

Decarbonising the Midlands Aerospace Supply Chain

AMTC

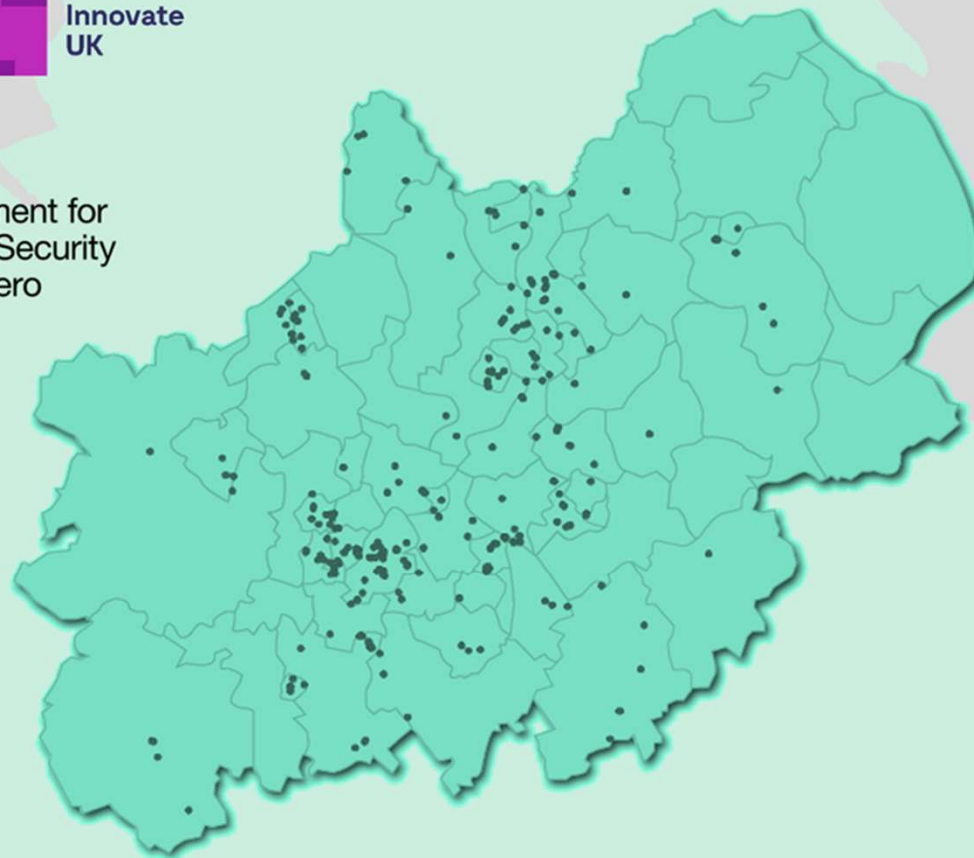
Advanced Manufacturing Training Centre, Coventry

11th July 2024

8:30 - 16:00



Department for Energy Security & Net Zero

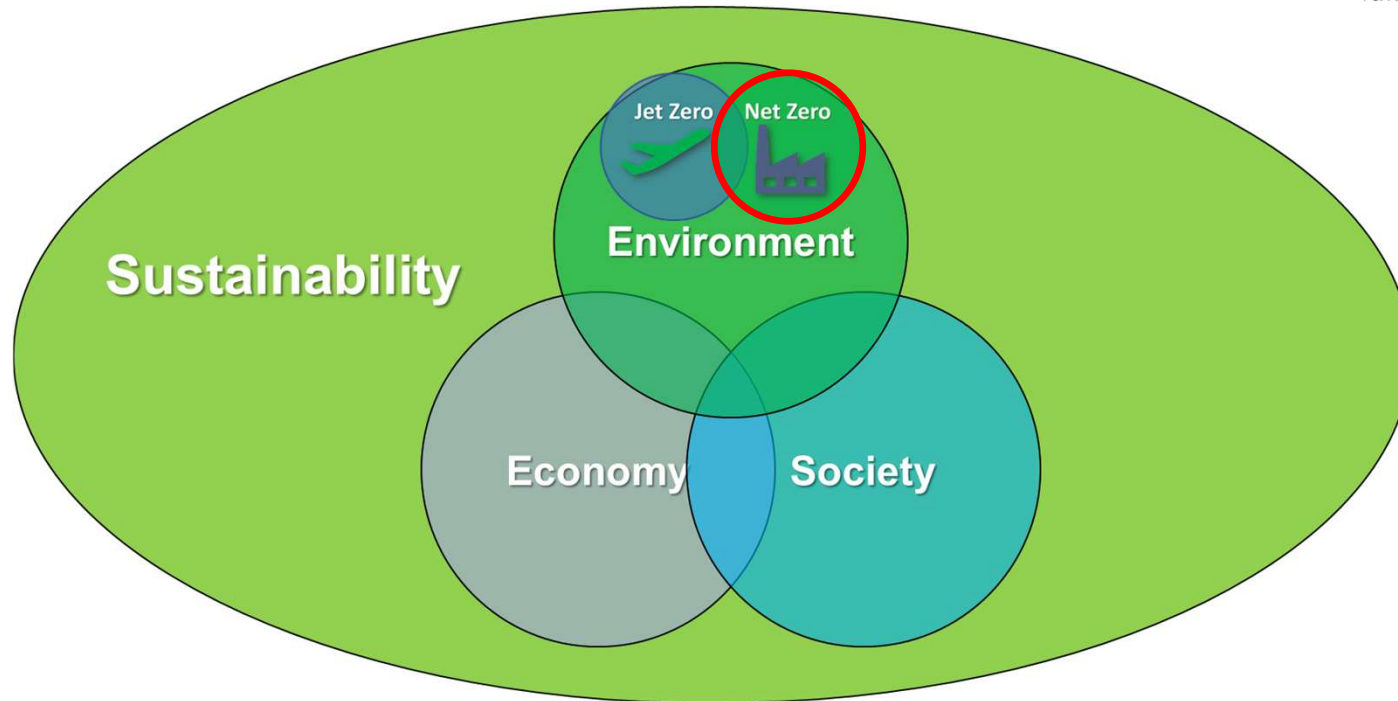


IUK DESNZ Local Industrial Decarbonisation Plans: **Decarbonising the Midlands Aerospace Cluster (DMAC)** Innovate UK Project No: 10090207

Agenda

| Start Time | Topic | Presenter |
|------------|---|----------------------------|
| 08:30 | Registration & Networking | |
| 09:00 | Welcome | Dr Andrew Mair, MAA |
| 09:05 | Overview of today and the DMAC Programme | Chris Weir, MAA |
| 09:50 | Networking & Stands | |
| 10:20 | OEM - (Emissions) Sustainability in the Supply-chain - VoC | Alan Seed, Rolls-Royce |
| 10:40 | Tier 1 - (Emissions) Sustainability in the Supply-chain - VoC | Dr Dawn Pope, Collins Aero |
| 11:00 | Legislation coming your way - CBAM | Dr Russ Hall, WMG |
| 11:30 | Panel Q&A: Morning Session - expectations of the supply-chain | Presenters |
| 12:00 | Lunch, Networking & Stands | |
| 13:00 | Intro afternoon session on case studies, solutions & support | Tim Holmes, MAA |
| 13:10 | Case Study 1 - G & O Springs | Steve Boyd, G&O Springs |
| 13:30 | Case Study 2 - Arrowsmith | Jason Aldridge, Arrowsmith |
| 13:50 | Case Study 3 - Technoset | Kevan Kane, Technoset |
| 14:10 | Panel Discussion & Q&A then close formal session | Presenters |
| 14:40 | Get involved in DMAC | Tim Holmes, MAA |
| 14:55 | Networking & Stands | |
| 15:10 | Support & Funding Opportunities Clinic | Dr Pamela Farries, MAA |
| 16:00 | Close | |

Decarbonising the Midlands Aerospace Cluster

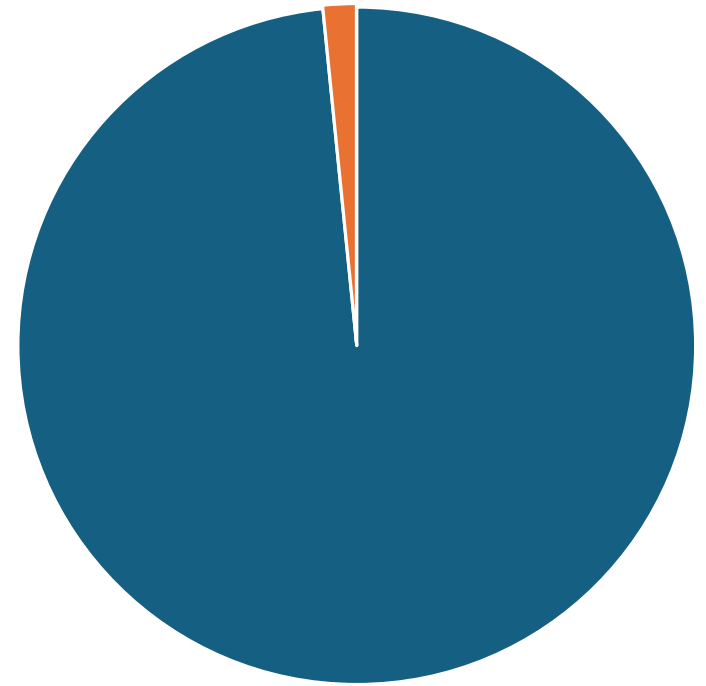
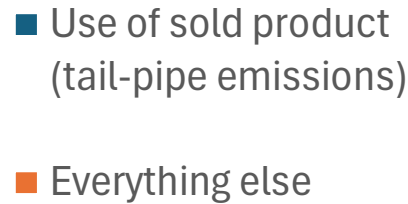


Today we focus on the reduction of Green House Gas (GHG) Emissions from the supply chain
[“Upstream Scope 3” emissions to an OEM or Tier 1 customer]

‘Jet Zero’ versus ‘Net Zero’

Some typical values:

- In aerospace, downstream tail pipe emissions dominate (~98%)*
- Excluding these tail-pipe emissions, supply chain makes up ~65%* of the remaining emissions footprint.
- Your customers need to reduce this supply-chain footprint.



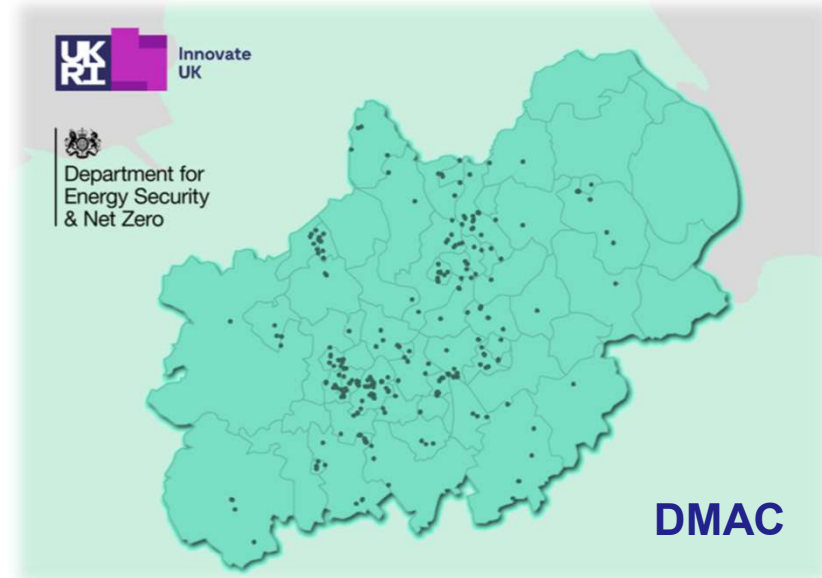
* % values derived from Collins Aerospace – Actuation Systems data

While we can't ignore the challenge of tail-pipe emissions, today we are focusing on the reduction of Green House Gas (GHG) Emissions from the supply chain

Decarbonising the Midlands Aerospace Cluster

Today you'll hear about

- **DMAC** programme
- **Customers'** needs
- **Regulations** heading our way
- **Supply chain** experiences
- **Funding & Support** opportunities

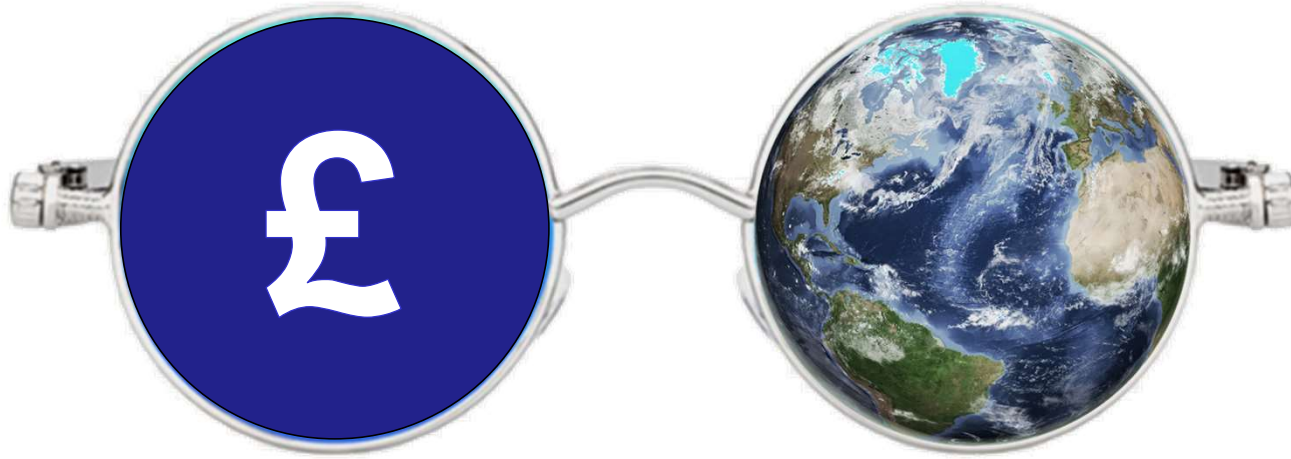


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[“Upstream Scope 3” emissions to an OEM or Tier 1 customer]

Motivation to reduce emissions ...

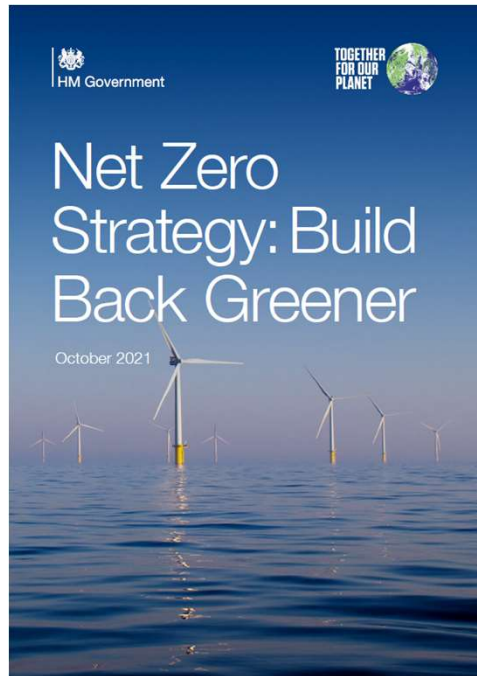
Economic Sustainability

Environmental Sustainability



Investor pressure on corporations and Government regulations mean you need to do this for business continuity.

Encouragement to reduce emissions ...



