

Coal Phase Out in the EAP Region

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February 26, 2021



Outline

1 Context and Outlook of Coal Consumption in the EAP Region

- What is the magnitude of the problem and what are the trends?

2 Factors Influencing Coal Phaseout

- What challenges and opportunities are the client governments facing?

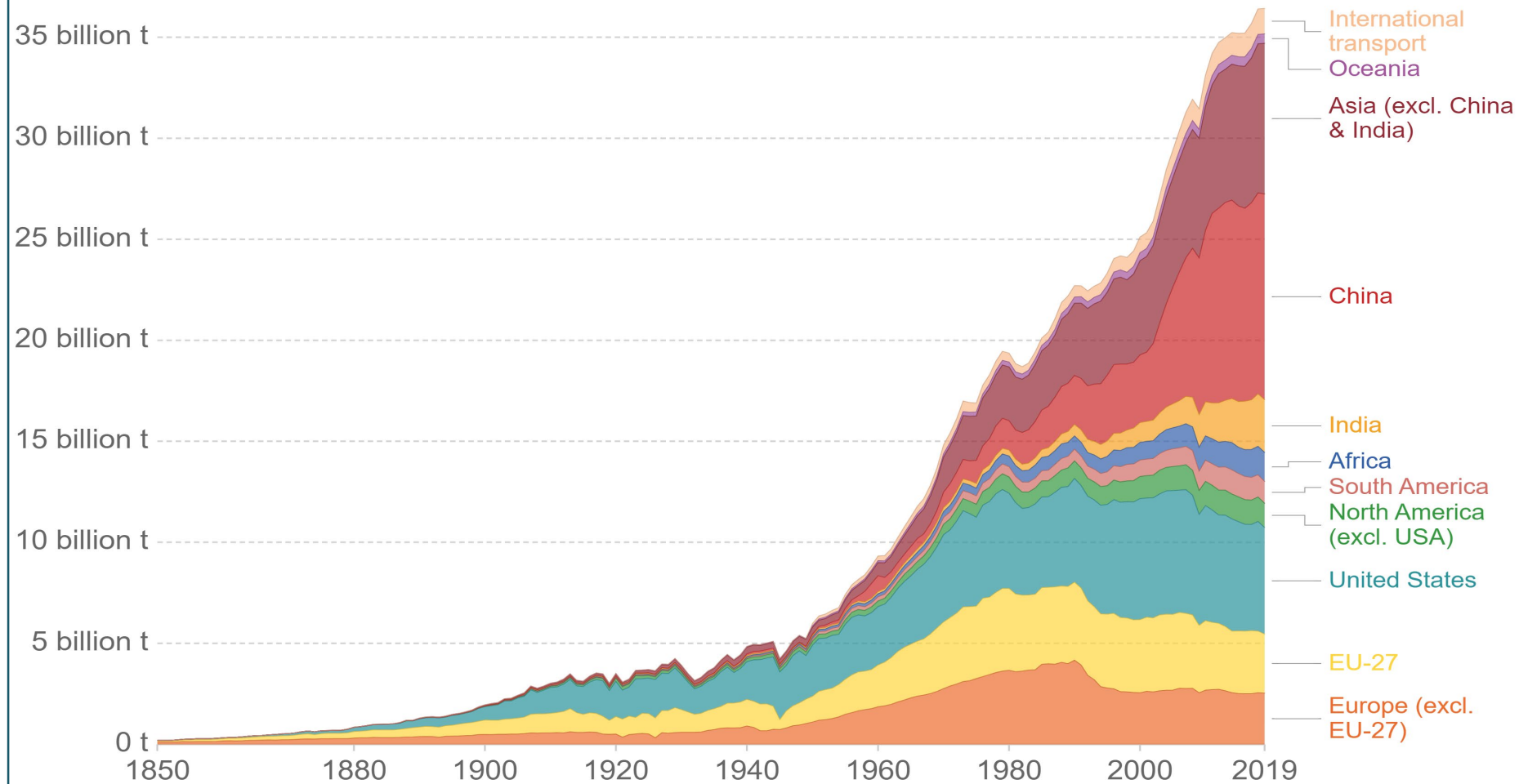
3 World Bank Engagement Strategy

- How is our program trying to address the issues?

