



13 March 2025

## Tecogen: A Unique Solution to the Data Centre Power Crisis

Dear Investors

The explosive growth of data centres, fuelled by AI and cloud computing, is colliding with a constrained power grid. Traditional grid connections are facing significant delays due to a backlog of renewable energy projects seeking interconnection. This creates an opportunity for alternative power solutions, particularly those that offer both cost-effectiveness and rapid deployment. Tecogen Inc., with its unique gas-powered chiller technology and a strategic partnership with industry giant Vertiv, is well-positioned to capitalise on this growing demand. Tecogen's solution not only addresses power constraints but also offers potential cost advantages and increased operational flexibility for data centre operators.

### The Growing Data Centre Power Problem:

The United States is experiencing a surge in data centre construction. Driven by the demands of artificial intelligence (AI), cloud services, and other data-intensive applications, the need for computing power is outpacing the ability of the electrical grid to keep up. Bloom Energy's annual *Data Centre Power Report* highlighted this issue. They highlighted that the existing base of 25GW of data centres as of the end of 2024 is dwarfed by another 20GW of announced developments this year. They estimate that approximately 30% of all data centre sites are expected to use onsite power as their primary energy source.

This rapid expansion is exacerbated by a significant bottleneck: the interconnection queue for new power generation projects. The vast majority of these requests are from renewable energy sources (solar, wind, etc.), which are also experiencing rapid growth. The sheer volume of applications has created a substantial backlog, leading to multi-year delays for new data centres seeking grid connections. In some cases, data centres are receiving only a fraction of the power they request from utilities, significantly hindering their operational capacity.

### The Rise of On-Site Power Generation:

The limitations of grid access, combined with the urgent need for computing power, have forced data centre operators, including major "hyperscalers" (like Microsoft, Amazon, Google, etc.), to explore on-site power generation solutions. These solutions offer several advantages:

- **Speed of Deployment:** On-site generation can be implemented much faster than waiting for grid upgrades.
- **Control and Reliability:** Data centres gain greater control over their power supply, reducing dependence on the grid's reliability.
- **Cost Certainty:** Electricity from the grid can be procured for around \$0.05 per kilowatt hour (kWh). While often more expensive per kWh than grid power (at least initially), on-site solutions provide predictable energy costs, shielding operators from potential price fluctuations.

Examples of this trend include:

- **Microsoft's Nuclear Deal:** Microsoft's agreement to restart the Three Mile Island nuclear power generators (at an estimated \$0.15/kWh) demonstrates the lengths to which companies will go to secure power.
- **Mobile Gas Generation:** Hyperscalers are deploying mobile gas-powered generation solutions from companies like Solaris Energy Infrastructure and APR Energy, also at costs around \$0.15/kWh.



- **Bloom Energy's Fuel Cells:** Bloom Energy's deal with AEP (a major U.S. utility) to supply 1 GW of gas-powered fuel cells underscores the growing demand for this type of solution, even at a higher estimated cost of \$0.20/kWh (including maintenance).

### **The Cooling Challenge: NVIDIA's Blackwell and the Need for Liquid Cooling**

The problem of data centre energy consumption is about to get even more pressing. The release of NVIDIA's latest generation of Blackwell chips is revolutionising high-performance computing. These chips offer significantly improved efficiency due to their ability to be packed more densely within server racks. Shorter distances between chips facilitate faster communication and data processing, potentially leading to a tenfold increase in efficiency.

However, this increased density generates significantly more heat. To prevent damage and ensure reliable operation, these next-generation data centres *must* employ advanced cooling solutions, including liquid cooling alongside traditional air conditioning. Cooling is a major component of a data centre's operating expenses; SemiAnalysis, an independent research company specialising in the Semiconductor and AI industries, estimates it accounts for roughly 30% of the total electricity bill. This is a critical consideration that has increased the demand for more efficient cooling solutions.

### **Tecogen's Unique Value Proposition: Gas-Powered Chilling**

Tecogen offers a compelling solution to both the power constraint and the cooling challenge: a gas-powered chiller system. While traditionally used in multi-family residential buildings, this technology has direct applicability to data centres.

Here's how it works and why it's significant:

- **Dual Functionality:** Tecogen's chillers provide both cooling (essential for maintaining optimal server temperatures) *and* electricity generation.
- **Lower Cost Power:** Tecogen's system generates electricity at an estimated cost of around \$0.12/kWh, significantly lower than many other on-site generation alternatives currently being deployed.
- **Reduced Grid Dependence:** By generating power on-site for cooling, Tecogen reduces the overall electricity demand placed on the grid. This can be crucial in situations where a data centre cannot secure its full power allocation from the utility. It allows a datacentre to operate closer to its full computing capacity.
- **Government-Backed Technology:** Tecogen's chiller technology originated from a U.S. government-funded research project. Of three companies selected, Tecogen was the only one to successfully develop a viable gas-powered chiller, suggesting a significant technological advantage and barrier to entry for competitors.
- **Fuel Flexibility:** Tecogen's "Hybrid-Drive" product can operate on either natural gas or electricity. This provides valuable optionality, allowing data centres to switch between power sources based on price and availability. This will help facilitate the sale of peak power.

### **Maximising Revenue in Co-location Data Centres**

Tecogen's solution offers a further advantage for co-location data centres (facilities that lease space and power to multiple clients). By increasing the total available power capacity (through on-site generation), Tecogen enables these facilities to sell more computing power.