2019:
UK legislated net-zero by 2050



2023:
EU launches CBAM initiative



2024:
no change in direction

Supply Chain emission reduction plans & reporting

Example: NHS has a clear roadmap for its supply chain including requirements for:

- Scope 1, 2 & 3 emissions reduction plans
- Product emissions reporting

NHS Net Zero Supplier Roadmap

| | |
|--------------------------------------|---|
| <p>From April 2022</p> | <p>Net Zero and Social Value All NHS procurements include a minimum 10% net zero and social value weighting. The net zero and social value guidance for NHS procurement teams helps to unlock health-specific outcomes (building on PPN 06/20). Net Zero and Social Value will be applied via the Evergreen assessment for NHS England Medicines tenders.</p> |
| <p>From April 2023/24</p> | <p>Carbon Reduction Plan For all new contracts above £5 million per annum, the NHS requires suppliers to publish a Carbon Reduction Plan for their UK Scope 1 and 2 emissions and a subset of scope 3 emissions as a minimum (aligning with PPN 06/21). From April 2024, this requirement is proportionately extended to cover all new procurements.</p> |
| <p>From April 2027</p> | <p>Carbon Reduction Plan for all emissions All suppliers will be required to publicly report targets, emissions and publish a Carbon Reduction Plan for global emissions aligned to the NHS net zero target, for all their Scope 1, 2 and 3 emissions.</p> |
| <p>From April 2028</p> | <p>Product-level requirements New requirements will be introduced overseeing the provision of carbon footprinting for individual products supplied to the NHS. The NHS will work with suppliers and regulators to determine the scope and methodology.</p> |



First ... a little background

- **Greenhouse Gas Protocol (GHG Protocol)**
 - Established 1990 by WRI & WBCSD
 - Globally recognised standard for measuring and managing greenhouse gas emissions
 - ‘Consistent framework’ for reporting
 - ISO 14060 series of standards, including:
 - ISO 14064-1: Organisation GHG reporting
 - ISO 14067: Product Carbon Footprint
 - Both the protocol & how it is used have evolved
 - Adopted by aerospace (IAEG)

The Greenhouse Gas Protocol

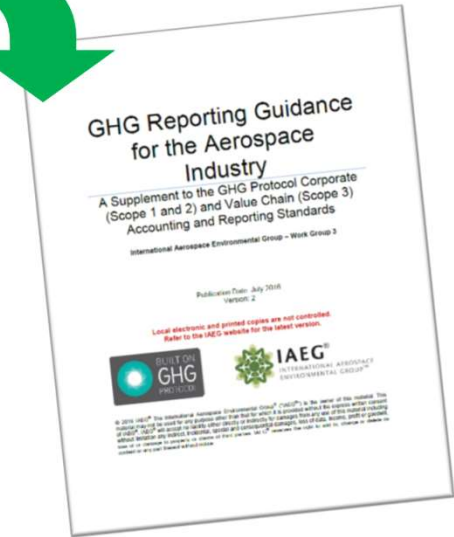


A Corporate Accounting and Reporting Standard
REVISED EDITION



WORLD
RESOURCES
INSTITUTE

World Business Council for
Sustainable Development



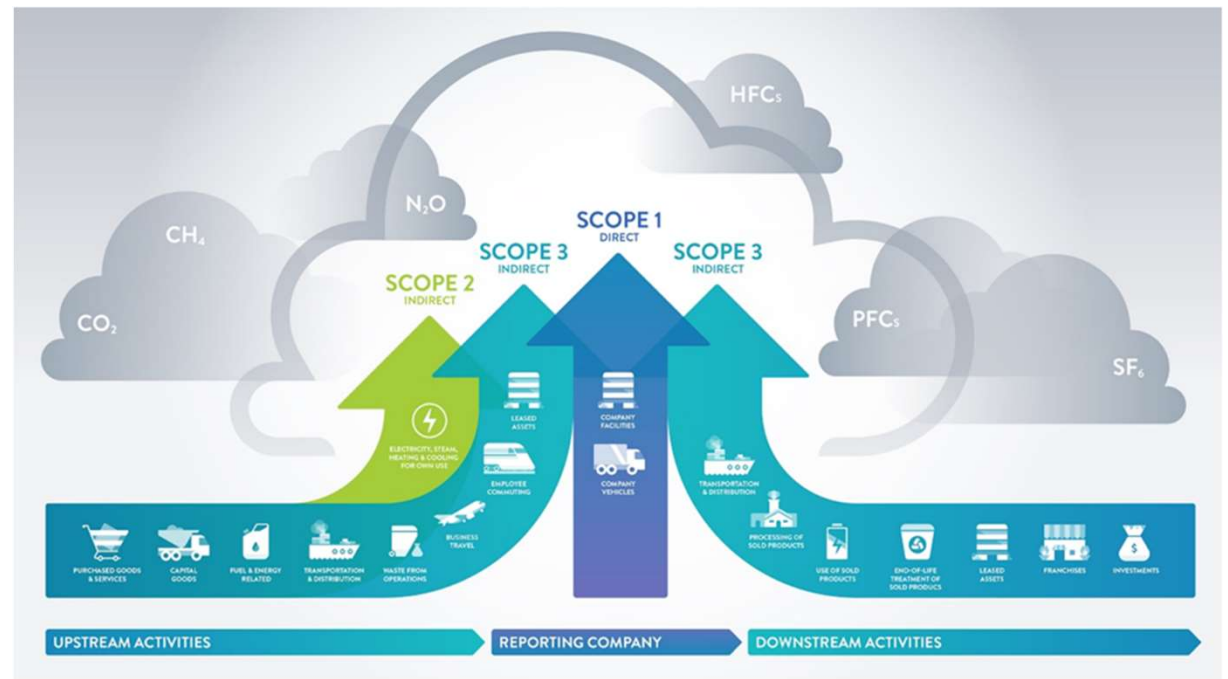
IAEG



GHG Emissions & Sources

GHG Emissions:

- Kyoto Protocol
 - 11 December 1997
- 6 GHG's:
 - carbon dioxide (CO₂)
 - methane (CH₄)
 - nitrous oxide (N₂O)
 - hydrofluorocarbons (HFCs)
 - perfluorocarbons (PFCs)
 - sulphurhexafluoride (SF₆)
- Sources of GHG's
 - Grouped into 3 Scopes



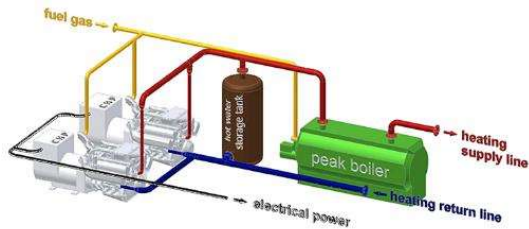
Source: IAEG Work Group 3 Webinar

“Scope 3 Purchased Goods & Services and Capital Goods: Excel Tool, User Guide, Methodology” 21st July 2020

GHG Emissions – Scope 1



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Source: Yellow Power



Photo: Ford Motor Company Ltd



Photo: Mettis Group



Photo: Energy Tax Savers, Inc.

Stationary Combustion

- Boilers for heating buildings, Gas furnaces and Gas-fired Combined Heat & Power (CHP) plants.

Mobile Combustion

- All vehicles owned or leased that burn fuels producing GHG.
 - Cars, vans, trucks and motorcycles

Process Emissions

- GHG Emissions released to the atmosphere from industrial processes.

Fugitive Emissions

- Leaks of GHG gases from refrigeration and air-conditioning units.

Emission Factors: Fuel Type determines CO₂ emissions; Form of Combustion determines CH₄ & N₂O emissions.

Scope 1: All direct GHG Emissions from sources that are owned or controlled by the company

GHG Emissions – Scope 2



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- GHG Emissions from purchased ‘electricity’ consumed within the boundary of the company.
- **Emission Factors:**
 - Location-based
 - Fuel mix of the local electricity grid
 - The emissions actually caused by the company operations.
 - Market-based
 - The emissions that a company is responsible for via purchasing decisions.
 - This may be different from the electricity that is generated locally.



Scope 2: Indirect Emissions from *purchased* ‘electricity’ *consumed* ‘on-site’ by the company
Note: ‘Electricity’ = consumed electricity, steam, heat, or cooling

GHG Emissions – Scope 3



- **Indirect Upstream & Downstream GHG Emissions**
- **Upstream**
 - Dominated by supply-chain
- **Downstream**
 - Dominated by aircraft tail-pipe emissions
- **DMAC**
 - includes upstream emissions
 - excludes downstream emissions

| # | Scope 3 Category | |
|----|--|------------|
| 1 | Purchased Goods & Services | Upstream |
| 2 | Capital Goods | |
| 3 | Energy & Fuel Related Activities | |
| 4 | Upstream Transportation & Distribution | |
| 5 | Waste Generated in Operations | |
| 6 | Business Travel | |
| 7 | Employee Commuting | |
| 8 | Upstream Leased Assets | |
| 9 | Downstream Transportation & Distribution | Downstream |
| 10 | Processing of Sold Products | |
| 11 | Use of Sold Products | |
| 12 | End of Life Treatment of Sold Products | |
| 13 | Downstream Leased Assets | |
| 14 | Franchises | |
| 15 | Investments | |

Scope 3: Indirect Emissions resulting from assets & services not owned or controlled by the reporting organisation, but that the organisation indirectly affects in its value chain.

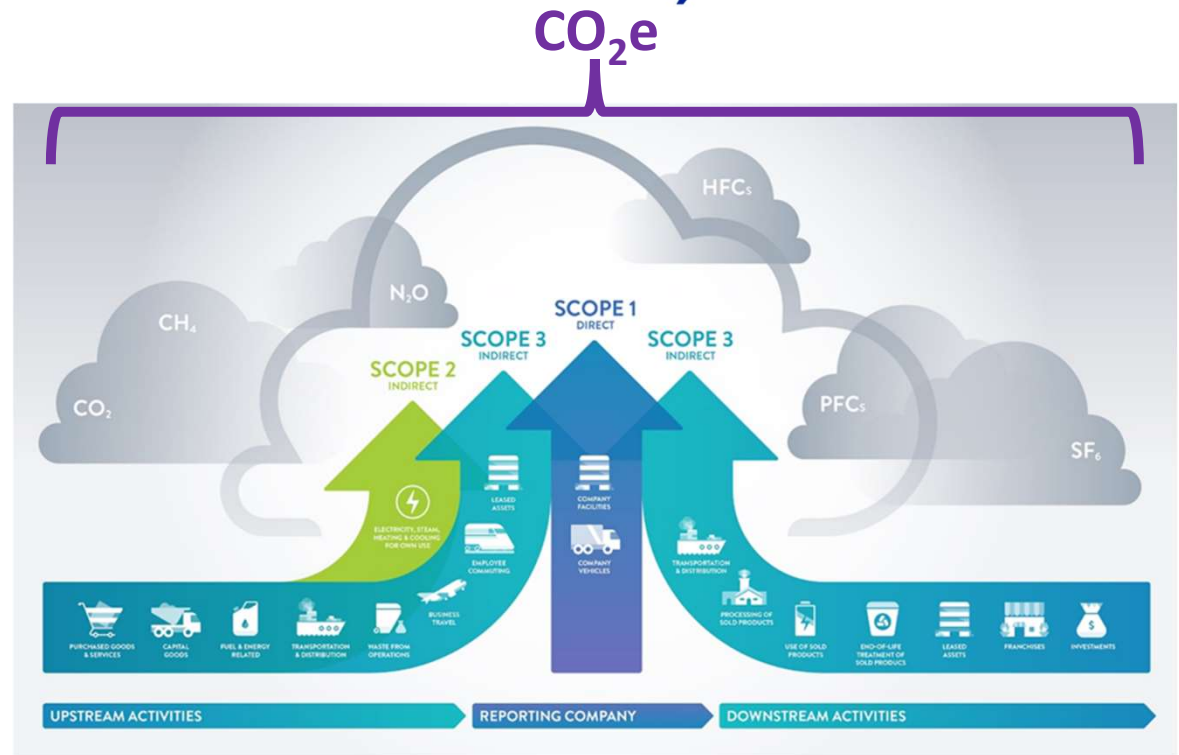
GHG Emissions – CO₂ equivalent



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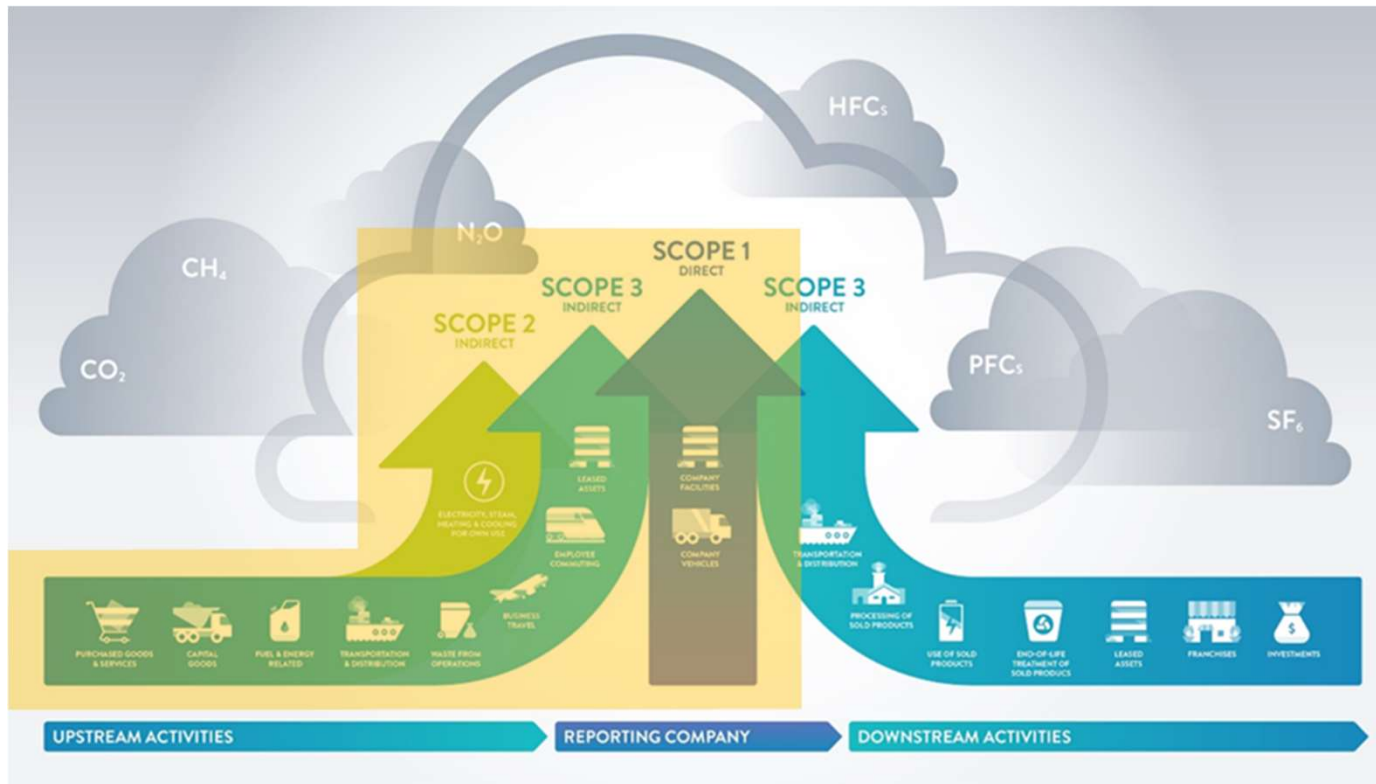
‘CO₂e’ or ‘CO₂ equivalent’

- Different GHGs can impact global warming differently.
 - e.g. Methane (CH₄) causes 25 times more global warming than CO₂.
- CO₂e caters for this by expressing all the different GHG emissions in terms of the equivalent CO₂.
 - e.g. 1 tonne of Methane would be expressed as 25 tonne CO₂e.



Data measurements (such as weight, spend, energy consumptions etc) are factored to convert them into GHG emissions in terms of an equivalent impact of CO₂ [CO₂e].

DMAC – Programme Overview



Source: IAEG Work Group 3 Webinar "Scope 3 Purchased Goods & Services and Capital Goods: Excel Tool, User Guide, Methodology" 21st July 2020

DESNZ's IDC and LIDP initiatives

Industrial Decarbonisation Challenge (IDC) first targeted clustered sites.

Clustered sites
37.6 MtCO₂e



25.6
MtCO₂e

Non-iron and steel industry

12.0
MtCO₂e

Iron and steel

Dispersed sites
33.6 MtCO₂e



4.2
MtCO₂e

Dispersed cement sites

12.3
MtCO₂e

Energy intensive (excluding cement)

17.1
MtCO₂e

Less energy intensive

Local Industrial Decarbonisation Plans (LIDP) includes DMAC

DESNZ LIDP

Local Industrial Decarbonisation Plans – Objectives:

1. To support the development of credible, context-sensitive, strategic plans for decarbonising local industrial clusters.
2. To increase organisational collaboration and strengthen decarbonisation planning skills, capacity and capability in local industrial clusters.
3. To gather evidence to inform decarbonisation of other local industrial clusters and dispersed sites.

In December 2023, DMAC was one of 12 successful bids for LIDP funding.



DESNZ LIDP and DMAC alignment

Local Industrial Decarbonisation Plans – Objectives:

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**DMAC
Strategy**

**DMAC
'trials' for
Scopes
1, 2 & 3**

DMAC Workpackages align with DESNZ LIDP Objectives.



Overview: DMAC Programme

Objective: To understand how the Midlands Aerospace Cluster could achieve Net Zero by 2050.

Focus is on upstream supply chain emissions reduction with three key elements:

- Accelerate the supply chain's maturity in emissions reduction and reporting;
- Prepare the supply chain for customer requirements & regulation changes (e.g. CBAM);
- Outline a decarbonisation strategy for the region
 - including energy requirements, comparing two alternative scenarios to replace natural gas:
 - #1 electrify wherever possible, and
 - #2 green electric/hydrogen mix.



One year programme (Jan to Dec 2024) to deliver a credible strategic plan for the decarbonisation of the Midlands Aerospace Cluster ... and beyond!



DMAC core team



The core team comprises of the MAA with six industrial supply-chain partners, two Tier 1's & four supply-chain (three established aerospace companies, one new entrant).



DMAC extended team

- Industrial Team
- Steering Committee
- Advisory Board
- Extended Team
(Supporting Organisations)



The core team comprises of industrial supply-chain partners, assisted by a broader Advisory Board and Supporting Organisations including policy makers and decarbonisation experts.



DMAC Advisory Board

Decarbonising the Midlands Aerospace Cluster (DMAC) Advisory Board

Midlands Aerospace Cluster OEM & Tier 1 Companies

Rolls-Royce
(OEM Aeroengines)
Jen Houghton
Head of Environmental
Strategy

ITP Aero
(Engine modules)
Brendan Kelly
HS&E Business Partner

Collins Aerospace
(Actuation Systems)
Dr Dawn Pope
EH&S Advisor -
Sustainability

Moog
(Actuation/Control Systems)
Mark Turner
Supply Chain Director

Parker-Meggitt
(Equipment/Control Systems)
Amanda Martins
EMEA Sustainability
Manager

Representatives from Local Aerospace Cluster Alliance, Project Partners, Academia, HVM Catapult & Local Authorities

**Midlands Aerospace
Alliance**
Dr Andrew Mair
CEO

**Project Partner
Representatives**
Representatives from
partner companies

**Warwick Manufacturing
Group / HVM Catapult /
University of Warwick**
Simon Webb
CTO - WMG

**Local Authorities
WMCA**
Charlie Hopkirk
Cluster Delivery Manager
WMCA

**Regional Policy
Midlands Engine**
Jacob Vivian
Project Manager – Policy
& Partnerships



DMAC Supporting Organisations include...



