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Unlock power. Unleash growth.

Power solutions for off-grid data centres

A study by
Wärtsilä Energy



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Some images in this report have been created or modified using artificial intelligence (AI).

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Summary

The rapid growth of artificial intelligence (AI), cloud computing and digital services is driving unprecedented investment in data centre capacity worldwide. At the same time, grid bottlenecks and lengthy connection timelines are becoming major constraints on how quickly new data centre capacity can be deployed. To overcome these challenges, developers are increasingly turning to off-grid data centres powered by onsite generation to accelerate speed-to-power.

This study evaluates the commercially available gas-based primary power solutions which can meet this demand. It models representative AI data centres in Texas, US; Southern England, UK; and Victoria, Australia, assessing their technical performance, lifecycle economics and natural resource requirements.

The study concludes that medium-speed engines provide the strongest overall solution across the cases assessed. Their modular design, high availability and reliability, and limited derating at high ambient temperatures reduce the need for redundancy and oversizing. The fast start-up and ramping capability of medium-speed engine technology also reduces energy storage requirements, resulting in lower capital investment and a smaller land footprint.

These advantages, together with high fuel efficiency and competitive maintenance costs, result in **medium-speed engines achieving the lowest levelised cost of energy (LCOE) across all three markets assessed, 15–30% below gas turbine alternatives and equivalent to annual savings of approximately EUR 110,000–340,000 per MW of data centre capacity served**. Medium-speed engines also deliver very low operational water consumption, using approximately **99.97 % less water** than the most water-intensive solutions assessed.

With appropriate mitigations, all gas technologies assessed can meet applicable noise and local air-emission limits. Waste heat recovery can further reduce power usage effectiveness (PUE) through absorption chiller-based cooling, although policy incentives may be required to support wider adoption in some regions.

The results of this study are clear: Medium-speed engines offer the most balanced combination of reliability, cost competitiveness, flexibility and resource efficiency for off-grid AI data centre deployment.



Chapter 1

Powering AI beyond the grid



1.1. The rise of off-grid data centres

The rapid growth of artificial intelligence (AI), cloud computing and digital services is driving unprecedented growth in data centre investment. As developers race to bring new capacity online, access to reliable power is increasingly determining where and how quickly data centres can be deployed. With grid bottlenecks persisting and grid connection queues growing across major data centre markets, developers are turning to dedicated onsite primary power solutions. These solutions allow facilities to be commissioned independently of constrained electricity networks, providing a significant speed-to-power advantage in an increasingly competitive AI market.

For many data centres, dedicated onsite primary power represents a relatively small incremental investment that can unlock significant value by helping these assets become operational more quickly. These solutions may account for only 5–10% of the capital cost of a fully fitted data centre, but their ability to bring data centre capacity online earlier can materially improve project economics, leading to financial benefits that greatly exceed the initial investment [1]. With data centre colocation lease rates exceeding **EUR 180/kW/month in major markets, a 12-month delay to a 500 MW data centre could result in approximately EUR 1.1 billion in forgone revenue**, exceeding the total capital investment required by an onsite primary power solution [2].

1.2. Beyond speed to power

Deployed to overcome lengthy grid connection timelines and enable earlier data centre operations, speed-to-power is a primary requirement for onsite primary power solutions. Achieving this requires rapid permitting, short equipment lead times, modular system design, streamlined project execution and phased commissioning, enabling capacity to be brought online quickly and expanded as demand grows.

Onsite primary power solutions must also meet the high reliability and availability requirements of data centres, where outages can result in significant financial losses, reputational damage and risks to critical computing infrastructure. As AI workloads become larger and more volatile, the power solutions deployed must respond flexibly to variable load profiles without compromising service continuity. Given the long operating life of these assets, competitive lifecycle economics are equally important, supported by efficient system sizing, optimised capital investment, high fuel efficiency, and competitive operation and maintenance costs.

Beyond technical and economic performance, environmental and community impacts are important considerations. Developers face growing pressure to minimise local air emissions, water consumption, noise, visual impacts and land use. Addressing these challenges is important not only for meeting regulatory and permitting requirements, but also for achieving and maintaining community acceptance and securing a social licence to operate.

Chapter 2

Choosing the right solution

Figure 1

No single technology leads across every metric, but medium-speed engines provide the **strongest overall balance** of performance

	Efficiency	Ramp up to full load	Unlimited stops/starts	Modular design	Heat tolerance	Altitude tolerance	Gas pressure	Water use	Natural gas CO_2 emissions	Carbon neutral fuels CO_2 emissions
MSE	50%	< 2 min	●	●	●	●	●	●	●	●
HSE	40%	< 2 min	●	●	●	●	●	●	●	●
AERO	40%	< 10 min	●	●	●	●	●	●	●	●
OCGT	40%	< 15 min	●	●	●	●	●	●	●	●
CCGT	55%	> 30 min	●	●	●	●	●	●	●	●

Note: Comparative performance of off-grid primary power solutions, illustrating the trade-offs across efficiency, flexibility, operational resilience, resource requirements and emissions. Efficiency values shown here are indicative rounded gross efficiency figures. Source: Wärtsilä analysis 2026.

2.1.

The emerging onsite primary power landscape

Gas-based technologies have emerged as the leading primary power technology option for off-grid data centres. Their selection reflects several characteristics well suited to data centre requirements, including the potential to bring capacity online more rapidly than through a new grid connection, modular scalability, and the ability to provide reliable, dispatchable power. Gas-based technologies can respond to changing load requirements and maintain continuous generation regardless of weather conditions. Their high power density helps minimise land requirements, an important consideration in major data centre markets where land availability is limited. Each of these gas-based primary power solutions presents different trade-offs across efficiency, flexibility, capital cost, land use, water consumption and other resource requirements.

Of the nearly 10 GW of data centre capacity using onsite power generation currently operating or under construction, the gas-based technologies selected include medium-speed engines (MSE), high-speed reciprocating gas engines (HSE), aeroderivative gas turbines (AERO), open-cycle gas turbines (OCGT), and combined-cycle gas turbines (CCGTs) [3]. Their key technical, economic and environmental performance metrics are summarised in Figure 1.

