Ethos performance management - case studies for warehouse and food production

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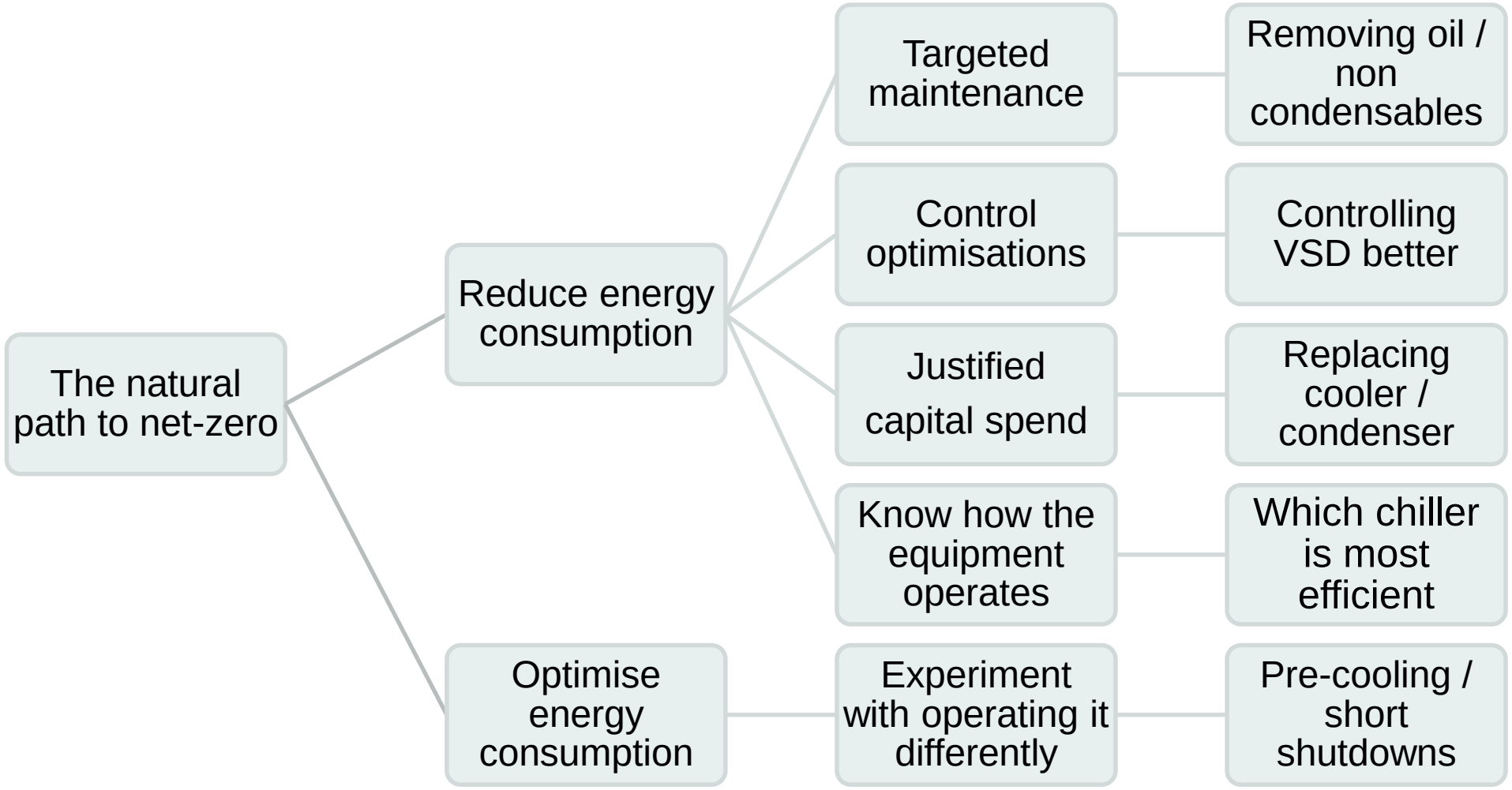
Purpose of this presentation

