Business Case Study: Global Energy Optimisation & Decarbonization Strategy

1. Executive Summary

57,389 MWh Energy Consumption	11,215 tCO_2 emissions	$5.8M CAPEX*	$600k Total savings*	$5.5M 10-year NPV

*Savings are calculated net of inflation over a 4-year period

This business case study assesses global energy consumption, carbon emissions, and operational optimisation opportunities across facilities belonging to an international company operating in the power generation and distribution industry. The analysis is based on comprehensive site audits conducted by Watts-ON Consultants.

Across the key audited global sites, total facility energy consumption currently reaches **57,389 MWh per year**, resulting in approximately **11,215 tCO_2 of annual emissions** and an estimated annual energy cost of **$6,203,991**.

Maintaining the status quo under a **"Do Nothing" scenario** would expose the business to significant financial risk, with cumulative energy cost inflation estimated to reach approximately **$1.4 million by 2029**.

To address these challenges, a comprehensive multi-pillar energy optimisation programme requiring an estimated **CAPEX investment of $5.8 million** has been developed. This CAPEX does not include projects identified by the site teams at the time of the energy audit whose savings have been included in the future company energy consumption projections. The proposed interventions are expected to deliver a **21% reduction in total energy consumption**, equivalent to approximately **12,000 MWh of annual savings**, together with a **20% reduction in carbon emissions**, reducing annual carbon output to approximately **9,013 tCO_2**.

The programme is expected to deliver a **10% reduction in total annual energy costs**, generating approximately **$600,000 in net annual savings** after accounting for an assumed **3% annual energy price inflation** over the four-year evaluation period.

From a financial perspective, the programme provides an estimated **simple payback period of 4.2 years** and a **10-year Net Present Value (NPV) of $5.5 million**, based on a **3% discount rate** and **3% annual energy price inflation**.

21% Energy Reduction	20% CO_2 Reduction	4.2-year Payback

2. Data, Digital Assessment & Methodology

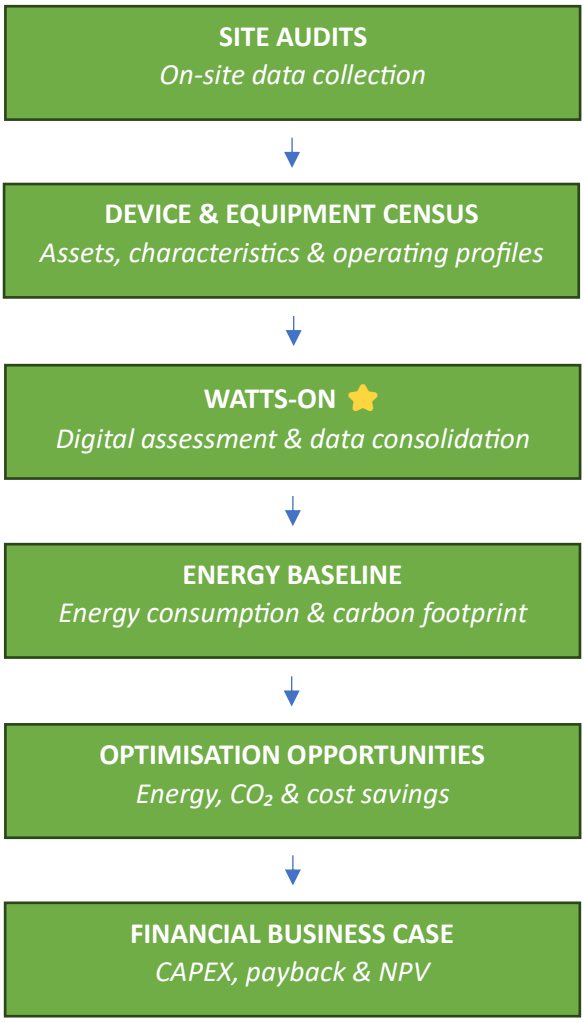
The energy, operational and optimisation assessments presented in this business case were supported by **Watts-ON**, the energy management and optimisation software platform developed by **Watts-ON Consultants**.

Watts-ON was used to structure and consolidate the data collected during the site audit programme, including the **census of energy-consuming devices and equipment**, their operating characteristics, usage profiles and relevant technical parameters.

The platform was also used to support the development of the **energy consumption baseline**, the identification and quantification of major energy-consuming assets, and the assessment of potential optimisation measures. Consumption estimates, energy-saving calculations, carbon impact assessments and the financial evaluation of the proposed interventions were derived from the data collected and processed through the Watts-ON platform.