High-speed diesel generators, although widely deployed for standby power, are generally unsuitable for continuous primary power due to higher operating costs, local air emissions and associated permitting restrictions, shorter maintenance intervals, lower reliability under sustained baseload operation, and potential fuel supply challenges at large scale [4].

A range of emerging technologies have also been widely discussed as potential options for off-grid data centre power, including small modular reactors (SMRs), long-duration energy storage (LDES) and solid oxide fuel cells (SOFCs). However, these technologies have yet to achieve deployment at scale, reflecting constraints such as technology maturity, manufacturing capacity limitations, permitting and regulatory requirements, and technical limitations. They are therefore excluded from the comparative assessment in this study.

2.2.

Defining the right solution

To identify the optimal primary power solution for off-grid data centres, this study evaluates commercially available onsite primary power solutions against technical, economic and environmental criteria. The assessment considers representative AI data centres in Texas, US; Southern England, UK; and Victoria, Australia, capturing a range of climatic conditions, market environments and operating conditions that influence output derating, cooling requirements and water consumption.

Each power solution is paired with energy storage and designed to satisfy typical AI data centre reliability requirements. Energy generation capacity is sized to account for operating reserves, planned and unplanned maintenance and output derating under high ambient temperatures. Energy storage is sized to provide contingency reserves and the operational flexibility required to maintain uninterrupted supply during short-term load fluctuations and transient events. Sub-second disturbances are assumed to be managed by the uninterruptible power supply (UPS) system.

Operational performance and lifecycle costs are evaluated using PLEXOS® energy system modelling software over a 20-year assessment period with five-minute dispatch intervals. Energy storage requirements are assessed at one-second resolution. The analysis incorporates capital expenditure, fuel consumption, maintenance costs, water consumption, CO_2 emissions, site-specific operating conditions and representative AI training and inference load profiles. Data centres are assumed to utilise direct liquid cooling with air economisers and air-cooled chillers, with alternative scenarios assessing the potential benefits of waste heat recovery and absorption chillers.

Representative AI data centres

Case studies across key global markets. Designed to reflect local conditions, grid access constraints and market requirements.



Texas, US

400 MW
data centre capacity



Southern England, UK

150 MW
data centre capacity



Victoria, Australia

150 MW
data centre capacity



Chapter 3

Powering AI at scale

3.1.

Built for reliability

To meet data centre capacity and reliability requirements, onsite primary power solutions need to be designed to maintain continuous operation through planned and unplanned maintenance events, while accounting for output derating under high ambient temperatures. As shown in Figure 2, different technologies require significantly different levels of installed capacity to deliver the same level of reliable power.

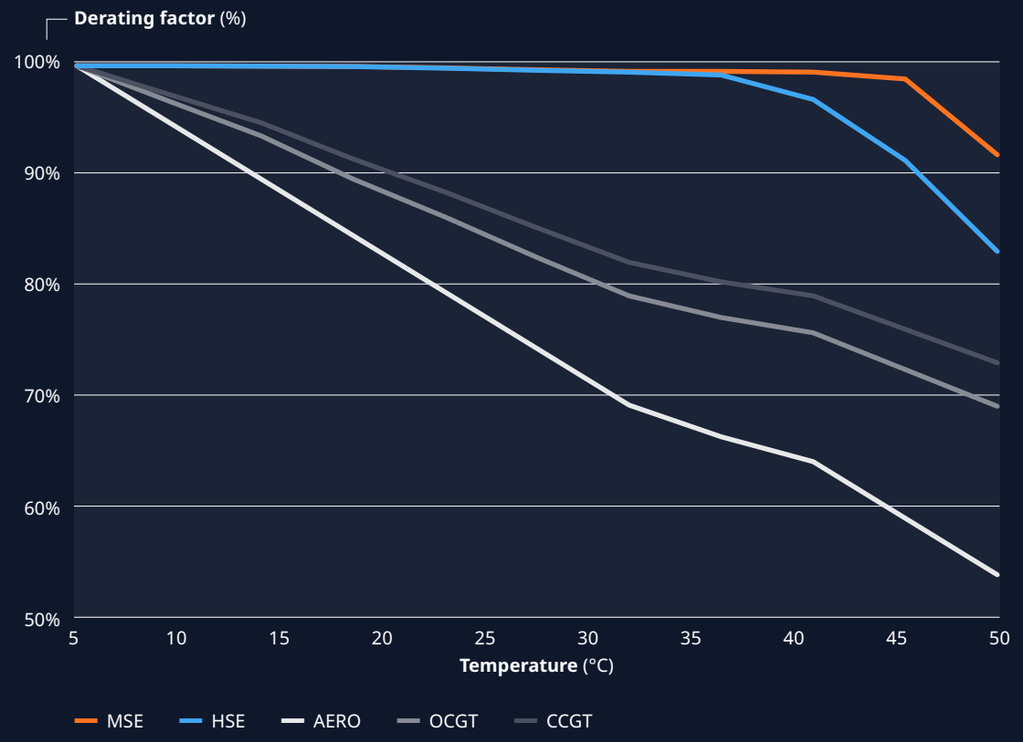
These differences in power solution sizing are driven by generation unit size, modularity, unit availability and reliability, ambient-temperature sensitivity and operational flexibility. Power solutions based on larger generating units generally require greater redundancy to cover the loss or maintenance of individual units, while technologies with higher temperature sensitivity require additional derating reserve in warmer climates. As a result, the largest redundancy levels are seen in solutions combining large unit sizes with greater ambient-temperature derating, increasing the total capacity required to reliably serve the data centre load.

