भारत 2023 INDIA

G20 India Presidency 2023
1st ENERGY TRANSITIONS WORKING GROUP MEETING

Financing needs for new age critical clean energy technologies
Battery Energy Storage (BES) & CO_2 capture, utilization and storage (CCUS)

Prof. Amit Garg

IIM Ahmedabad in collaboration with NTPC NETRA

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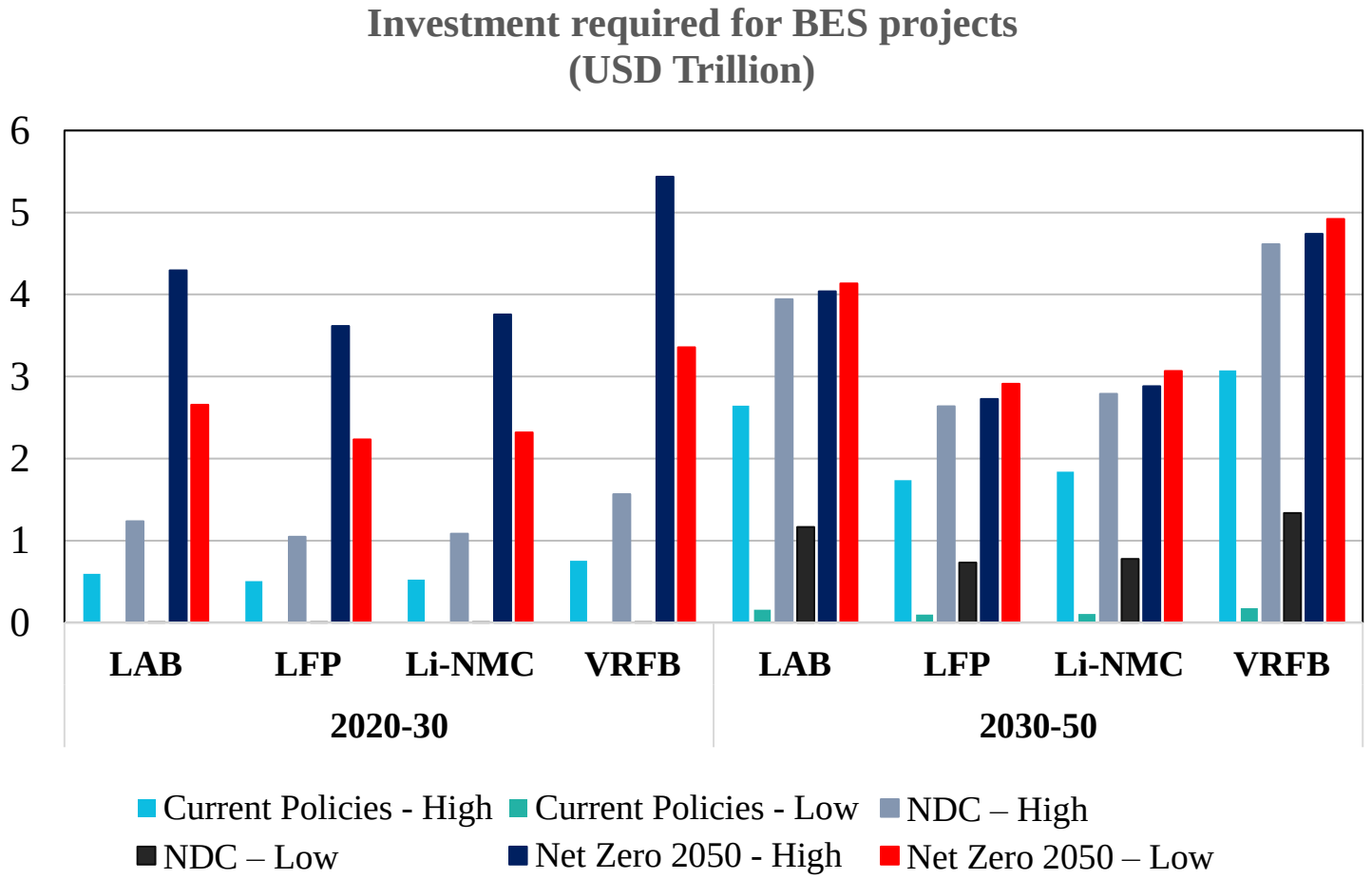
Date: **5th February 2023**
Venue: Bengaluru, Karnataka