Reducing coal consumption in EAP region is central to global climate action

1

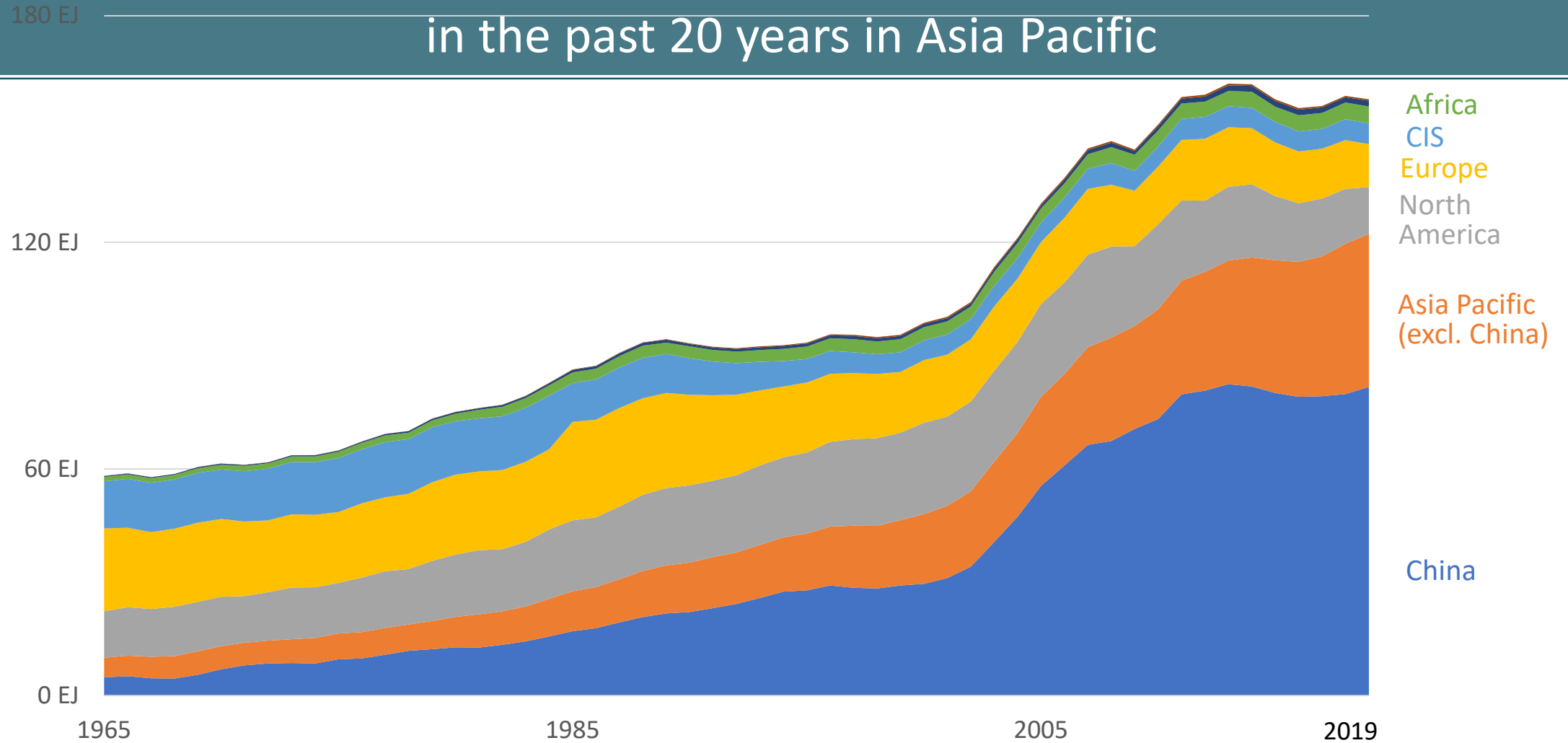
56 percent of global annual CO2 emissions came from Asia