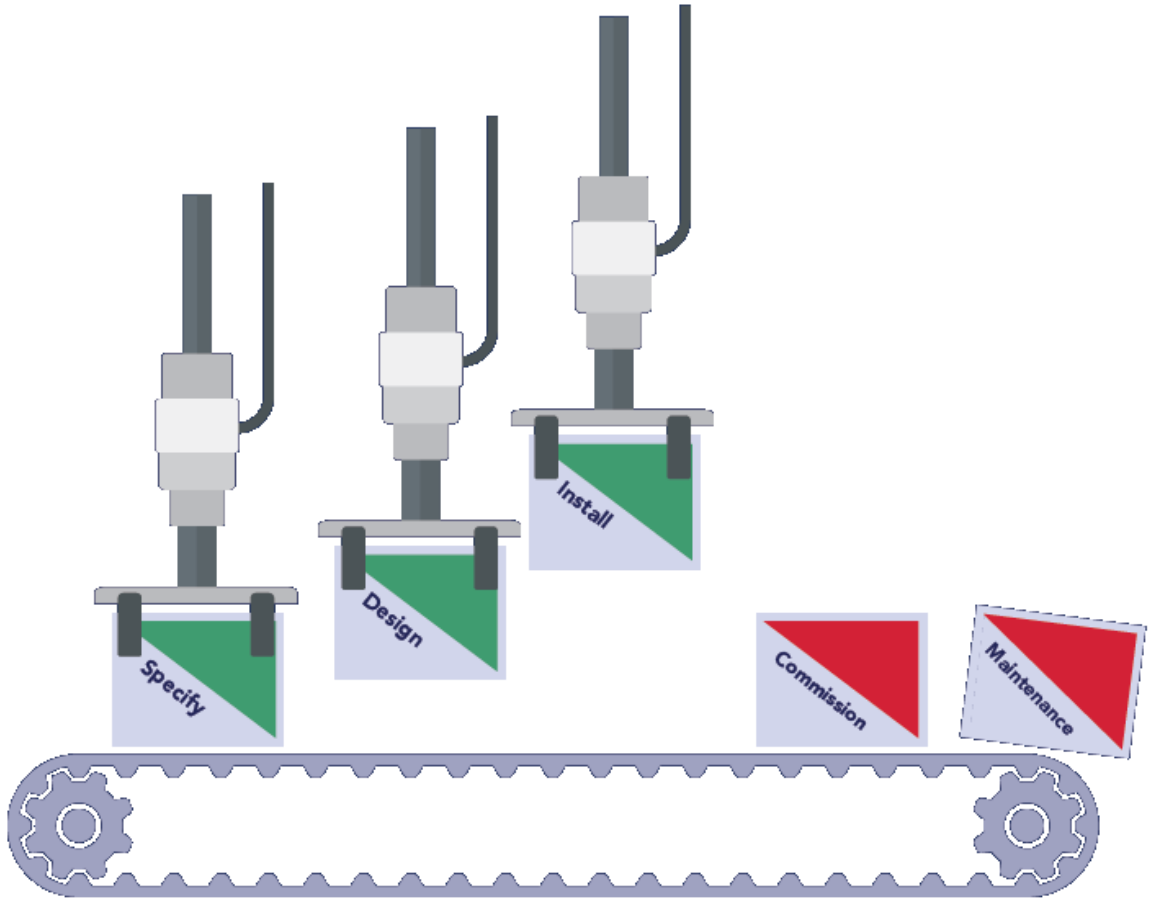


Performance management is needed on all systems

- Is equipment performing optimally?
- Is it being operated optimally?

