

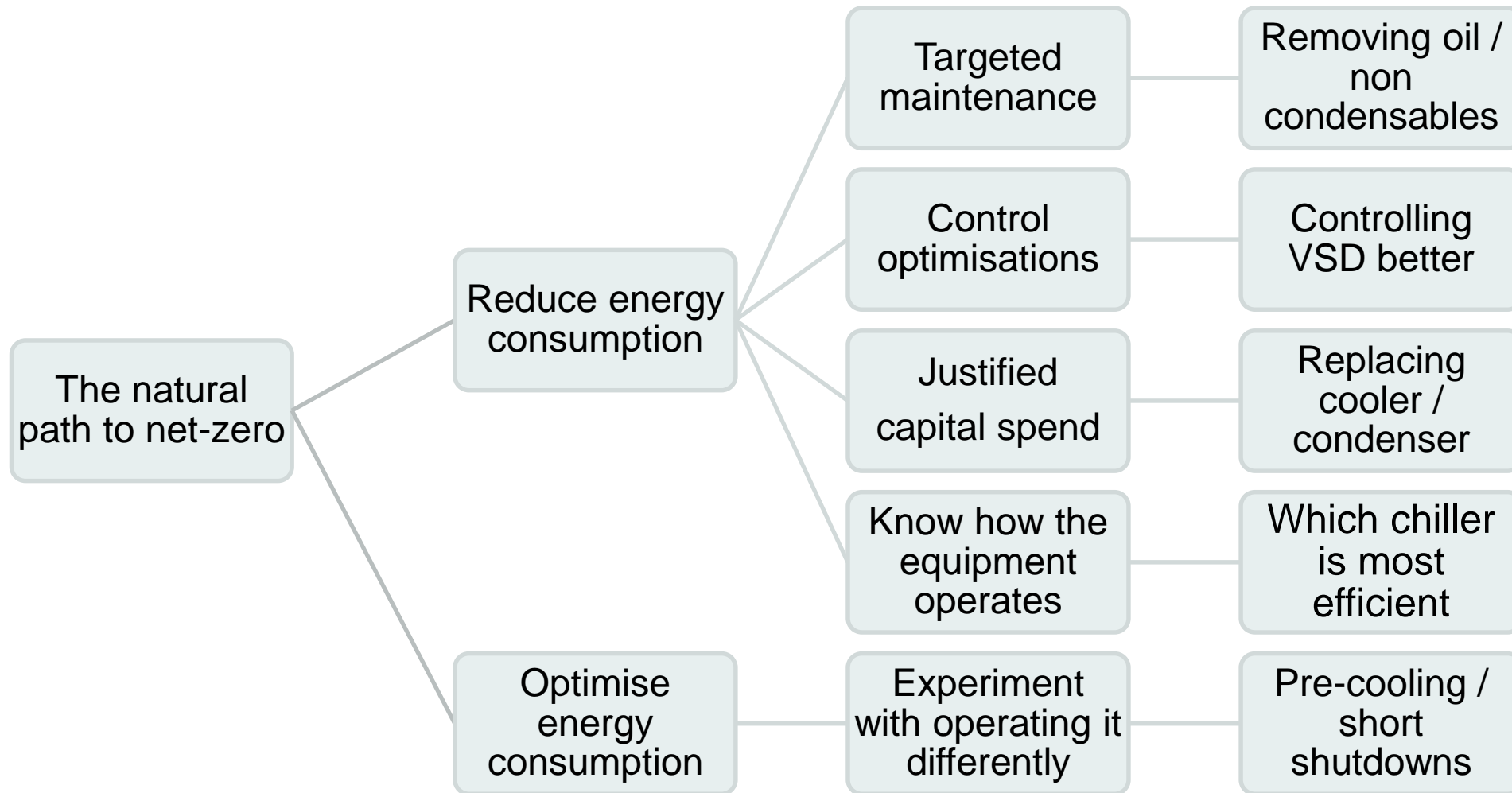
# Ethos performance management - case studies for warehouse and food production

