ECONOMIC STATEMENT: CASE FOR AQUA FLOW ENERGY (AFE) INVESTMENT

Target Sector: Global Data Centre Infrastructure Power needs
Core Objective: To secure 24/7 carbon-free baseload power at a Levelized Cost of Energy (LCOE) significantly lower than grid or diesel alternatives.

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1. The 24/7 Baseload Crisis

The global data centre market, comprising approximately **12,000 facilities**, faces a critical energy bottleneck [40, user query]. Modern facilities require an average of **1.5 MW per hour of constant, uninterrupted power**, resulting in annual electricity expenditures of approximately **AU $4.5 million per location**.

As AI scaling continues to accelerate, energy consumption is projected to double or triple by 2028. Unlike intermittent solar or wind, the server rack has "zero tolerance for downtime," which can lead to catastrophic hardware failure and financial loss.

2. The Physics of High-Density Power

AFE leverages the fundamental physical advantage of water, which is **814 times denser than air** at sea level. This density allows AFE units to be **800 times smaller** than wind turbines while generating equivalent power.

- **Space Efficiency:** A 1 MW AFE unit (the "Hull") has a driving area of roughly **10 square meters**, compared to roughly **30 square meters** for a similar wind machine.
- **Predictability:** Unlike fluky urban wind, river and tidal flows are **100% predictable by timing, speed, and direction**, providing the constant baseload power "machine brains" require.

3. Financial Breakdown: AFE vs. The Grid

Investing in AFE units allows Data Centres to transition from high-cost, volatile grid energy to a stable, low-cost internal supply.

Metric	Grid/Market Rate (AEMO)	Aqua Flow Energy (AFE)
LCOE per MWh	**$60.00 – $150.00**	**$75.00**
Capital Expenditure (CapEx)	**$1-2.5 million per MW**	**$1,000,000 per 1 MW unit**
Annual Maintenance	Variable/Rising	**$50,000 per unit**
Operating Margin	N/A	**Estimated $37+ per MWh**

*Calculated ROI: At $*50.00*/MWh, a 1MW unit generates a profit of approximately $300,000 per year*, or at least **50% ROI** for AFE.

4. Operational Efficiency and Proximity

Data centres are strategically clustered near major rivers for cooling and urban proximity. By deploying AFE units on existing infrastructure, such as **bridge pylons**, generation occurs exactly where it is consumed.

- **Eliminating Leakage:** Generating power on-site eliminates the standard **15% transmission loss** associated with long-distance cabling.
- **Infrastructure Synergy:** AFE units are non-consumptive and "roll with the water," meaning they do not evaporate or alter the flow needed for a data centre's

cooling systems.

5. "Podular" Maintenance and Uptime
To ensure the **maximum uptime** required by infrastructure, AFE utilizes a **"Podular" design**.

- **Rapid Interchangeability:** During servicing, the generator pod is simply lifted out and replaced with a fresh one, allowing for quick, safe maintenance in a factory environment rather than hazardous underwater conditions.
- **Rugged Simplicity:** With essentially one moving part (the central shaft) and off-the-shelf heavy-duty components, the system is designed for **long-term exposure** with 6-monthly service intervals.

6. Conclusion: Securing Your Infrastructure's Future
With a **Serviceable Obtainable Market (SOM) exceeding AU $1 billion in Australia** and a global market at least 100 times larger, AFE represents the most cost-effective path to carbon neutrality for the data revolution. By investing in AFE, data centres can decouple from volatile fossil fuel markets, bypass grid bottlenecks, and secure the 24/7 reliability vital for the future of "machine brains".