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Clean Energy Development and Energy Transition

World Bank Support in East Asia and Pacific Region

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Energy and Extractive Global Practice

East Asia and Pacific Region

The World Bank

Thursday, December 9, 2021



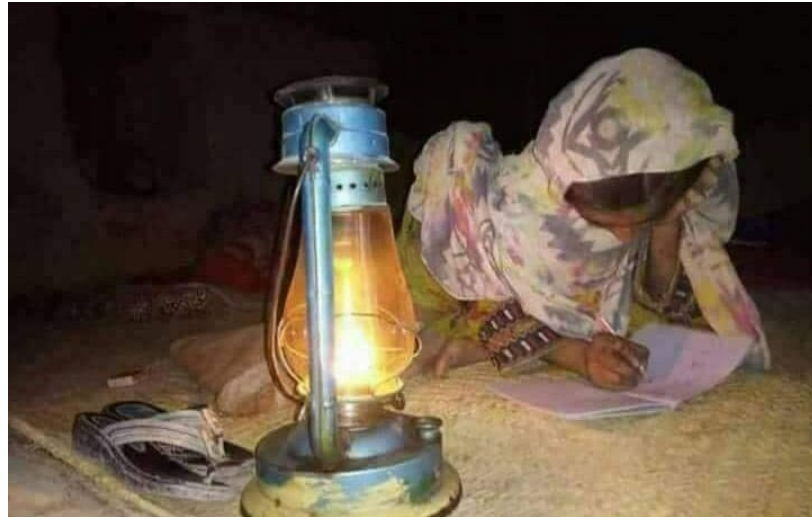
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Energy & Extractives

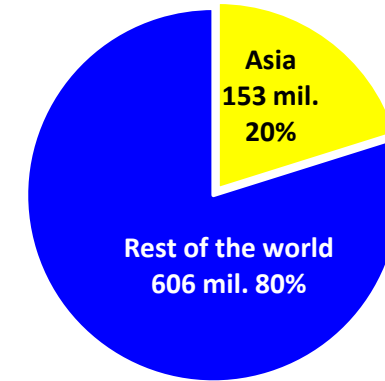


Asia

The difficult challenges

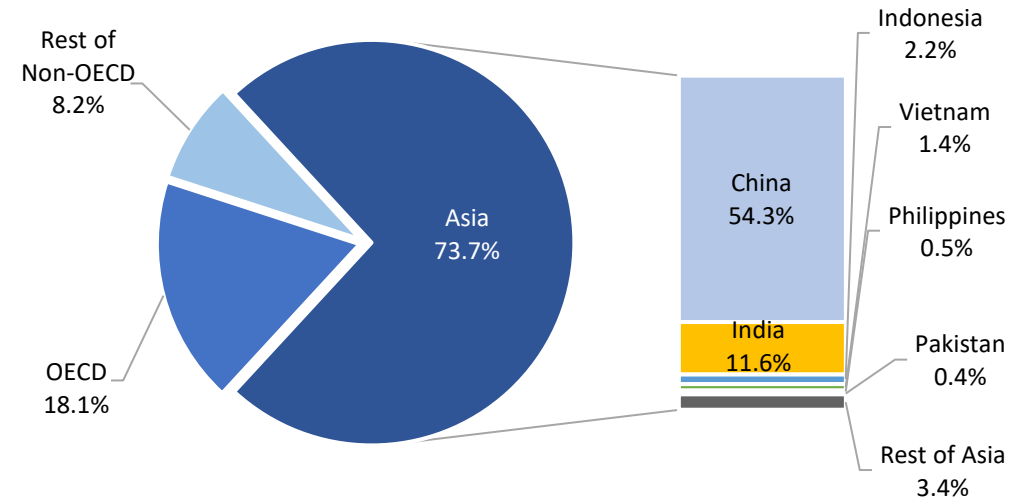


People without access to electricity



* SDG7: The Energy Progress Report 2021

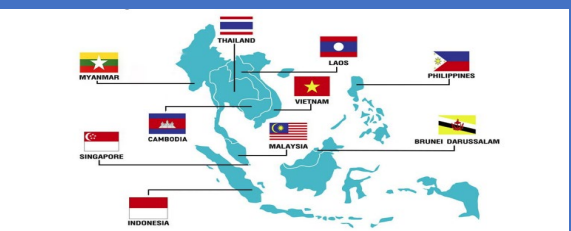
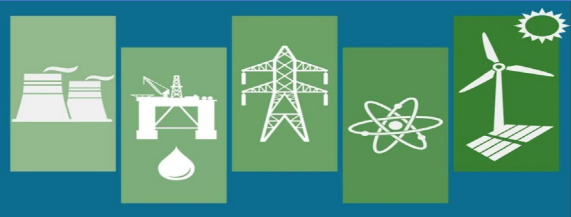
Coal consumption