John Clark Ceng, MIMechE, MInstR

eurammom Symposium, 17th June 2021

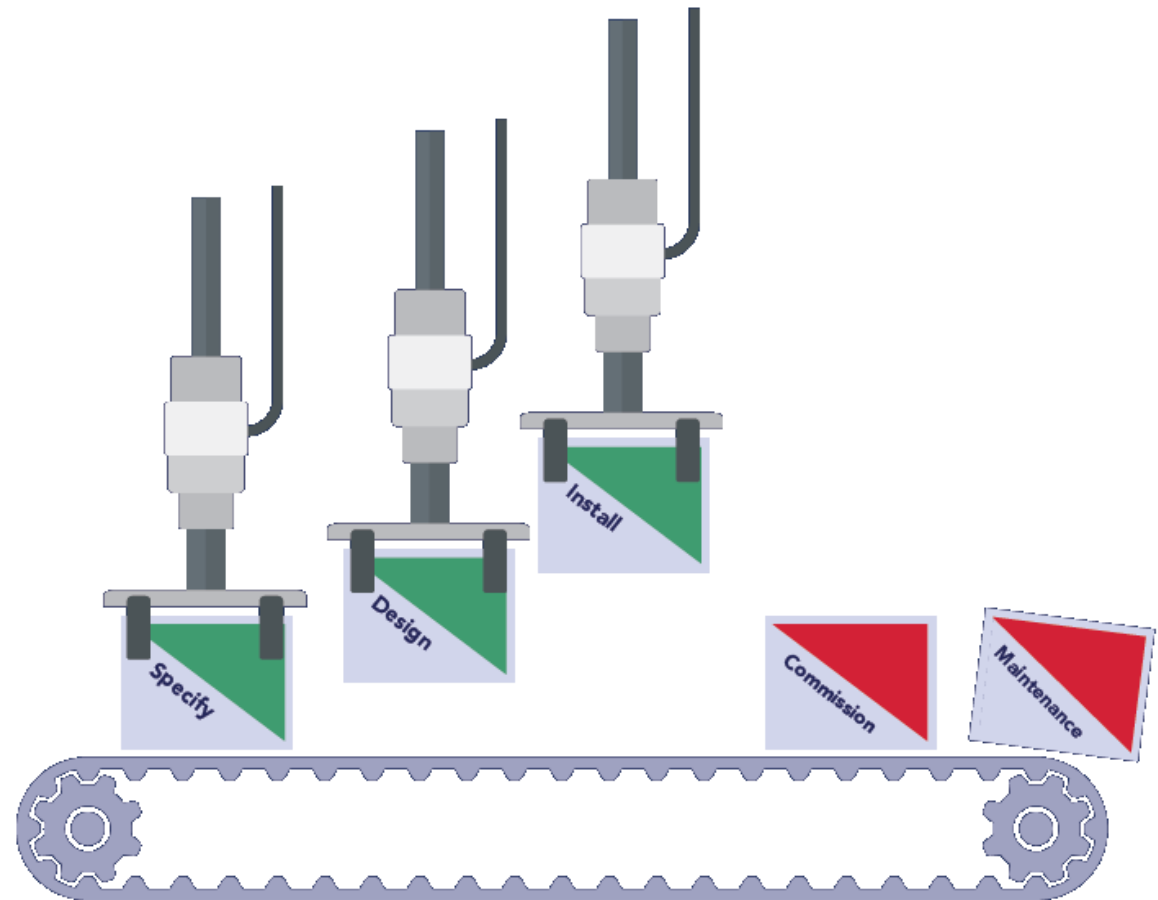


# Purpose of this presentation

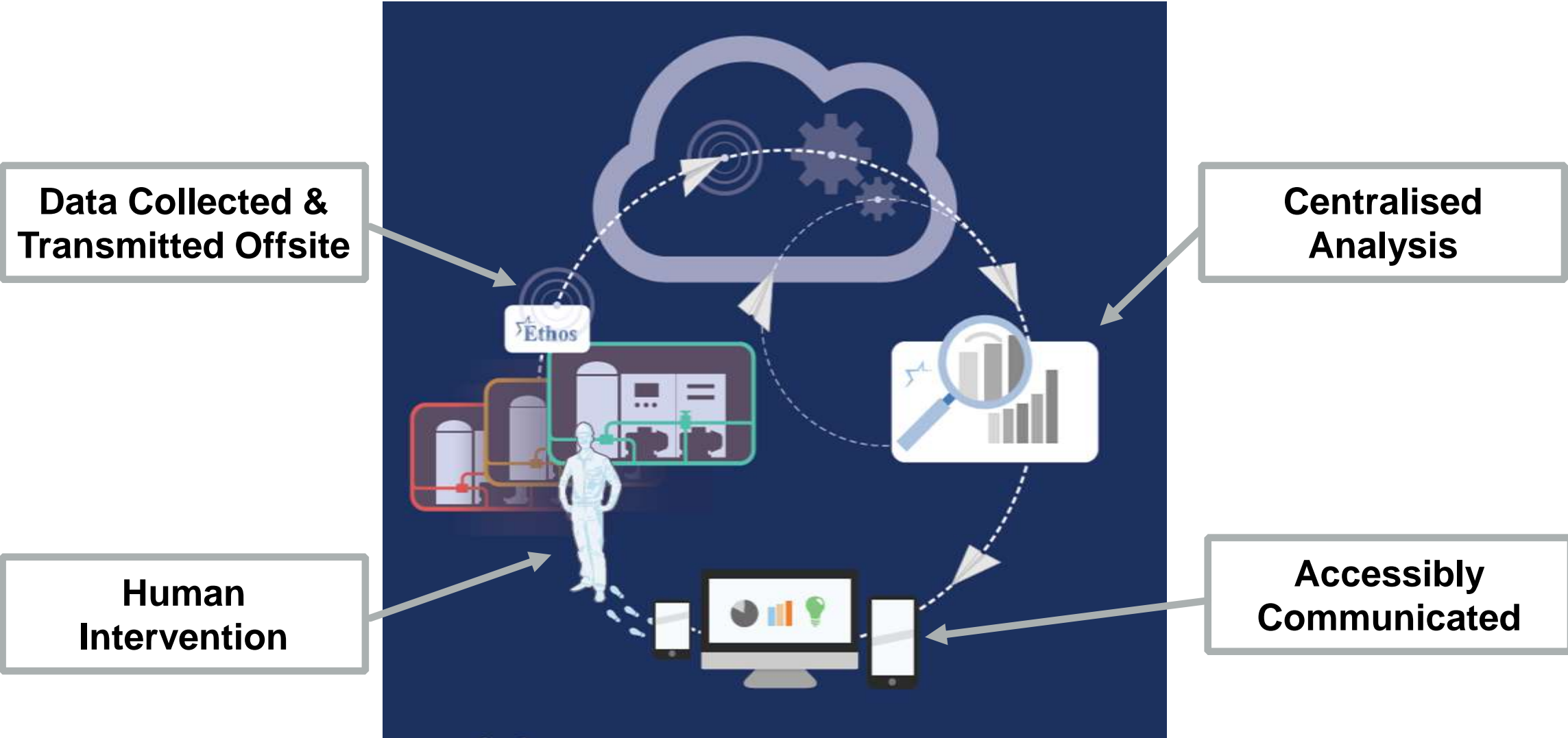


# Performance management is needed on all systems

- 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



# 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

21  
clients

50  
locations

176  
dashboards

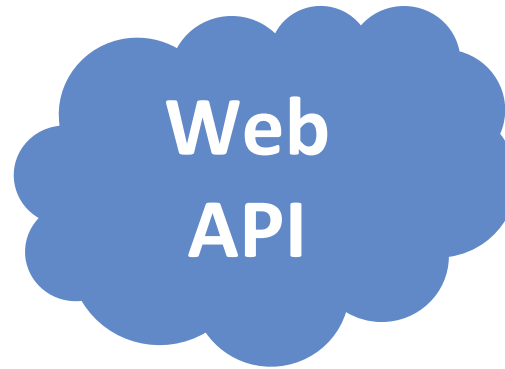
505 million data records  
→ 35 billion data items