Advisory Board



Pro Environmental Enterprise Support Network (PEES)



West Midlands Combined Authority



What we've done so far...

- We are now all at similar places on the emissions reporting and reduction planning journey.
- We have trialled different approaches to efficiently / automatically obtain emission footprints for different products.
- We have investigated a number of solutions opportunities within local clusters, packaging, energy storage, waste etc.
- **Strategic plan:**
We are pulling together a high-level view of the regional sector's carbon footprint and its decarbonisation journey.

Team Emissions Reporting & Reduction Plans

| Partner Status: Jan 2024 | Scope 1 & 2 Emissions Baseline | Scope 3 Emissions Baseline | Plans/Actions in place to reduce emissions |
|--------------------------|--------------------------------|----------------------------|--|
| Company #1 | | | |
| Company #2 | | | |
| Company #3 | | | |
| Company #4 | | | |
| Company #5 | | | |
| Company #6 | | | |
| Company #7 | | | |



| Partner Status: March 2024 | Scope 1 & 2 Emissions Baseline | Scope 3 Emissions Baseline | Plans/Actions in place to reduce emissions |
|----------------------------|--------------------------------|----------------------------|--|
| Company #1 | | | |
| Company #2 | | | |
| Company #3 | | | |
| Company #4 | | | |
| Company #5 | | | |
| Company #6 | | | |
| Company #7 | | | |



Emission Reduction & Elimination Strategies include...

Emission Reduction Strategies:

- **Use less energy**
 - Energy reduction
 - More efficient operations
 - Eliminate operations
 - Re-use waste
 - Avoid waste
- **Product strategies**
 - Re-use product
 - Re-condition
 - Re-purpose
 - Re-cycle product
 - Re-design

Emission Elimination Strategies:

- **Energy sources**
 - Green sources from the grid / network
 - Green sources locally generated
- **New process technology
e.g. furnaces**

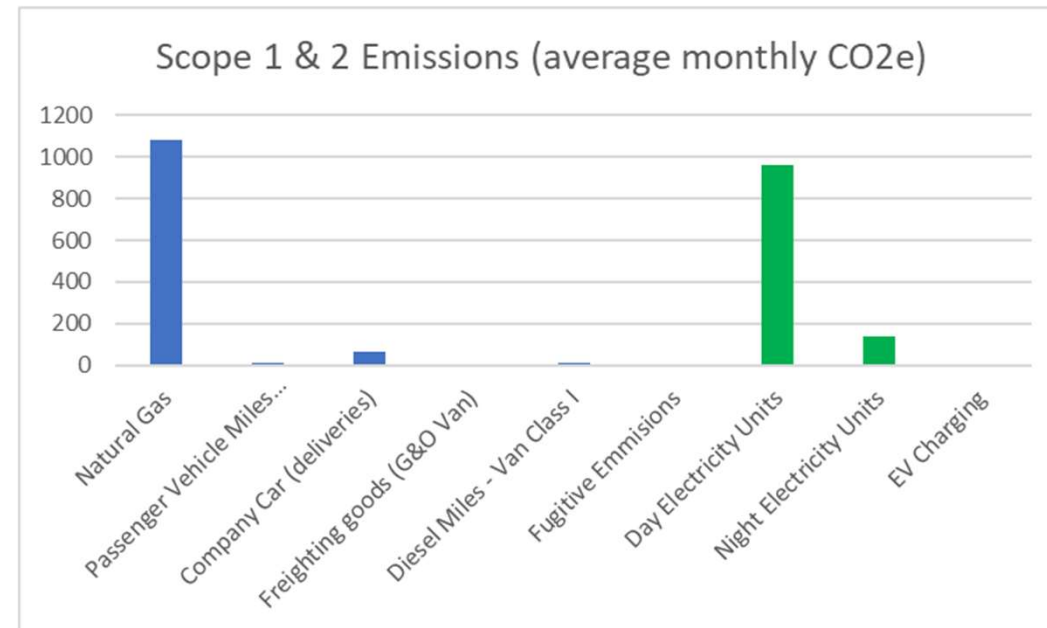
Two alternative strategies

 1. Electrify wherever possible
 2. Hydrogen / Electric mix

Replacement for Natural Gas

For many companies:

- Scope 1 and 2:
 - Natural Gas & Electricity dominate
Example opposite: 96%
- What is the solution for natural gas replacement?
 - Electricity?
 - Hydrogen?



DMAC Survey Questionnaire

We are gathering data for use in DMAC reporting and will use it to generate a picture of overall GHG emissions and energy usage across the Midlands Aerospace supply chain.

No direct links to companies or individuals will be published.

For help completing contact tim.holmes@midlandsaerospace.org.uk

<https://forms.office.com/e/2kSSFdcydJ>



Out in the hall, we have...

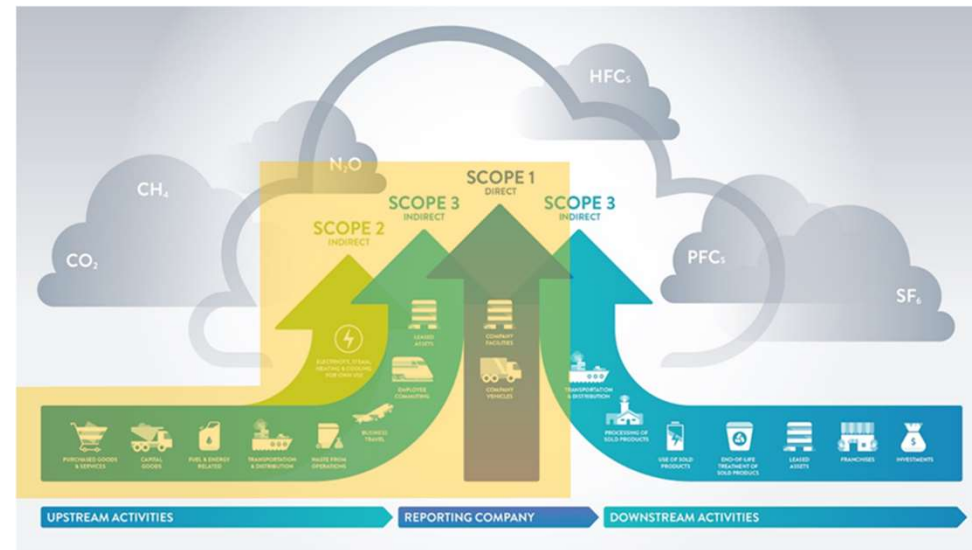
| Organisation | Service |
|-----------------------------------|------------------------------------|
| MTC and partners | Business Energy Advice Service |
| WMG (Warwick Manufacturing Group) | Net Zero Innovation Network |
| MAA (Midlands Aerospace Alliance) | MAA Membership & Support Projects |
| Sustainability West Midlands | Net Zero Grants & Support |
| Coventry City Council | Decarbonisation Net Zero Programme |
| Unipart Consultancy & Riskoa | EmVide Life Cycle Assessment Tool |

Agenda

Networking Break and visit the stalls.

Please be ready to restart at 10:15 to hear from Rolls-Royce, Collins Aerospace and WMG.

DMAC: Decarbonising the Midlands Aerospace Cluster



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Customer and Regulatory Requirements:

- **Alan Seed**
Head of Sustainable Procurement, Rolls-Royce
- **Dr Dawn Pope**
EHS Advisor (Sustainability), Collins Aerospace
- **Dr Russ Hall**
Lead for Reduction of Industrial Emissions & Circular Economy, WMG





Sustainability

Alan Seed
Head of Sustainable Procurement

June 2024

Sustainability at Rolls-Royce

We are committed to reaching net zero carbon emissions from our operations and facilities and that our products are compatible with net zero operations by 2050

- decarbonising our operations, facilities and business activities
- enabling our customers to operate their products in a way that is compatible with low or net zero carbon emissions
- delivering new products and solutions that can accelerate the global energy transition
- creating the necessary enabling environment, with public and policy support, to achieve our collective climate goals

UN Sustainable Development Goals

Energy Transition





| | | | |
|---|--|--|--|
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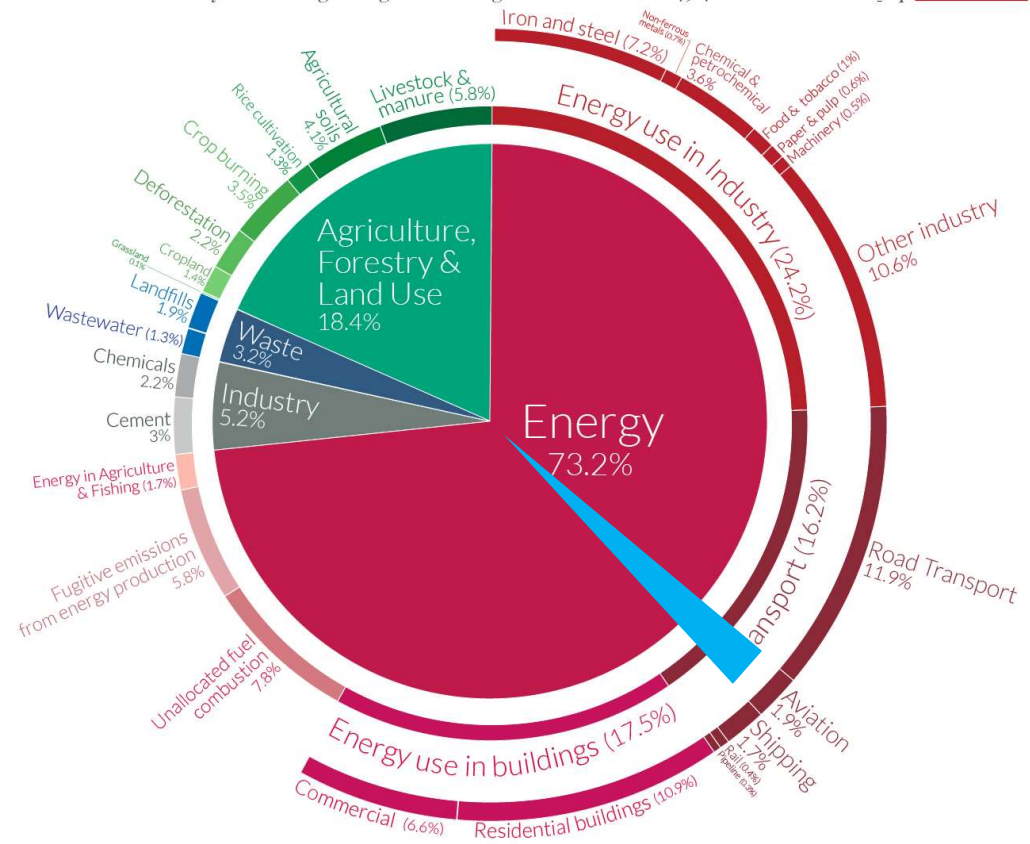


Do we matter

Global greenhouse gas emissions by sector



This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO₂eq.



Aviation contributes 1.9% of total green-house gas emissions

81% of aviation emissions come from passenger travel

Source: [Emissions by sector - Our World in Data](#)

OurWorldinData.org – Research and data to make progress against the world's largest problems.

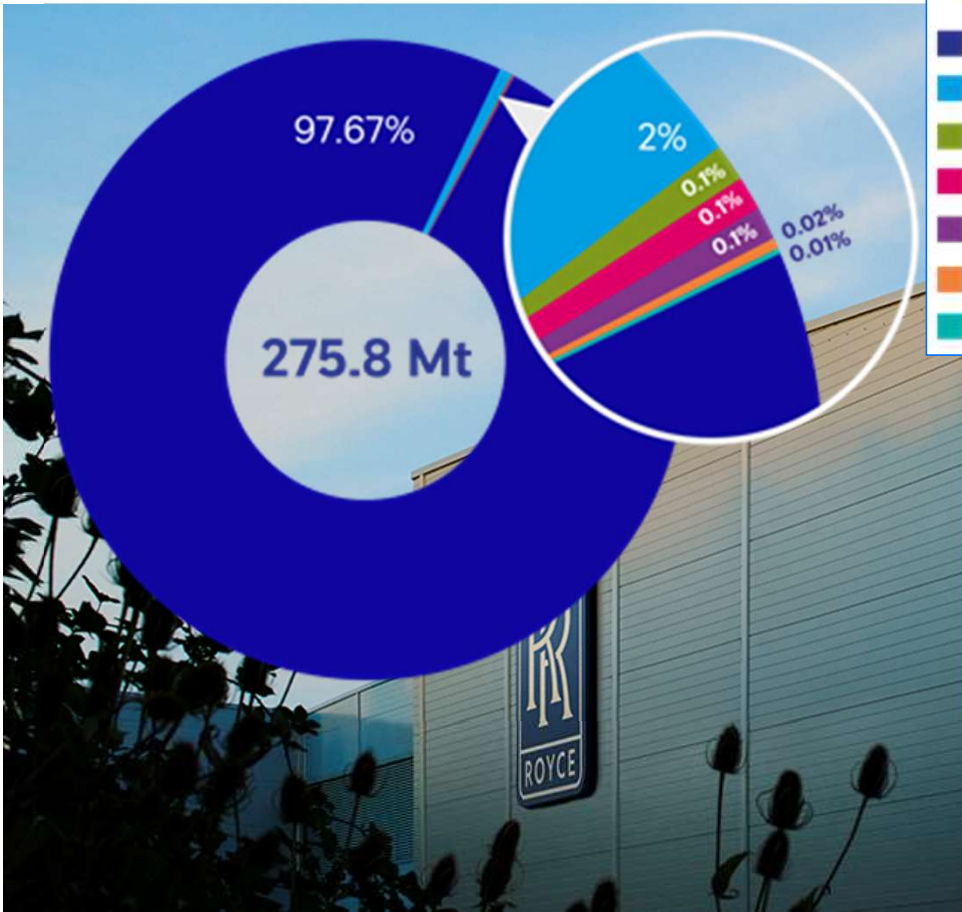
Source: Climate Watch, the World Resources Institute (2020).

Licensed under CC-BY by the author Hannah Ritchie (2020).



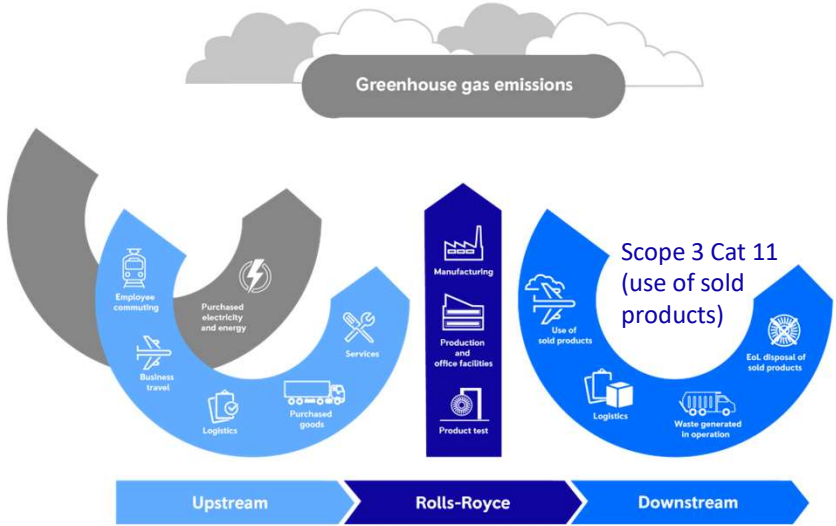
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Our emissions footprint



Our Emissions Footprint

- Existing fleet (use of sold products): 270 Mt
- Purchased goods and services (including raw materials): 5 Mt
- Product test emissions: 300 kt
- Own manufacturing, production and office facilities: 285 kt
- Employee commuting: 200 kt
- Business travel: 50 kt
- Logistics: 30 kt



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Working on our product emissions - Scope 3 Cat 11

All in production Civil Aerospace products proven SAF compatible

CIVIL
AEROSPACE

SAF compatibility



Engine efficiency



Proven compatibility of major Defence engines in production for 100% SAF

DEFENCE

Micro-reactors



Design for sustainability



80% of our Power Systems portfolio for use on sustainable fuels

POWER
SYSTEMS

Micro grids



Batteries



Sustainable fuels



New Markets

Small Modular Reactors (SMRs)





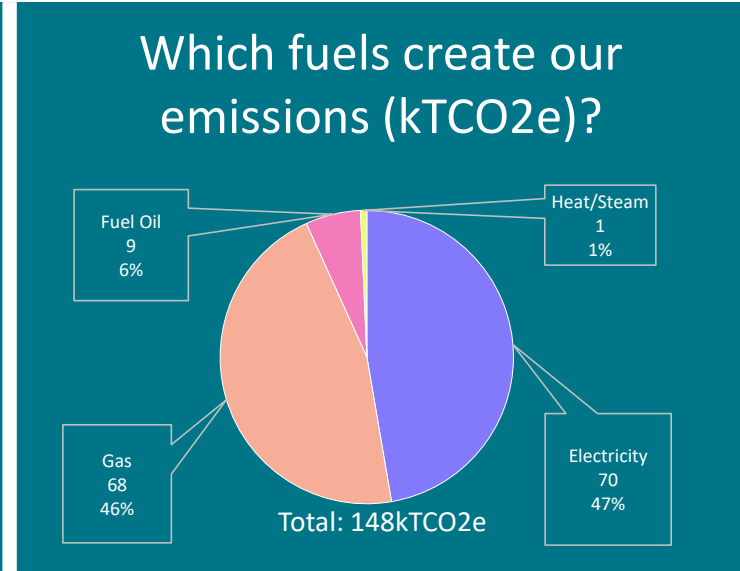
Scope 1 and 2 Emissions from Facilities

- 2014 Baseline: 446kTCO₂e
- 2023 Performance: 148kTCO₂e (-67%)