Reducing coal consumption in EAP region is central to global climate action

2

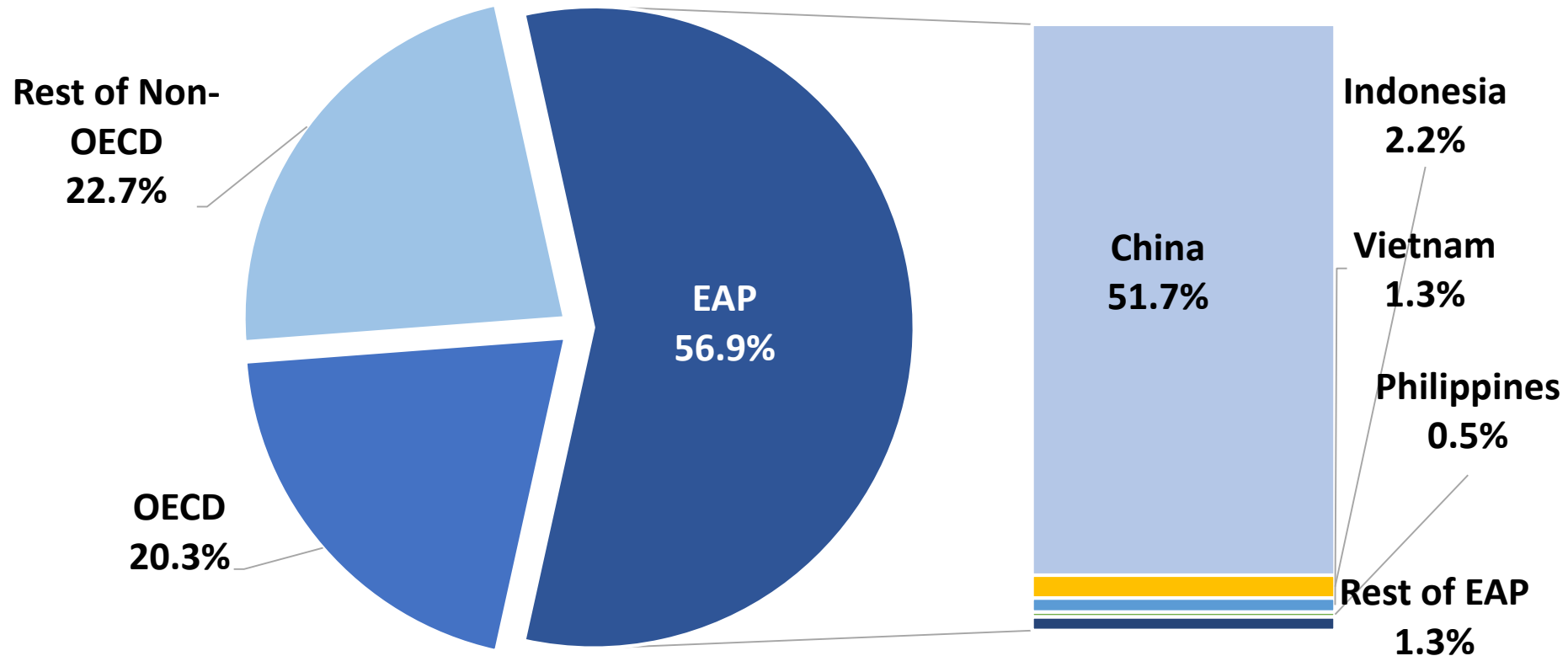
Coal consumption increased by 150 percent
in the past 20 years in Asia Pacific