# Capturing the data



PLC Based Data Logger

“separate set of sensors”



API Connection

“already have the data,  
just send it over”



Network Edge Device

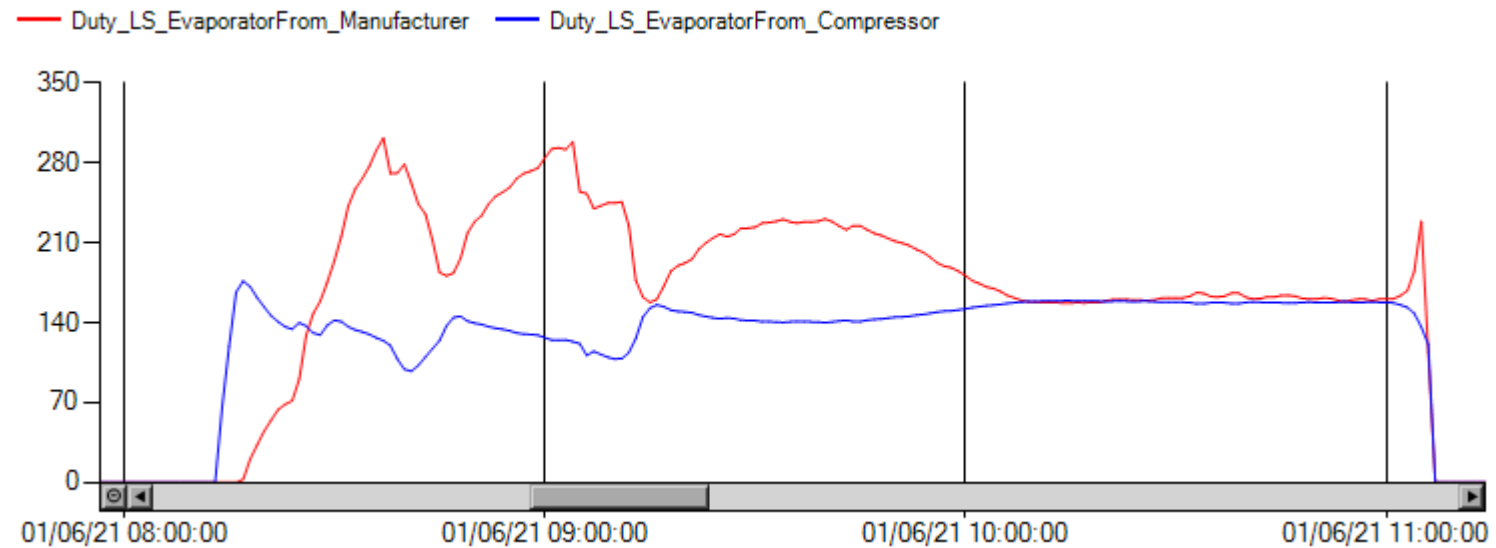
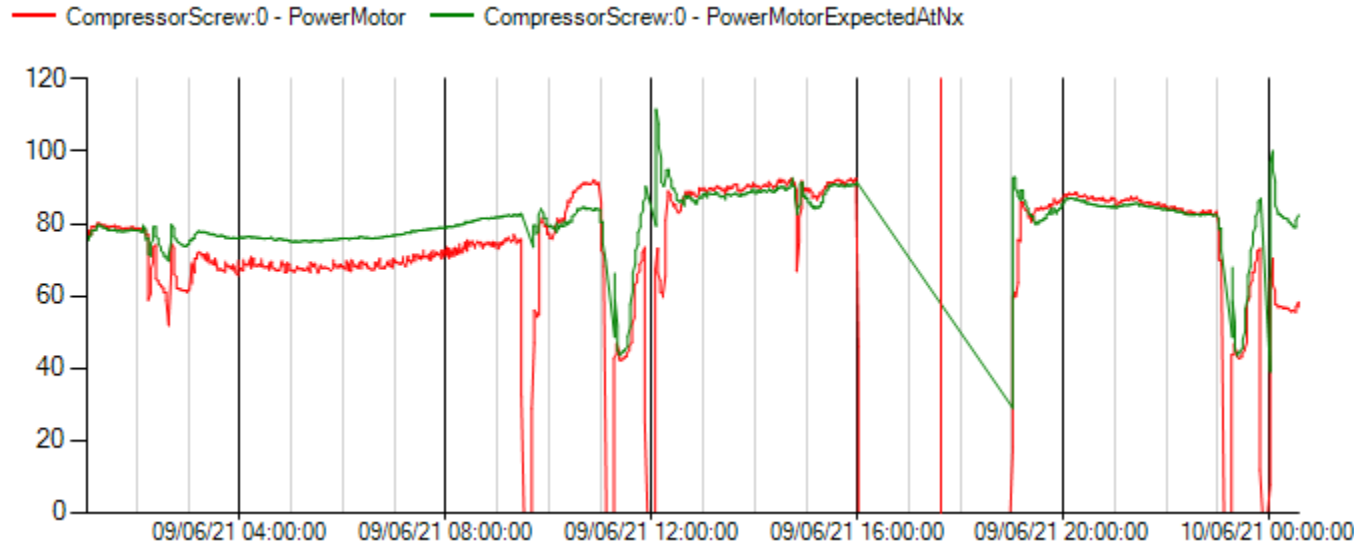
“ask the existing control  
system its sensor data”