* BP Statistical Review of World Energy 2021

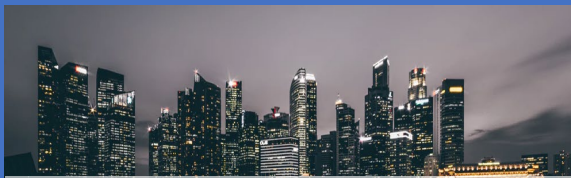


RE & Access to Electricity

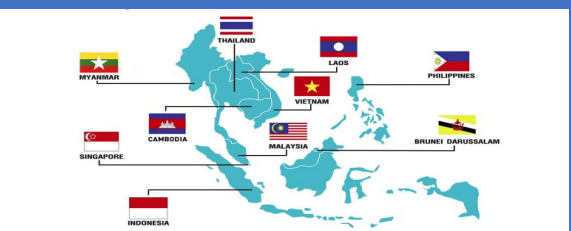
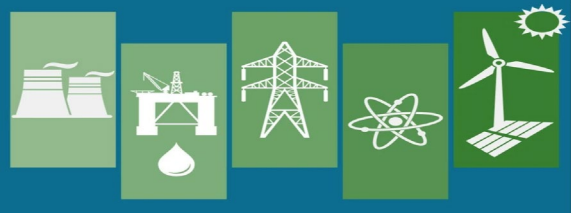


World Bank engagement in electrification and clean energy transition – Business Areas

1. **Expansion to electricity services:** grid extension, RE-based power generation; grid extension, RE plus batter storage based mini-grids, and Soday Home Systems
2. **Scale up clean energy alternatives and energy efficiency:** Policies & regulations, investment; leveraging financing; de-risking and mobilizing private sector financing
3. **Slow down coal:** Policies & regulations to reduce coal consumption in the energy sector and to accelerate energy transition
4. **Support decarbonization in the industrial and transport sector:** Technical assistance to facilitate electrification; explore disruptive technology application for decarbonization, e.g. battery storage, green hydrogen, CCUS
5. **Just Transitions:** addressing macroeconomic, social and environmental impacts of coal mine closure and coal power plant retirement and repurposing



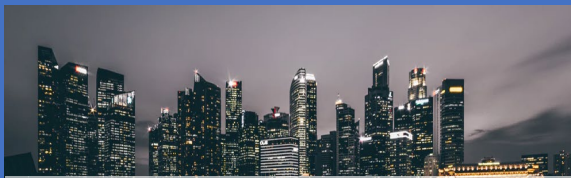
RE & Access to Electricity



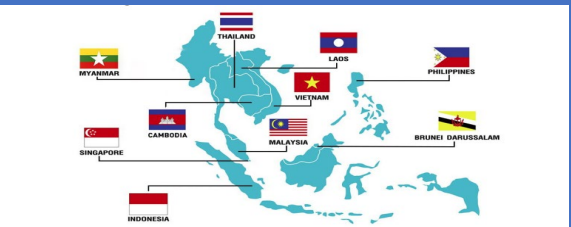
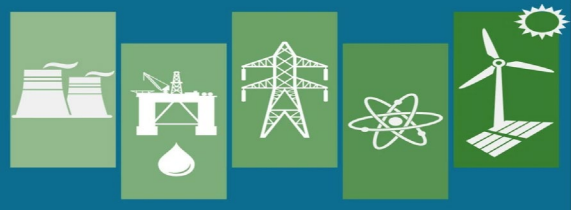
World Bank engagement in electrification and clean energy transition – TA and Investments

- Electrification and access to modern energy services
- Renewable energy and energy efficiency
- Energy transition and Just Transition
- Sector governance / utility performance and grid improvement
- Disruptive technology (Battery storage, green hydrogen, CCUS)
- Regional power interconnections

Access to Electricity and Grid Improvement



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■ **Distribution network expansion and upgrade**

- Expansion of transmission and distribution network:

- **Myanmar:** National electrification Project (IDA \$400m)
- **Indonesia:** ISEL 1 - Sustainable Least-cost Electrification-1 (p174350) (IDA\$300 + \$500m)
 - 115 kV transmission
 - Battery storage; System upgrade
 - Last-mile Electrification
- **PNG:** Rural Electrification Project (IDA \$100m + \$xx Co-financing)
 - Grid rehabilitation and expansion
 - Mini-grid and off-grid electrification (SHS)

