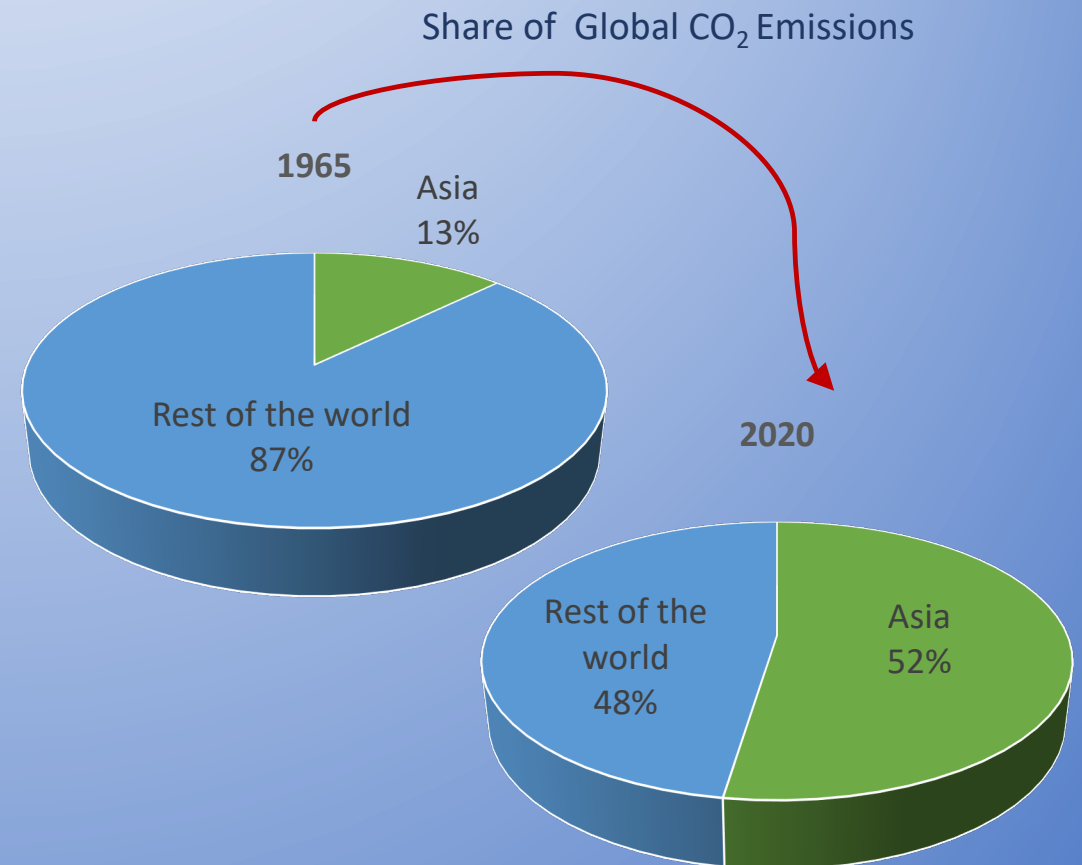
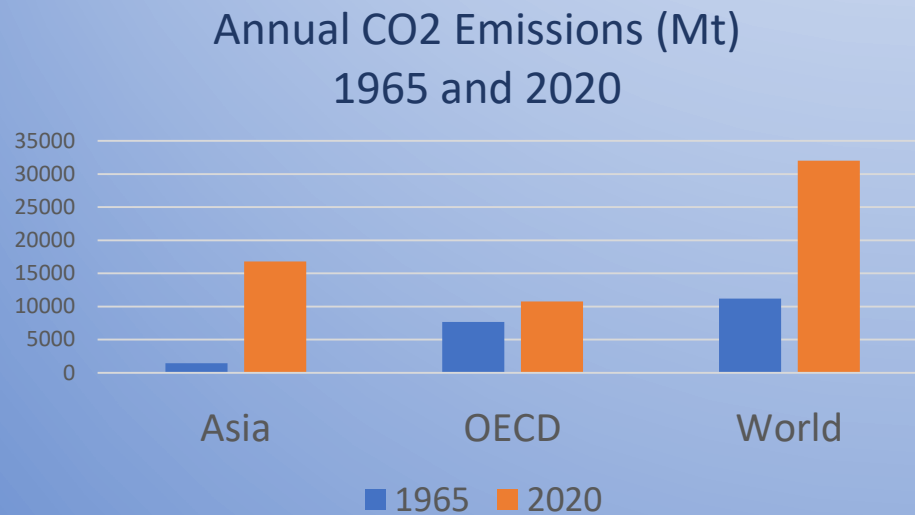