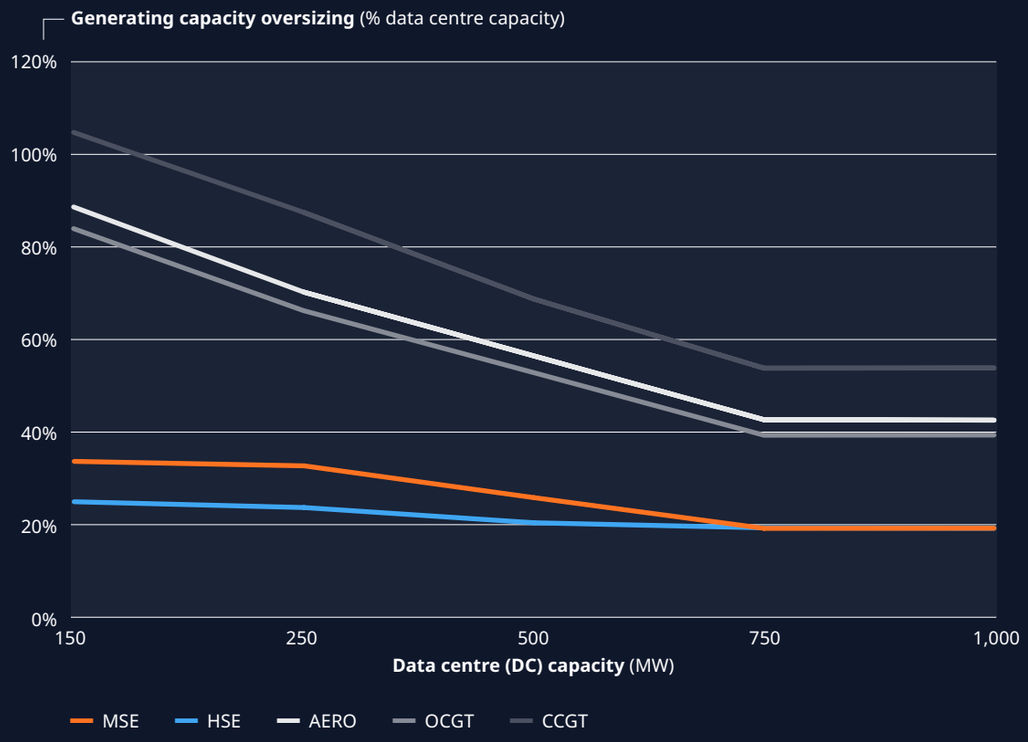
As shown in Figure 3, across the three case studies, **engine-based solutions require the lowest total installed capacity, with thermal redundancy requirements equivalent to approximately 20–30% of peak data centre demand**. The technology's combination of high availability, reliability and modular design allows installed capacity to be closely matched to peak load while maintaining sufficient redundancy for planned and unplanned maintenance. High-speed engines (HSE) benefit from relatively small unit sizes and a modular configuration. However, compared with medium-speed engine (MSE) solutions, high-speed engine solutions' shorter planned maintenance intervals and more frequent unplanned maintenance under continuous baseload operation require additional units to maintain adequate reserve capacity and plant availability.

Figure 2

Medium-speed engines **maintain output** at high temperatures with **less capacity** oversizing

Lower temperature derating and smaller redundancy requirements reduce the amount of additional capacity needed to ensure reliable operation.

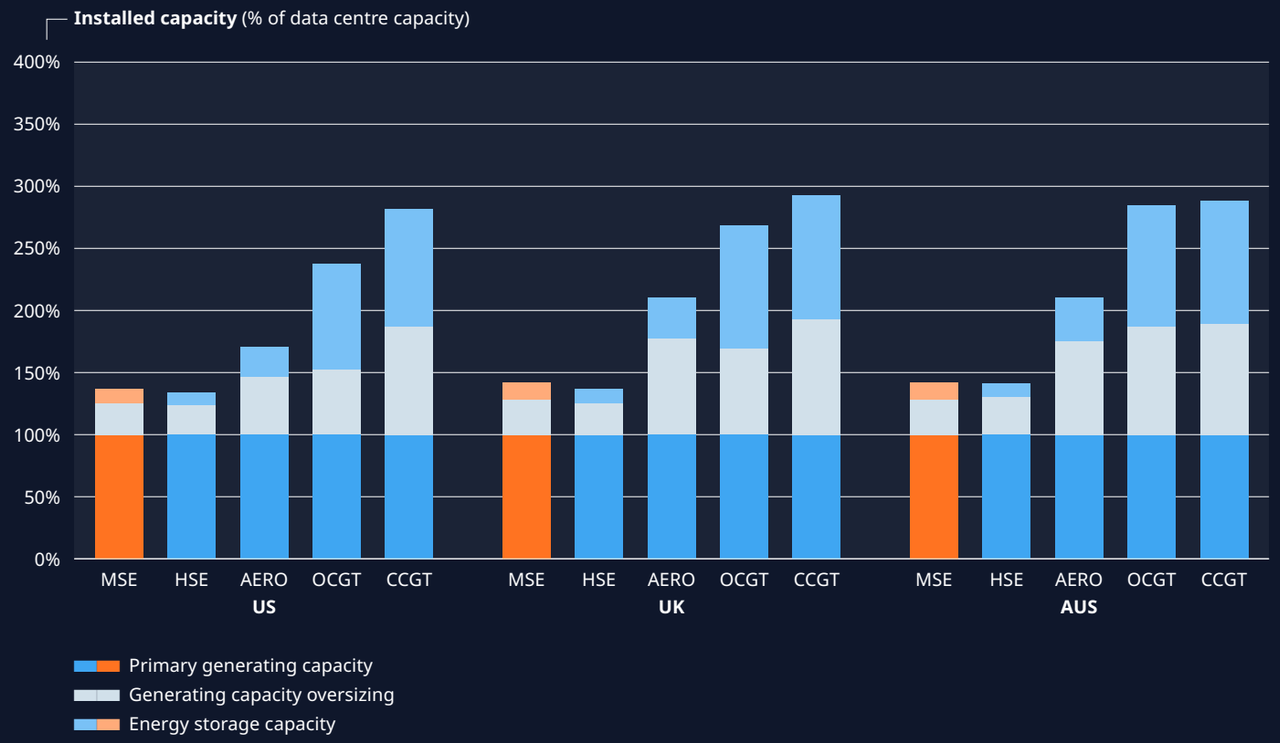




Note: The temperature derating factor represents the percentage of a unit's rated capacity that remains available after accounting for temperature-related reductions in capacity. It is expressed as a percentage relative to the unit's rated capacity at a reference temperature of 5°C. The thermal capacity oversizing requirements for different data centre sizes, as illustrated in the graph above, reflect the additional capacity needed to accommodate maintenance requirements and temperature-related derating, assuming a maximum ambient temperature of 38°C. Source: Wärtsilä analysis and modelling 2026.