- Upgrade of distribution network:

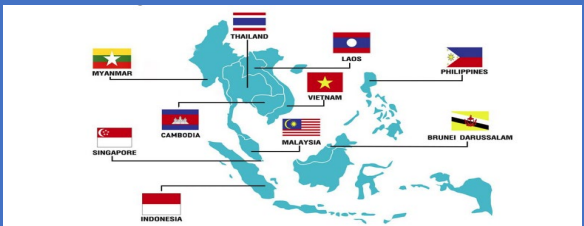
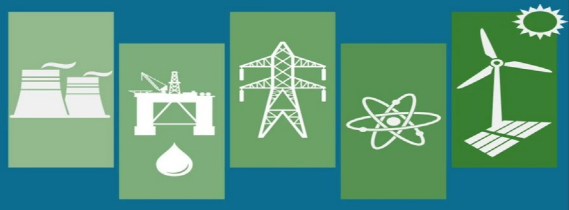
- **Mongolia:** Energy Sector Development Project
- **Lao PDR:** urgent investment for reliability improvement and loss reduction
- **PNG:** UPRIP - Energy Utility Performance and Reliability Improvement Project (P167820)

- Power system planning

- **Mongolia:** update least-cost power system planning
- **Indonesia:** Java-Bali Power System Masterplan
- **PNG:** update Least-cost power system planning



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Renewable Energy Development

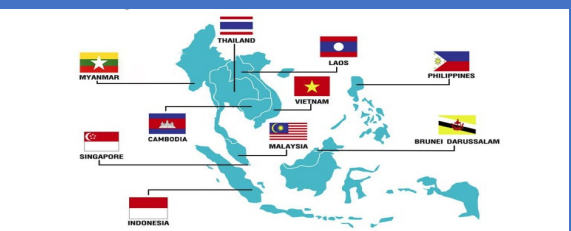
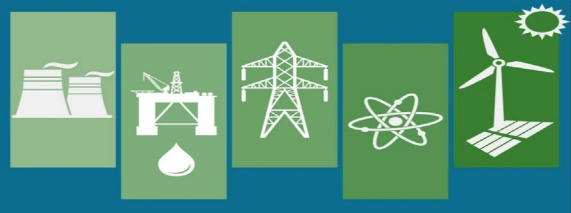
■ Hydropower

- Pumped storage: Development of Pumped Storage Hydropower in Java Bali System Project (IBRD\$380m + AIIB\$250m)
 - Upper Cisokan Pumped storage (4x260 MW)
 - Civil works: two RCC dams, underground powerhouse, etc.
 - Goods: 500 kV switch yards & transmission lines (16 km, double circuits)
 - Services: Engineering; PRP; Preparation of new hydro; System planning

- Hydro rehabilitation
 - Philippines Agus-Pulangi Hydropower cascades (IBRD \$140m+AfD \$70m)
 - 7 dams, 1,000 MW, two phases
 - Civil works: Hydraulic, mechanic and electric equipment
 - Goods: Dam safety instrumentation system; Plant control systems; auxiliary systems
 - Services: Owner's Engineer; Panel of Experts



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Renewable Energy Development

■ Hydropower

- Green-field Hydro

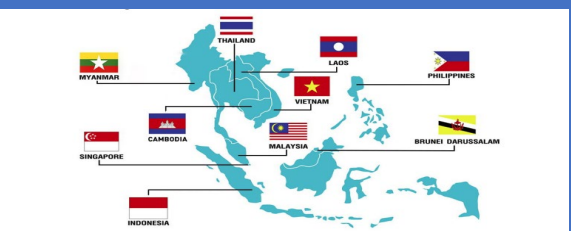
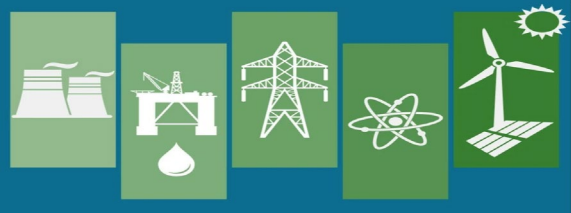
- **Solomon Islands:** Tina River Hydro
 - IPP & EPC contract

- Feasibility Study including ESIA

- **Indonesia:** Development of Pumped Storage Hydropower in Java Bali System Project
 - Matenggeng Pumped Storage
 - Poko Hydropower
- **PNG:**
 - Naro Brown Hydro (34 MW)
 - Stand alone TA on Feasibility Study, tendering documents for auction
 - Rehabilitation of existing hydro
 - TA on feasibility study under the UPRIP