Crucially, data centre compute power usage is often uneven throughout the day. There are peak periods of high demand. By providing a reliable and cost-effective source of on-site power, Tecogen allows co-location



providers to confidently sell peak power at premium prices. Major co-location providers like Equinix, Digital Realty, and NextDC reportedly sell electricity at an average of around \$0.35/kWh. Given Tecogen's estimated generation cost of \$0.12/kWh, this represents a substantial profit margin opportunity during peak demand periods.

### **Proven Technology and Existing Deployments**

Tecogen's technology is not theoretical; it's proven in real-world applications. The company's chillers are already operational in a Northeast data centre and numerous apartment complexes across the U.S. A significant current project is the installation of Tecogen's system at the Las Vegas Convention Centre, demonstrating its scalability and applicability to large, power-intensive facilities.

### **The Vertiv Partnership: Solving the Distribution Challenge**

A key historical challenge for Tecogen, a relatively small company, has been marketing and distribution. How could it effectively reach the vast and rapidly growing data centre market?

The answer came recently in the form of a strategic distribution agreement with Vertiv (VRT), a global leader in data centre infrastructure solutions. Vertiv generates approximately \$8 billion in annual revenue and provides thermal management systems (including liquid cooling) for roughly one-third of data centres worldwide. This partnership is a game-changer for Tecogen.

### **Why Vertiv Chose Tecogen:**

- **Unique Technology:** As previously discussed, Tecogen's gas-powered chiller appears to be a unique offering in the market. This suggests that Vertiv recognised the difficulty of replicating the technology in-house.
- **Addressing a Critical Need:** Vertiv's [press release](#) explicitly highlights the collaboration's goal of addressing power constraints and enabling the deployment of AI at scale. This underscores the urgency of the problem Tecogen is solving.

### **Key Terms of the Vertiv Agreement:**

Tecogen's decision to publicly release the agreement highlights management's transparency. In our past discussions with management, we've found them to be competent, transparent and ethically principled.

Key terms of the agreement include:

- **Exclusive Distribution (Ex-US):** Vertiv has exclusive rights to sell Tecogen's chillers to data centres worldwide, excluding the United States.
- **Potential US Exclusivity:** If Vertiv achieves sufficient sales volume in the U.S., the exclusivity can extend to the American market.
- **Volume Discounts:** The agreement includes volume-based discounts, incentivising Vertiv to maximise sales.
- **Service Revenue:** Tecogen retains the revenue stream from servicing the installed units.
- **Potential Manufacturing Collaboration:** The agreement contemplates the possibility of Vertiv manufacturing the chillers if demand exceeds Tecogen's capacity, with Tecogen receiving royalties.
- **Minimum Sales and Marketing Commitment:** Vertiv is obligated to meet minimum sales targets and invest in a significant marketing budget to promote the product.



- **Potential Cost Savings:** Vertiv has agreed to assist Tecogen in sourcing components at more favourable terms, potentially improving margins.

This partnership effectively resolves Tecogen's distribution hurdle, providing access to Vertiv's extensive global sales network and established relationships within the data centre industry. We couldn't think of a better distribution partner in the industry than Vertiv.

### Valuation and Investment Thesis

Tecogen currently trades at a market capitalisation of approximately \$55 million. Based on the scale of the Las Vegas Convention Centre project, supplying a single medium-sized data centre could potentially double Tecogen's current revenue. With a gross margin of around 45%, this could translate to roughly \$5 million in additional profit.

The potential market is vast. There are currently around 5,500 data centres in the U.S., and Bloom Energy projects this number to grow to 10,000 within the next five years.

The investment thesis can effectively be summarised based on the following:

- **Significant Upside:** If Tecogen can secure contracts for just two data centres, its valuation could reasonably be expected to rise to around \$200 million, comparable to TSS Inc.
- **Exponential Growth Potential:** Wider adoption of Tecogen's solution could lead to substantially higher valuations.
- **Insider Ownership and Confidence:** Company directors, who already own approximately 45% of the company, have been increasing their stakes, demonstrating their belief in the company's prospects.

### Risks

While the potential rewards are substantial, it's important to acknowledge the risks:

- **Execution Risk:** Tecogen and Vertiv must successfully execute their partnership and effectively market the product.
- **Competition:** While Tecogen's technology appears unique, there is always a risk that new solutions or competitors could emerge.
- **Technology Adoption:** The rate of data centre adoption of gas-powered chilling solutions is uncertain.
- **Gas Price Volatility:** Fluctuations in natural gas prices could impact the cost-effectiveness of Tecogen's solution.
- **Regulatory Changes:** Changes to environmental regulations or energy policy could impact the viability of gas-powered solutions.

### Conclusion

We believe Tecogen Inc. presents a compelling investment opportunity in the rapidly expanding data centre market. The company's unique gas-powered chiller technology, coupled with the strategic Vertiv partnership, positions it to address the critical power constraints and cooling challenges facing the industry.

As the data centre buildout continues at a feverish pace, and as AI proliferates across industries, the imperative for efficient and reliable cooling will only intensify. With proven technology, strong gross margins, and a capital-light distribution model, Tecogen's upside potential appears substantial, while the growing global demand for cost-effective onsite power solutions limits its downside. While risks exist, we see Tecogen as a unique and



underrecognized beneficiary of the data centre sector's energy challenges – one that could see swift revaluation with just a few successful project wins.

Kind Regards,  
Fawkes Capital Management

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