Reducing coal consumption in EAP region is central to global climate action

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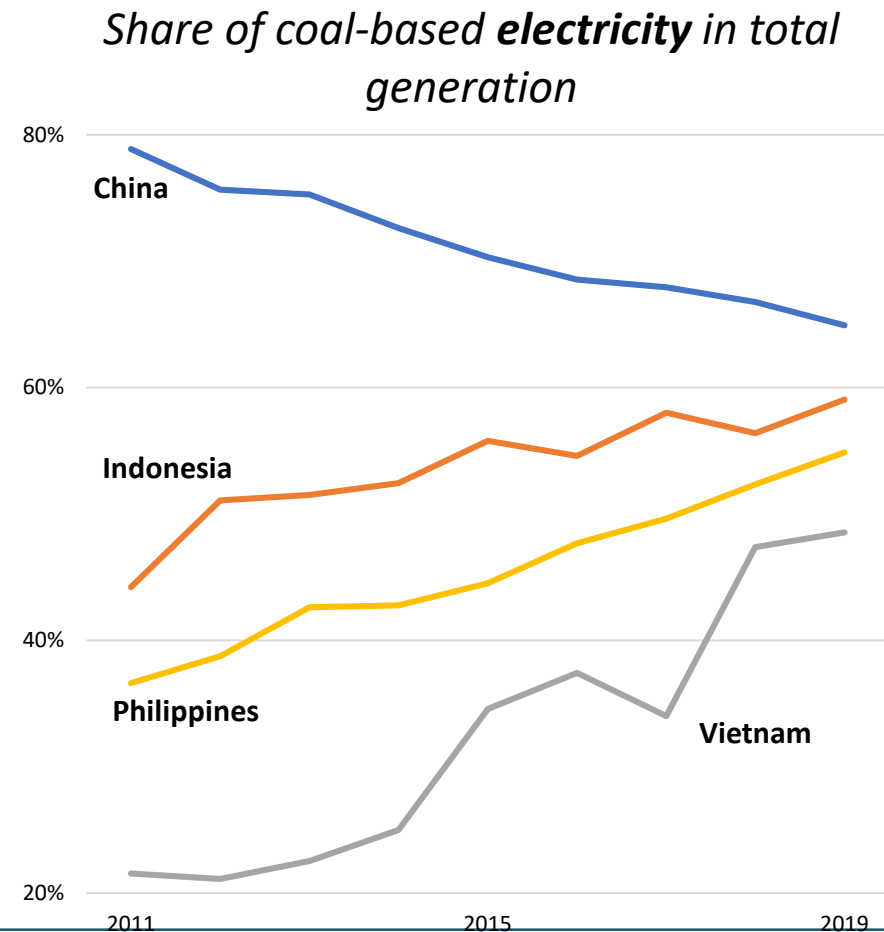
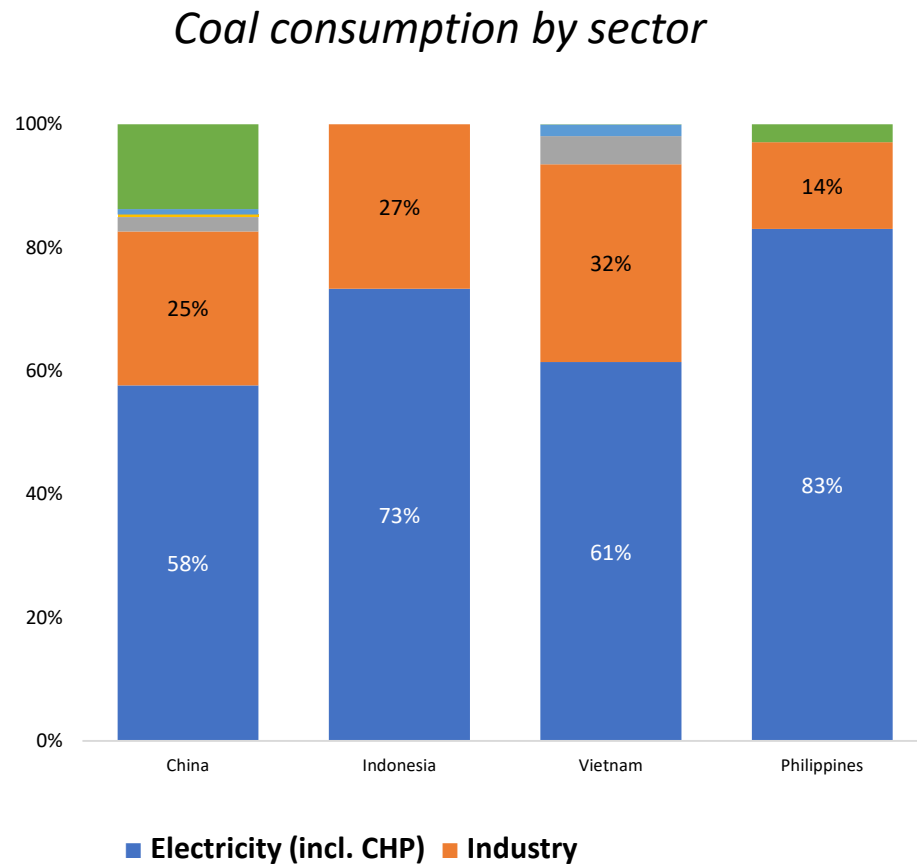
EAP accounts for 57 percent of global coal consumption, and 98 percent of EAP consumption comes from four countries



Reducing coal consumption in EAP region is central to global climate action

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60 to 80 percent of coal consumption goes to power sector, driving coal consumption growth in these EAP countries