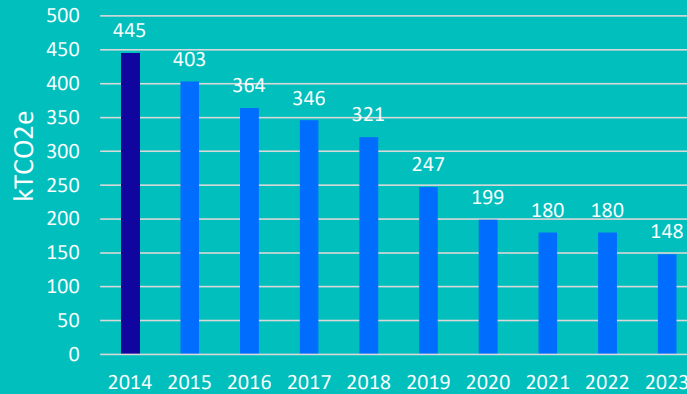
Overview

GHG kTCO₂e

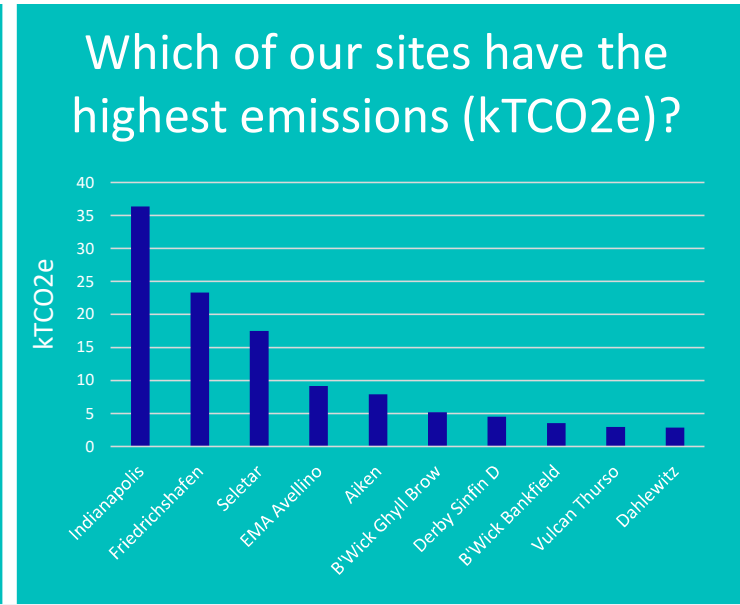
| Business | kTCO ₂ e | Portion of RR facility GHGs |
|---------------|---------------------|-----------------------------|
| Civil | 64 | 43% |
| Defence | 45 | 30% |
| Power Systems | 38 | 26% |
| Other | 1 | 1% |



Breakdown



Status: **67% Reduction**
(297kTCO₂e)
Target: **100% Reduction/0kTCO₂e**





Facilities Decarbonisation on Progress

Bristol – 3.4MW Roof Mounted Solar
10% of annual site electricity needs. GHG reduction of 38,000 tCO₂e



Friedrichshafen – Microgrid Off Grid Energy System
Power Systems hydrogen genset, battery pack and solar panels



Bristol – 1.2MW Ground Source Heat Pumps
50 boreholes driven 120m into the ground and 750m² of solar thermal matting. Efficiency of 400%, GHG reduction of 12,315 tCO₂e.



PROJECT INFORMATION

PHASE 1 - now
Generating 2 million kWh of heat for the site

1,000kW of heat pump capacity is installed, achieving an efficiency of 400%

800,000 kWh of energy collected via solar matting

1,000,000 kWh of energy and cooling from the ground

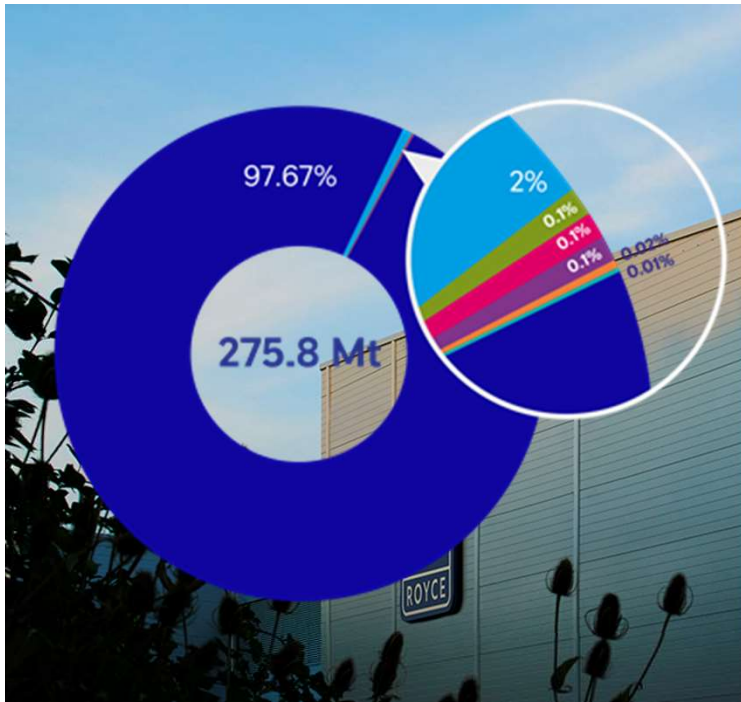
TEST CELLS

mite SSE.co Webcam

Highlights

- 67% reduction in facility GHG emissions since 2014.
- 31% reduction in absolute energy use since 2014 despite good business growth post-covid.
- Strong focus on energy management/optimisation work benefiting from early investment in metering, automated data collection and BMS.
- Solar PV & thermal, CHP, batteries and ground source heat pumps deployed creating off-grid capability across multiple sites.

Purchased goods & services - Scope 3 Cat 1



Scope 3 Cat 1 management is essential- but challenging

- 5Mt CO₂e is “significant” TCFD
- Critical to our Net Zero journey (hard to abate sector)
 - Lead energy transition
 - Regulatory requirements current and future CBAM (carbon border adjustment mechanism)
 - Minimise reliance on carbon credits
 - Reputation: Customers, Shareholders, NGOs, Public, Suppliers.
- Percentage term significance will grow as we address CO₂ emissions from products



Our approach

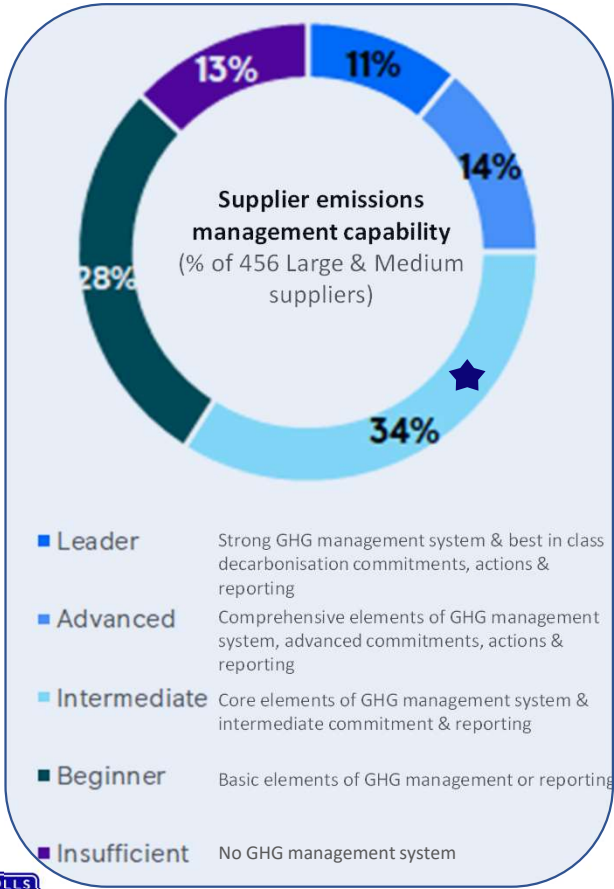
We can't do this alone!

We have a lot to learn!

..and a long way to go

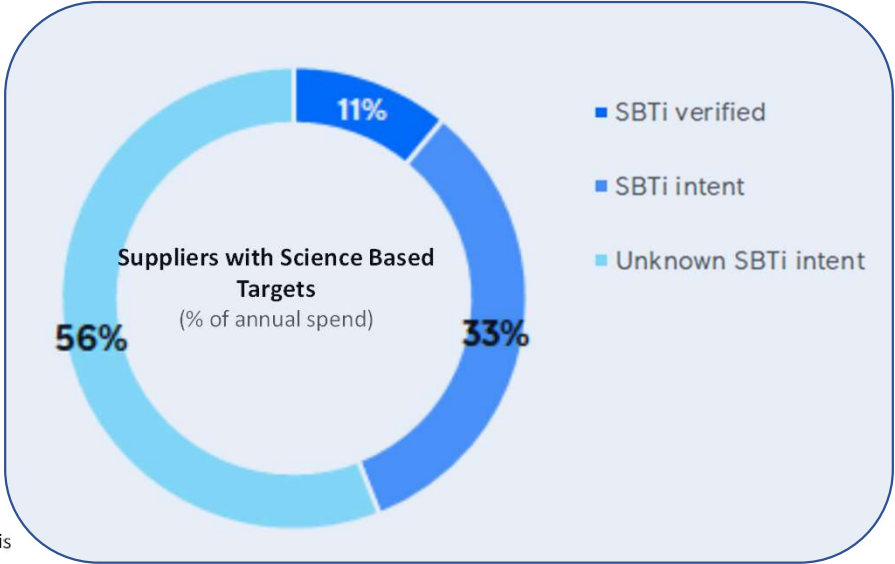


Supplier emissions management capability



Current indicators of emissions management capability

- 25% of large & medium suppliers have a high level of emission management capability
- 41 of suppliers are rated beginner or insufficient
- 11% of suppliers have SBTi verified Science based targets



Data sourced from Ecovadis

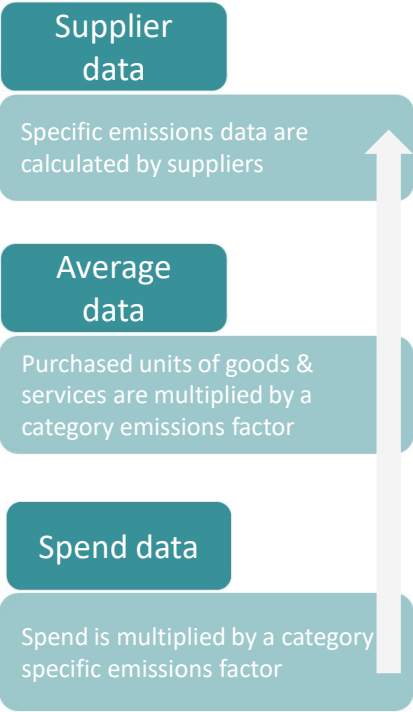


No GHG management system

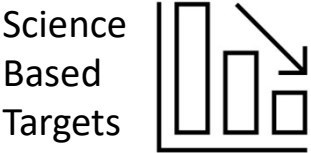
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Capability & considerations

Develop emissions management capability

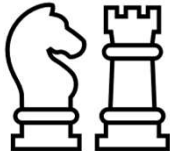


ecovadis

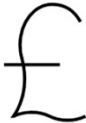


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Embed emissions consideration into our processes



Category Strategies



Sourcing



Scorecards



Contracts



Thankyou



DECARBONISING THE MIDLANDS AEROSPACE SUPPLY CHAIN

Wolverhampton site activity

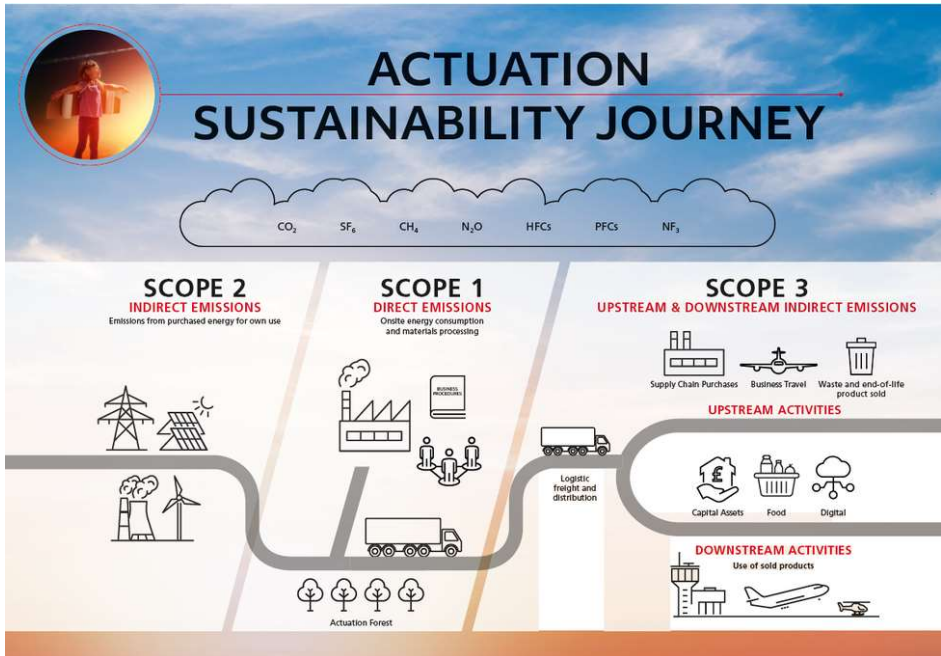
July 2024

OUR NET ZERO JOURNEY

- Where are we on Scope 1-3
- How do we assess the supply chain
- Case studies

Content of the session

WHERE ARE WE SCOPE 1-3



June 2023 C4 & AS started carbon footprint work

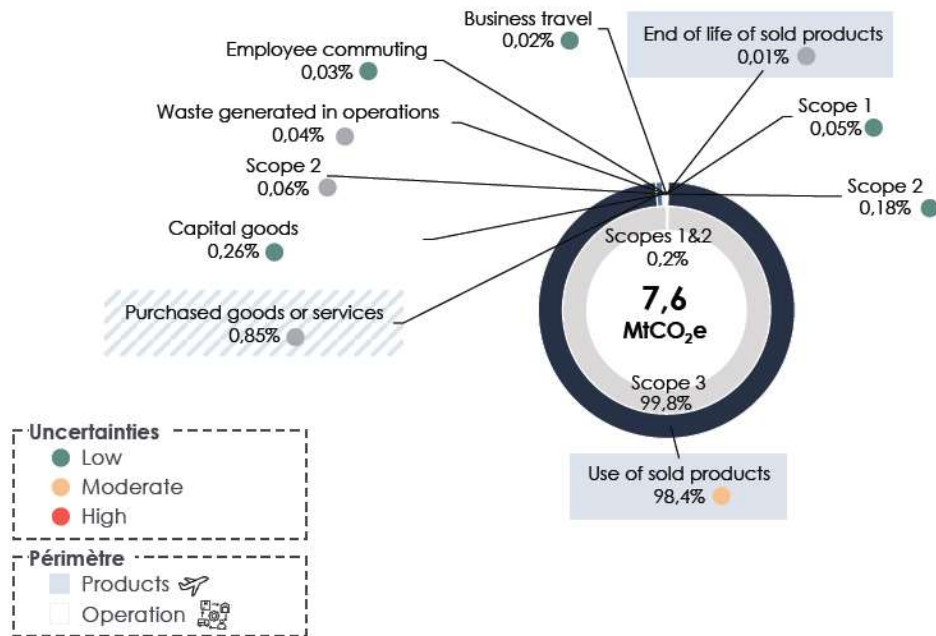
October 2023 C4 Carbon footprint prepared
Oct- Dec 2023 Workshops to define the emission reduction roadmap

Sustainability goals issued May 2024

Site teams working on decarbonisation with targets for 2024

C4 Carbon Footprint

SCOPE 1-3 AS SUMMARY



Scope 1 & 2 17,000 tonnes CO₂e
 Scope 3 104,000 tonnes CO₂e

Scope 1 & 2 is 0.2% of emissions
 Scope 3 is 99.8% of emissions
 Of which sold product use is 98.4% of emissions

The Corporate AS Carbon footprint

AS EMISSION REDUCTION TARGETS

- Scope 1-2 for direct emission Actuation will follow on the Raytheon goal,
 - Reduce by 46% by 2030 compared to 2019 baseline.
- Scope 3 Actuation Systems Goal is
 - Reduce by 4.2% year over year
 - Engage with our top 100 suppliers to align on Paris Agreement goals by 2025
 - Suppliers will have to:
 - Measure their Carbon footprint
 - Commit-on decarbonization targets (SBTi)
 - Reduce CO2 Emissions
 - Communicate on progress and allocate their CO2e emissions to Actuation systems

Emissions Targets

PATHWAYS TO NET ZERO

STRATEGIES FOR A SUSTAINABLE FUTURE RTX LEVEL / COLLIN LEVEL / SBU & FUNCTIONAL LEVEL



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RTX level

PATHWAYS TO NET ZERO



Collins Roadmap

PATHWAYS TO NET ZERO

STAKEHOLDER ENGAGEMENT

CHOOSE ZERO Campaign & the Drive Toward Zero Carbon

- Quarterly campaign focused on prioritizing **employee safety** and **environmental sustainability**
- Each quarter, **CHOOSE ZERO** will highlight key topics enabling our two parallel journeys - towards **Zero Repeat Workplace Incidents** and the **Drive Towards Zero Carbon**
- Toolkits with simple ways YOU can make a difference and showcase the great progress being made throughout the organization with spotlights in Liffort and on LinkedIn

Q2 TOOLKIT CONTENTS

Ready-to-use resources delivered to your inbox

- Manager speaking points
- Video
- Digital signage
- Poster
- Zoom backgrounds (2)
- Email signature



Collins Aerospace 18 May 2022
CHOOSE ZERO Advanced Executive

Q2 CHOOSE ZERO Toolkit: Safety Culture, New Cardinal Rules & the Drive Toward Zero Carbon

Communications Toolkit will provide resources directly to Operations, EH&S and all communications leads on the CHOOSE ZERO safety and sustainability campaign. Toolkits will focus on critical safety and sustainability measures for each quarter, providing leaders with templates, talking points, posters, and other resources for communication and buy-in across sites.