Sources: Enerdata. 2021. Energy Statistics Yearbook 2020 and International Energy Agency. Electricity Information. 2020. <https://www.iea.org/data-and-statistics/data-product/electricity-information>



Asia's Share of Global CO2 Emission

- Along with rapidly growing energy consumption, carbon dioxide (CO₂) emissions have also grown.



Sources: BP. 2021. BP Statistical Review of World Energy 2020; and World Bank. World Development Indicators.

Key Energy Challenges in Asia and the Pacific



Energy Access

- Roughly **350m people** remain without adequate supply and **54 million** still have no access to electricity
- About **1.7b people** without access to clean cooking



Energy Security

- IEA scenarios suggest **doubling of electricity demand in the region by 2040**
- Renewable energy investments could reach **\$1.3 trillion annually by 2030**



Environmental Sustainability

- About **50% of global CO2 emissions from fossil fuels**
- **Approximately 25% of CO2 emissions from coal power generation**
- The battle against climate change will be **won or lost in Asia and the Pacific**

Opportunities and Changing Energy Landscape



Energy Landscape

Profound changes in Asia and the Pacific:

- Falling cost of renewable energy vs. conventional energy
- Emerging new and innovative low-carbon energy technologies



Global Commitments

Global commitments to universal access and climate action:

- Sustainable Development Goal 7: Universal Energy Access by 2030
- Paris Agreement: Nationally Determined Contributions (NDCs)



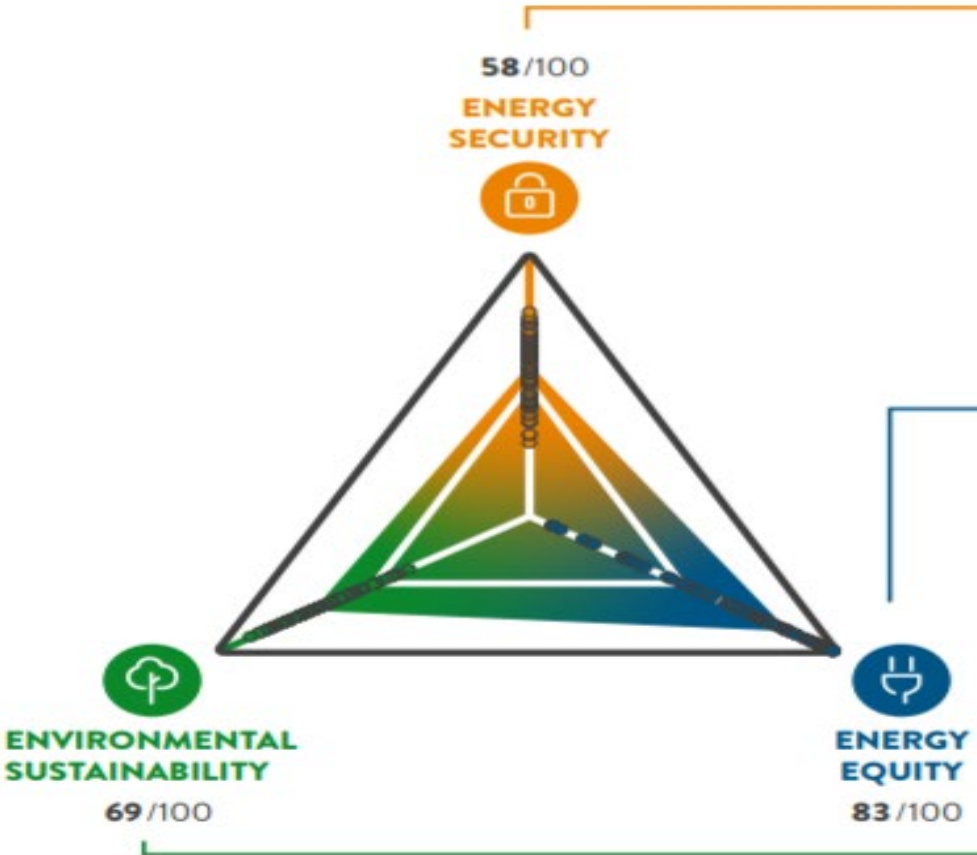
ADB's Commitments

ADB is the Asia and the Pacific Climate Bank:

- \$100 billion of cumulative climate finance by 2030 from our own resources
- At least 75% of our operations support climate action for the period 2019 to 2030

Energy Trilemma

World Energy Trilemma Index

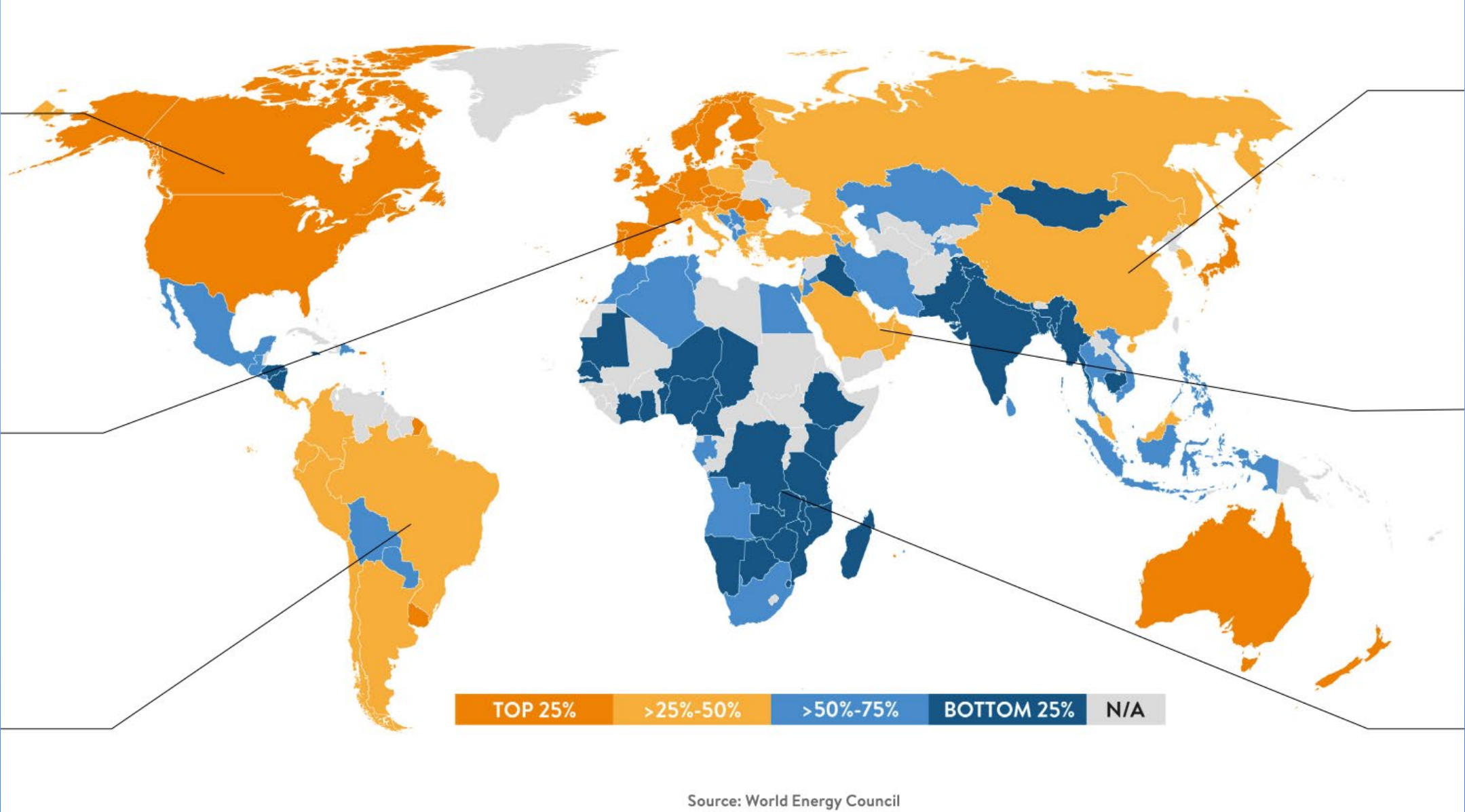


Reflects a nation's capacity to meet current and future energy demand reliably, withstand and bounce back swiftly from system shocks with minimal disruption to supplies.