Coal phaseout in EAP will likely be carried out in three stages



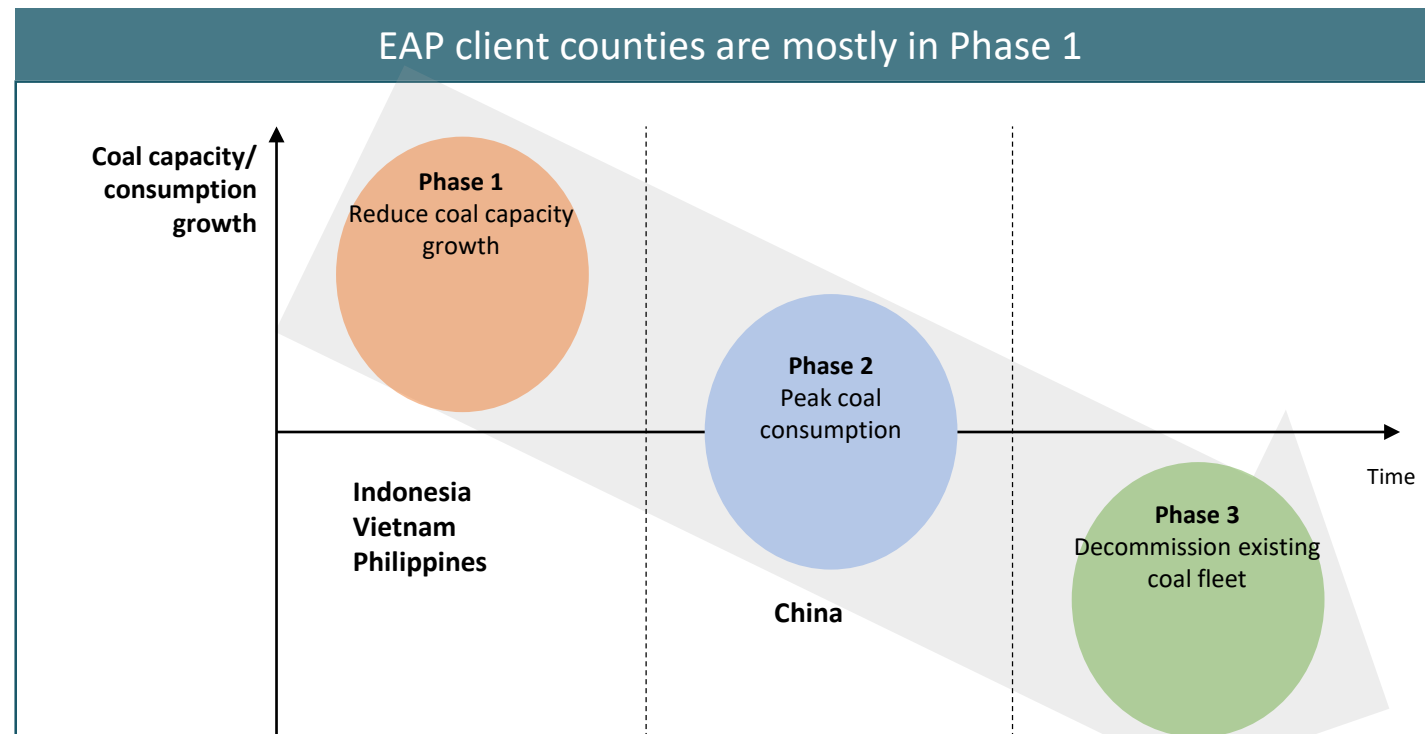
In the current context, it is unlikely to be feasible technically or financially to eliminate coal from power systems abruptly

- **Technical:** coal-fired power plants
 - (i) under construction or licensed,
 - (ii) still playing a critical role for energy security; and
 - (iii) Decision on subsequent plants will depend on the speed of development of alternatives and grid infrastructure upgrades.
- **Financial:** clean energy alternatives
 - (i) increasingly becoming competitive,
 - (ii) viability gap.



Countries need to make investment decisions now and will base them on the current cost assumptions and trends

- **Power System Planning:**
 - (i) cost benefit analyses, “Least Cost” approach
- **International Support:** Concessional financing can support
 - (i) lowering the cost of alternatives, as well as
 - (ii) influencing NDC commitments, sector planning, investment decisions.