Q2 Toolkit Topics

- Safety Culture
- New Cardinal Rules
- Drive Toward Zero Carbon

Expectations of Q2 CHOOSE ZERO toolkit

Thank you to those who joined our first Snack & Learn of 2022. We are excited to expand this campaign to the full Advanced Structures organization and thank you for your continued commitment to being a leader of safety. To help the drive toward zero repeat workplace incidents and sustainability, and lead meaningful change at your local sites.

ACTION REQUIRED: Use all Operations leads, what would it be like?

STEP #1: Review the **deck** from the May 9 Snack & Learn to get an overview of this quarter's key focus areas. Also take a few minutes to check out the banner assets (Digital, Facebook, Instagram, Poster) from our 2022 launch email to all Advanced Structures employees. These materials are **NOT** meant for flow-down but rather, simply for your information.

STEP #2: Work with your EH&S site lead to customize the **provided speaking points** and **customize** these important safety messages with your team.

STEP #3: Work with your site communications and EH&S leads to translate, post, edit or distribute the collateral provided below and reinforce safety messaging at your site:

- Video (short)** to reinforce the Cardinal Rules
- Facebook/Slide post** to reinforce the drive process on digital signage and in Team Halls
- Poster (print)** in your lobby or shop floor entrances to highlight the Cardinal Rules
- Event Backdrop (1)** to use as appropriate live events
- Event Backdrop (2)** to use as your background during Zoom calls
- Zoom Background (1)** to use as your background during Zoom calls
- Zoom Background (2)** to use as your background during Zoom calls

Additional Resources

- EH&S Storybook link**
- Email **Katie Smith** to provide any feedback on the communications toolkit. We want to know what's working and what's missing so that we can adjust accordingly.

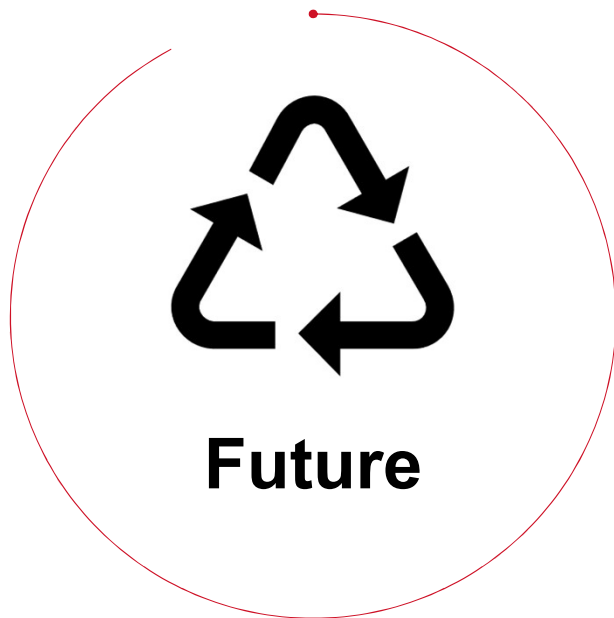
Collins Aerospace



Quarterly CHOOSE ZERO Campaign, 'Snack and Learn' Session & Survey

Choose Zero Campaign

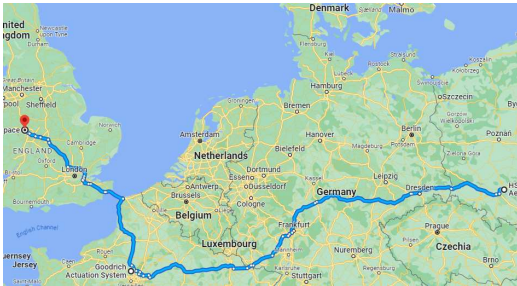
WORKING WITH THE SUPPLY CHAIN



Sustainability will begin to become a decision making metric in Supply Chain:

- Transfer CO2 Tracking
- NPI Supplier Selection
 - already seen a shift towards electric solutions and technology projects
- Supplier Sustainability Maturity Assessments
- Account Reviews
- SRM Metrics

MAJOR SUSTAINABILITY INITIATIVES



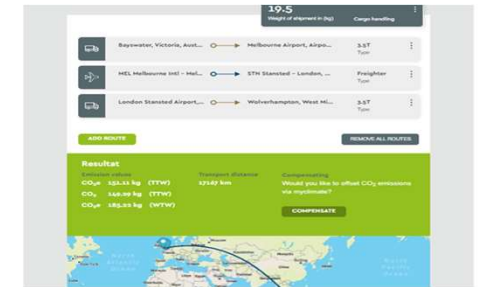
Milk Run Initiative

- Previously transported small parcel shipments to both sites in France and the UK (St Ouen and Wolverhampton) via air
- Reliant on air and high emissions compared to other modes of transport
- Milk run via road now runs from Wroclaw to UK via France. May extend to Rzeszow in future
- Cost saving: 15%
Transit time reduction: 1-2 days
Emissions reduction: 80% annually



JJX Electric Sprinter Van

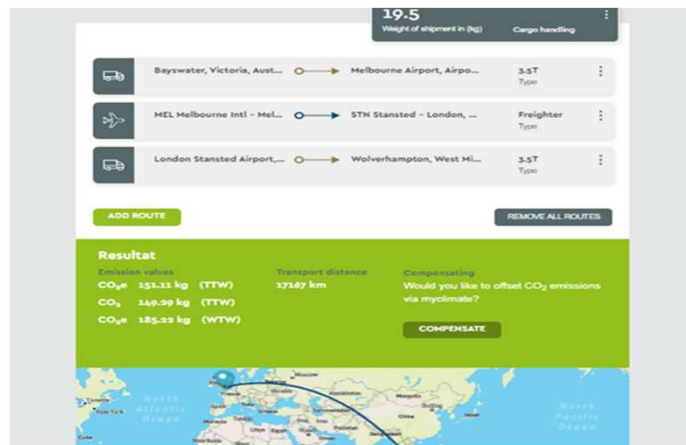
- JJX operate feeder services from Wolverhampton to Dudley for shipment to customers in France and Germany.
- Traditionally have been served by Diesel powered vehicles. Very frequent usage therefore high frequency of journeys and emissions
- Now served by several Electric Powered Sprinter vans
- Currently saving 8 metric tonnes of Carbon emissions annually



CO2 Impact Calculator in Passport Process

- Previously CO2 impact not considered in the transfer process – primarily focused around cost saving and quality/performance
- Event held to define how CO2 could be incorporated into the Transfer passport process
- Pilot G2 performed by Chris Cocksedge – CO2 calculator used to determine CO2 effects of transfer and determine an offset
- Next stages are to define how this can be included as a criteria for transfer projects at G2, not just a metric

NEW TRANSFER PROCESS



Tracking CO2 Impact

| Supplier Name and Address: | | | | | | | |
|--|-----------|------|----------|----------|--------------|----------|-----------------|
| Collins Contact e-mail: | | | | | | | |
| Date of evaluation | | | | | | | |
| Maturity Questions | Responses | Date | Evidence | Comments | Action owner | Due Date | Action Status % |
| Is supplier aware and/or interested in sustainability and has intention to collaborate on this account? | yes | | | | | | |
| Does supplier have an internal process or policy to reduce carbon footprint? | yes | | | | | | |
| Maturity Level 1: Initial | | | | | | | |
| Does supplier have a policy or initiative to measure, monitor and reduce GHG emission? | yes | | | | | | |
| Does the supplier have an internal process for Environmental Management | yes | | | | | | |
| Maturity Level 2: Managed | | | | | | | |
| Has supplier started any initiatives related to GHG emission? | yes | | | | | | |
| Has supplier assessed its scope 1 and 2 based on a validated or recognized standard | yes | | | | | | |
| Maturity Level 3: Defined | | | | | | | |
| Does the Supplier have an accredited EMS such as ISO 14001, ISO 15001 or equivalent | yes | | | | | | |
| Has the supplier defined objectives on scope 1 and 2 and has formally communicated on it | yes | | | | | | |
| Has supplier got a scope 1 and 2 plan defined with related organization, budget and resources | yes | | | | | | |
| Maturity Level 4: Quantitative | | | | | | | |
| Does supplier's roadmap on scope 1 and 2 progress as per plan? | yes | | | | | | |
| Has supplier started scope 3 initiative in addition to scope 1 and 2 | yes | | | | | | |
| Maturity Level 5: Optimizing | | | | | | | |
| Has the supplier defined a roadmap on scope 3? | yes | | | | | | |
| Has the supplier validated it's 15C trajectory with validation of SBTi or a supplier has been defined as carbon neutral? | yes | | | | | | |
| Maturity Score | 5.0 | | | | | | |
| Box Score | 11 | | | | | | |

Supplier Sustainability Maturity

SUSTAINABILITY TRENDS IN LOGISTICS



| | Sustainable Aviation Fuel (SAF) | Modal Shifts | Sustainable Packaging |
|----------------------|--|---|--|
| Market Drivers | <ul style="list-style-type: none"> • Push to find an alternative fuel for aviation away from Fossil Fuels. • Scope 1 and 3 emissions impacted on freight. | <ul style="list-style-type: none"> • Instant emission reduction to move freight away from Air. • Switch to Road or Sea shows a reduction of 40 – 90% emissions. | <ul style="list-style-type: none"> • Aim to reduce materials used in packaging for freight. • Key focus on reduction in plastic and imported packaging. • Plastic and Waste Tax implementation. |
| Market Challenges | <ul style="list-style-type: none"> • 0.1% of global fuel is from SAF sources. • Sources and energy required to manufacture is high. | <ul style="list-style-type: none"> • Reliability of alternatives to air for speed and efficiency. | <ul style="list-style-type: none"> • Culture of overpacking to ensure quality. • Plastic over-used in shipments and lack of recycling. |
| Market Opportunities | <ul style="list-style-type: none"> • Bulk buying of SAF fuel to generate economies of scale to compete against fossil fuel. • Short term reduction of emissions of 70% due to difference in manufacture process. | <ul style="list-style-type: none"> • European road network due freight inside the continent. • Freight transit time and cost more optimal for Road compared to air. (Europe Only) | <ul style="list-style-type: none"> • Trend is that alternatives to Plastic are better quality and more sustainable. • Challenge culture and long-term practices. |

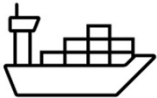
MODAL SHIFT AIR → ROAD/SEA



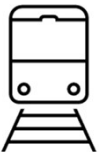
- 350 – 2000 g CO₂e/TKM



- 32 – 380g CO₂e/TKM



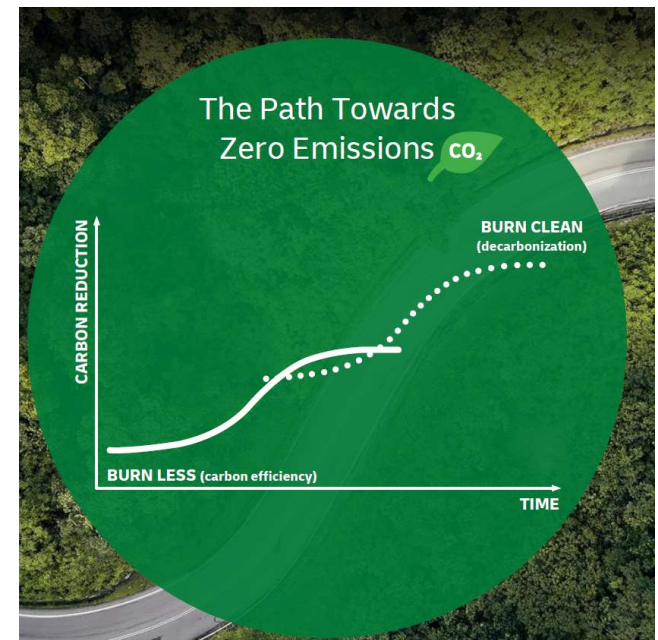
- 6 – 40g CO₂e/TKM



- 0.1 – 60g CO₂e/TKM



- *TKM* – transport of one tonne over a KM.



MODAL SHIFT AIR → ROAD/SEA

Example Shipment Rome -> Birmingham comparing going via Air or Road using DHL Carbon Calculator.

The screenshot displays the DHL Carbon Calculator interface. At the top, the DHL logo is on the left, followed by 'CARBON CALCULATOR'. On the right, there are tabs for 'SCENARIOS' and 'LEGAL', and a 'VERIFIED' badge from SGS. Below the header, a 'SCENARIOS' section shows two scenarios for the route 'Rome to Birmingham'.

| Scenario | Mode | Distance (km) | Weight (kg) | Volume (cbm) | CO ₂ e (kg) |
|----------|------|---------------|-------------|--------------|------------------------|
| 1 | Air | 1,706.03 | 25 | 0.15 | 36.80 |
| 2 | Road | 2,038 | 25 | 0.08 | 2.41 |

Additional data from the calculator interface:

- Scenario 1 (Air):** 921.98 gCO₂/RTK, 37.15 kgCO₂e (TTW), 45.33 kgCO₂e (WW), 36.80 kgCO₂.
- Scenario 2 (Road):** 2.45 kgCO₂e (TTW), 2.91 kgCO₂e (WW).

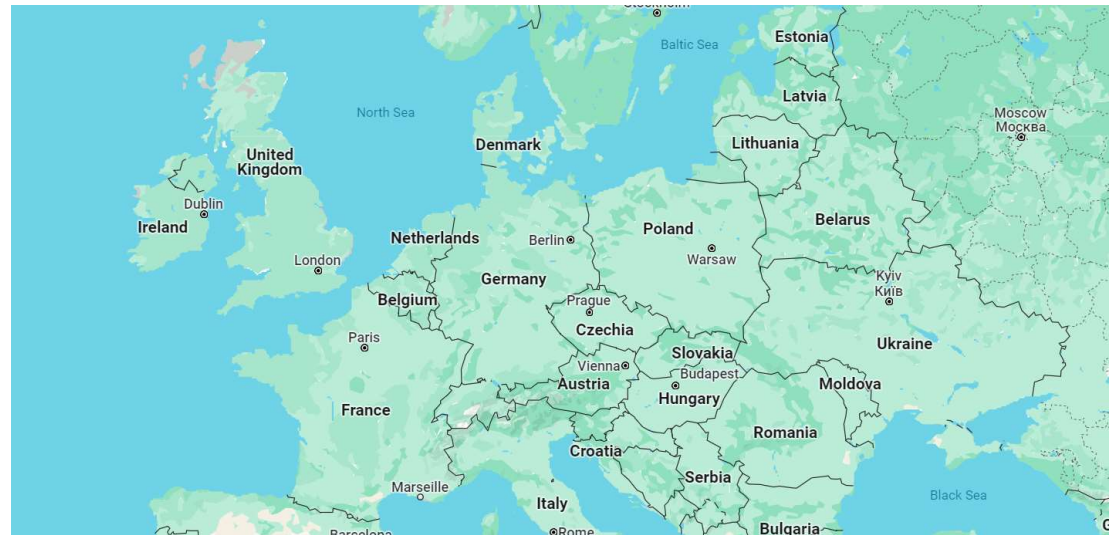
MODAL SHIFT ACTUATION EUROPE - 2023

Project Air -> Road Actuation Europe

Sites Included: France (St Ouen + Vernon) and UK (Banbury and Wolverhampton)

Aims of the Project:

- To identify current freight routes served by air and assess feasibility to switch to road.
- Find high volume and usage routes and create road networks.
- Find common routes between UK and France to leverage geographical advantages.
- Business case cost, delivery and sustainability benefits.



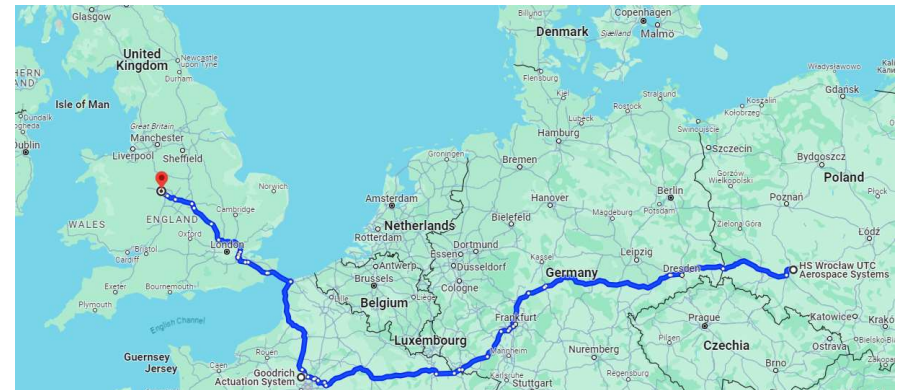
| Actuation Country | 2022 Inbound Air Freight Europe |
|-------------------|---------------------------------|
| France | 31 Metric Tonnes |
| UK | 46 Metric Tonnes |

IN FOCUS: JJX MILK RUN EXPANSION PL 2023

Route Selected: Collins Wroclaw -> UK/France

- 2022 State: Air FedEx
- 2023 State: Hybrid FedEx Air / JJX Road

| Route | Weight Shipped (Metric Tonnes) | % Total Inbound Freight |
|--------------------------|--------------------------------|-------------------------|
| Wroclaw -> St Ouen | 13 | 41% |
| Wroclaw -> Wolverhampton | 25 | 54% |



Launched April 2023

- Weekly Milk Run from Wroclaw to St Ouen/Wolverhampton on every Wednesday.
- Cost saving reduction of – 10%
- Transit time reduction of 2 days from air.
- Sustainability Benefits: *see separate slide.*

Sustainability Solutions are not the costly option !