Financing Needs for BES Projects

- To achieve net zero, investment of USD 8 to 10 Trillion is required till 2050 (Up to 18 Billion per year)
- Technologies are at different levels of development and likely penetration
- As per Refinitive (2022), 162 companies with a total market capitalization of USD 394 billion in the BES space are currently operating in 24 countries

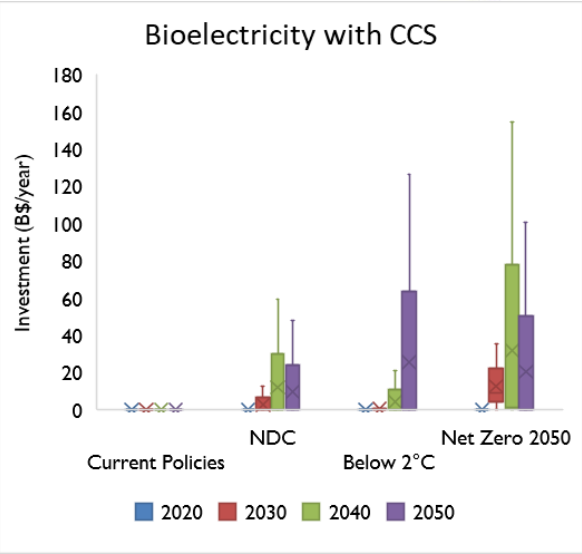


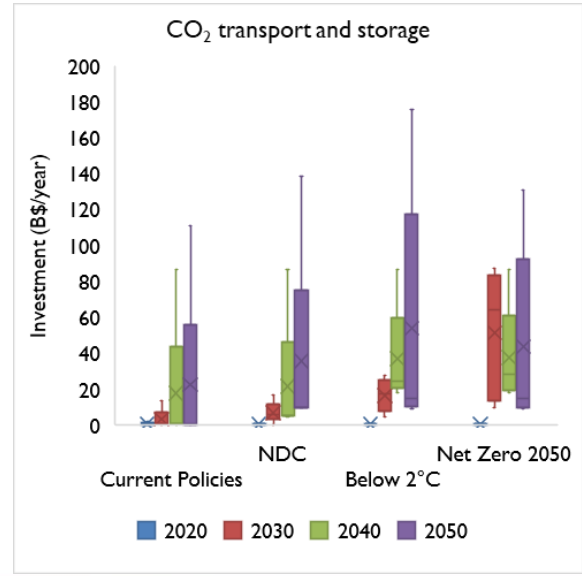
Policy Recommendations to encourage Financing of BES Projects

- Encourage low-cost financing of BES
  - Create a dedicated fund supported by MDBs/DFIs to finance BES projects globally
  - Paid-in capital and callable capital of MDBs should be increased periodically to enhance financing capabilities
  - De-risk BES projects to crowd-in Private investment
- Subsidize clean energy technologies
- Promote international cooperation on Research, Development, Financing and Regulatory mechanisms for BES technologies and critical minerals
- Public programs to promote energy storage infrastructure
- Integrate grid-scale battery storage as part of long-term energy transition plan