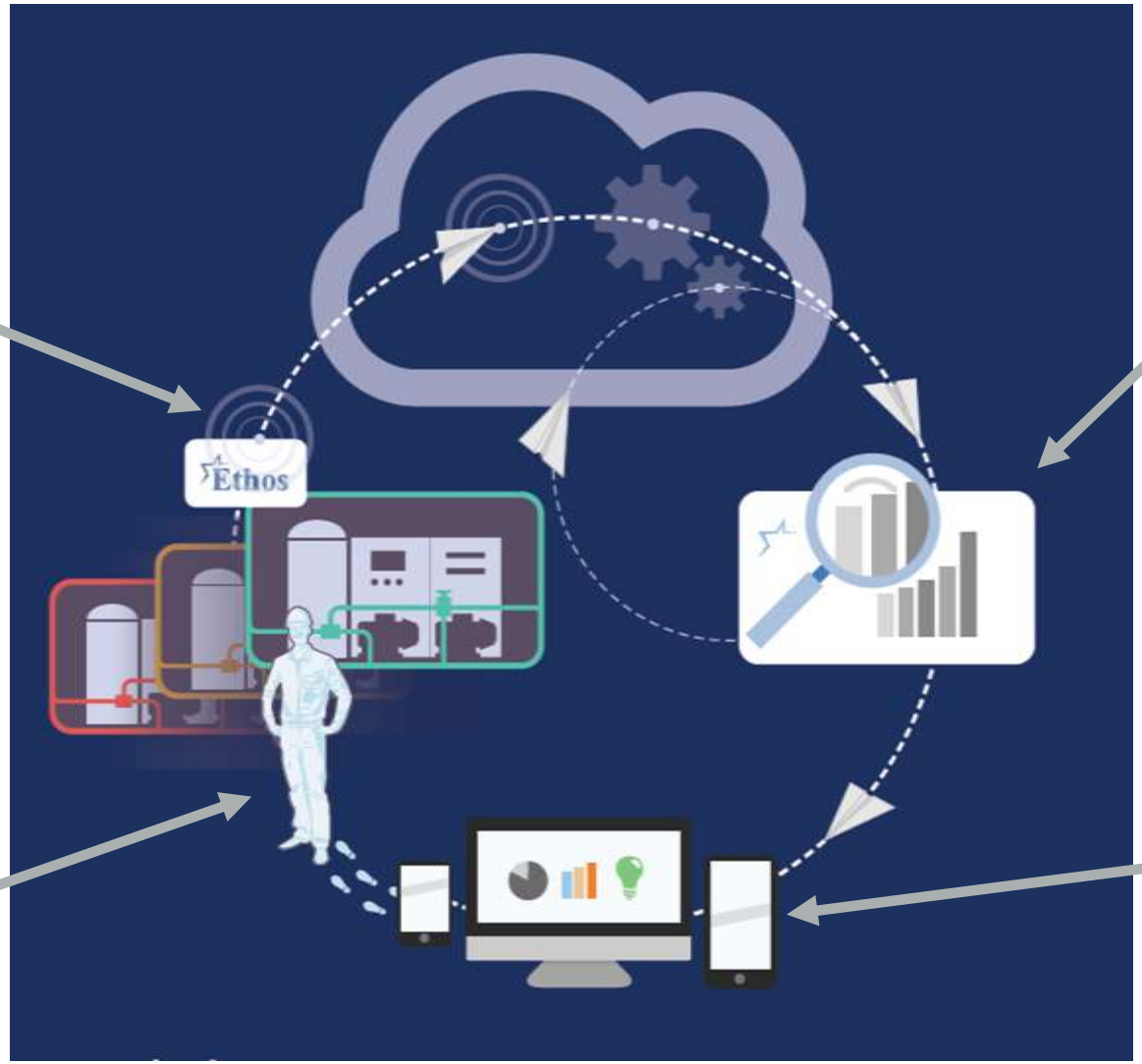
- Performance management of existing systems cost more to install but more opportunity to save
- New systems should still be managed

