

Solutioning for Transition Finance at Scale: A Proposal for India

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The Context

- For global climate mitigation what happens in Asia over next 10-15 years is vital for the world – getting the mitigation strategies in China, India, Indonesia, Vietnam, Thailand, and the Philippines is crucial
- China does not need foreign capital and is also much further along in its transition pathway – we need to solve for the external financing needs of India and ASEAN.
- The need of the day: Intelligent approaches to Transition Finance

Challenges to Transition Financing

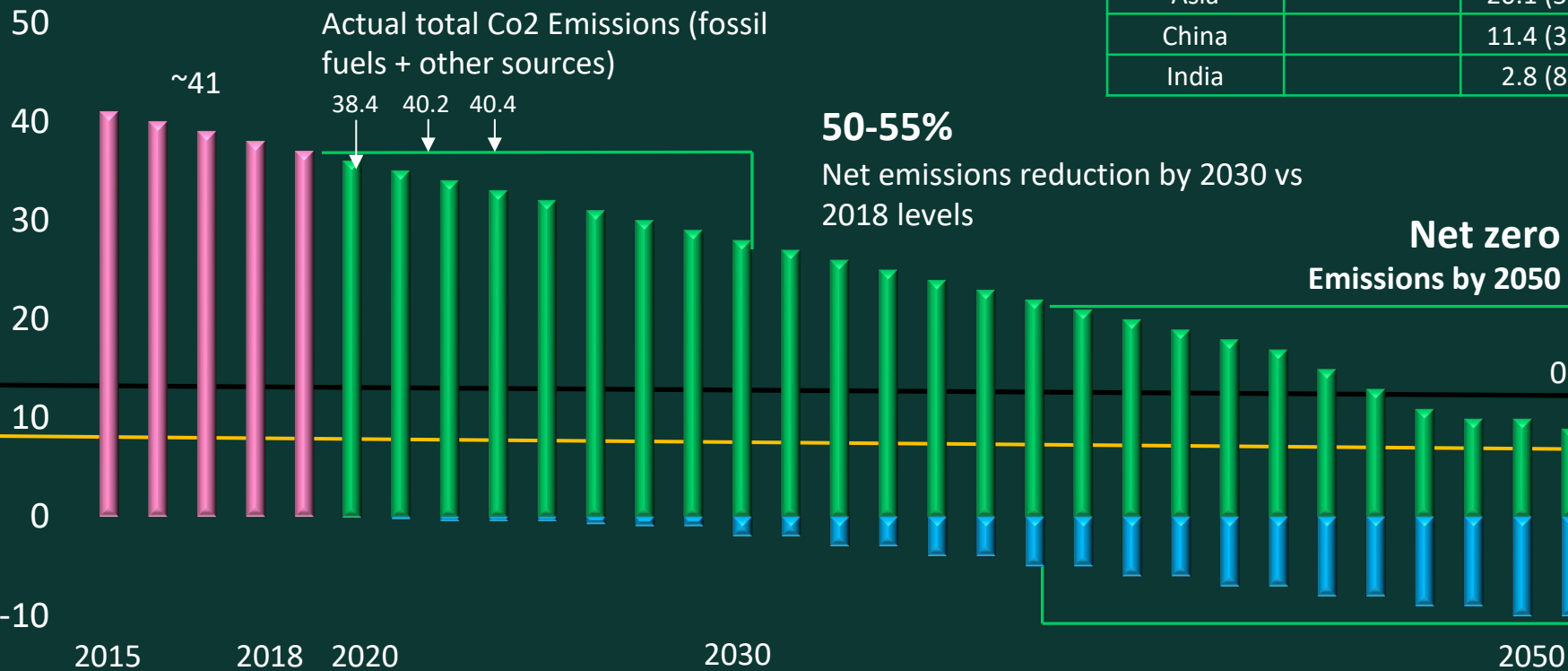
- The Elephant in the room

G7 Perspective on Asia's Transition

● Historic Emissions
 ● 1.5C Pathway Positive Emissions
 ● 1.5C Pathway Negative Emissions

| Region | Co2 Emissions 2022 GT | | | |
|--------|-----------------------|------------------|----------|-----|
| | All sources Fossil | o/w Fossil Fuels | o/w Coal | |
| World | 40.4 | 37.2 | 15.2 | |
| G7 | | 10.0 (27%) | 2.1 | 14% |
| Asia | | 20.1 (54%) | 11.7 | 77% |
| China | | 11.4 (31%) | 8.3 | 55% |
| India | | 2.8 (8%) | 1.9 | 13% |