This approach provides a consistent, centralised and traceable methodology for comparing facilities, identifying energy-saving opportunities and quantifying the potential impact of individual interventions. It also establishes a digital foundation that can be maintained and progressively updated as additional metering, operational and performance data become available.

The combination of **on-site engineering audits, detailed equipment inventories and digital analysis through Watts-ON** enables the recommendations presented in this case study to be grounded in the actual operating characteristics of the audited facilities rather than relying solely on generic industry benchmarks or high-level assumptions.



3. Global Footprint & Baseline Analysis

Facility energy and carbon profiles vary significantly depending on building function, local climate conditions and the presence of energy-intensive equipment, including heavy-equipment testing facilities.

The audit campaign conducted by Watts-ON Consultants identified several operational and data-management challenges, including inconsistent consumption data tracking, limited sub-metering coverage and incomplete engineering inventories.

The assessment also identified significant consumption drivers associated with facilities performing large-equipment testing, together with widespread **24/7/7 operating schedules** that, in several cases, were used by only a very small proportion of facility staff.

The optimisation programme is structured around a series of complementary measures designed to address both operational inefficiencies and longer-term infrastructure opportunities.

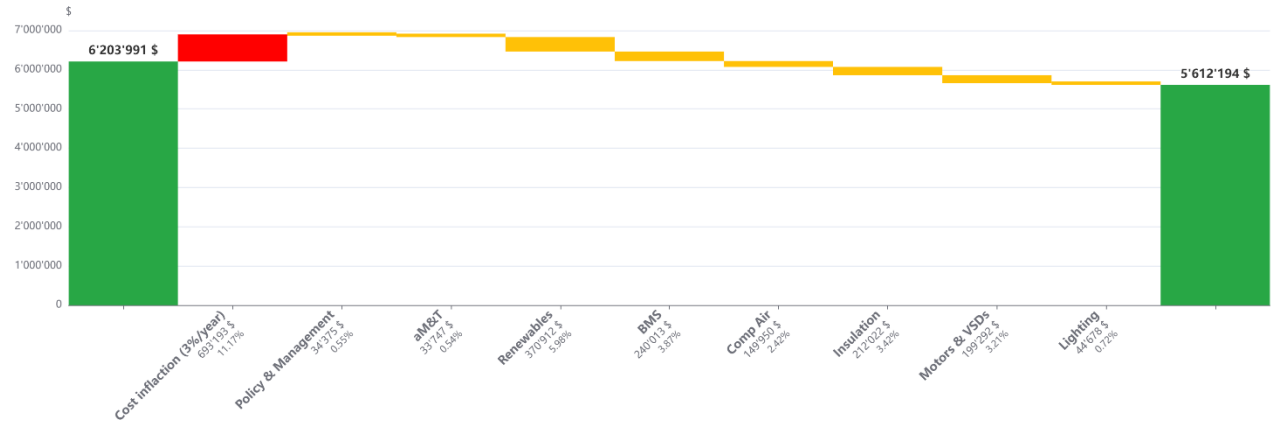


Figure 1 - Annual energy cost reduction potential by optimisation measure.

Operational policy changes are expected to deliver a **0.92% reduction in MWh consumption** and a **0.94% reduction in tCO_2 emissions**, generating approximately **$34,375 in annual savings**. Key actions include eliminating unnecessary 24/7/7 operating schedules, enforcing appropriate internal temperature setpoints, isolating unused operational zones and implementing standardised switch-off protocols.

Deployment of **Automatic Monitoring, Metering & Targeting (aM&T)** systems across key sites is expected to enable a **0.67% reduction in MWh consumption** and a **0.84% reduction in tCO_2 emissions**, corresponding to approximately **$33,747 in annual savings**. The measure is supported by centralised metering, improved energy visibility and dedicated energy management oversight.

Building Management System (BMS) optimisation represents a significant opportunity, delivering an estimated **4.52% reduction in MWh consumption** and a **3.75% reduction in tCO_2 emissions**, equivalent to approximately **$240,013 in annual savings**. The proposed actions include correcting legacy operating schedules, eliminating simultaneous heating and cooling, recommissioning PID control loops and implementing Fault Detection & Diagnostics (FDD).

Compressed air optimisation is expected to reduce energy consumption by **1.95%** and carbon emissions by **2.04%**, generating approximately **$149,950 in annual savings**. Key measures include replacing fixed-speed compressors with Variable Speed Drive (VSD) units, transitioning towards satellite compressed-air systems where appropriate, repairing air leaks, reducing header pressure and recovering waste heat.