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Renewable Energy Development

■ Solar + BSS

- **Indonesia:** TA to RE Pricing; public solar pilot + auction tenders under ISEL-1
- **Vietnam:** TA for policy change on auction (moving away from FIT)
- **Myanmar:** TA to prepare auction tenders for floating solar
- **Philippines:** 7 x 1 MW solar mini-grids under the ACEP

■ Wind

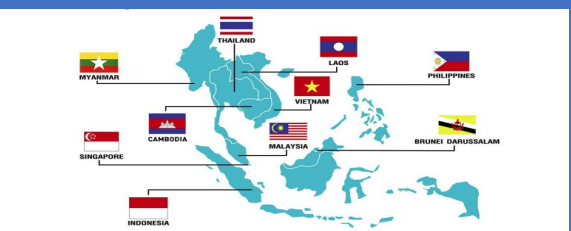
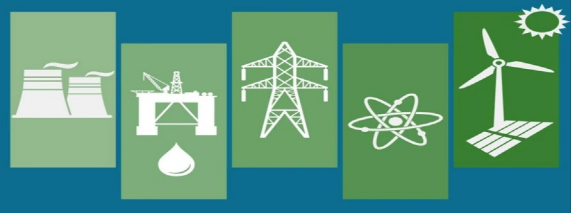
- **Vietnam:** Technical assistance on Off-shore Wind Roadmap
- **Philippines:** Technical assistance on Off-shore Wind Roadmap

■ Geothermal

- **Indonesia:** De-risking of investments in upstream exploitation
 - First Loss Cover through FIs
 - Two windows: public and private sectors, respectively



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Energy Efficiency Development

■ Vietnam

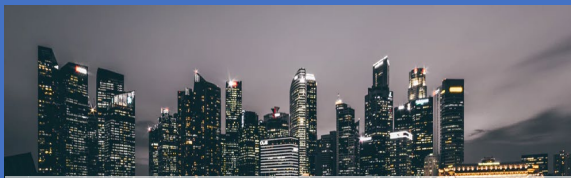
- Scaling up Energy Efficiency Project (\$11.3m + \$75m)
 - partial credit guarantees (RSF Guarantees) to participating financial institutions (PFIs)
 - Covering potential defaults on loans (PFI Loans)

■ Philippines

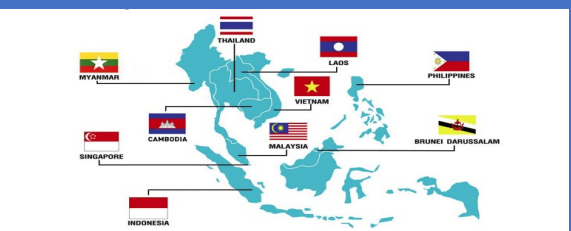
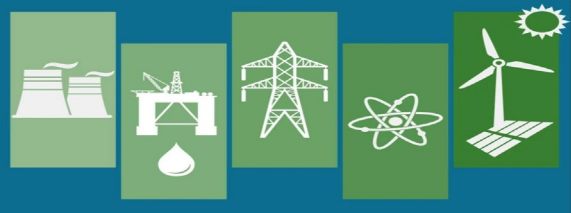
- TA on EE of Public building

■ Mongolia

- District heating network rehabilitation for loss reduction
- TA on EE of public buildings



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Application of new technology & Energy Transition

■ Battery Storage

- China Battery Storage and RE Project (IBRD \$300m + Huxia \$450m)
 - Investments through FI: Battery storage applications on G/T/D and Consumer sides
 - Services: TA on regulations on battery safety, environmental, recycling
- TA to RE + Battery Storage Auction
 - Indonesia; Vietnam; China; Cambodia

■ Hydrogen, CCUS & Coal power plant repurposing

- TA on policy, regulation and piloting as part of Energy Transition
 - **Hydrogen:** China (piloting); Vietnam, Laos and Indonesia (early-stage discussion)
 - **CCUS:** China (piloting)
 - Repurposing: China, Vietnam, Indonesia (planning)

■ Energy Sector Modeling

- System planning and carbon emission reduction alignment w/ Paris Agreement
Modeling on macroeconomic, financial and social impacts



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Link to World Bank Projects and Programs procurement:

<https://www.worldbank.org/en/projects-operations/products-and-services/procurement-projects-programs>



Thank you !