Emissions

Projected national emissions fall substantially from the 2025 baseline of 401.05 Mt CO_2-e in all scenarios, but the scale and distribution of reductions vary materially.

Under the Ampol-1p5DS, total net emissions decline by 117.8% between 2025 and 2050, reaching -71.48 Mt CO_2-e by 2050, implying a net-negative system. The Ampol-2p5DS achieves a 99.1% reduction over the period, stabilising just above net zero at 3.52 Mt CO_2-e in 2050. In contrast, the Ampol-House-View delivers a 48.8% reduction, with residual emissions of 205.41 Mt CO_2-e in 2050—around 277 Mt CO_2-e higher than the 1.5°C-aligned pathway. These trajectories highlight the importance of both the pace and breadth of decarbonisation across sectors.

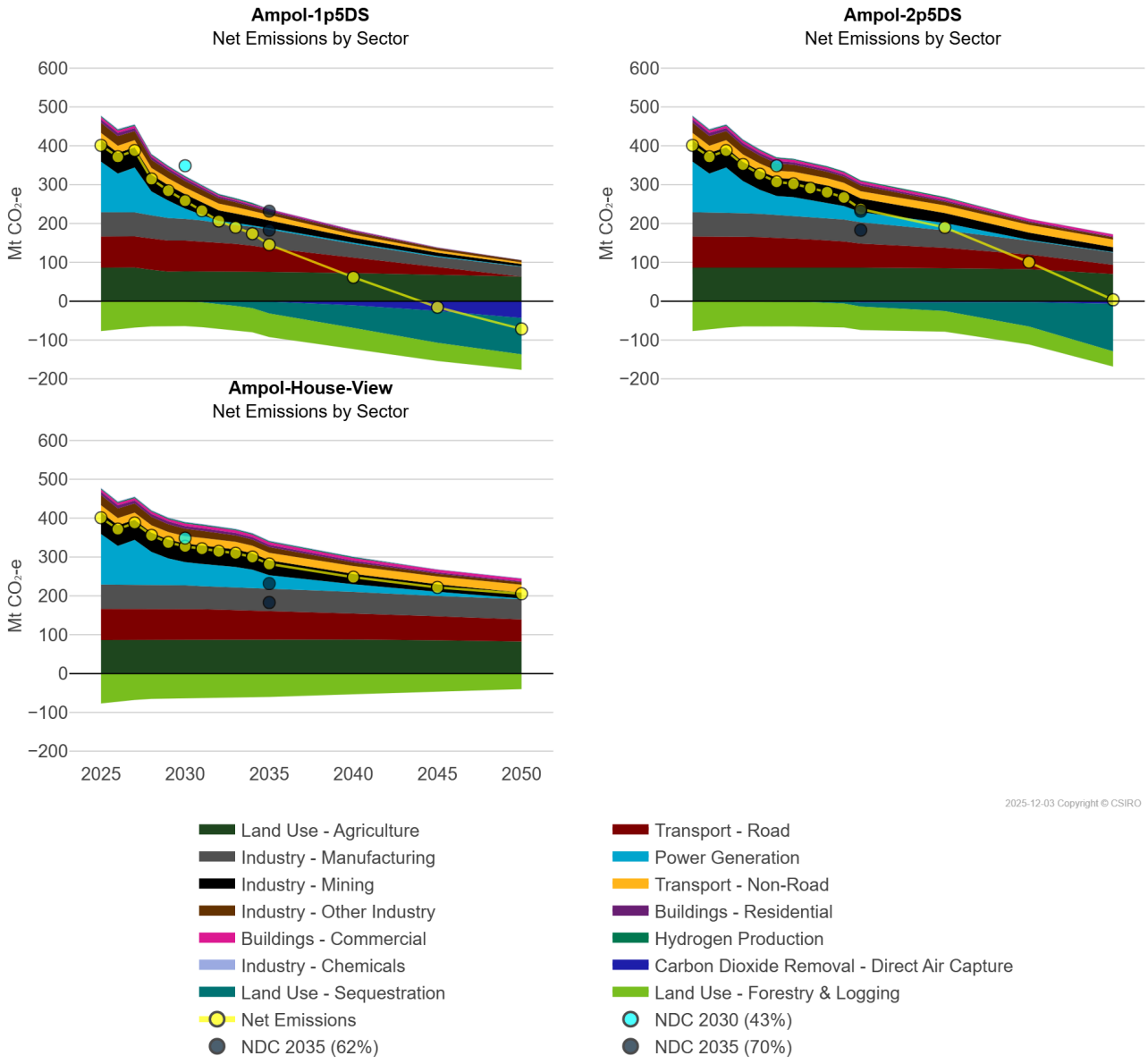

Figure: Projected net emissions by sector from 2025 to 2050 across scenarios, showing the transition from positive to net-negative emissions in Ampol-1p5DS, near-zero outcomes in Ampol-2p5DS, and substantial residual emissions in Ampol-House-View.

Sectoral contributions to emissions reductions

All scenarios start from the same 2025 baseline but differ in how reductions are distributed:

- **Ampol-1p5DS** achieves the deepest aggregate cut, with total reductions of 472.53 Mt CO_2-e relative to 2025. Power Generation provides the largest single contribution (-128.92 Mt CO_2-e), followed by Industry (-109.74 Mt CO_2-e) and Transport (-94.07 Mt CO_2-e).

Land Use, Buildings and carbon dioxide removal together deliver the remaining reductions needed to reach net-negative emissions.

- **Ampol-2p5DS** delivers a 397.51 Mt CO_2-e reduction, driven by Power Generation (-128.92 Mt CO_2-e), Land Use (-101.06 Mt CO_2-e) and Industry (-97.01 Mt CO_2-e). Transport decarbonisation is more gradual than in the 1.5°C pathway, leaving higher residual emissions.
- **Ampol-House-View** records a more modest total reduction of 195.63 Mt CO_2-e. Power Generation still decarbonises strongly (-127.83 Mt CO_2-e), but Industry (-72.37 Mt CO_2-e) and Transport (-21.01 Mt CO_2-e) progress more slowly. Land Use is a net source rather than a sink, with emissions increasing by 33.58 Mt CO_2-e, materially weakening overall performance.

