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Why should gas turbines (or dispatchable thermal turbines) running on carbon-neutral fuels be recognised as a “final product/specific component considered to be primarily used for the production of net-zero technologies” in the Net-Zero Industry Act?

Gas turbines and other turbomachinery solutions operating on Carbon-neutral fuels should be considered net-zero technologies because they provide dispatchable, reliable, and low-emission power generation while fully aligning with decarbonisation targets. Below are the key reasons justifying their net-zero status:

1. Zero or near-Zero carbon emissions combustion:

- Hydrogen (H₂) combustion produces no CO₂ emissions, only water vapour (H₂O) and small amounts of NO_x (which can be mitigated with advanced combustion techniques). (See [ETN Global report on Hydrogen combustion challenges](#))
- Sustainable (bio)fuels (such as biomethane or synthetic fuels) are derived from organic waste, agricultural residues, or captured CO₂, making their carbon footprint close to neutral when considering the full life cycle. (ref. RED II directive).
- If a fuel does not contribute additional CO₂ to the atmosphere or is derived from captured carbon, it qualifies as net-zero.

2. Enabling grid stability in energy system with a high level of Variable Renewable Energy sources

- Gas turbines operation on hydrogen or biofuel provides fast-ramping, dispatchable power, ensuring grid reliability when solar and wind output fluctuate. (See [ACER report on Flexibility solutions](#))
- Unlike batteries, gas turbines can store and convert renewable fuels into power with high peak capacity over long durations, complementing seasonal energy storage.
- Net-zero energy systems require backup solutions for renewables—gas turbines running on hydrogen or sustainable (bio)fuels ensure uninterrupted clean power. (See [ETN Whitepaper on Critical role of dispatchable power generation](#))

3. Scalability and infrastructure readiness

- Many existing gas turbine power plants can be retrofitted to run on hydrogen or (bio) fuels, significantly reducing emissions without new infrastructure. (See [ETN Global report on Hydrogen Gas Turbines](#))
- Hydrogen-ready gas turbines are already being deployed, and (bio) fuels can be used in current systems with minor modifications.

- A scalable and cost-effective transition to net-zero is possible by leveraging existing assets, rather than building an entirely new power system.

4. Carbon Capture compatibility for additional reductions

- Hydrogen and sustainable (bio) fuel-fired gas turbines can be integrated with Carbon Capture, Utilisation, and Storage (CCUS) to further remove any remaining emissions, making them a negative-emissions solution in some cases.
- Net-zero systems must eliminate residual emissions—CCUS integration ensures turbines go beyond net-zero when needed.

Conclusion: Gas Turbines – a Net-Zero Technology

Gas turbines running on Carbon-neutral fuels fully support a net-zero energy future by:

- Producing little to no CO₂ emissions
- Providing dispatchable and affordable backup for renewables
- Leveraging existing infrastructure for cost-effective decarbonisation
- Enabling deeper emissions reductions when combined with CCUS
- For a secure, flexible, and net-zero energy system, gas turbines running on clean fuels are not just an option—they are a necessity.

Call to action:

We advocate that gas turbines running on carbon-neutral fuels should be recognised as a “final product/specific component considered to be primarily used for the production of net-zero technologies” in the Net-Zero Industry Act.