Heating and insulation improvements are expected to deliver a **4.22% reduction in MWh consumption** and a **4.49% reduction in tCO_2 emissions**, corresponding to approximately **$212,022 in annual savings**.

Opportunities include insulation upgrades to boilers, pipework, rooftop units and building envelopes, complemented by the deployment of solar-control window films where appropriate.

Motor and VSD retrofits are expected to provide a **2.84% reduction in MWh consumption** and a **2.19% reduction in tCO_2 emissions**, generating approximately **$199,292 in annual savings**. The programme includes the replacement of legacy motors and the optimisation of fans and pumps through the application of affinity laws and appropriate variable-speed control.

Lighting upgrades are expected to deliver a **0.65% reduction in MWh consumption** and a **0.78% reduction in tCO_2 emissions**, equivalent to approximately **$44,678 in annual savings**. The proposed programme focuses on migration to high-efficiency LED lighting, supported by daylight harvesting and occupancy-based controls.

Finally, the expansion of **rooftop Solar PV installations** represents one of the largest individual opportunities identified, delivering an estimated **5.17% reduction in MWh consumption** and a **4.60% reduction in tCO_2 emissions**, while generating approximately **$370,912 in annual energy cost savings**.

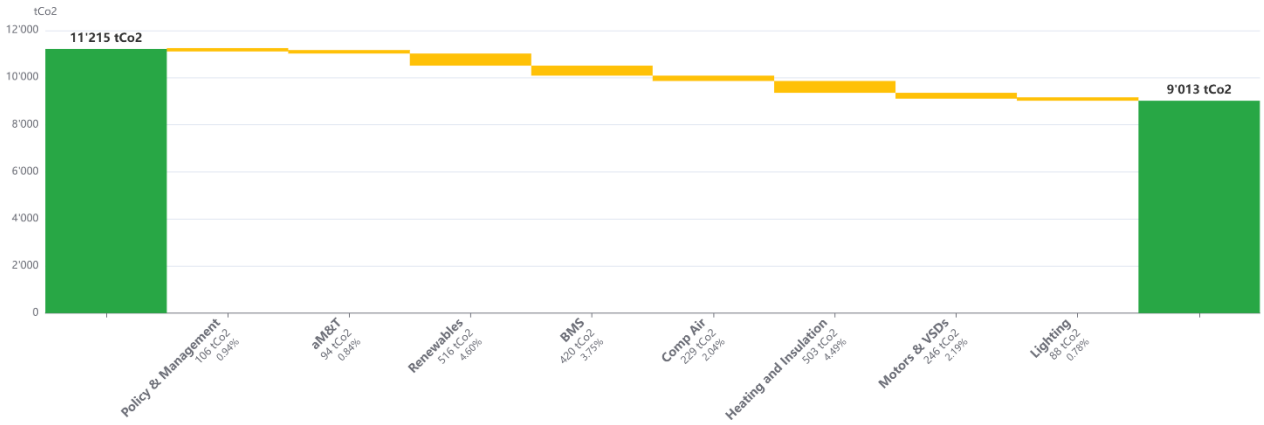


Figure 2 - Contribution of optimisation measures to annual CO_2 emissions reduction.

4. Financial Impact & Investment Case

While the identified optimisation measures require an upfront investment, maintaining the current operating model exposes the business to increasing energy costs over time. The "Do Nothing" scenario provides a reference case against which the financial impact of the proposed programme can be assessed.