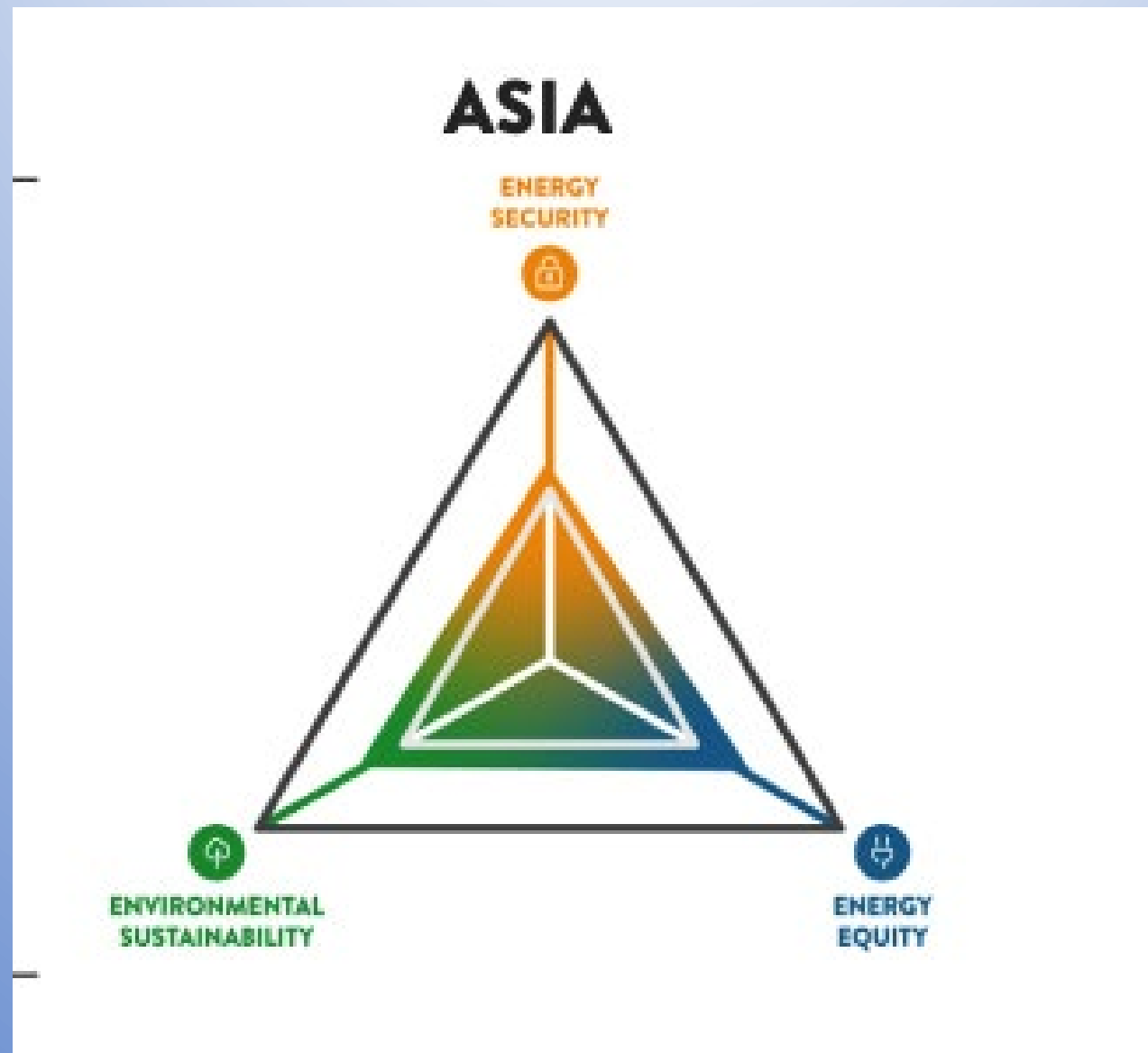
Assesses a country's ability to provide universal access to affordable, fairly priced and abundant energy for domestic and commercial use.