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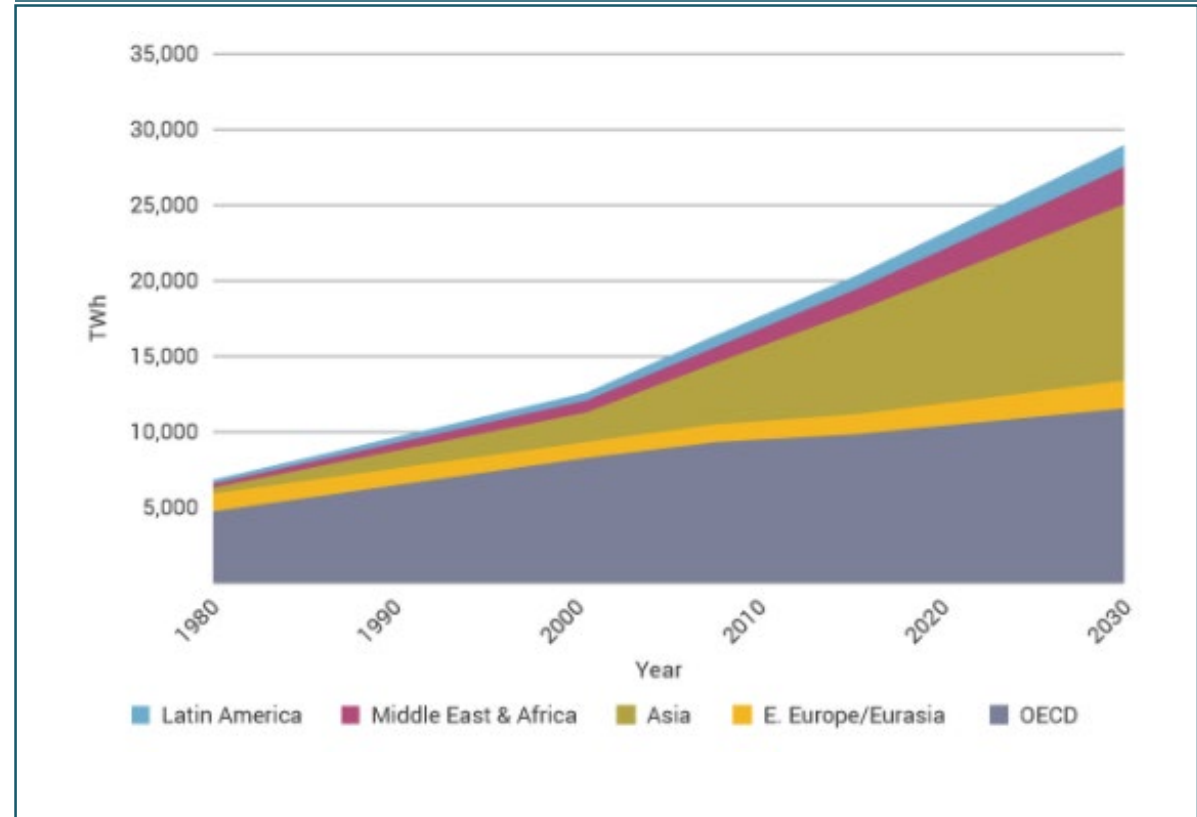
Providing stable energy for growth is of primary concern to authorities



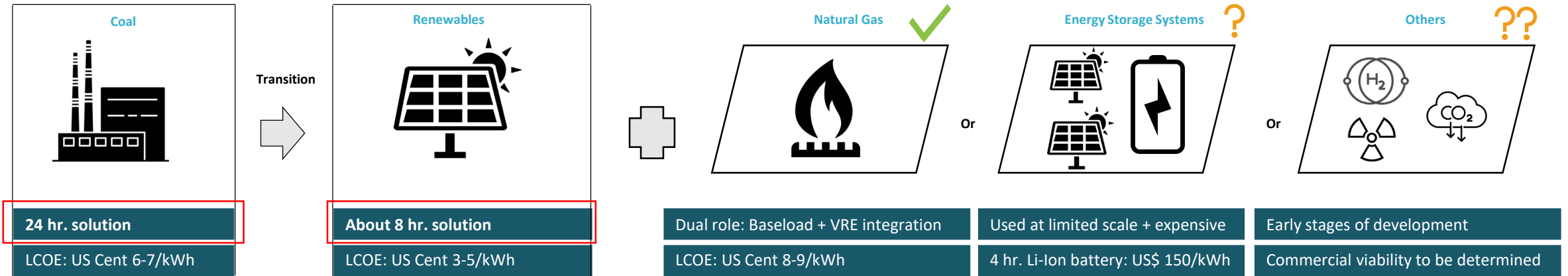
Sustained energy demand growth will continue in EAP

