

## Key Messages Document: Grids Briefing Note

- **Clean electrification is the backbone of global decarbonisation. This means that power grids, which link the generation and use of electricity, will play a central role. Under net-zero scenarios, the total length of grids must grow by over 50% by 2050 – a \$22.5 trillion investment.**
- **The development of power grids should aim to optimise the system, reducing the total build required** by deploying innovative grid technologies that increase the efficiency of power flows, increasing storage and flexibility and the use of long-distance interconnectors. **However, even full deployment of all optimisation routes will not eliminate the need to build new grids.**
- **Grids have been a "laggard" in the energy transition – slow to adapt to new needs.** Increasing the rate of grid build requires a step-change for many countries, particularly in developed economies where the build rate in recent years has been stable or declining. **Yet, the world risks losing out on large volumes of cheap renewables for clean electricity if systems fail to build at the speed required.** Five times the amount of solar PV and wind capacity added in 2022 are now waiting in grid connection queues.<sup>1</sup> Furthermore, congestion payments – where grid operators pay renewable generators not to produce due to insufficient grid capacity – are rapidly increasing. Critically, the International Energy Agency (IEA) estimates that in a grid-delay scenario the world could miss out on 58 Gt CO<sub>2</sub> of cumulative emissions savings by 2050, equivalent to global power sector CO<sub>2</sub> emissions from the past four years and almost 30% of the remaining carbon budget for a 1.5°C scenario.<sup>2</sup>
- **Therefore, to fast-track grid build and deliver the transition at the pace and scale required, policymakers and industry must take action across four critical areas. They must:**
  1. Implement a strategic vision for grids and generation coordinated across key stakeholders and supported by clear data.
  2. Address slow permitting and approvals, and grow societal acceptance.
  3. Address skill, component and material gaps.
  4. Reform financing structures and increase access to finance.

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<sup>1</sup> Note: not all projects in queues will turn into realised projects; some project applications for grid connection are speculative. See IEA (2023), *Electricity Grids and Secure Transitions*.

<sup>2</sup> This is the carbon budget remaining for a 50% chance of staying within a 1.5°C scenario. See IEA (2023), *Electricity Grids and Secure Transition*; Forster et. Al (2024), *Indicators of Global Climate Change 2023: annual update of key indicators of the state of the climate system and human influence*.