Figure 3

Engine-based solutions require **significantly less installed capacity** to deliver the same reliable power output



Higher reliability, modularity and lower derating reduce both generating capacity oversizing requirements and energy storage needs.

Note: Installed capacity requirements are shown by primary power solution and market, expressed as a percentage of the data centre capacity. Generating capacity oversizing accounts for planned and unplanned maintenance, high-temperature derating, and excess capacity arising from unit sizing increments. Energy storage provides contingency reserves and flexibility to manage short-term load fluctuations and transients. Source: Wärtsilä analysis and modelling 2026.

Gas turbine technologies require substantially greater installed capacity to achieve the same level of reliability. Their larger unit sizes increase reserve requirements to protect against the loss of individual generating units, while their greater sensitivity to ambient temperature requires additional derating capacity in warmer climates. Combined-cycle gas turbines (CCGTs) therefore have the highest oversizing requirement of the technologies assessed, ranging from approximately 85–95% of data centre capacity across the three case studies.

These differences in installed capacity translate directly into material differences in capital investment. For the 400 MW Texas case study, medium-speed engines (MSEs) require approximately EUR 450 million less capital investment than combined-cycle gas turbines due to their lower generating capacity requirement. When the additional energy storage capacity needed to compensate for combined-cycle gas turbines' slower start-up and ramping performance is included, the total capital cost difference increases to approximately EUR 590 million.

The sizing analysis highlights an important consideration when comparing data centre power solutions. Capital costs expressed in EUR per kW of installed generation capacity can be misleading, as technologies with relatively competitive unit costs may require substantial oversizing and additional energy storage capacity to reliably serve the same data centre load. A more meaningful metric is therefore EUR per kW of data centre capacity, which reflects the total capital investment required to reliably supply one kilowatt of peak data centre demand. **On this basis, combined-cycle gas turbines required a 50% higher capital investment compared to medium-speed engines, despite the technologies being competitive on a EUR per kW capital cost basis.**

3.2.

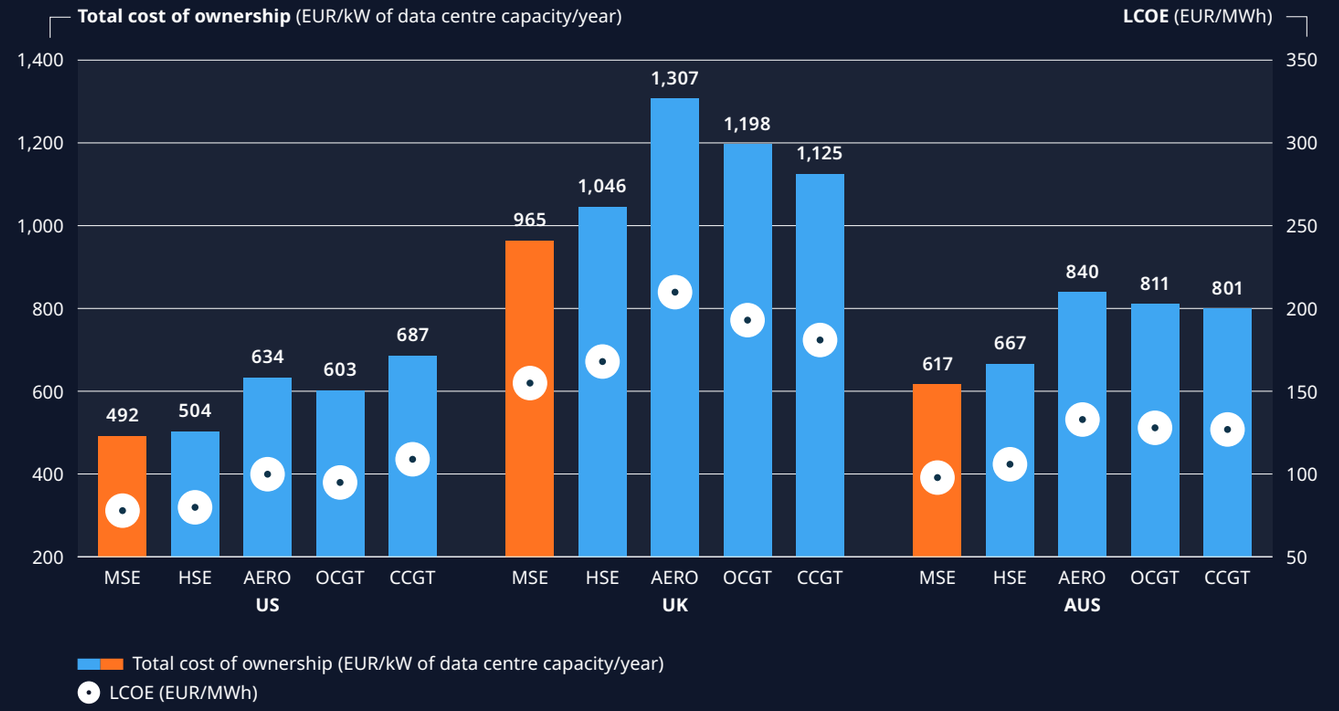
The economics of primary power

The differences in system sizing, capital investment, operating costs and fuel efficiency are reflected in the resulting levelised cost of electricity (LCOE) shown in Figure 4. Medium-speed engines consistently deliver the lowest LCOE across all three case studies, approximately 15–30% below the gas turbine technologies assessed. **This translates into annual cost savings of approximately EUR 110,000–340,000 per MW of data centre capacity served**. For the 400 MW Texas case study, medium-speed engines deliver more than EUR 78 million in annual savings compared with combined-cycle gas turbines (CCGTs). Despite relatively limited oversizing requirements, high-speed engines (HSEs) achieve a higher LCOE than medium-speed engines (MSEs) due to lower fuel efficiency and higher maintenance costs under continuous operation.

Differences between markets are primarily driven by project scale, ambient conditions, local fuel prices and carbon pricing. The resulting LCOEs can be compared against electricity prices for large power users. In Texas, the average industrial electricity price in 2025 was approximately EUR 59/MWh [5]. In the UK, very large non-domestic consumers paid approximately EUR 251/MWh, while in Victoria, electricity prices for large businesses were approximately EUR 121/MWh before network and other market charges [6,7]. These benchmarks indicate that onsite primary power can be cost-competitive in higher-priced electricity markets such as the UK and Victoria, while in Texas its economic case is more strongly supported by the value of speed-to-power and avoiding costly grid connection delays.