- Data is easier to collect, connect & analyse than ever



Suggested solution

Data Collected & Transmitted Offsite



Centralised Analysis

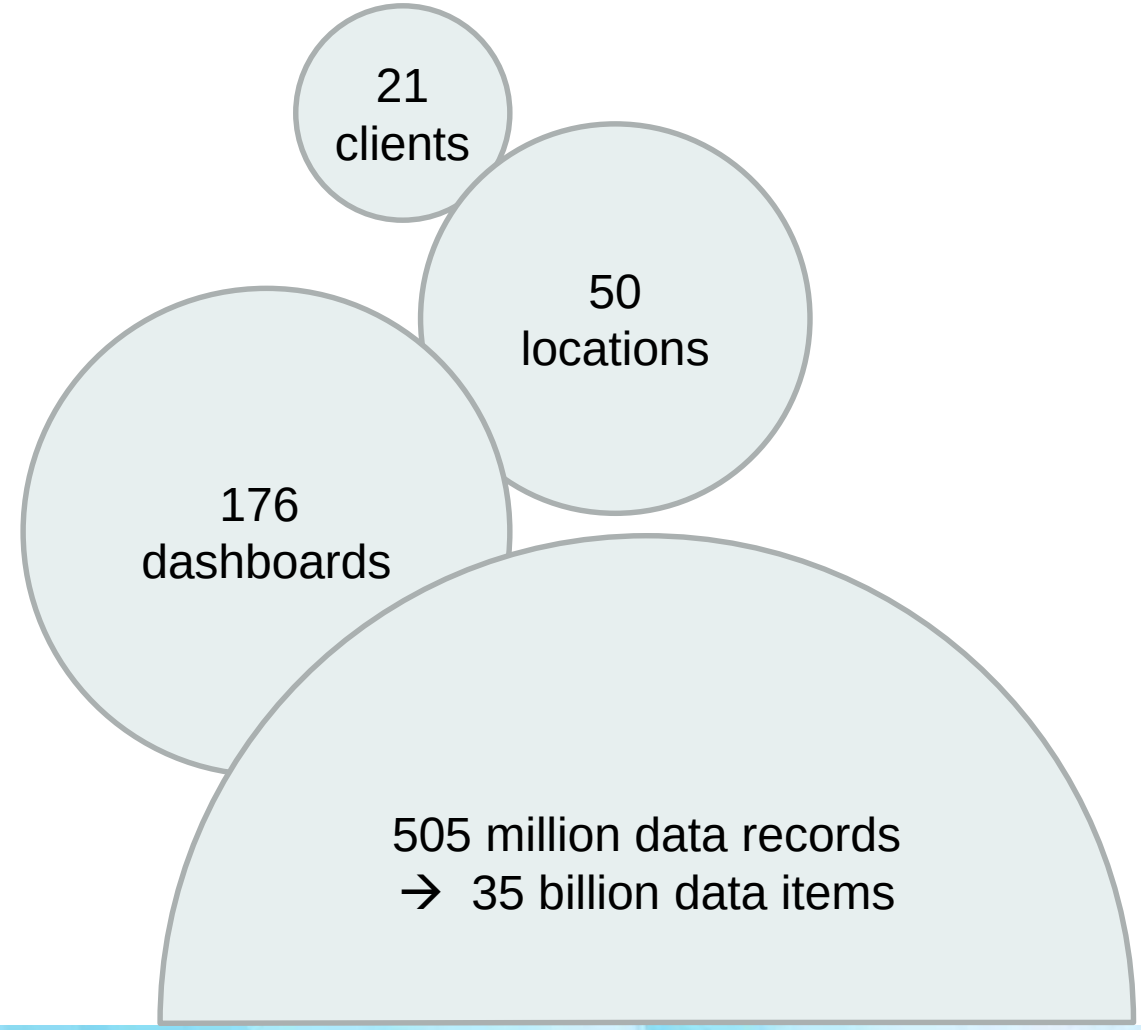
Human Intervention

Accessibly Communicated

What is Ethos - Our experience and journey so far

Combining data and technical expertise

- 2016 • Early days - experimentation with data
- 2017 • Initial trials and pilot projects
- 2018 • Developing sensors and data loggers
- 2019 • Collecting data from existing PLCs
- 2020 • Modular Digital Twin
- 2021 • Delivering value / Action ownership



Capturing the data

PLC Based Data Logger

“separate set of sensors”

API Connection

“already have the data, just send it over”

