Energise

DCKV System

MEASUREMENT & VERIFICATION

Prepared for:

S&S Northern Ltd

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Qualified for Energy Technology List™

ASSESSMENT

SCOPE OF ASSESSMENT

Equipment/site assessed & Expected results

Assessment is undertaken on a variable speed kitchen ventilation installation. Sub-metering was installed to support the analysis for the specific loads. Demand Control Kitchen Ventilation is a regular energy efficiency measure in commercial kitchens and can reduce energy consumption and costs significantly.

In this particular case, the modelled consumed was proposed to be lowered by 39.8% as an expected result based on a food service that operates with the below published hours:

Food served	
Friday	11:30am - 9:45pm
Saturday	11:30am - 9:45pm
Sunday	11:30am - 9:45pm
Monday	11:30am - 9:45pm
Tuesday	11:30am - 9:45pm
Wednesday	11:30am - 9:45pm
Thursday	11:30am - 9:45pm

Within a Commercial kitchen the extraction of waste heat and other requirements for air flow (e.g. to remove odours, fumes and combustion products) creates a significant demand for energy.

The expected energy saving (extrapolated to a 12-month period) was 6,795 kWh

RESULTS OF ASSESSMENT

Actual measurement

The assessment was conducted using a combination of specialist equipment leased short term from Elcomponent (a three-phase power logger) and the existing electrical monitoring equipment in place at the site which monitors energy consumption on a half hourly basis. Despite following manufacturer instructions, there was some data corruption from the Elcomponent data. Energise have followed the steps outlined in ISO50044 to complete the assessment and used modelling and other available data sources (including the existing monitoring at the site) to provide an assessment of the benefit of the actions undertaken. The structure of the ISO50044 requirements is listed below followed by a summary statement of the outcomes.