- **Electricity demand growth:**
 - (i) at 6-8 percent in many EAP countries
 - (ii) Policy makers look for uninterrupted power
 - (iii) Energy security: concerns and geopolitics of energy trade further encourage decision to continue relying on trusted trading partners and supply chains
- **Per capita electricity consumption**
 - (i) in many EAP countries is about one-fifth of OECD levels

Growth in electricity demand EAP countries will dwarf that of OECD countries in the coming decades



Operational alternatives to coal are limited and migration is not as easy



Levelized Cost of Electricity (LCOE): average net present cost of electricity generation for a generating plant over its lifetime



EAP countries are struggling to **overcome technological hurdles** in transitioning away from coal

- **Coal capacity replaced by renewables alone is not enough** - additional investments are required to overcome the partial availability and variability of renewables
 - **Energy storage systems (ESS)** are limited scale solutions and are cost-prohibitive;
 - **Green/blue hydrogen and carbon capture and sequestration (CCS)** technologies are still at early stages of development
 - **Hydropower and Nuclear:** Many countries do not have large-scale hydropower resources left and nuclear energy has higher safety and security risks
 - **Pumped hydropower** could be a feasible solution in certain EAP countries
- **Natural gas can become a viable bridging fuel** - emits 50 percent less GHGs than coal and plays a vital dual role: (i) baseload, (ii) fast ramp-up capability
 - New investments in **gas-to-power plants** are unlikely to become stranded assets
- **Grid capacity and flexibility**
 - For VRE integration, together with **improved dispatch** management and new regulations

Reining in financial costs while considering economic impacts is important



Balancing power sector finances during transition is challenging

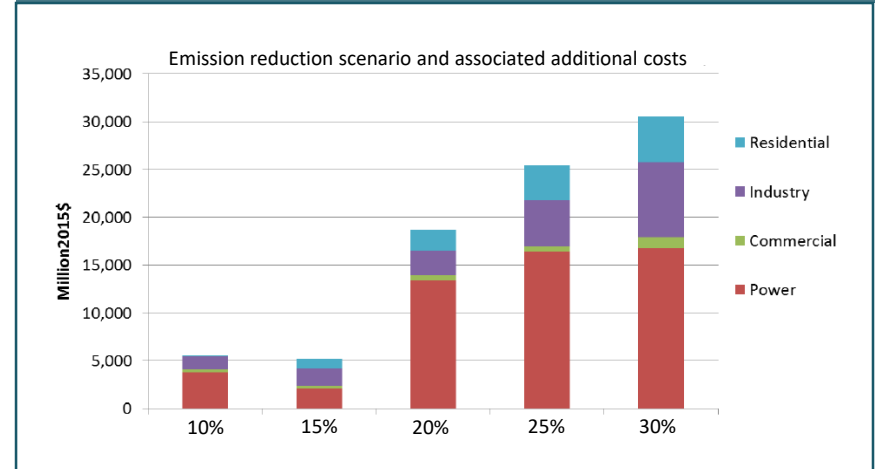
- higher upfront capital costs
- higher revenue requirements -- **electricity tariff** and possible inflationary pressures on the economy
- **Private capital** mobilization are crucial for clean energy transition
- **Bridging financing gap** – carbon trading systems; ODA concessional; climate financing



Macro-economic impacts of clean energy transition are underestimated

- **Costs and benefits external to the power sector** are usually not fully factored in power system planning and decision-making scenarios

For client countries such as Vietnam, 30% reduction in GHG emissions would mean additional \$30 billion in investment



Proposed Carbon Border Adjustment in EU and USA can become an impediment for coal dependent exporters



Addressing social impacts and overcoming vested interests is necessary



Social awareness against coal is increasing which influences local decisions

- Rapid growth in the past years in EAP countries has clearly come at the cost of **environmental degradation**. **Local pollution** levels in EAP countries are making cities almost unlivable
- **Civil society groups** voice opinions against coal
- Local administrations are **refusing to provide land use certificates** and other permits to new coal power plants in their jurisdictions



Governments are not yet fully prepared for implications of 'just transition'

- **Coal mine closure**: macroeconomic, social and environmental impacts
 - Investment and revenues
 - Jobs
 - Social services