Represents the transition of a country's energy system towards mitigating and avoiding potential environmental harm and climate change impacts.

Energy Trilemma Index

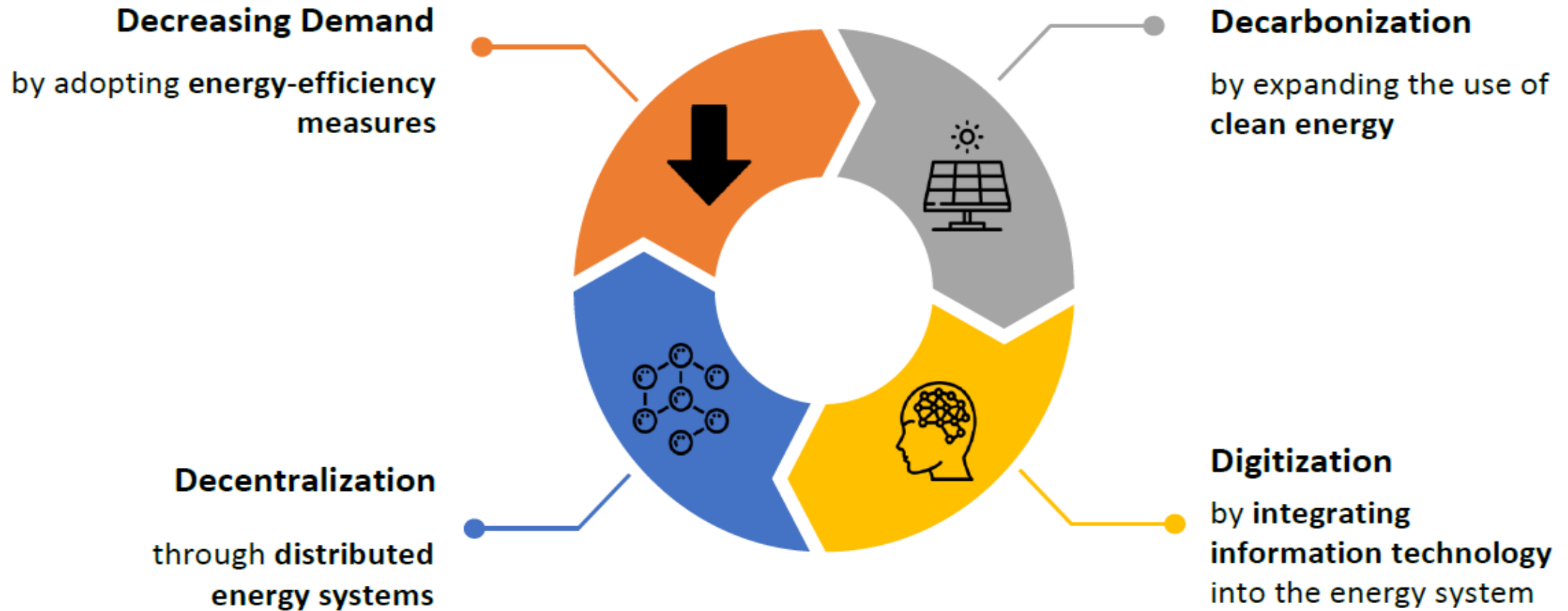


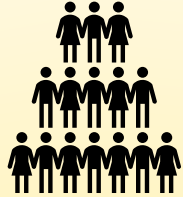
Energy Trilemma - Asia



Source: World Energy Council

Future of Energy Systems





**Principle 1.
Securing Energy
for a Prosperous
and Inclusive Asia
and the Pacific**

*Support efforts to bring **affordable, reliable, sustainable, and modern energy to all**, so as to eradicate extreme poverty and reduce social inequalities.*



**Principle 2.
Building a
Sustainable and
Resilient Energy
Future**

*Provide support to its DMCs to tackle **climate change, enhance environmental sustainability, and build climate and disaster resilience.***