Figure 4

Medium-speed engines deliver **the lowest cost of ownership** across all markets assessed



Lower fuel costs, reduced oversizing requirements and lower maintenance costs translate into materially lower lifecycle costs.

Note: Total annual cost of ownership by primary power solution and market, expressed as EUR per kW of data center capacity per year, or alternatively, as LCOE (EUR per MWh of data centre demand). Source: Wärtsilä analysis and modelling 2026.

> Medium-speed engines achieve 15–30% lower LCOE than gas turbine technologies assessed.

3.3.

More power, less land

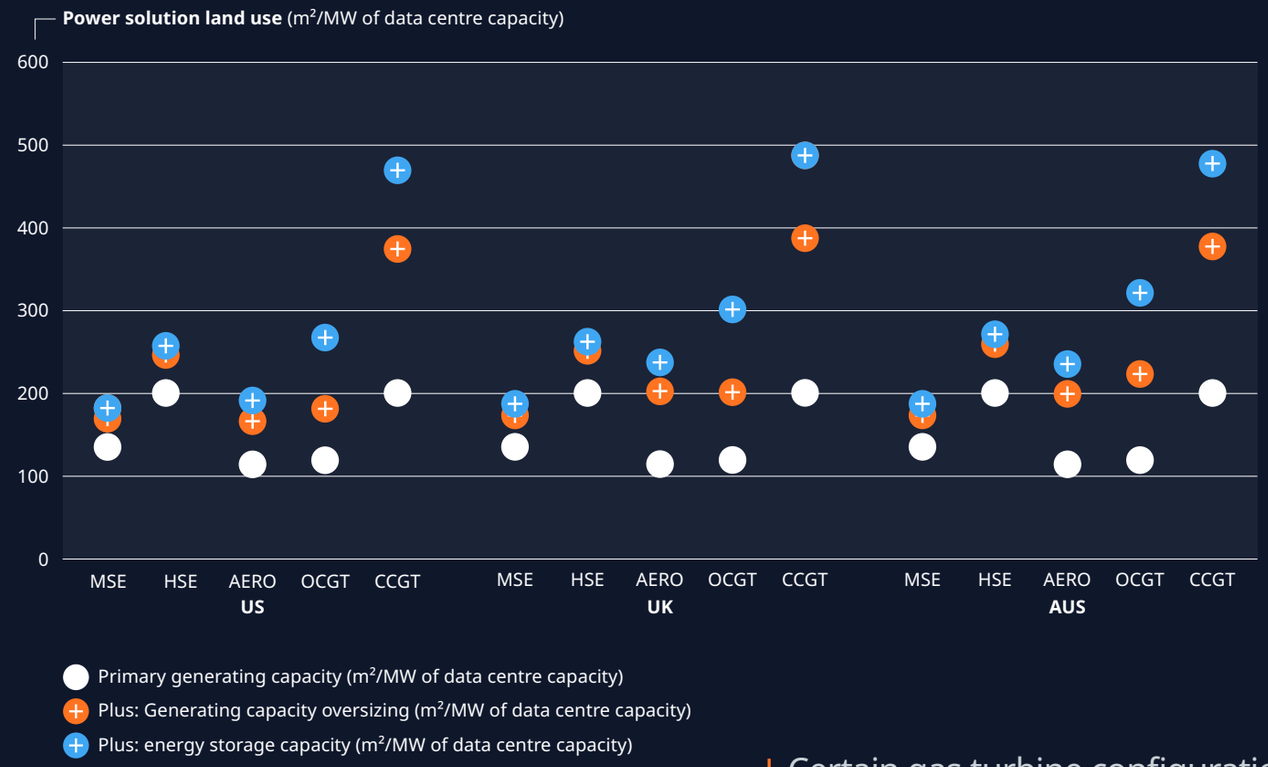
Land availability is an important constraint in many of the world's largest data centre markets, where suitable land is limited. As AI data centres increase in scale, developers are placing greater emphasis on power solutions that minimise land requirements.

As shown in Figure 5, land requirements vary significantly between the technologies assessed. Medium-speed engines (MSEs) have the lowest overall land requirement per MW of data centre capacity, reflecting their combination of high power density, modular unit sizes and limited capacity oversizing.

Some large gas turbines offer high power density at the individual unit level. However, this advantage can be offset by the additional generation and energy storage capacity required to meet redundancy and flexibility requirements. As a result, certain gas turbine configurations can require two and a half times more land than medium-speed engine (MSE) solutions to reliably supply a data centre of the same capacity. For example, a 400 MW data centre could require approximately 72,700 m^2 of land for a medium-speed engine (MSE) based power solution, compared with approximately 187,700 m^2 for a Combined-cycle gas turbine (CCGT) power plant.

Figure 5

Medium-speed engines require the **least land** across all markets assessed



Differences in generating capacity oversizing requirements and energy-storage needs significantly affect the total site footprint.

Note: Land use intensity by primary power solution and market, showing the average land footprint of each power generation technology component, expressed in square metres per MW of data centre capacity (m^2/MW of data centre capacity). Land footprint estimates are derived from satellite imagery analysis of a large sample of operational power plants of comparable scale. Source: Wärtsilä analysis, 2026

> Certain gas turbine configurations can require two and a half times more land than medium-speed engine solutions to reliably supply a data centre of the same capacity.

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3.4.