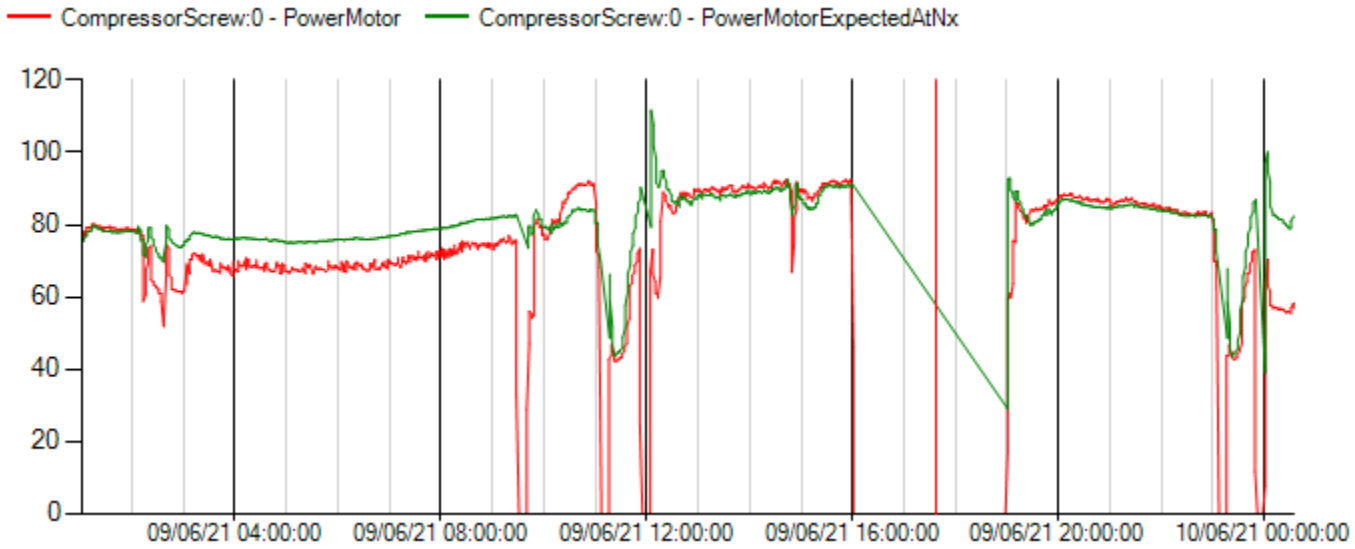
Network Edge Device

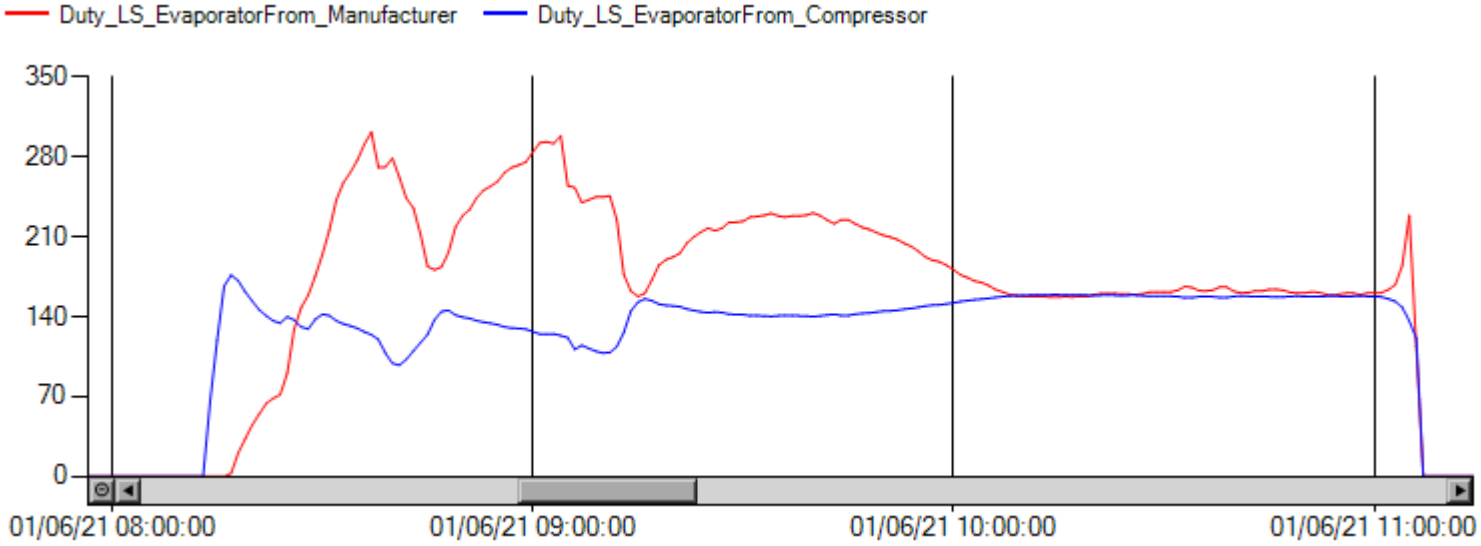
“ask the existing control system its sensor data”