# 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

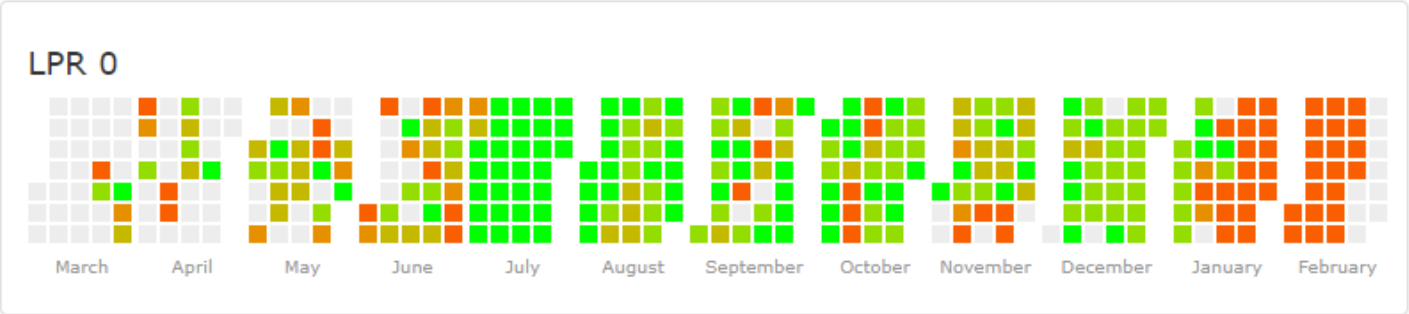
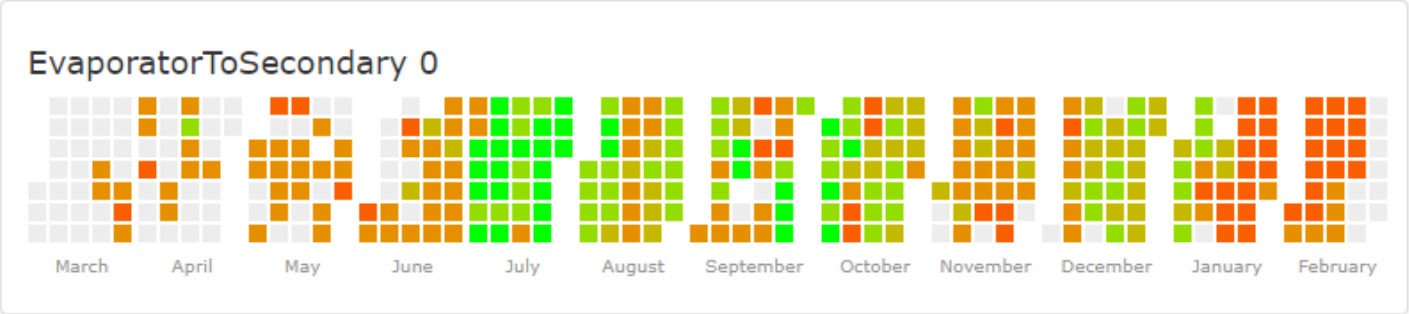
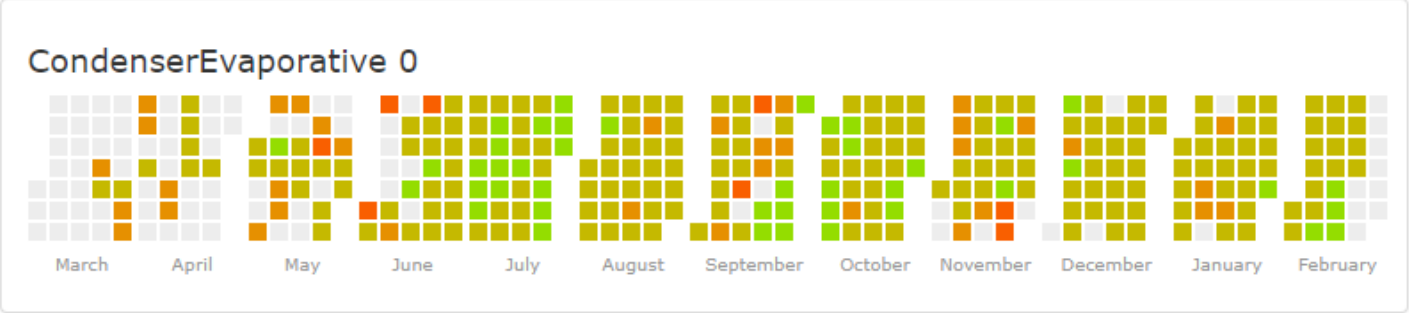