IN FOCUS: JJX MILK RUN EXPANSION PL 2024

Additional Route Selected: Collins Rzeszow -> UK

- 2023 State: Air DHL Express
- 2024 State: Hybrid DHL Express Air / JJX Road

| Route | Weight Shipped (Metric Tonnes) | % Total Inbound Freight |
|--------------------------|--------------------------------|-------------------------|
| Rzeszow -> Wolverhampton | 8 | 17% |

Potential on the Expansion:

- Further Reduction of CO2e 3 tonnes per year.
- Launch Date January 2024.
- Cost Saving of 10 – 15% vs Air.



Sustainability Solutions are not the costly option !

KITE PACKAGING PARTNERSHIP

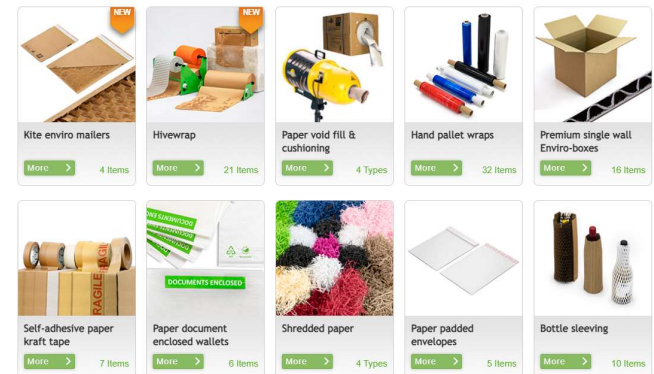
In 2024 we intend to switch supply of certain packaging to Kite Packaging who offer a sustainable solution for Wolverhampton.

Key Sustainability Benefits and Initiatives:

- Certified Carbon Neutral Business in both Scope 1 and 2 emissions.
- Packaging leader in finding alternatives to plastic products and transition to paper-based products.
- Large knowledge working with a variety of industries including Aerospace, Automotive and Retail.



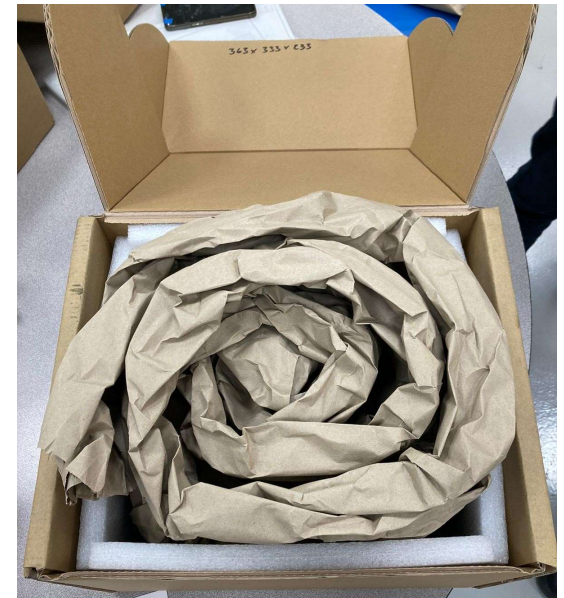
Environmental products



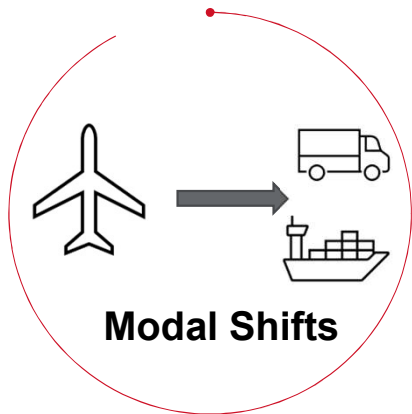
SUSTAINABLE PACKAGING

Examples of New Proposed Packaging:

- Entirely paper-based solution for packaging and 100% recyclable.
- Outer white layer is made of a paper-based solution.
- No use of single use plastics (bubble wrap).



SUMMARY AND PROGRESS FOR 2024



- Push forward with more shifts from Air to Sea/Road.
- Support synergies between Actuation sites in Europe
- Rzeszow deliveries to Wolves and St Ouen.

- Implement new packaging concept and design in Wolverhampton with Kite.
- Investigate reusable packaging at 3PL sites.



THE NEXT STEPS

Ongoing Net Zero Plans

PROJECT 1: SUSTAINABILITY STRATEGY



Corporate AS Plans & projects
LCA, Forests, supply chain,

| | | |
|--|--|---|
| Purpose & Objectives Actuation Sustainability Strategy: how to combine carbon emission reduction with volume growth William Richards Issam Ituoni Johan Schodel | | Deliverables Volumes by sites in SFP (up to 2030) Carbon Emission by sites to reach Actuation target Factors influencing Carbon emissions |
| Background <ul style="list-style-type: none"> Actuation has clear target to reduce carbon emission by 46% by 2030. Sales volumes are growing in the same period | Scope <ul style="list-style-type: none"> Understand competitors sustainability Strategy Model emissions reduction needed to reach Sustainability Actuation long term targets in a period of volume growth Identify factors influencing sustainability in this environment | Risk |
| Key Activities <ul style="list-style-type: none"> Sustainability target & factors Market intelligence VPS / SFP Models | Out of Scope Initiatives to hit the strategy target Dependencies Market trend | Programme Deliverables <ul style="list-style-type: none"> Sustainability Business Strategy <ul style="list-style-type: none"> Marketing & Business Development |

Next Steps

ACTUATION SYSTEMS FOREST

Investing in Carbon Sinks

Actuation Systems' forest
Forest created by Actuation Systems
[Visit Forest](#)

Trees planted in this forest

- Orange**
Citrus sinensis [Learn more](#)
- Orange**
Citrus sinensis [Learn more](#)
- Croton Serafina**
Croton macrostachyus [Learn more](#)
- Leucaena**
Leucaena leucocephala [Learn more](#)
- Cacao**
Theobroma cacao [Learn more](#)
- Cacao**
Theobroma cacao [Learn more](#)

[Have you received a tree?](#)

The world map shows four location markers with the following carbon sink values: 450 (North America), 350 (Europe), 250 (Africa), and 2150 (South America).

ACTUATION SYSTEMS – COLLINS AEROSPACE

Emissions reduction in the upstream supply chain

- Collins Aerospace is on a journey to reduce its carbon emissions
 - Have you started on your journey?
- A key part of this strategy is the reduction of emissions from the Supply Chain
- Sustainability will begin to become a decision-making metric in Supply Chain

Thank you

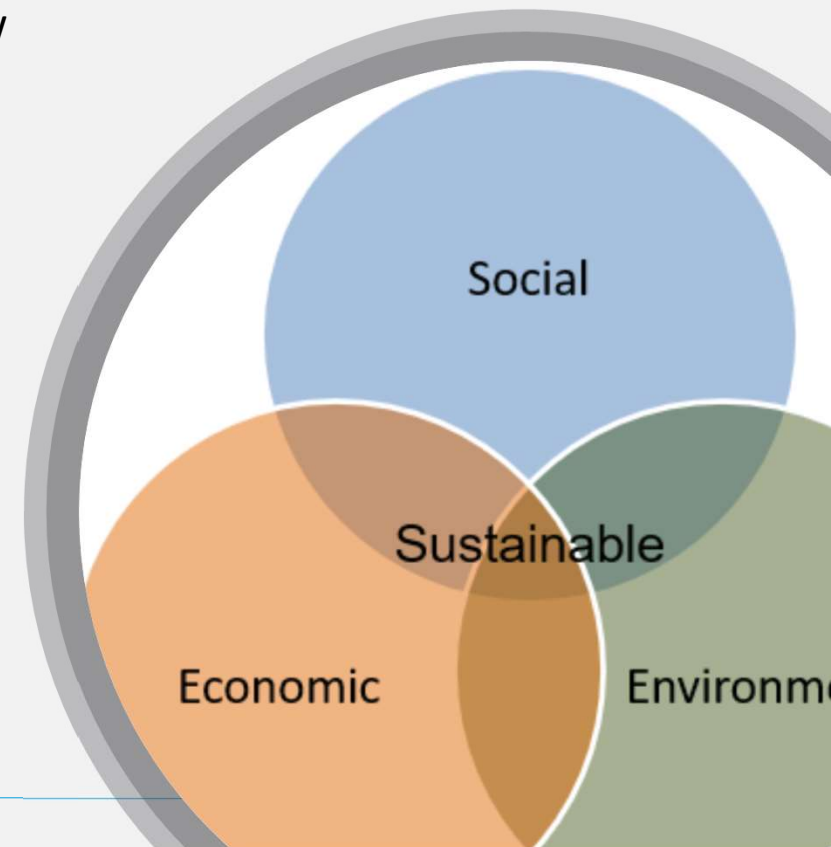
A photograph of an industrial facility, likely a refinery or chemical plant, at dusk. The sky is a deep blue, and the facility is illuminated with warm yellow lights. In the foreground, there are several large white storage tanks and a complex network of pipes and distillation columns. The overall scene is industrial and modern.

Supply Chain Emissions & CBAM

Dr. Russ Hall
11/07/2024

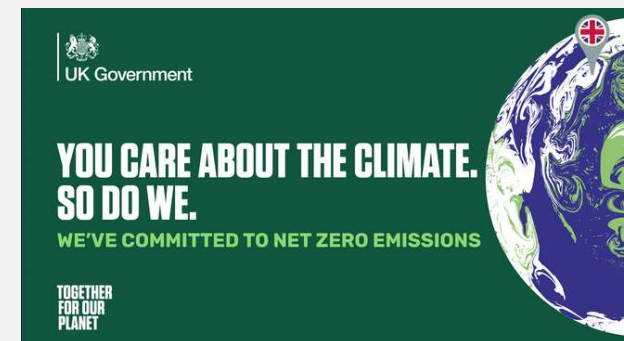
Industrial Sustainability

- Sustainability is... making sure we're all still here tomorrow (not net-zero...)
- Supported by three pillars[†]:
 - **Social** – e.g. wellbeing, quality of living, culture, community
 - **Economic** – Profit, growth, business models, cost savings
 - **Environmental** – Compromised natural systems, global warming, waste reduction
- Solutions to one pillar need to be applicable to the other two pillars for a sustainable future
- Growth and sustainability are achievable together



Net-Zero

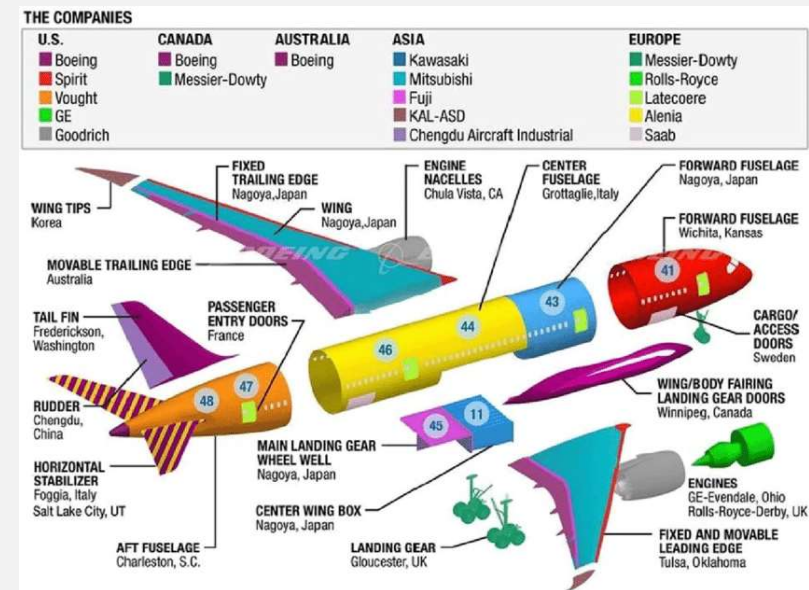
- Net-zero fits into the environmental pillar of sustainability
- **GHG = CO₂e = Emissions**
- Net-zero by 2050 means:
 - **Net GHG emissions are zero**, they can still be released but what is released is captured
 - Only GHG emissions from nature remain
 - **A legal obligation**, signed into UK law in June 2019[‡]
- Three primary emission scopes – 1: direct, 2: purchased energy, 3: indirect
- Industry is responsible for approximately 12% of total UK territorial GHG emissions[§]



[†] UK Net Zero Research and Innovation Framework <https://assets.publishing.service.gov.uk/media/61824eade90e071979dfee08/uk-net-zero-research-innovation-framework.pdf>
[‡] UK becomes first major economy to pass net zero emissions law <https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-net-zero-emissions-law>
[§] The Sixth Carbon Budget Manufacturing and construction <https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Manufacturing-and-construction.pdf>

GHG Emission Scopes

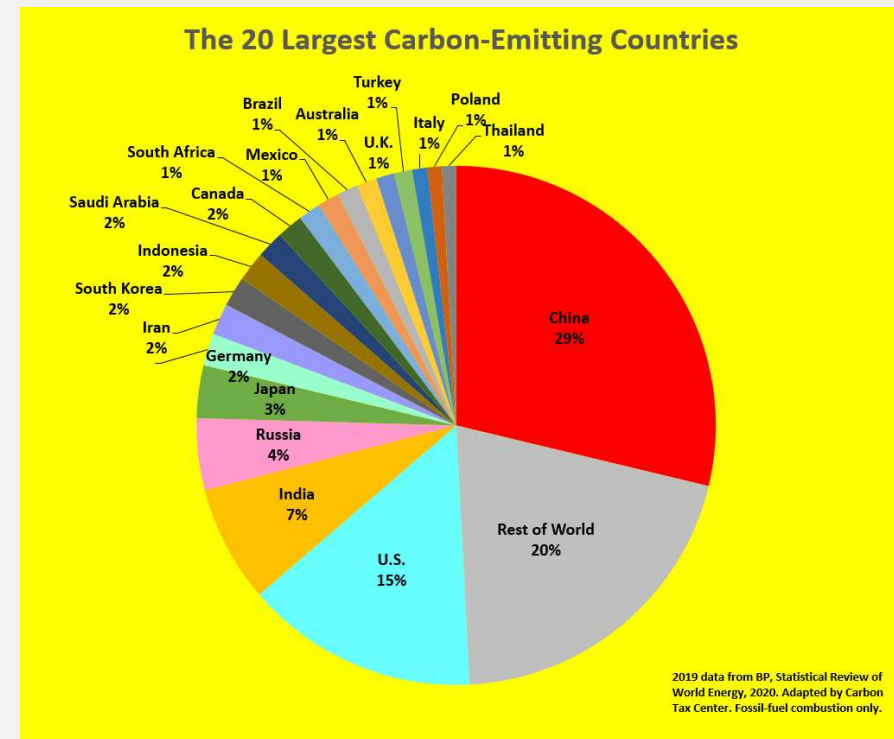
- **Scope 1** – Direct emissions from company operations (e.g. fuel combustion, company vehicles)
- **Scope 2** – Emissions from Indirect purchased electricity or steam
- **Scope 3 – Upstream:**
 - Complex, global, long supply chains
 - Different levels of literacy and reporting
 - Different requirements
- **Scope 3 – Downstream:**
 - Out of sight
 - Control of product use requires assumptions
 - Limited control over disposal
- For most businesses, the bulk of emissions are in their supply chains



Boeing's Global Supply Chain
Source: The Boeing Company

Carbon Leakage

- **Carbon Leakage** is an increase in emissions in one country caused by emissions reductions in another country
- Carbon Leakage can happen for a number of reasons:
 - Emissions regulations and measurement
 - Offshoring
 - Local cost increases
 - Product and material availability
- EU and UK are implementing **Carbon Border Adjustment Mechanisms (CBAM)** to target carbon leakage