Building the digital twin

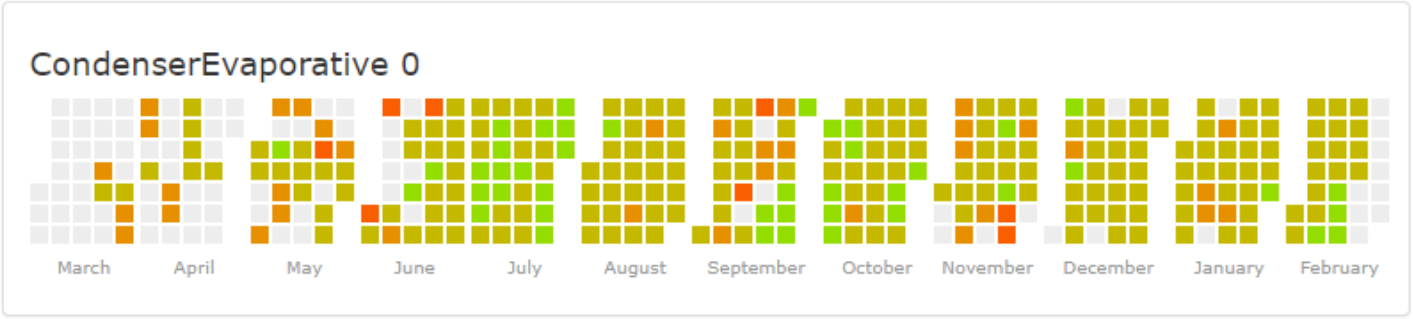
- Design
  - Physics / Engineering models
  - Modular design for scalability due to time cost
- Model
  - Input design information or reference data
  - Mapping of measured data tags to entry points
- Simulation and Verification
  - Run in local debug with detailed graphs
  - Typically “two votes“ but where possible “three votes“ to root out bad data