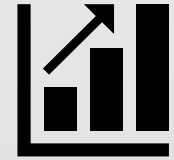
**Principle 3.
Supporting
Institutions, Private
Sector
Participation, and
Good Governance**

*Support the **institutional development, financial sustainability, and good governance** of energy sector institutions and companies, as well as private sector participation.*



**Principle 4.
Promoting
Regional
Cooperation and
Integration**

*Promote **regional energy cooperation and the integration of energy systems** to strengthen energy security and increase cross-border access to cleaner energy sources.*



**Principle 5.
Integrated Cross-
Sector Operations
to Maximum
Development
Impact**

*Combine **finance, knowledge, partnerships, and its country-focused approach** to deliver integrated solutions with comprehensive and magnified development impacts.*

Salient Features

Improving energy efficiency across energy supply and consumption chains;

Accelerating the deployment of renewable energy

Pursuing strategic decarbonization and phase-out of coal

Increasing the resilience of energy infrastructure

Support carbon capture, utilization, and storage technologies for power plants and industries;

Encourage DMCs to phase out fossil fuel subsidies

Include social cost of carbon in analysis of projects

Salient Features

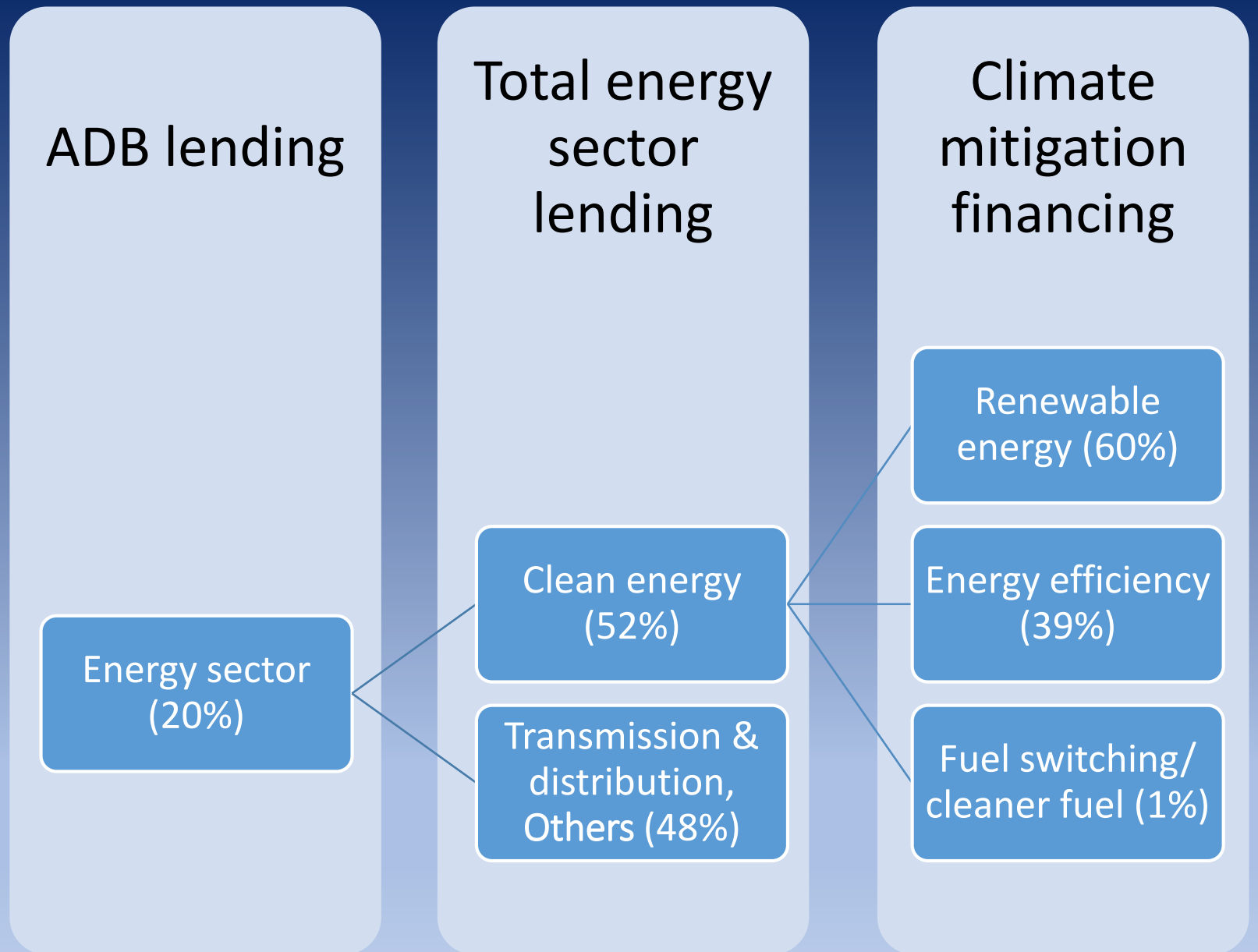
No Support

- Upstream or midstream oil projects
- Coal facilities including new coal-fired generation
- Nuclear energy
- Natural gas exploration or drilling activities

Be Selective

- Support for mid-stream and downstream natural gas
- Oil fired generation
- Large hydropower

Energy Sector Portfolio, 2011–2021 *(annual average share)*



Implementation Focus

Confronting

- Confronting climate change challenge by facilitating just low-carbon energy transition through a common but differentiated approach and integrated energy planning

Supporting

- Supporting DMCs in implementing just energy transition, ETM in particular

Expanding

- Expanding support for advanced clean energy technologies, demand-side energy efficiency including demand response and decentralized energy systems

Increasing

- Increasing digitalization, smart power systems for increased clean energy deployment, real-time demand response and efficient power system management

Leveraging

- Leveraging commercial financing to accelerate the energy transition through One-ADB approach, innovative financing mechanisms and business models



Energy Transition Initiatives

Production

- Clean power generation
 - Solar, wind
- Production efficiency improvement
- Alternative fuels H2, bio-fuels