# Interpreting the results





# Conveying and managing the actions

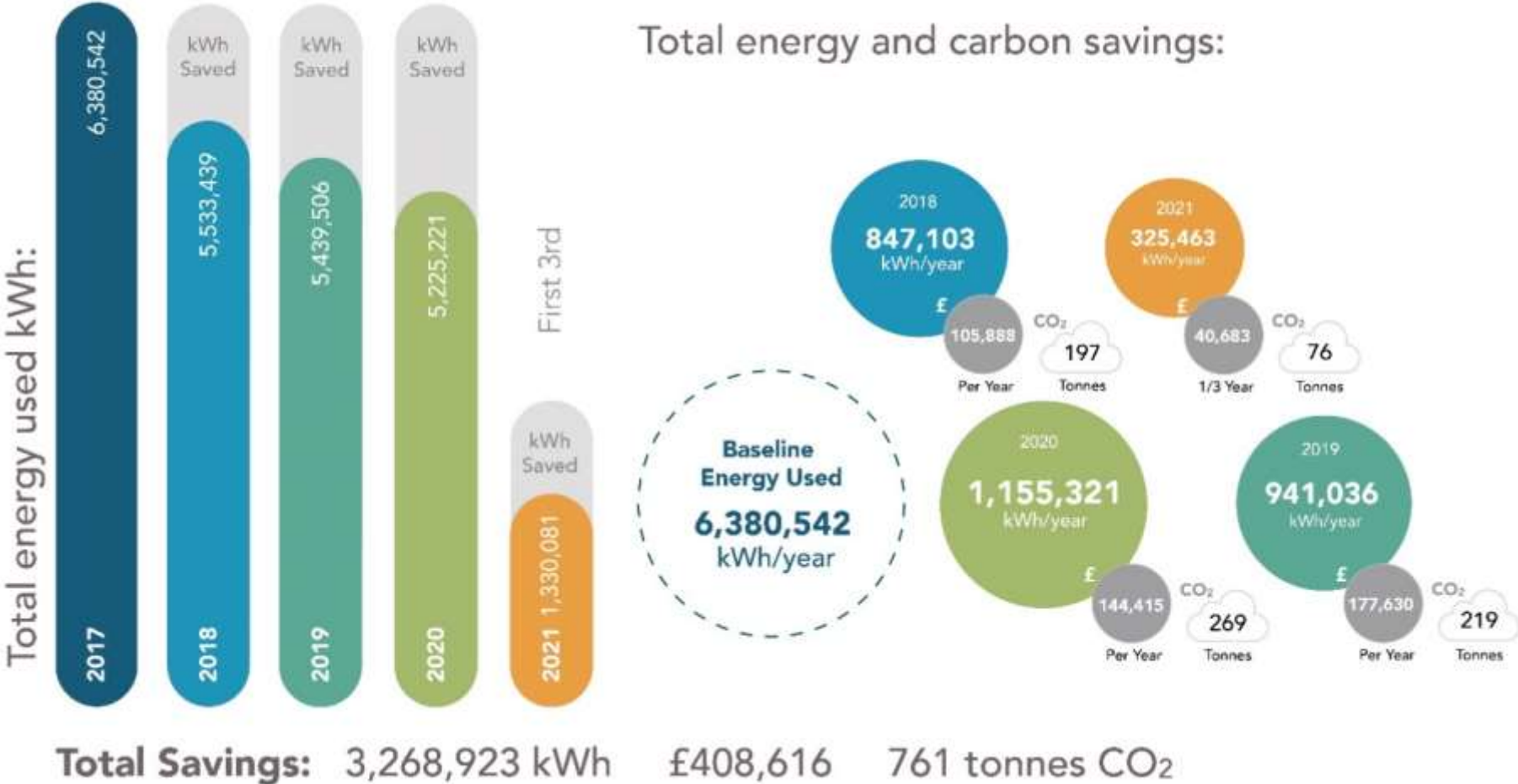


The screenshot shows a browser window titled 'Dashboard Actions - Ethos'. The 'Add Action' form includes the following fields:

- Responsible Party:** SDA
- Visibility:** SDA
- Title:** Condenser Fan Control
- Action Description:** Floating head pressure limited to minimum of 24°C however there is no operational reason behind this.
- Suggested Solution:** Reduce setpoint from 24°C and monitor benefit.

An 'Add Action' button is located at the bottom right of the form. The browser's address bar shows 'Search Google or type a URL'. The dashboard sidebar on the right contains 'Home', 'Select Dashboard', 'Trends', and 'Contact'.

# Example success



## Example opportunities

<b>Economisers offline 10% kWhrs</b>	<b>Condenser air build-up 6% kWhrs</b>
<b>Condenser VSDs not optimised 6% kWhrs</b>	<b>Evaporators fouled 10% kWhrs</b>

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

Contact:

Dr. Karin Jahn | Lyoner Straße 18 | 60528 Frankfurt | Germany

Phone: +49 (0)69 6603-1277 | E-Mail: [karin.jahn@eurammon.com](mailto:karin.jahn@eurammon.com)