Water efficiency

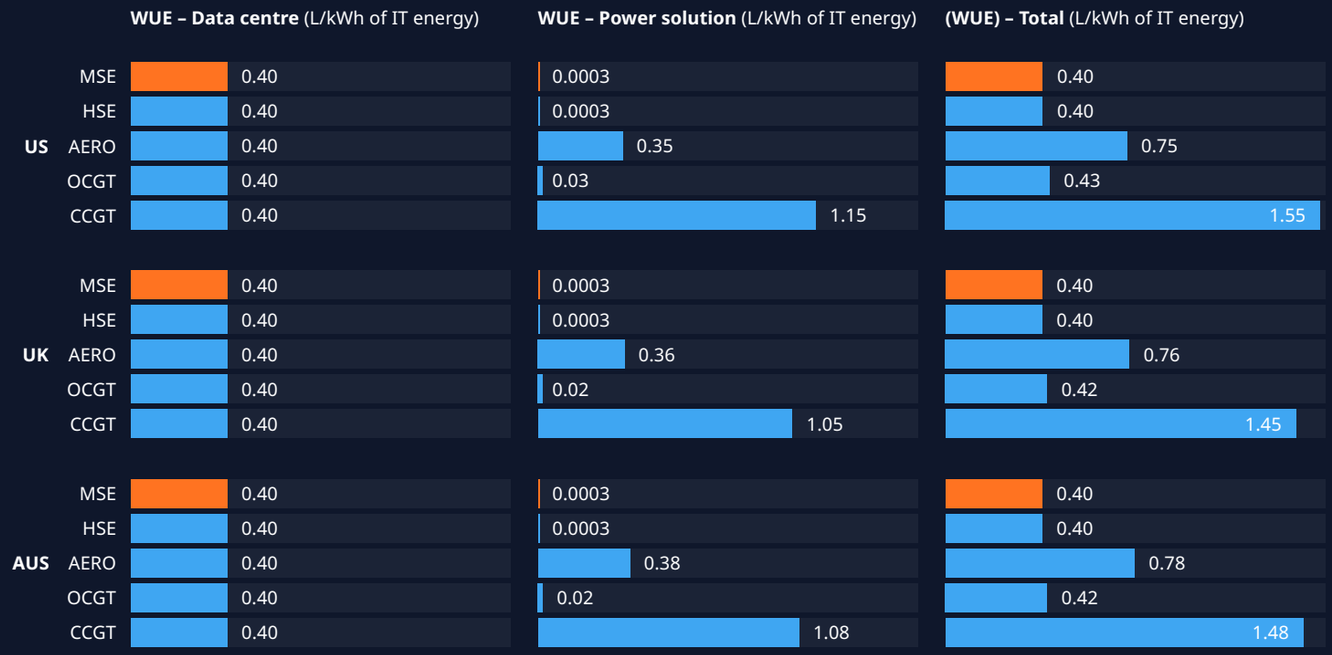
Alongside reliability and cost, water consumption is becoming an increasingly important consideration for data centres. Water availability is an inherently local concern and can influence permitting, community acceptance and site selection, particularly in water-stressed regions [8]. Developers are therefore placing greater emphasis on technologies that minimise operational water consumption, commonly assessed using Water Usage Effectiveness (WUE), which measures the amount of water consumed per kWh of data centre IT load served.

As shown in Figure 6, water consumption varies significantly between power solutions. Combined-cycle gas turbines (CCGTs) can require substantial water for steam-cycle operation and condenser cooling, while gas turbines operating in hot climates require inlet-air cooling to maintain output under high ambient temperatures. In contrast, engine technology uses closed-loop cooling systems with minimal water consumption, substantially reducing operational water requirements.

The modelling results demonstrate significant differences in water intensity between technologies. Engines consistently maintain very low operational water consumption across the three case studies. In the 400 MW Texas case, combined-cycle gas turbines (CCGTs) consume approximately 3,700 times more water than medium-speed engines, equivalent to more than 2.5 million m^3 per year. This is comparable to the annual household water consumption of approximately 5,500 US homes, illustrating the potential significance of technology choice in regions where water availability is constrained [9].

Figure 6

Engine technologies use the **least water** across all markets assessed



Note: Water consumption intensity (or Water Usage Effectiveness, WUE) of data centre and primary power solution across markets and technologies, expressed as litres per kWh of data centre IT energy served. Data centres are assumed to utilise direct liquid cooling with air economisers and air-cooled chillers, Source: Wärtsilä modelling and analysis 2026.

Technologies that rely on steam cycles or inlet-air cooling can dramatically increase water requirements in operation.

> In the 400 MW Texas case, combined-cycle gas turbines (CCGTs) consume approximately 3,700 times more water than medium-speed engines

3.5.

Managing emissions

Local air quality is an important planning and permitting consideration for onsite power generation, particularly for data centres developed near major population centres. Regulations typically limit pollutants such as nitrogen oxides (NO_x), sulfur oxides (SO_x), carbon monoxide (CO) and particulate matter (PM). Compared with diesel generation, natural gas combustion produces substantially lower particulate matter and sulphur oxide emissions [4]. With appropriate emission-control technologies, including selective catalytic reduction (SCR) and oxidation catalysts, all gas-based primary power solutions considered can be designed to meet applicable local air quality requirements.

Comparing the operational carbon dioxide (CO_2) emissions of the different technologies shows a wide range in generation carbon intensity. As shown in Figure 7, all technologies assessed have Carbon Usage Effectiveness (CUE) values of 0.42–0.67, with medium-speed engines and combined-cycle gas turbines (CCGTs) achieving the lowest levels due to their higher fuel efficiency.

3.6.

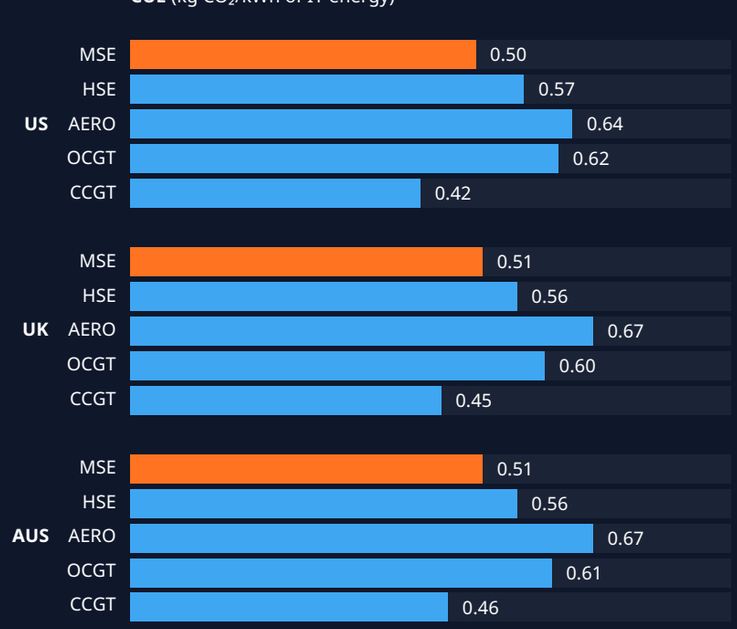
Mitigating noise

Managing noise emissions is another important consideration for permitting and community acceptance. As with local air emissions, compliance with noise limits depends less on the underlying generation technology than on the effectiveness of site-specific noise mitigation measures. Across major data centre markets, regulations typically require operational noise levels at nearby residential properties to remain within approximately 45–60 dBA, depending on location and time of day [10,11,12].