- Accelerated decommission of fossil fuel systems
- Improving generation dispatch regimes

Transportation

- Power transmission and distribution efficiency improvement
- Flexible infrastructure for alternative cleaner fuel

Utilization

- Efficiency improvement
 - combined heat and power
 - Improved metering
- Alternative energy for transport and industries
 - Electricity, H2, biofuels
- Alternative technologies
 - Heat pumps
 - Solar heating

Continuing Energy Transition Challenges

- Policy and regulatory
 - Inadequate reflection of countries' commitments in the policies and regulations
- Institutional
 - Weak institutional structures and inertia resisting accelerated transition
- Technological
 - Weak power networks and system control for increased clean energy deployment
- Social
 - Addressing issues with the affected communities
- Financing
 - Inadequate concessional resources to bridge financing gaps



Energy Policy: The Carbon-Neutral Transition

goods production, services provision

new opportunities

workers & communities (future jobs,
demand for skills)

Planning a Just Transition

1

MITIGATE NEGATIVE
SOCIOECONOMIC
IMPACTS

2

INCREASE
TRANSITION-
ASSOCIATED
OPPORTUNITIES

3

SUPPORT AFFECTED
WORKERS,
COMMUNITIES

4

ENHANCE
SUSTAINABLE,
INCLUSIVE, RESILIENT
LIVELIHOODS FOR ALL



ADB Supports a Just Energy Transition

support planning

promote technology transfers

involve stakeholders at all stages

differentiated approach

- energy sector reform
- green inclusive energy infrastructure
- gender equality
- greater private sector participation

ADB Supports a Just Energy Transition

cross-sector and integrated solutions

- Integrate modern energy access
- Address dislocation and adjustment costs
- Create quality jobs
- Energy contributions in other thematic areas or sectors:
 - Cold storage for health
 - Water treatment , better air quality for urban
 - Human resource development, better learning for education
- Train and reskill energy sector workers with the shift to cleaner modes
 - Design new policies
 - Manage demanding projects

Final Remarks

- International financing institutions like ADB will continue play a major role in energy transition
- Focus shifting away from traditional areas of investments
- Support for new and innovative technologies, approaches, just transition to take over
- Sovereign financing need to be used to maximize leveraging private sector investments and focused interventions in addressing just transition needs

Thank you.

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