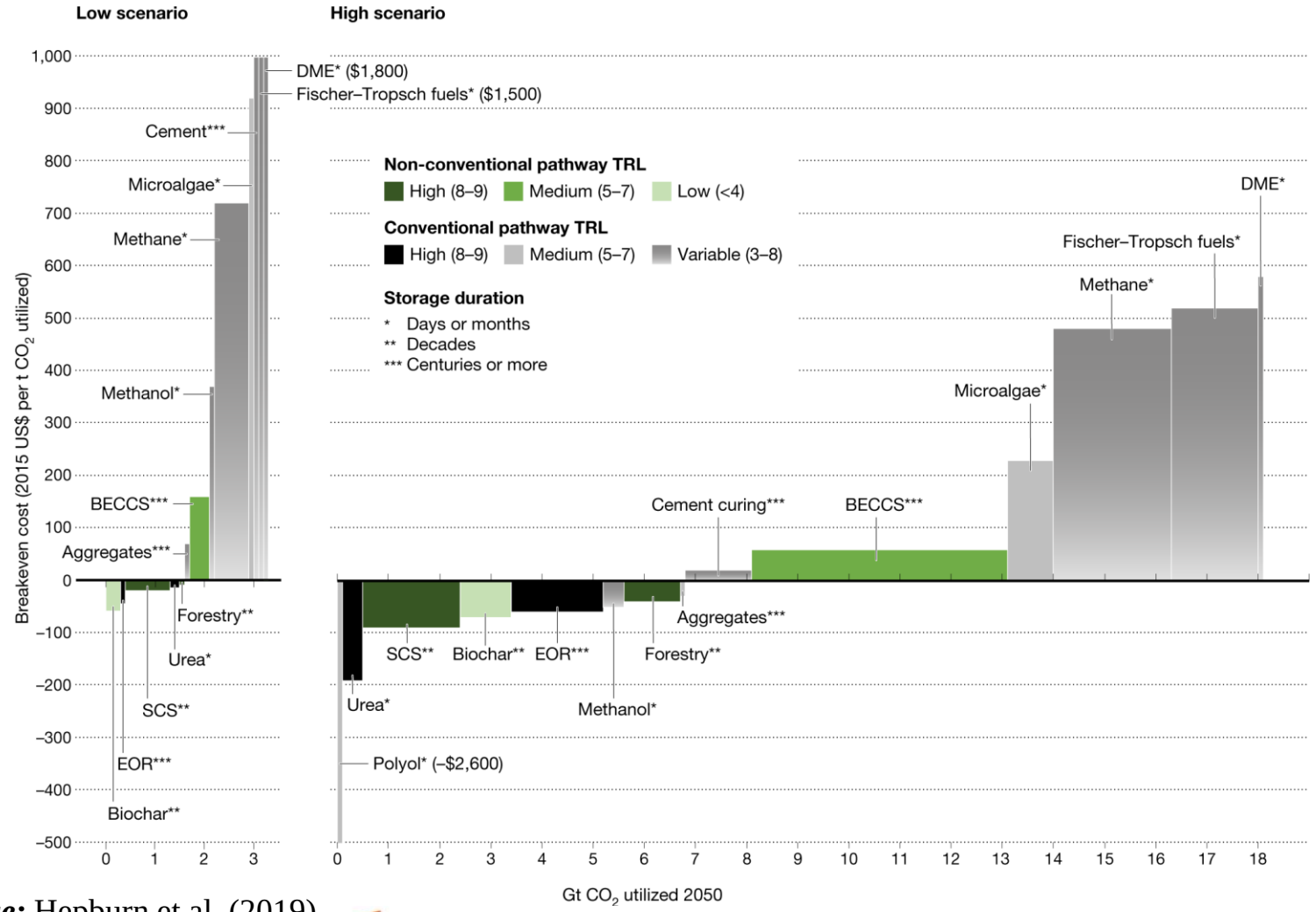
Financing Needs for CCUS Projects

- Depending on national context, countries may have higher investment in CCUS in coal, gas or bioenergy at the capture end
- $22-32 billion/year required for CO_2 transport (pipeline) and storage infrastructure by 2040 in "Below 2ºC" scenario (*Network for Greening the Financing System [NGFS] data*)
- Market size for CCU may increase from a couple of hundred billion dollars in 2030 to $4-5 trillion in 2050
- Prominent CCU investments likely to be seen in precast concrete, aggregates, animal feed, formic acid and methanol *(U.S. National Academies of Sciences study, 2022)*
- These investments will have a long-ranging impact by providing returns for 30-50 years
- Data shown for select categories from NGFS (right side)





Marginal Abatement Costs for CCUS to decrease with Scale



Source: Hepburn et al. (2019)

- Currently, CCUS requires a high carbon price to be feasible – at this stage, it can come from government or multilateral support
- Cost of CCS ~ \$50-120/t-CO_2 for power sector, lower for high-purity industrial sources
- Cost of CCU ~ (-\$80) to \$1800/t-CO_2 now but can come down to (-\$500) to \$580/t-CO_2 through economies of scale
- Shows the importance of low-cost financing