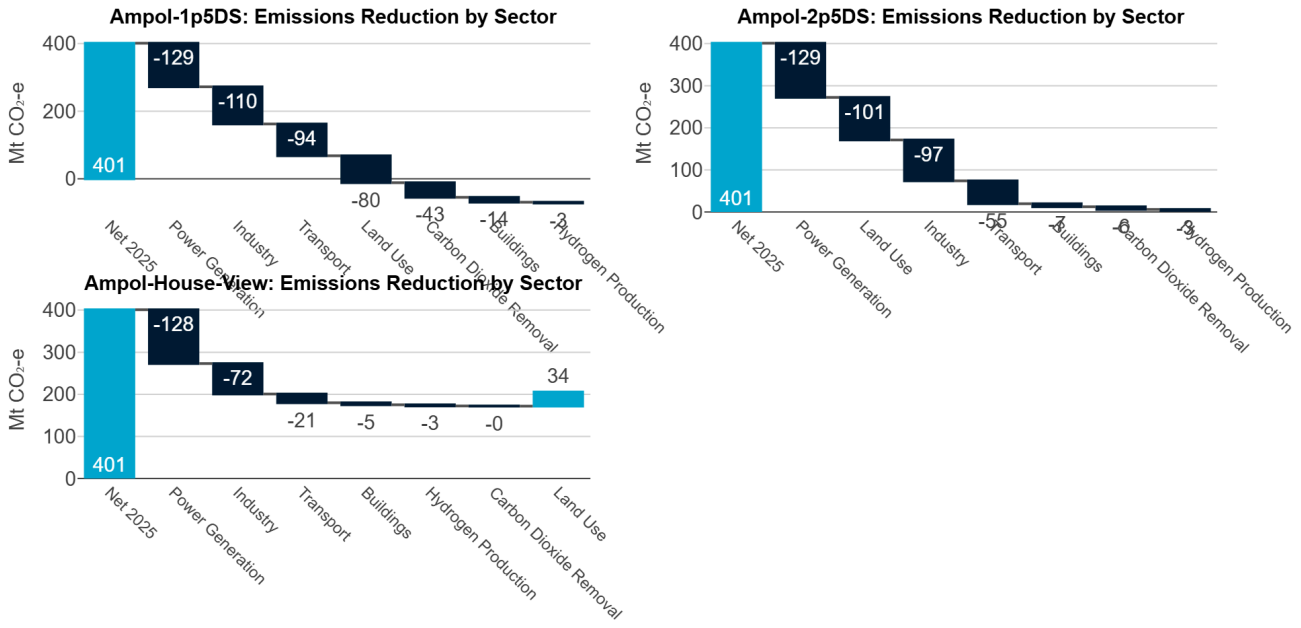

Figure: Cumulative emissions reductions by major sector from the 2025 baseline to 2050, highlighting the dominant role of Power Generation and the differing contributions from Transport, Industry and Land Use in each scenario.

Power generation

Decarbonisation of electricity is rapid and deep in all scenarios. Emissions from electricity generation fall from 129.87 Mt CO_2-e in 2025 to 0.94 Mt CO_2-e in 2050 under Ampol-1p5DS and 0.95 Mt CO_2-e under Ampol-2p5DS, a 99.3% reduction in both cases. Even in the Ampol-House-View, where fossil generation is retired more slowly, emissions decline by

98.4% to 2.04 Mt CO_2-e by 2050. The small divergence between scenarios underscores that power sector decarbonisation is a robust feature of the transition, largely independent of broader assumptions.