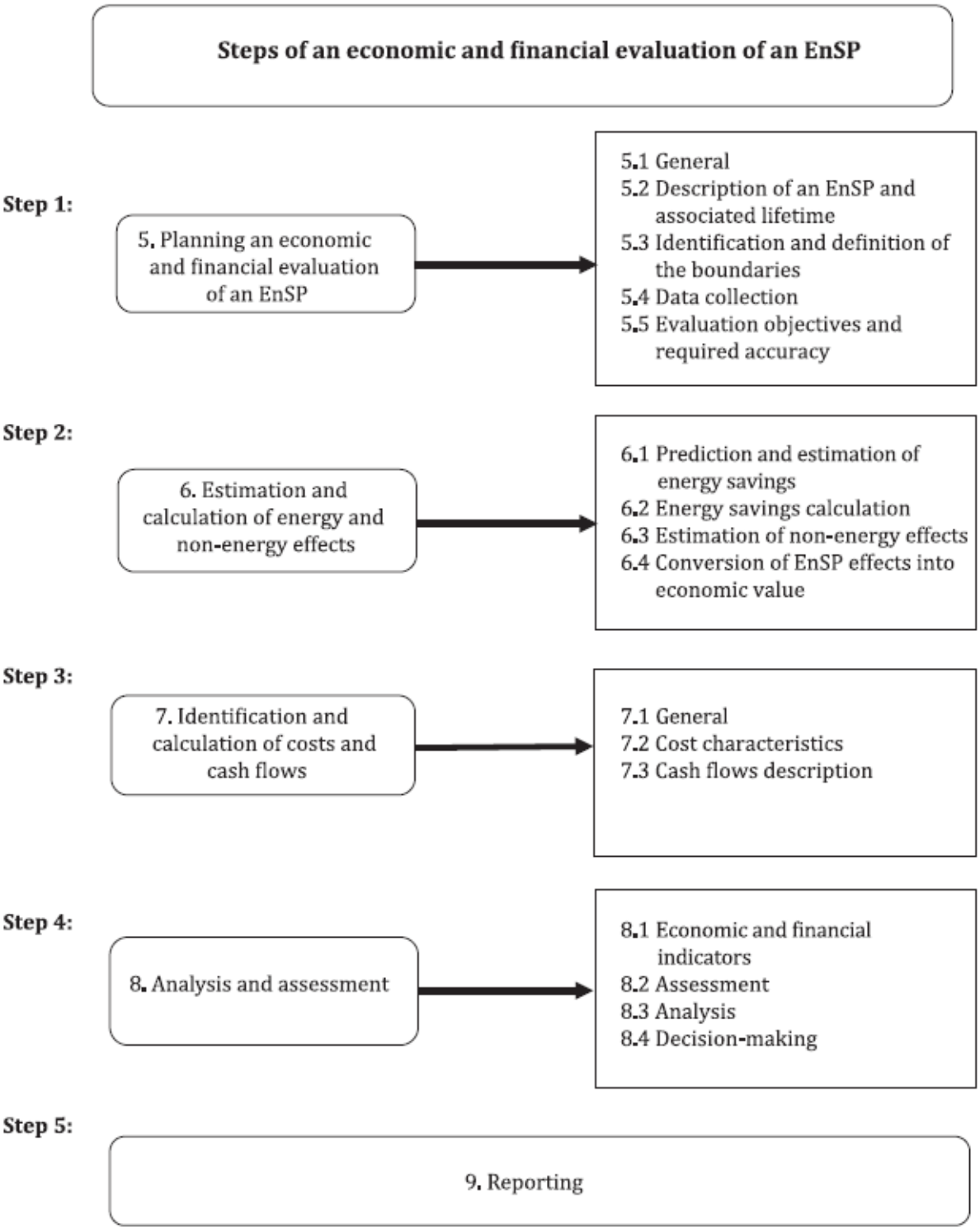

Figure 1 — Economic and financial evaluation approach

Step 1:

- General: The scope of the assessment is defined at the start of this document
- Description of the energy saving project: Variable speed kitchen ventilation (inverter driven)
- Boundaries: Assessment of the equipment at Cambridge site.
- Data collection: Specialist equipment leased short term from Elcomponent (a three-phase power logger) and the existing electrical monitoring equipment
- Evaluation objectives: Assessment of results versus expected

Step 2:

- Predicted energy saving (annualised) in kWh: 6,795 kWh
- Predicted average load reduction in % for measured equipment: 39.8%
- Energy saving calculation: Assessment against energy usage prior to installation, including an assessment at a site level compared to the equivalent weeks of operation of the site in the previous year
- Control for variables: Use of site level data has been restricted to periods where limited other variables exist in trading patterns (load comparisons restricted to lunch) when conducting load comparisons

Step 2a:

- Measured energy saving (annualised) in kWh: 6,675 kWh
- Measured average load reduction in % for measured equipment: 39.1%
- Measured result as percentage of expected: 98.2%

Step 3:

- Financial benefit (annualised): £1,909.05
- Unit rate used for modelling: 28.6p/kWh (annualised)

Step 4:

- Not assessed – individual project (pilot)

Step 5:

- This document is the main report on the success of this project

REDUCE CARBON AND HVAC LOAD, SAVE ENERGY, IMPROVE KITCHEN COMFORT

Don't let your profits go up in smoke

Demand Controlled Kitchen Ventilation System providing significant energy cost savings to Commercial Kitchens

THE CHALLENGE

Commercial kitchens are running exhaust fans continuously throughout operating hours. Conditioned air is exhausted out of the building at rapid rates, resulting in increased emissions and energy use.

THE SOLUTION

The Merlin 3000S energy saving control system has been specifically designed for NEW and RETROFIT store applications, providing automated control over the ventilation system by adjusting exhaust and kitchen HVAC inlet air in response to the presence and level of cooking activity. Based on the temperature inside the exhaust hoods, the Merlin 3000S maximizes kitchen ventilation energy efficiency and reduces energy waste while improving kitchen comfort. The Merlin 3000S is also qualified for Energy Technology List (ETL).

- Quick and simple installation
- One controller monitors up to two hoods
- Works with gas or electric kitchen appliances
- Average installed ROI is 1-2 years based on climate

THE SYSTEM

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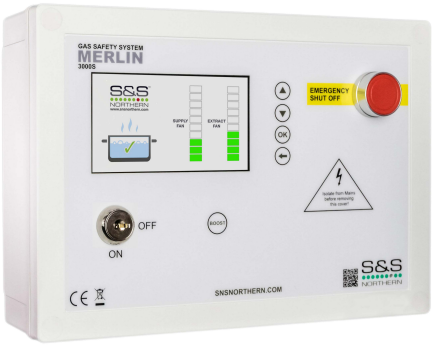
Merlin 3000S System

Inputs

(2) Temperature Probes
(2) Optical Sensors
(1) Fire Panel
(1) Gas Meter
(1) CO Detector
(1) CO2 Detector
(1) Emergency Stop Button



Outputs

(1) Extract Fan
(1) Supply Fan
(2) 0-10V
(1) SPDT Relay
(1) 12VDC

DCKV Program Status - Pilot Results

Cambridge Case Study

The 2023 commercial kitchen case study restaurant, carried out in Cambridge, sought to optimize energy usage and operational efficiency within their commercial kitchen environment. In pursuit of this goal, they collaborated with us to implement the Merlin 3000S energy-saving system. The below data has been recorded over a 12 month period and at the Cambridge site, only exhausted fan demand based control was implemented.

Predicted vs. Measured Results:

Predicted Energy Saving (Annualized): 6,795 kWh
Predicted Average Load Reduction: 39.8%

Measured Energy Saving (Annualized): 6,675 kWh
Measured Average Load Reduction: 39.1%
Measured Result as Percentage of Expected: 98.2%

Financial Benefits:

The implementation of the Merlin 3000S yielded significant financial benefits.
Annualized Financial Benefit: £1,909.05
Unit Rate Used for Modeling: 28.6p/kWh

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