With established mitigation measures, all of the primary power solutions considered can be designed to meet applicable noise requirements. Performance can be further improved through measures such as acoustic enclosures, silencers, barriers and appropriate equipment layout. The 214 MW medium-speed engine power plant in Texas, US, demonstrates the effectiveness of such measures with independent acoustic modelling indicating noise levels of approximately 40–45 dBA just beyond the site's boundary, comparable to a quiet residential neighbourhood [13].

Figure 7

Higher-efficiency technologies **reduce CO_2 emissions** per unit of IT energy delivered



Fuel efficiency is the primary driver of operational carbon intensity across the technologies assessed.

Note: Carbon emission intensity (Carbon Usage Effectiveness, CUE) by primary power solution and market, expressed in kilograms of CO_2 per kilowatt-hour of IT energy delivered (kg CO_2/kWh). Regional differences in emission values reflect variations in the engine and gas turbine models deployed, as well as their respective efficiency levels. Wärtsilä modelling and analysis 2026.

Chapter 4

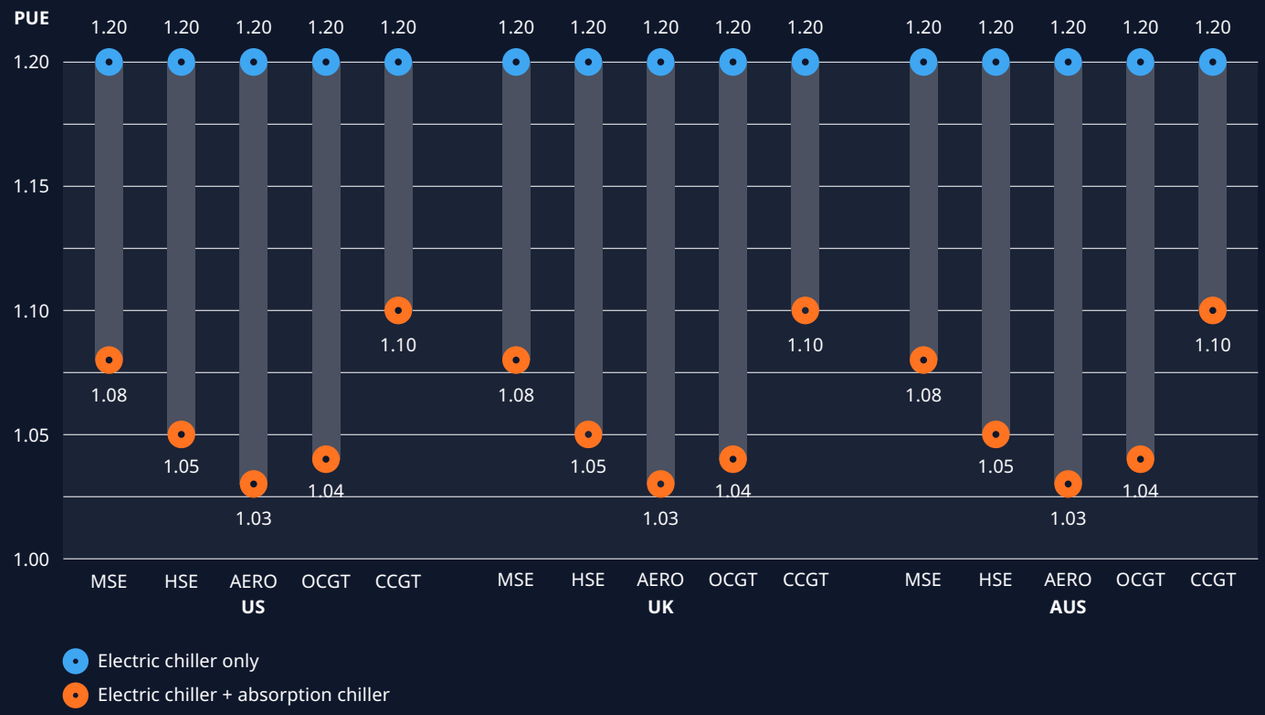
Waste heat to cooling

With data centre cooling typically accounting for the majority of non-IT electricity consumption, reducing cooling demand is a key focus for data centres seeking to improve Power Usage Effectiveness (PUE). One effective approach is to utilise waste heat from onsite power generation. Heat recovered from engine or turbine cooling systems and exhaust gases can be used to drive absorption chillers, reducing the electricity required for electrical cooling, lowering fuel consumption and operational emissions.

To assess this opportunity, an additional scenario was modelled in which recovered waste heat was used to supply absorption chillers alongside conventional air economisers and air-cooled chillers. As shown in Figure 8, **integrating absorption chillers improves PUE across all three case studies and technologies by reducing electrical cooling demand and, consequently, the amount of electricity that must be generated onsite**.

Figure 8

Waste-heat recovery consistently **improves** data centre energy **efficiency**



Using recovered heat to drive absorption chillers reduces electrical cooling demand across all technologies and markets assessed.