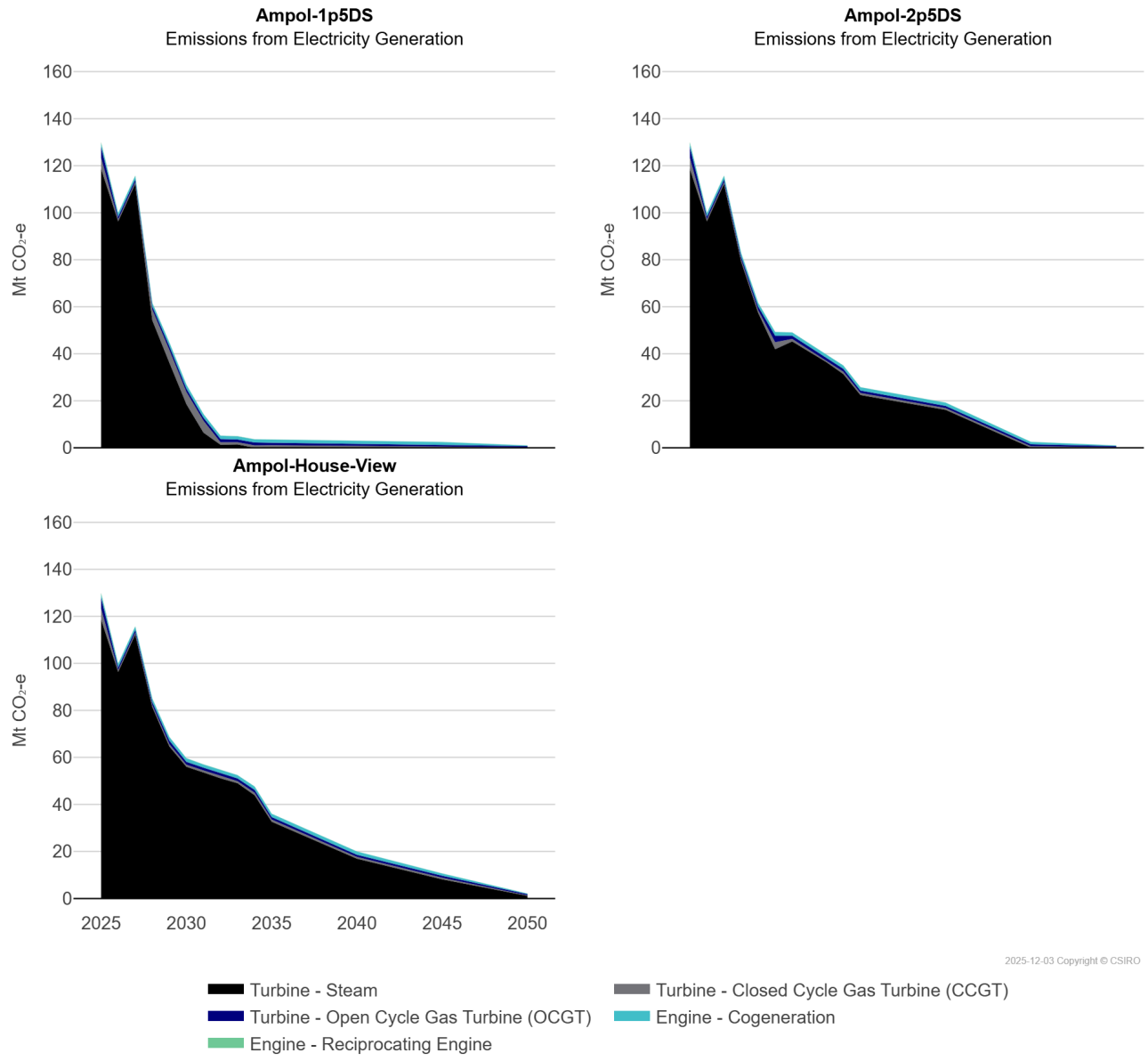

Figure: Emissions from electricity generation by technology, showing near-complete phase-out of emissions from steam turbines and gas-fired plant in all scenarios by 2050.

Domestic transport

Transport emissions show the greatest divergence across scenarios. Starting from 98.07 Mt CO_2-e in 2025:

- Under **Ampol-1p5DS**, domestic transport emissions fall by 95.9% to 4.0 Mt CO_2-e in 2050, reflecting rapid electrification of road transport and efficiency improvements across all subsectors.
- Under **Ampol-2p5DS**, emissions decline by 55.7% to 43.42 Mt CO_2-e in 2050, with slower uptake of zero-emissions vehicles and continued reliance on liquid fuels in heavy and long-distance segments.
- In the **Ampol-House-View**, transport emissions fall only 21.4% to 77.06 Mt CO_2-e by 2050, leaving the sector 73.1 Mt CO_2-e higher than in the 1.5°C pathway. Passenger vehicles, light commercial vehicles and heavy trucks remain the dominant sources of residual emissions.