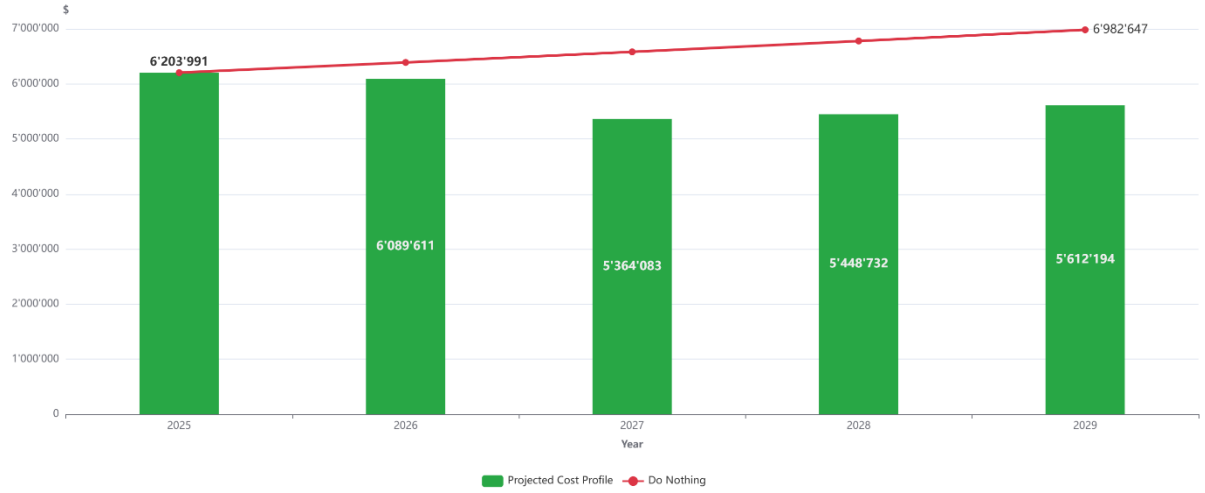


Figure 3 – Utility running cost projection assuming an annual energy inflation rate of 3%.

5. Recommendations

To systematically capture the **$5.5 million NPV opportunity** and support the company's long-term decarbonisation objectives across its global operations, a clear governance framework and centralised energy management approach should be established.

First, the client should appoint a dedicated **Global Energy & Decarbonization Lead** within the central management team. This role should be responsible for overseeing programme performance, validating results, enforcing global execution standards and maintaining central energy data governance.

Second, the company should allocate approximately **2.5 person-years of external expert support** to work alongside internal facility teams. This support would assist with project prioritisation, detailed technical design reviews, implementation oversight and continuous **Measurement & Verification (M&V)** activities.

Third, establishing a **standardised enterprise-wide digital energy database** is critical to maintaining long-term operational visibility. The platform should provide a consistent structure for collecting and managing energy data, sharing best practices across business units and reducing the historical friction associated with manual data collection and fragmented information sources. The Watts-ON platform can provide the digital foundation for this approach, supporting the continued evolution of the energy management programme beyond the initial audit phase.

Finally, capital investment and specialist resources should be prioritised towards **high-impact and technically complex manufacturing and testing locations**, while performance benchmarks and best practices from high-performing sites should be leveraged across the wider global portfolio.

Taken together, these actions provide the governance, digital infrastructure and technical capability required to translate the identified energy-saving opportunities into measurable and sustained financial, operational and decarbonisation benefits.

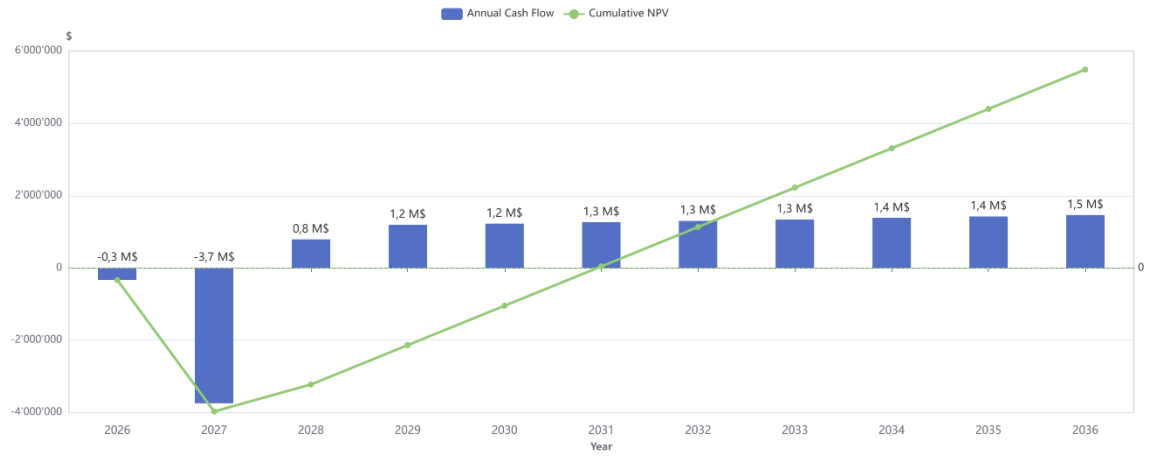


Figure 4 - 10-year NPV profile of the proposed energy optimisation programme, highlighting the positive financial value generated over the investment horizon after accounting for CAPEX, energy savings, inflation and the 3% discount rate.