Net Carbon Dioxide Emissions GtCO₂



Average residual life of Asian coal projects:

~25 years

The residual global carbon budget for 2023-2050 is ~490 Gigatons

570 GTCO₂

Cumulative 2015-50 Carbon Budget

Image: Institute of International Finance, Taskforce on Scaling Voluntary Carbon Markets, 2021, https://www.iif.com/Portals/1/Files/TSVCM_Summary.pdf. Percentage data from Our Own in Data and International Energy Agency <https://iea.blob.core.windows.net/assets/3c8fa115-35c4-4474-b237-1b00424c8844/CO2Emissionsin2022.pdf>

The Asian perspective...

- Absence of growth-centricity: a 'mitigation first' and 'compensation for loss' mind set makes it hard to mobilize socio-political support for frameworks like Jet-P – big gap between the perspectives of the Global North (GN) and Global South (GS) on approach to transition pathways

Challenges for Transition Finance contd.

- Regulations and multiple stakeholder driven demands constraining flow of capital from Global North to South for transition
- Commercial viability of transition pathways very sensitive to cost of capital because of high fixed capital investment requirements (to replace 1 MW of coal fired electricity you need ~4 MW of RE capacity + grid investment)
- High cost of capital: actual and perceived risk associated with transition technologies and business models
- Blended finance is key, at least as an early-stage catalyst

Challenges for Transition Finance contd.

- Availability of concessional/blended capital needed to accelerate pace of transition
- Dearth of opportunities for deployment at scale: myopic focus on structuring of individual transactions
- Private sector and markets alone will not deliver transition – insufficient attention focused on role of state, including especially the role of strategically important SOEs
- Credibility of transition plans difficult to assess

CO₂ Emissions: The Case of India

- Annual emissions: 2.8 GT of CO₂
- Global Share: 8% of CO₂; 13% of Coal (China is 33% of CO₂ and 55% of Coal)
- Emissions per capita: 2t CO₂ (China is 4x, US is >7x)
- Emissions intensity of GDP: 0.26 tCO₂ per USD 1000 (China 0.45, US 0.21, World 0.26)
- Emissions elasticity of GDP growth: ~0.86

Key Climate Goals

- Reduce emissions intensity of GDP 45% by 2030 relative to 2005
- Increase non-fossil fuel electricity generation to 'about 50%' of installed capacity' by 2030 'with transfer of technology and low-cost international finance' (with domestic aspirational target of 500 GW of RE by 2030)
- Net Zero by 2070

Good Progress...

- Annual carbon emission growth < real GDP growth
- Renewable installed capacity doubled over past decade from 73GW in 2013-14 to 191 GW in 2023-24 (o/w solar is now 82 GW and wind 46 GW)
- Array of incentives for expansion of solar capacity
- Government support for electrification of transport fleet
- Significant investment in green hydrogen
- Modest expansion of nuclear underway
- Incentives for battery storage capacity

But...

- Annual capacity addition in RE too slow -- needs to triple from 18 GW to 50 GW to hit aspirational 500 GW target by 2030
- GDP elasticity of emissions must decline by >30% to stay on track for NDC target reduction in emissions intensity
- Coal generation continues to expand to meet rising demand for electricity and securing energy security=> total annual emissions unlikely to peak until late 2030s => decarbonization pace would have to accelerate significantly in later years to meet net zero targets and increases risk and potential cost from future stranded assets
- Insufficient clarity on longer term state-level and sectoral pathways, financing strategies, and essential supporting policy action

Immediate Priority: Focus on the Electricity Sector Transition

- Government goal is for India to reach developed country status by 2047. This implies >7% annual GDP growth rate target
- Per official projections, electricity demand expected to rise 5.0-6.0% per cent per annum or from ~1700 billion units in 2024 to >2600 billion units by 2032
- Installed capacity is expected to rise from 442 GW to 900 GW by 2032
- To ensure energy security and grid stability, reliable base load generation capacity is vital. Hence Gov plans to expand coal from 218 GW to 283 GW by 2032.
- To meet its 2070 net zero targets, more aggressive action upfront is needed to speed up the development of non-fossil fuel generation capacity to reduce dependence on coal as fast as is physically and practically possible

No Electricity Sector Transition is possible without a strategic role for NTPC...