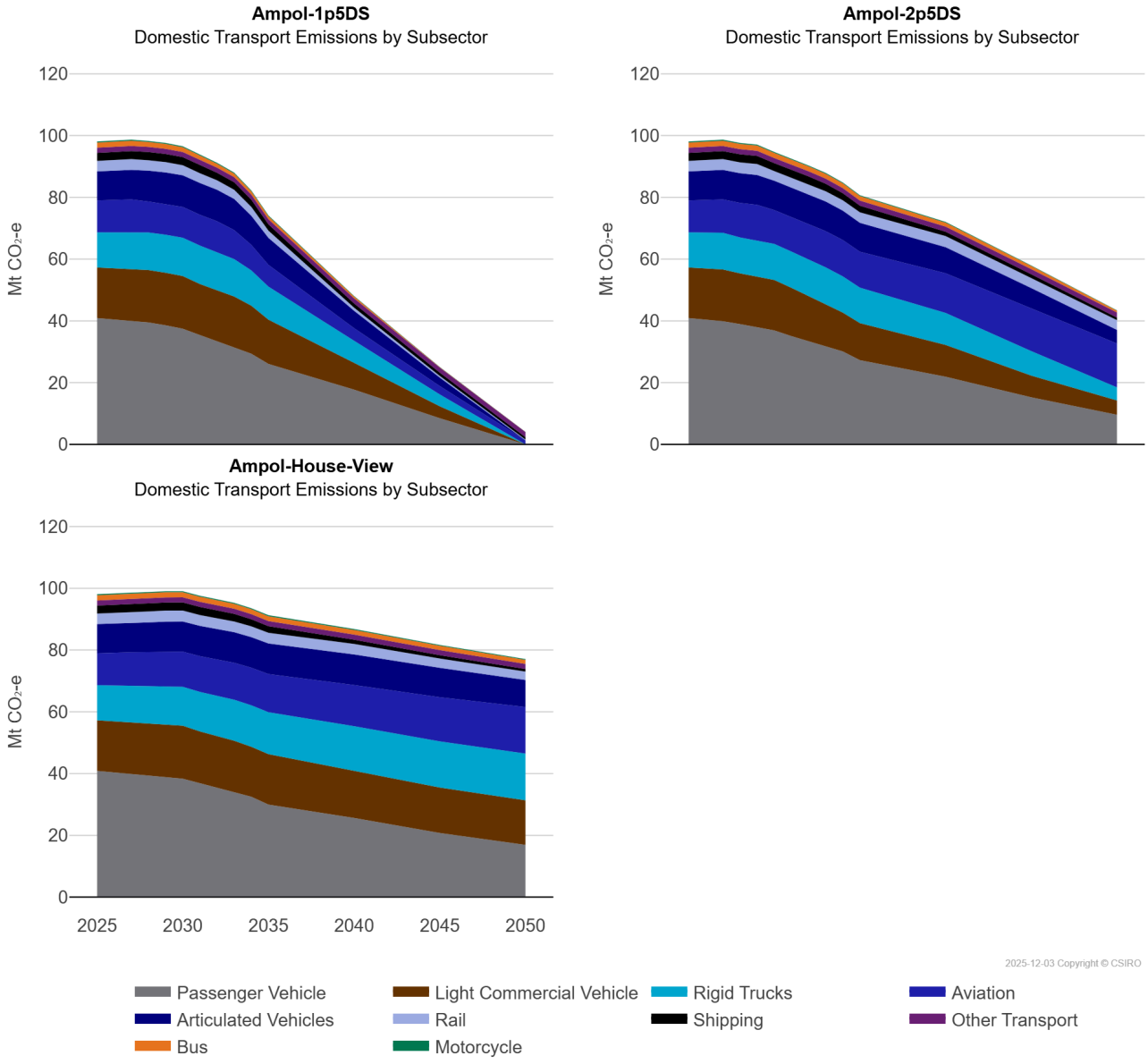

Figure: Domestic transport emissions by subsector, illustrating rapid, broad-based reductions in the 1.5°C pathway compared with slower and more uneven decarbonisation in the other scenarios.

Built environment

Emissions from the built environment (residential and commercial buildings) also vary significantly:

- In **Ampol-1p5DS**, building emissions fall from 14.25 Mt CO_2-e in 2025 to zero by 2050, a 100% reduction. This is consistent with full electrification of space and water heating, high building efficiency standards and low-emissions electricity.
- **Ampol-2p5DS** achieves a 49.3% reduction, with emissions declining to 7.22 Mt CO_2-e by 2050.
- **Ampol-House-View** is less ambitious, with emissions falling 34.6% to 9.32 Mt CO_2-e in 2050—9.3 Mt CO_2-e higher than in the 1.5°C scenario.