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World Bank support to core analytics on decarbonization and coal transition



Energy sector analytics are important inputs for broader engagements (NDC scenario development, emission/air pollution control)



Reducing **coal consumption** in the energy sector

- **Macro-modeling of GHG emissions supported by power sector analysis:** Scenarios for replacing coal power with clean energy alternatives (identification of feasible GHG emission peaking and carbon neutrality). Assessing associated impacts on cost (investments) and revenue (tariff) – EEX with ENV, EFI, MTI
 - Completed for China Shanxi DPO Operation and Green China Report
 - Ongoing for Vietnam, Indonesia, and Philippines
- **Subsidy and pricing:** socioeconomic impacts of power sector subsidy reform. Environmental and social costs of coal use and carbon tax – MTI, HEASP, EEX
- **Gas as a transition fuel:** Analytical work on gas market development, pricing, and regulations. Identification and pre-feasibility study for gas-to-power in Vietnam
- **Decarbonization of energy use in transport** sector (Energy/Transport/Digital) - E-Mobility studies

Reducing **coal production** and a *Just Transition for All*

Coal Mine Closure

- **Macro-economic impacts:** Economic transition to address macro-economic impacts of coal mine closure: loss of revenues; SMEs
- **Social impacts:** Retraining to support re-employment of coal miners; ensure continuation of social services in coal production region
- **Environmental impacts:** Environmental standards and international practices for coal mine closure

Decommissioning and re-purposing of assets:

- Pricing and incentive mechanism for accelerating **retiring** of existing coal plants.
- Incentivizing of **re-purposing** coal power assets and support coal mine closure, with pilot in Shanxi

World Bank's support to energy (coal) transition agenda in Indonesia



Lending program complements government's efforts on clean energy transition



Reducing coal consumption in the energy sector

Reducing coal production and a *Just Transition for All*



Pillar 1: Policies and regulations to reduce the use of coal

- China:** to peak coal consumption for power; stop expansion of coal capacity; retire coal capacity and repurpose assets; for GHG emission peaking and carbon neutrality in energy sector
- China: Shanxi DPO for Energy Transition (\$300m, FY22)
 - China: GEF for GHG Peaking (\$17m, FY22)
- Indonesia:** Pricing and subsidy reforms, power system planning to **reduce coal capacity growth**
- Indonesia: P4R for Sector Reforms and Decarbonization (\$200m, FY22 TBD)
- Vietnam:** Power System Planning to **reduce coal capacity growth**; gas market development to replace coal
- Vietnam: Power Sector Master Plan; gas and power sector regulations (IPF operation)
- Philippines:** Initiating dialogues on Energy Transition and coal consumption for power
- Philippine: PASA on Energy Transition



Pillar 2: Finance for clean energy alternatives & EE

- RE generation to replace coal power**
- China: Battery Storage for RE (\$300m, FI, on-going)
 - Indonesia: Pumped Hydropower (\$400m, FY21); Geothermal MPA (\$325, FI, on-going)
 - Philippines: Agus hydro rehabilitation (\$300m, FY22)
 - Vietnam: REACH (\$200m, FY21) & REACH 2 (\$200m, FY22/23)
- Gas to replace coal**
- China: JJJ Air Pollution Control, gas for heating (\$500m, on-going)
 - Vietnam: Gas to power (\$1,000 m, TBD)
- Energy Efficiency (EE)**
- Philippines: Public building EE (\$200m, FY23 TBD)
 - Vietnam: Possible decarbonization project (\$200m, TBD)
- Regional Interconnection for clean power import**
- Vietnam-Laos & China Interconnection project (TBD)
- Decarbonization of energy use for transport**
- China: Energy / Transport / Digital Network integration (\$300 m, TBD)



Pillar 3: Just Transition for All in reducing coal production

- China: Shanxi DPO to support Coal Mine Closure**
- **Decommissioning and repurposing:** piloting for coal mine closure, coal power plant in China
 - **Energy Transition Fund** to support economic transition: financing, governance, operation and risk management of the Fund
 - **Jobs and social services:** pooling of Government and social funding; reskilling and education; ensuring continuation of social services in coal production region
 - **Environmental standards:** international practice for coal mine closure
- Indonesia P4R** supporting dialogues on *Just Transition for All* in coal production region
- Addressing macro-economic, social and environmental impacts

Thank You !