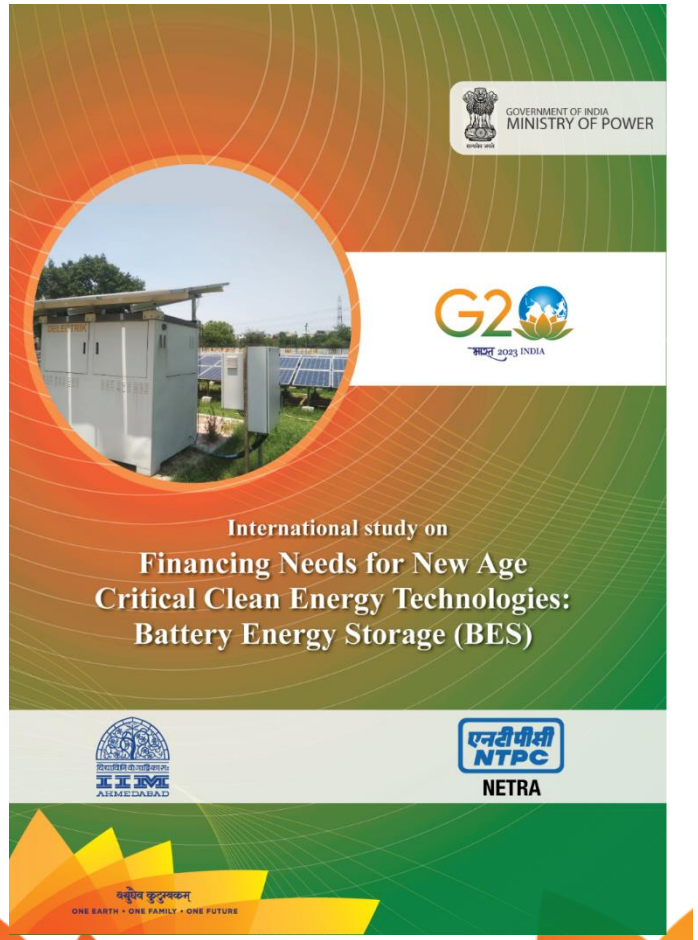
Policy Recommendations to encourage Financing of CCUS Projects

- Provide sequestration tax credits and investment tax credits for reducing revenue risks
- Develop CCUS projects based on hub-and-cluster models by creating networks of sources and sinks
- Grant Based Funding for technical assistance and demonstration of CCUS technologies (especially storage and utilization)
- Viability gap funding by global financing institutions can be a potent mechanism to improve the bankability and viability of CCUS projects globally, especially in EMDCs
- Needed a Dedicated fund at global level to fund CCUS projects at commercial scale and crowd-in investment from private investors
- Provide clear guidance for storage liability of sequestered or utilized CO_2
- Incremental cost of green CCU products could be supported

Instruments to Finance BES and CCUS Projects

- Common Instruments
  - Green Bonds
  - Outcome-based sustainability debt (Bonds/Loans)
  - Collective investment vehicle (Structured Equity Funds)
  - Syndicated Loans (Co-financing)
  - Guarantees
  - Credit Default Swaps (CDS)
- Specific Instruments for BES Projects
  - Leasing batteries for BES projects
  - BES Investment Trusts
- Encourage acceptance in Carbon Markets for both BES and CCUS projects

Authors and Contributors



Study Partner for G20 Reports

Indian Institute of Management Ahmedabad: Amit Garg, Udayan Singh, Omkar Patange, Sanjay Kumar Jain, Jyoti Maheshwari, Tirthankar Nag, Vidhee Avashia, Saritha Sudharmma Vishwanathan, Ajay Kumar Singh

Knowledge Partner for G20 Reports

NTPC NETRA: Shaswattam, Subrata Sarkar, Neeraj Goswami, Sahil Chopra, Partha Mukherjee, Madhurima Kumar, Sandeep Patel

Power Finance Corporation, Delhi

Thank You

Amit Garg
Professor, Public Systems Group
and NIIF Chair Professor in ESG
Indian Institute of Management Ahmedabad
amitgarg@iima.ac.in