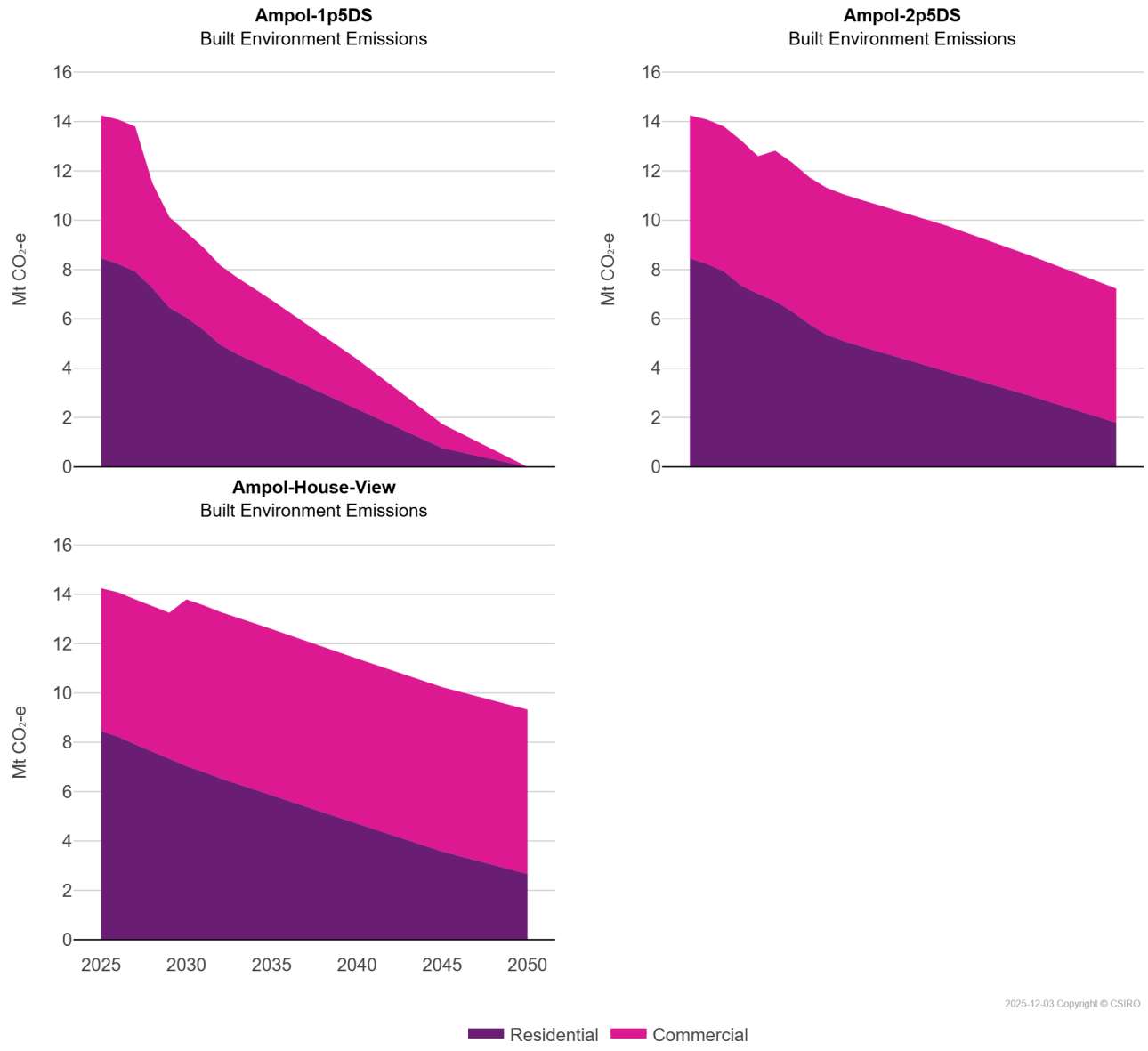

Figure: Residential and commercial building emissions to 2050, showing full decarbonisation in Ampol-1p5DS and persistent residual emissions in the other scenarios.

Implications

Across the projection period, achieving outcomes consistent with a 1.5°C pathway requires not only near-complete decarbonisation of power generation, but also deep reductions in transport, industry, buildings and net Land Use emissions. While the House-View scenario assumes strong progress in the power sector, slower structural change in other sectors and net Land Use emissions becoming a source rather than a sink result in substantially higher residual national emissions by 2050.