UK Legislation / Regulation

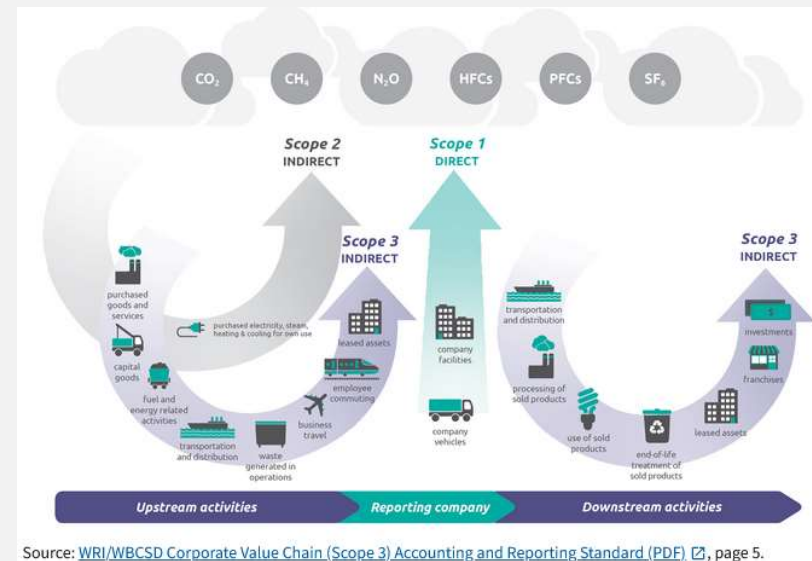
- **Climate Change Act** – commits the UK government to reducing greenhouse gas emissions by at least 100% of 1990 levels by 2050 (enacted in 2019)
- **Decarbonising Transport** – all new petrol and diesel vehicles will be zero emission by 2035
- **Streamlined Energy & Carbon Reporting (SECR)** – large companies, LLP, groups must report their Scope 1 & 2 GHG emissions in Directors reports, Scope 3 is actively encouraged
- **UK Emissions Trading Scheme (UK ETS)** – Power sector, energy intensive industries and aviation must report GHG emissions each year
- **Energy Savings Opportunity Scheme (ESOS)** – applies to large UK undertaking and corporate groups, identifies opportunities to reduce energy usage, reports every 4 years
- **Climate Change Agreements (CCA)** – voluntary energy and CO2 reduction schemes monitored by the Environment Agency that can lead to reductions in Climate Change Levy's
- **Carbon Border Adjustment Mechanism (CBAM)** – targets embodied emissions in goods purchased outside of the UK to help prevent carbon leakage, will come into force in 2027 – aluminium, cement, ceramics, fertilizers, glass, hydrogen, iron and steel

No unified approach to calculation, expensive, largely ignore Scope 3

EU = being tested. UK = being developed. Both include Scope 3

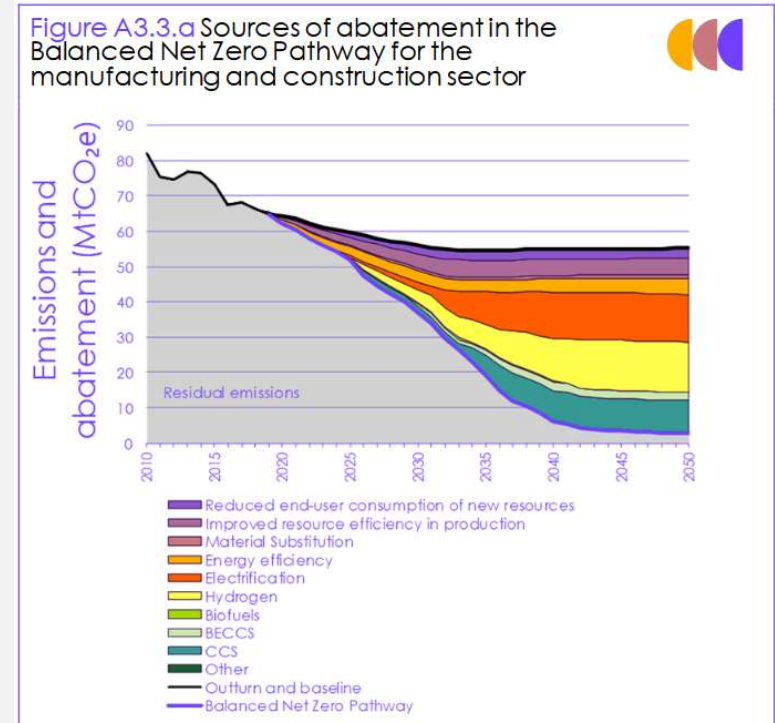
But... What about you?

- Emissions reporting is coming!
- Company level:
 - Large companies already have to complete company reporting
 - SMEs will need to complete reporting at some point
- Product level:
 - EU CBAM – already real, focused on certain goods, simple and semi-complex products
 - UK CBAM – being developed, focused on certain goods, will include complex products
 - Both defined by CN codes



Supply Chain Emission Calculations & Reductions

- Calculating embodied emissions:
 - Mass (amounts and conversion factors)
 - Life Cycle Analysis (software & databases)
- Emissions causes:
 - Inefficiency
 - Processes with big energy (mining, converting, heating)
 - Energy grids (low carbon energy grid = low carbon product, usually)
 - Too much stuff... Using less material and energy = lower embodied emissions



Balanced Net Zero Pathway – UK Industry – The 6th Carbon Budget

<https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Manufacturing-and-construction.pdf>

Closing Comments

- **GHG emissions** – reporting, reduction, management – **not going away**
- EU and UK CBAM – we all need to be ready
 - Some great resources here: <https://www.carbonchain.com/cbam>
 - And here: https://taxation-customs.ec.europa.eu/system/files/2023-12/Questions%20and%20Answers_Carbon%20Border%20Adjustment%20Mechanism%20%28CBAM%29.pdf
- Sustainable manufacturing is an opportunity – reshoring, control, bigger markets



<https://www.sikich.com/insight/green-manufacturing-how-to-be-an-eco-friendly-manufacturer/>

Thank you.

WMG

University of Warwick

Coventry

CV4 7AL

United Kingdom



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wmgmarketing@warwick.ac.uk



[@wmgwarwick](https://twitter.com/wmgwarwick)



[wmgwarwick](https://www.instagram.com/wmgwarwick)



[wmg-university-of-warwick](https://www.linkedin.com/company/wmg-university-of-warwick)

Panel Session #1

Customer and Regulatory Requirements: Are we ready?

- **Alan Seed**
Head of Sustainable Procurement, Rolls-Royce
- **Dr Dawn Pope**
EHS Advisor (Sustainability), Collins Aerospace
- **Dr Russ Hall**
Lead for Reduction of Industrial Emissions & Circular Economy, WMG
- **Chair:** Chris Weir, MAA



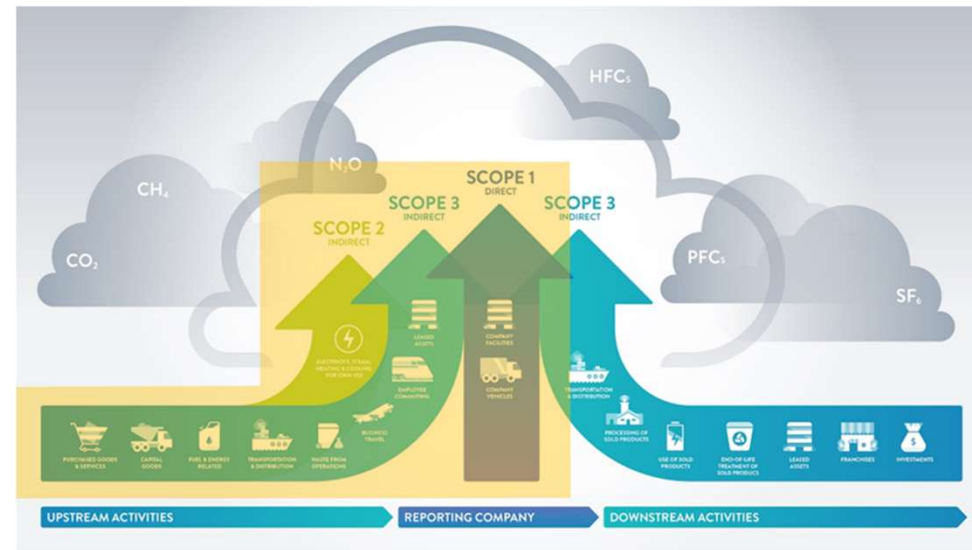
Agenda

Lunch!

Network and visit the stalls.

Please be ready to restart at 1pm.

DMAC: Decarbonising the Midlands Aerospace Cluster



Agenda

| Start Time | Topic | Presenter |
|------------|---|----------------------------|
| 08:30 | Registration & Networking | |
| 09:00 | Welcome | Dr Andrew Mair, MAA |
| 09:05 | Overview of today and the DMAC Programme | Chris Weir, MAA |
| 09:50 | Networking & Stands | |
| 10:20 | OEM - (Emissions) Sustainability in the Supply-chain - VoC | Alan Seed, Rolls-Royce |
| 10:40 | Tier 1 - (Emissions) Sustainability in the Supply-chain - VoC | Dr Dawn Pope, Collins Aero |
| 11:00 | Legislation coming your way - CBAM | Dr Russ Hall, WMG |
| 11:30 | Panel Q&A: Morning Session - expectations of the supply-chain | Presenters |
| 12:00 | Lunch, Networking & Stands | |
| 13:00 | Intro afternoon session on case studies, solutions & support | Tim Holmes, MAA |
| 13:10 | Case Study 1 - G & O Springs | Steve Boyd, G&O Springs |
| 13:30 | Case Study 2 - Arrowsmith | Jason Aldridge, Arrowsmith |
| 13:50 | Case Study 3 - Technoset | Kevan Kane, Technoset |
| 14:10 | Panel Discussion & Q&A then close formal session | Presenters |
| 14:40 | Get involved in DMAC | Tim Holmes, MAA |
| 14:55 | Networking & Stands | |
| 15:10 | Support & Funding Opportunities Clinic | Dr Pamela Farries, MAA |
| 16:00 | Close | |

DMAC Supply Chain Case Studies

Supply Chain experience on emissions reduction & reporting:

- **Steve Boyd**
Managing Director, G&O Springs
- **Jason Aldridge**
Managing Director, Arrowsmith (an ASG Group Company)
- **Kevan Kane**
Group Managing Director, Techno-Group

ESG Journey

Steve Boyd
Managing Director



Our journey to Net Zero

- Design of Low Carbon Technology Solutions to Reduce Consumption and CO2 Emissions
- Identify and Eliminate Non-Productive Consumption
- Energy Monitoring and Micro-metering of Energy Intensive Plant to Assess the Exact Level of Electricity Consumption
- Assessment of the Current Level of Electricity Consumption, Maximum Demand and Power Factor



Replace metal halide and fluorescent light fittings with more energy efficient LED equivalents saving:
7.1 TonnesCO2e

2020 Energy Assessment



| Description | Estimated annual savings | | | Estimated cost (£) | Payback period (years) |
|--|--------------------------|----------------------------|--------|--------------------|------------------------|
| | (£) | CO ₂ e (tonnes) | (kWh) | | |
| Reduction in the base load electricity consumption | 4,265 | 8.59 | 22,334 | 0 | 0 |
| Replace metal halide and fluorescent light fittings with more energy efficient LED equivalents | 3,517 | 7.1 | 18,414 | 15,000 | 4.26 |
| Install an inverter drive for the extraction system | 3,382 | 6.84 | 17,800 | 3,800 | 1.12 |
| Replace Kerry Ultrasonic Degreaser | 3,132 | 6.3 | 16,400 | 20,000 | 6.39 |
| Replace fixed speed drive compressor with a variable speed drive compressor | 665 | 1.34 | 3,500 | 7,000 | 10.5 |

 **2020 LOCOP Report**



We assumed we could sell back any excess to National Grid.....

The DNO (in our case National Grid) will only allow us to export 33KWp The rest is wasted.

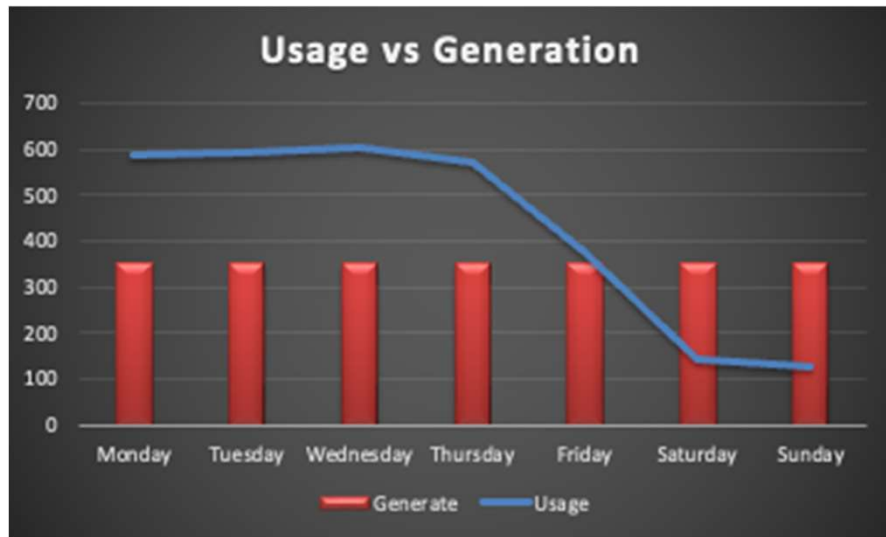
We also had to install an additional export limitation device with a specific ms response time to ensure we could not feed more into the grid.

And Pay them £1500 for the privilege to have them inspect it

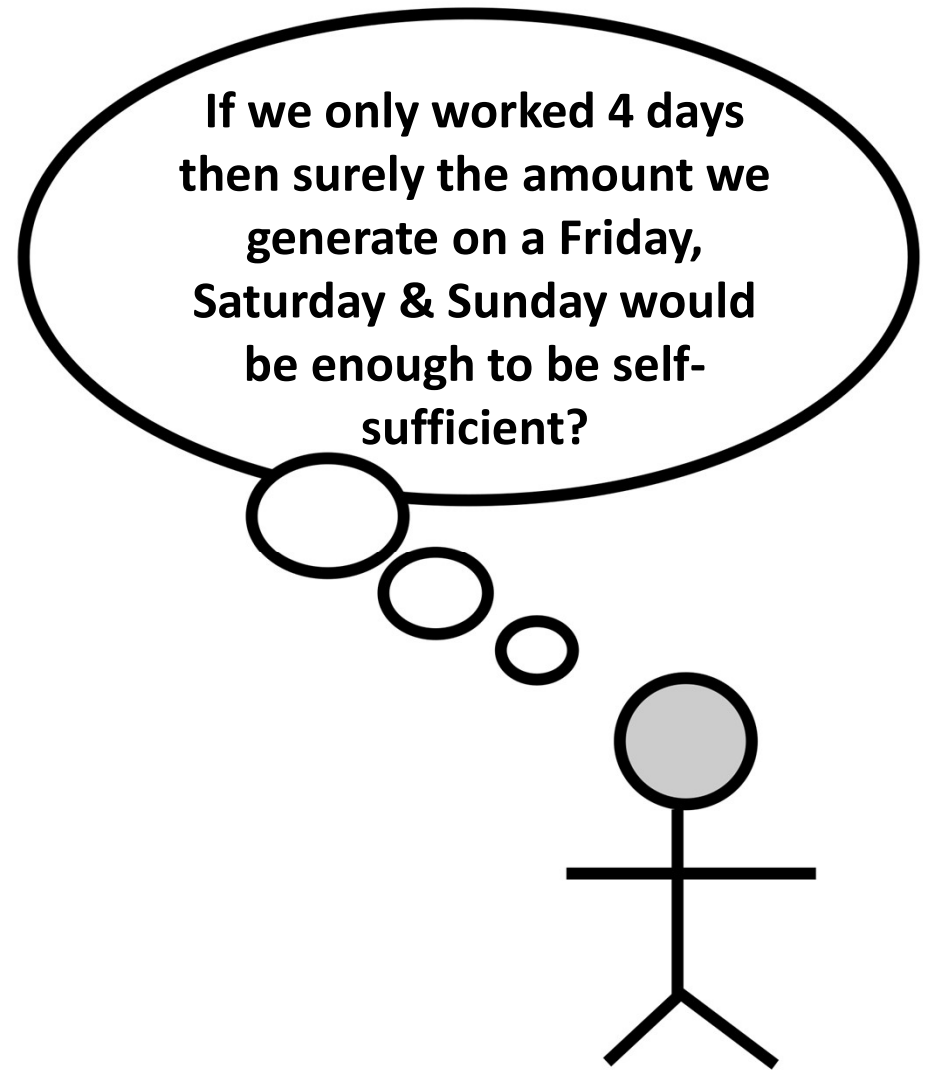
We installed a 108.25 KWp Solar PV System saving:
26.6 TonnesCO2e

| Description | Estimated annual savings | | | Estimated cost ¹ (£) | Payback period (years) |
|--|--------------------------|---------------------------|--------|---------------------------------|------------------------|
| | (£) | CO _{2e} (tonnes) | (kWh) | | |
| Install a 108.25kWp roof mounted solar PV system | £11,700 | 26.6 | 86,718 | £72,525 | 6.2 |
| | £11,700 | 26.6 | 86,718 | £72,525 | 6.2 |

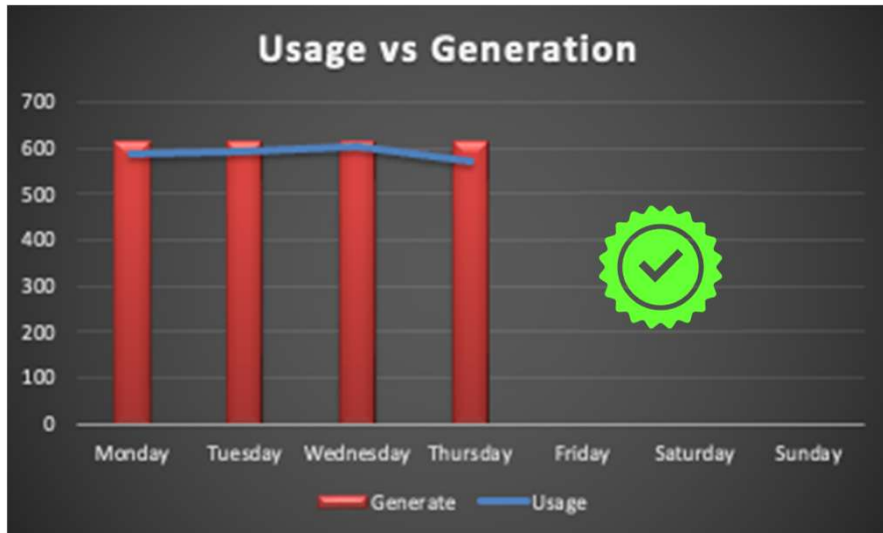
Average Energy Consumption (Blue Line) Pre Solar (based on half hourly data from provider)



Friday was 373 Kwh at 35p per unit = 130.55 per day (6788 per annum)

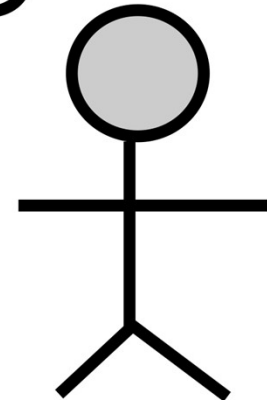


Energy generated and stored Friday, Saturday, Sunday



Note: Summer months only
due to weather profile

If we only worked 4 days
then surely the amount we
generate on a Friday,
Saturday & Sunday would
be enough to be self-
sufficient?