- Accounts for 17% of national installed generating capacity and 22% of electricity generated
- Sound balance sheet, strong project management capabilities
- Listing 'RE only' subsidiary company
- NTPC projects face lower counter-party payments risk
- Key role in ensuring reliable base load supply to support GDP growth targets
- Can lead market into commercializing new technologies (solar with storage; storage as service; modular nuclear)

NTPC's current plans

- Total installed capacity is 76 GW o/w RE is ~ 3GW
- Target capacity is ~157 GW by 2032 o/w coal is set to expand from 69 GW to 97 GW
- NTPC Green, a subsidiary company to be listed to pursue only green energy
- Target of 60 GW of RE capacity by 2032
- In the base case NTPC aims to increase share of non-fossil fuel based electricity from a paltry 4% to 38% in 8 years

Raising NTPC's ambition through engagement

- NTPC could do less than targeted coal expansion, and faster RE expansion provided:
 - It is able to deliver the same target units of base load electricity generated (to comply with the government's energy security goals)
 - It is commercially no worse off than under its base case business plan
- This will require blended finance to help NTPC to:
 - invest more than its current target in RE expansion (replacing 1MW of coal capacity requires ~4 MW in RE solar capacity because of intermittency)
 - And invest in the necessary incremental – still relatively high cost -- battery storage capacity to prevent grid instability

Business case for NTPC

- Reduce risk of conventional assets getting stranded (beyond 2035 lower dispatch because of alternatives because of must run status of RE assets + lower dispatch— coal will be reduced to base load and some ancillary services (peaks); by 2046 fleet of old coal plants unable to dispatch profitably)
- invest in future ready technologies
- Improve profitability and valuation of NTPCGEL
- To be achieved without compromising goal of supporting energy security targets of GoI

Case for transition financiers

- Support a growth-centric win-win strategy for accelerating pace of transition relative to reference case that reduces the fossil fuel intensity of electricity generated by NTPC measurably and at a pace faster than committed under the country's NDCs to 2030

A Proposal

| | Current | Reference Case | Accelerated Transition | Change relative to reference scenario | Savings to NTPC | Incremental Fixed Investment for NTPC | Net increase in investment spend for NTPC | Estimated subsidy for NTPCGEL debt service |
|--|---------|----------------|------------------------|---------------------------------------|-----------------|---------------------------------------|---|--|
| Total installed capacity GW | 76 | 157 | 172 | +25 GW | | | | |
| o/w Fossil Fuel | 69 | 97 | 92 | -5 GW | \$2.9 billion | | | |
| RE | 3 | 60 | 80 | +20 GW | | \$ 9.3 billion | \$15.4 billion o/w | <\$170 million per year for 12 years |
| Battery Storage | 0 | 0 | 4 | +4 GW | | \$ 2.3 billion | \$10.7 billion | |
| Modular nuclear | 0 | | 2 | +2 GW | | \$ 3.8 billion | debt funded | |
| Billion Units of electricity generated | | 610 | 610 | None | | | | |
| Fossil fuel intensity: Co2 per unit of electricity generated | | 0.72 kg/kwh | 0.66 kg/kwh | | | | | |

Underlying assumptions

- Estimated cost of debt required to deliver acceptable RoI to NTPC

| Tariff | Expected Tariff | Average Cost of Debt Available | Threshold cost of debt | Subsidy required |
|--------------|-----------------|--------------------------------|------------------------|------------------|
| Solar | INR 2.8/unit | 6.67% | 5.1% | |
| BESS | INR 3.5/unit | | 4.8% | |
| Solar + BESS | INR 6.5/unit | | 5.0% | 1.67% |
| Nuclear | INR 8.5/unit | | 4.6% | 2.07% |

Why is it 'win-win'?

Indian perspective

| | Reference Case 2024-2032 | Accelerated Transition Case 2024-2032 |
|---|-----------------------------|--|
| RE share in NTPC portfolio installed capacity | 38% | 47% |
| Coal capacity avoided | 0 | 5 GT |
| Non-fossil fuel share in NTPC electricity generated | 13% | 19% |
| Catalyzes commercialization of modular nuclear | | YES |
| Catalyzes commercialization of ESS and helps grid stability | | YES |
| Energy Security and grid stability | | YES |
| Growth centric solution | | YES |

Financier perspective

| | Reference Case 2024-2032 | Accelerated Transition 2024-2032 Reference Case 2024-2032 |
|---|-----------------------------|--|
| Use of Proceeds | NA | Ringfenced - only for green asset development |
| Measurable and verifiable progress indicators | NA | YES |
| Receptacle for blended finance at scale | | YES – funding need not be project specific – could be delivered into NTPCGEL balance sheet |

Thank You