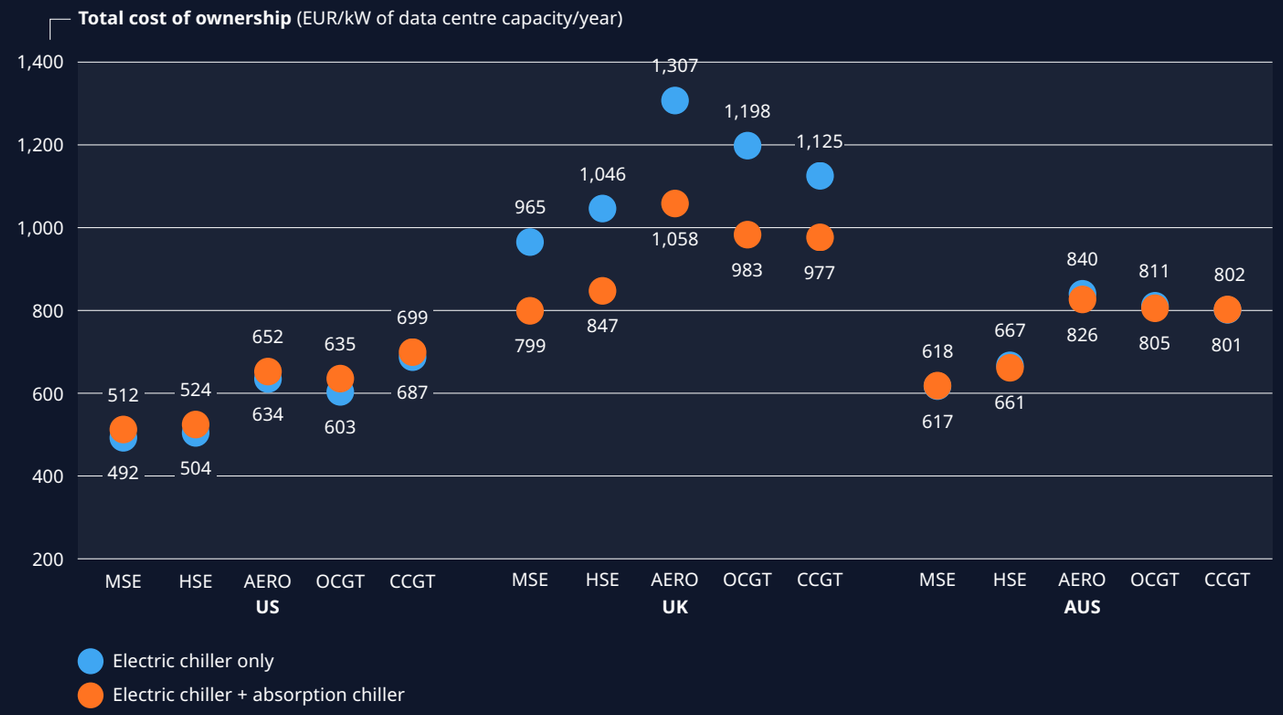
Note: PUE impact of absorption chiller integration by power solution and market. PUE values expressed as the ratio of total facility energy consumption to IT equipment energy consumption. Lower values indicate higher energy efficiency. Source: Wärtsilä modelling and analysis 2026.

As shown in Figure 9, the economic viability of absorption chillers varies considerably across regions, primarily due to differences in fuel prices and carbon taxes. In regions with relatively low fuel prices and no carbon taxes, the reductions in fuel consumption and variable operating costs achieved through absorption cooling are insufficient to offset the additional capital investment required. Conversely, in regions with higher fuel prices and carbon taxes, absorption cooling becomes more economically attractive, as the associated operating cost savings can outweigh the additional capital expenditure of absorption chillers, heat exchangers and associated heat-recovery equipment.

The results indicate that, on average across the power solutions assessed, integrating absorption chillers increases annual project costs by approximately EUR 8.2 million (3.5%) in Texas, US, while reducing costs by EUR 29.3 million (17.3%) in the UK and EUR 0.7 million (0.6%) in Victoria. These findings highlight the trade-off between the efficiency and environmental benefits of waste-heat-driven absorption cooling and its economic feasibility. Although absorption chillers can improve overall facility energy efficiency, reduce fuel consumption, and lower operational emissions, their cost-effectiveness remains highly dependent on regional energy prices, carbon taxation, and capital investment requirements. Their economic attractiveness could be further enhanced by reductions in absorption-chiller and heat-recovery system costs and policy incentives that increase the economic value of waste-heat utilisation.

Figure 9

The economics of waste-heat recovery **depend heavily** on local market conditions



Absorption chiller cooling lowers costs in some markets but increases them in others, reflecting differences in fuel prices and carbon costs.

Note: Change in total cost of ownership resulting from absorption chiller integration, by primary power solution and market, EUR per kW of data center capacity per year. Source: Wärtsilä modelling and analysis 2026.

Chapter 5

Conclusion

The results of this study demonstrate that medium-speed engines provide the strongest overall solution for off-grid AI data centres. Their modular design, high availability and reliability, and limited sensitivity to ambient conditions minimise generating capacity oversizing. Combined with their fast start-up and ramping capability, this also reduces energy storage requirements, lowering capital investment and land use.

These advantages translate into strong lifecycle economics. High fuel efficiency, competitive maintenance costs and efficient system sizing enable medium-speed engines to achieve **the lowest overall cost of electricity across the markets assessed**. Closed-loop cooling also enables very low operational water consumption, strengthening resource efficiency in water-constrained locations.

With appropriate mitigation, all gas-based technologies assessed in the study can meet applicable local air-emission and noise requirements. Waste heat recovery can further improve facility efficiency and reduce PUE through absorption chilling, although its economic attractiveness will depend on local conditions and policy support.

Overall, medium-speed engines emerge as the optimal solution for off-grid AI data centres, combining faster speed-to-power and lower total cost of ownership with reduced resource requirements, while delivering the reliability and operational flexibility needed to support rapidly scaling digital infrastructure.

References

1 McKinsey & Company, The data center dividend, 2025

2 CBRE, Global Data Center Trends, 2026

3 BloombergNEF, Data Centers Eye 114GW of On-Site Gas Amid Grid Delays, 2026

4 Better Data Center Project, Diesel Generators at Data Centers, 2026

5 U.S. Energy Information Administration, Electricity

6 Ofgem, State of the market report, 2026

7 Energy Australia, Pricing for large business customers – default rates (electricity)

8 AGU Advances, Data Centers Water Footprint: The Need for More Transparency, 2026

9 United States Environmental Protection Agency

10 UK Government, BS 4142 Noise Assessment Guidance, 2023

11 Environmental Protection Authority Victoria, Commerce, industry and trade noise guidelines, 2025

12 Fort Worth Texas, Noise Ordinance Update, 2024

13 Smartland Energy, Quiet, Efficient Power: A 214 MW RICE Plant Designed for Communities


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