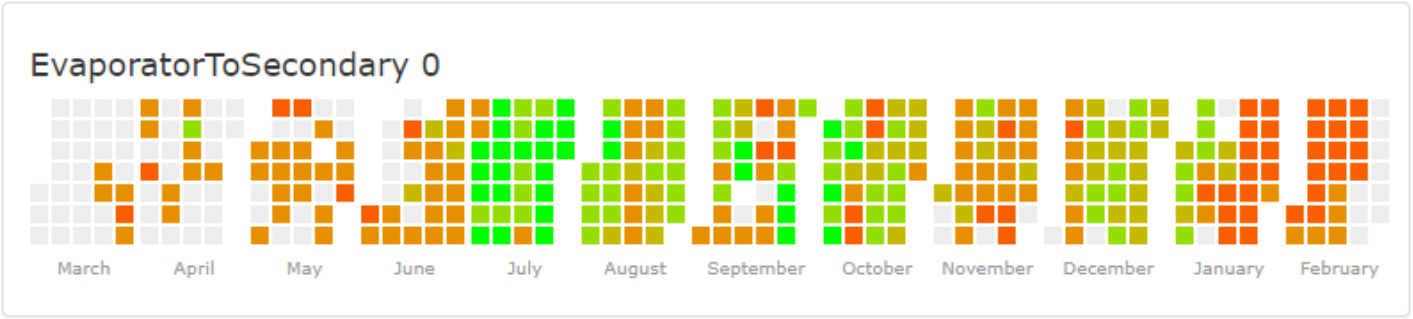
Interpreting the results

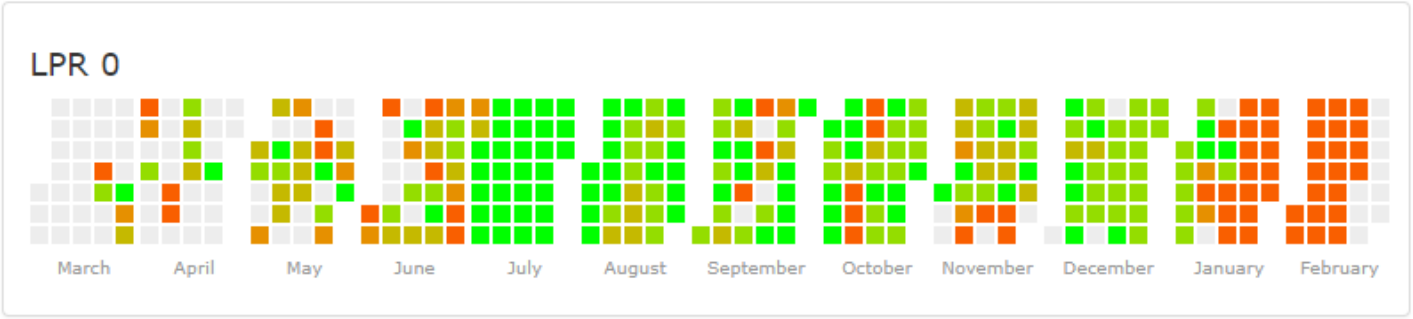


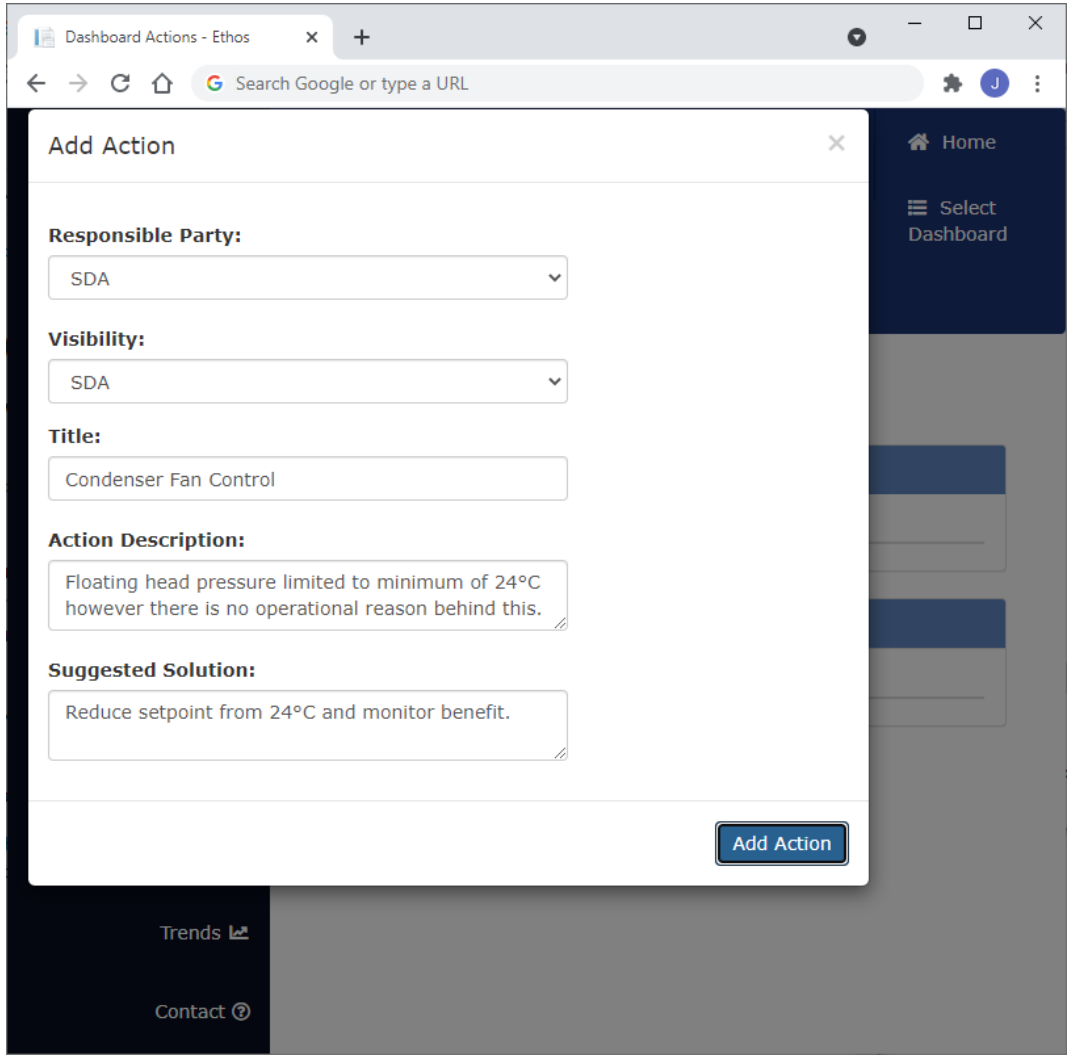


Conveying and managing the actions

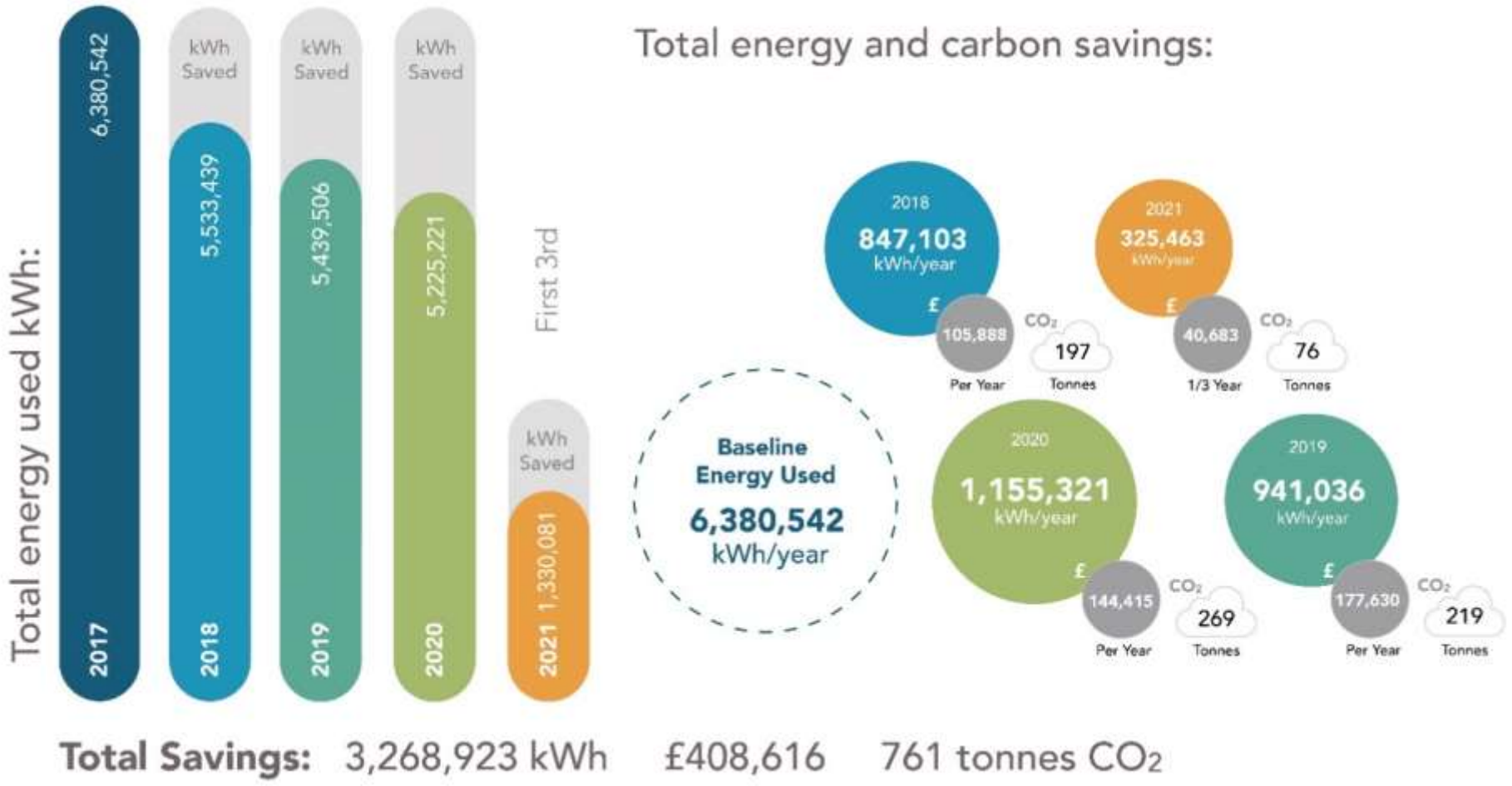








Example success



Example opportunities

Economisers offline 10% kWhrs	**Condenser air build-up 6% kWhrs**
Condenser VSDs not optimised 6% kWhrs	**Evaporators fouled 10% kWhrs**

eurammon e. V. is always available as a sparring partner for questions on refrigeration with natural refrigerants.

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