We would need to store 1200 KWh

- **Lead-Acid Batteries:** £142,200 - £189,600
- **Lithium-Ion Batteries:** £379,200 - £568,800
- **Flow Batteries:** £474,000 - £758,400



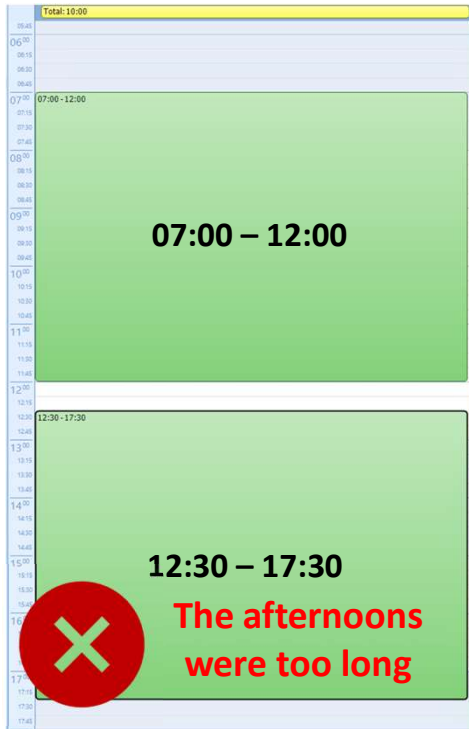
The payback just doesn't make sense!

However we needed to differentiate ourselves as an Employer to retain and attract skilled staff

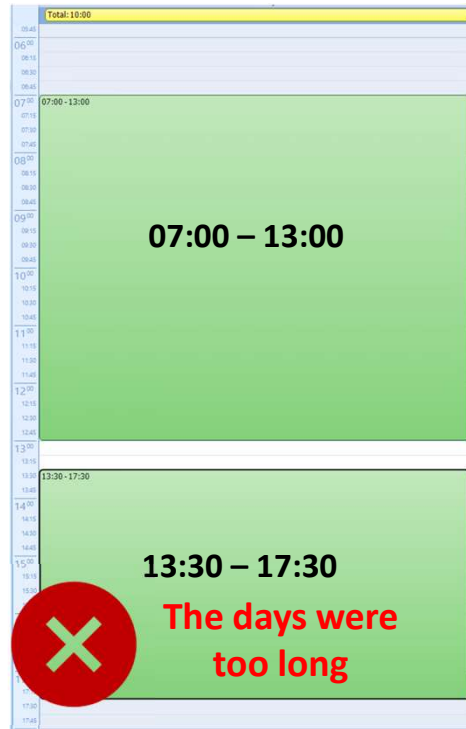
We also think we can solve the battery problem (or find someone to part fund it!)

The 4 Day Week

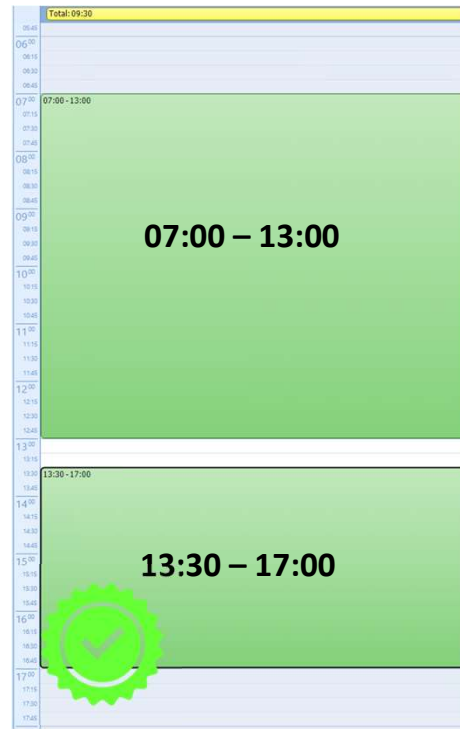
**Daily: 10 Hrs Weekly: 40 Hrs
Started 11/9/24**



**Daily: 10 Hrs Weekly: 40 Hrs
Started 2/10/24**



**Daily: 9.5 Hrs Weekly: 38 Hrs
Started 1/4/24**



**Employee Satisfaction
(measured using NPS)**



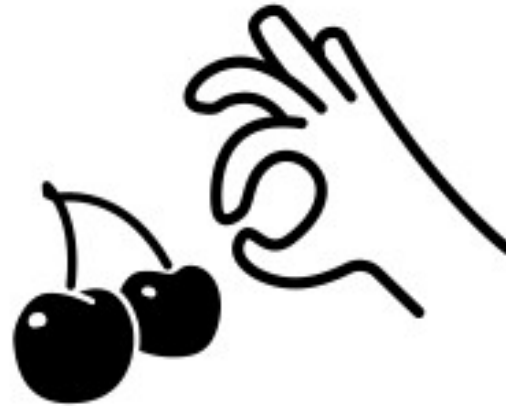
**Productivity
(measured via Launch
and Job OTIF)**

**Reducing our hours
has made us more
productive and offset
the affects of
minimum wage
increases**

ad
hoc



Eco friendly
Bubble wrap
what does it
actually save?



We were Cherry picking nice
things to do with no clear
vision or strategy

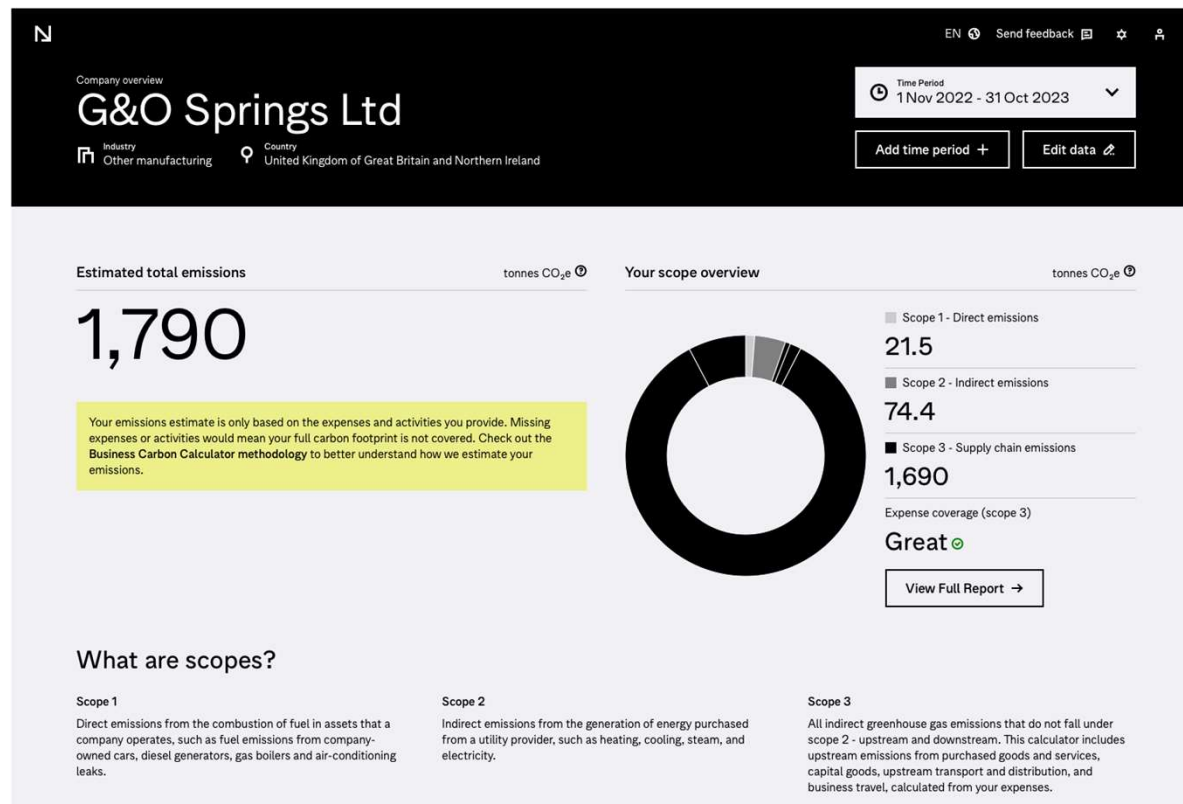
Decarbonising the Midlands Aerospace Cluster





IUK DESNZ Local Industrial Decarbonisation Plans: **Decarbonising the Midlands Aerospace Cluster (DMAC)** Innovate UK Project No: 10090207

SME Climate Hub



SME Climate HUB is Value based and looks too far back.

A great start but we need to be able to see the effects of our efforts to see if what we are doing is making a difference?

So (after seeing someone else's excel based system) we decided to write our own to give us monthly data

‘You can't improve what you don't measure’

Highly skilled collaborative, ethical teams delivering sustainable, innovative safety critical total life spring solutions

Carbon Accounting

GOV.UK Menu Search

Bring photo ID to vote Check what photo ID you'll need to vote in person in the General Election on 4 July.

Home > Environment > Climate change and energy > Energy and climate change: evidence and analysis

Research and analysis

Greenhouse gas reporting: conversion factors 2023

These emission conversion factors are for use by UK and international organisations to report on 2023 greenhouse gas emissions.

From: [Department for Energy Security and Net Zero](#)
 Published 7 June 2023
 Last updated 28 June 2023 — [See all updates](#)

[Get emails about this page](#)

Documents

[Conversion factors 2023: condensed set \(for most users\) - updated 28 June 2023](#)
 MS Excel Spreadsheet, 1.8 MB
 This file may not be suitable for users of assistive technology.
[Request an accessible format.](#)

Related content

Collection

[Government conversion factors for company reporting of greenhouse gas emissions](#)

UK Government GHG Conversion Factors for Company Reporting

Introduction

[Index](#)

| | | | |
|------------------------|------------|-------------|----------|
| Next publication date: | 10/06/2024 | Factor set: | Full set |
| Version: | 1.1 | Year: | 2023 |

UK Government GHG Conversion Factors for Company Reporting

Welcome to the UK Government Conversion Factors for greenhouse gas (GHG) reporting. These factors are suitable for use by UK-based organisations of all sizes and international organisations reporting on UK operations. Therefore, the scope of the factors is defined such that it is relevant to emissions reporting. The factors may also be used for other purposes, but users do this at their own risk.

[For new users of the conversion factors, ensure that you have first read the government's 'Environmental reporting guidelines' and the information on the rest of this sheet. Then follow the informative text at the top of each tab to report your emissions across Scopes 1, 2 and 3. It is not necessary to read the 'What's new' guidance.](#)

If you have used the conversion factors before, ensure you have read the 'What's new' guidance to understand the changes that have been made to the factors over the last year. Following the 'What's new' guidance will ensure that reporting is consistent and comparable year on year. Please note - activity-specific 'What's new' information is repeated in the relevant activity tabs.

For information about how the conversion factors have been derived, please refer to the accompanying 'Methodology paper' to the conversion factors.

Please note - factors that are:

- (a) not available, will be marked with an empty, light shaded cell:
- (b) have an invalid combination of criteria, will be marked with an empty, dark shaded cell:

How is this spreadsheet organised?

After the three introductory worksheets, each worksheet presents the emission factors for a single type of emissions-releasing activity (for example, using electricity or driving a passenger vehicle). These emissions-releasing activities are categorised into three groups known as scopes. Each activity is colour coded as either Scope 1, Scope 2, or Scope 3. Refer to the 'Index' tab for links to each sheet.

- Scope 1 (direct emissions)** emissions are those from activities owned or controlled by your organisation. Examples of Scope 1 emissions include emissions from combustion in owned or controlled boilers, furnaces and vehicles; and emissions from chemical production in owned or controlled process equipment.
- Scope 2 (energy indirect)** emissions are those released into the atmosphere that are associated with your consumption of purchased electricity, heat, steam and cooling. These indirect emissions are a consequence of your organisation's energy use, but occur at sources you do not own or control.
- Scope 3 (other indirect)** emissions are a consequence of your actions that occur at sources you do not own or control and are not classed as Scope 2 emissions. Examples of Scope 3 emissions are business travel by means not owned or controlled by your organisation, waste disposal, materials or fuels your organisation purchases. Deciding if emissions from a vehicle, office or factory that you use are Scope 1 or Scope 3 may depend on how you define your operational boundaries. Scope 3 emissions can be from activities that are upstream or downstream of your organisation. [More information on Scope 3 and other aspects of reporting can be found in the Greenhouse Gas Protocol Corporate Standard.](#)

How are individual worksheets in this spreadsheet organised?

Each worksheet provides the following information:

[Introduction](#) [What's new](#) [Index](#) [Fuels](#) [Bioenergy](#) [Refrigerant & other](#) [Passenger vehicles](#) [Delivery vehicles](#) [SECR kWh pass & o](#) [+](#)

See:

<https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>

Carbon Accounting

We created a spreadsheet using the GOV.uk conversion factors that related to our business Scope 1,2 & 3 activities

| Activity | Type | Unit | kg CO ₂ e |
|--------------------------|--------------|----------|----------------------|
| Cars (by market segment) | Mini | km | 0.107746 |
| | | miles | 0.173416 |
| | Supermini | km | 0.132146 |
| | | miles | 0.212676 |
| | Lower medium | km | 0.143456 |
| | | miles | 0.230876 |
| | Upper medium | km | 0.160496 |
| | | miles | 0.258296 |
| | Executive | km | 0.173096 |
| | | miles | 0.278586 |
| | Luxury | km | 0.211196 |
| | | miles | 0.339896 |
| Sports | km | 0.169436 | |
| | miles | 0.272686 | |
| Dual purpose 4X4 | km | 0.201946 | |
| | miles | 0.325006 | |
| MPV | km | 0.176596 | |
| | miles | 0.284216 | |

| Activity | Type | Unit | kg CO ₂ e |
|----------|---------------------|--------------|----------------------|
| Rail | National rail | passenger.km | 0.035463 |
| | International rail | passenger.km | 0.004459 |
| | Light rail and tram | passenger.km | 0.028603 |
| | London Underground | passenger.km | 0.027802 |

| Activity | Haul | Class | Unit | kg CO ₂ e |
|----------|-------------------------------|-----------------------|--------------|----------------------|
| Flights | Domestic, to/from UK | Average passenger | passenger.km | 0.27258 |
| | | Average passenger | passenger.km | 0.18592 |
| | | Economy class | passenger.km | 0.18287 |
| | Short-haul, to/from UK | Business class | passenger.km | 0.27430 |
| | | Average passenger | passenger.km | 0.26128 |
| | | Economy class | passenger.km | 0.20011 |
| | Long-haul, to/from UK | Premium economy class | passenger.km | 0.32016 |
| | | Business class | passenger.km | 0.58029 |
| | | First class | passenger.km | 0.80040 |
| | International, to/from non-UK | Average passenger | passenger.km | 0.17580 |
| | | Economy class | passenger.km | 0.13464 |
| | | Premium economy class | passenger.km | 0.21542 |
| | Business class | passenger.km | 0.39044 | |
| | | First class | passenger.km | 0.53854 |

| Item | Units | Scope | Who | How | Conversion Factors (2023) kg CO ₂ e | Conversion Factors (2023) kg CO ₂ e of CO ₂ per unit |
|---|---|-------|-----------|----------------|--|--|
| SCOPE 1 | | | | | | |
| Natural Gas | Kwh | 1 | Lisa | Bill | 0.18 | 0.18256 |
| Passenger Vehicle Miles (Delivering Parts) | Miles | 1 | Dave | Mileage Claims | 0.212676 | 0.20997 |
| Supermini (FOF) Scope 1 | Miles | 1 | Dave | Mileage Claims | 0.14212 | 0.14047 |
| Freighting goods (G&O Van) | Miles | 1 | Dave | Mileage Claims | | |
| Diesel Miles - Van Class I (up to 1.305 tonnes) | Miles | 1 | Dave | Mileage Claims | | |
| SCOPE 2 | | | | | | |
| Day Electricity Units | Kwh | 2 | Lisa | Bill | 0.207074 | 0.20496 |
| Night Electricity Units | Kwh | 2 | Lisa | Bill | 0.207074 | 0.20496 |
| SCOPE 3 | | | | | | |
| Water usage | cubic metres | 3 | Lisa | Bill | 0.177 | n/a |
| Water treatment (waste water) | cubic metres | 3 | Lisa | Bill | 0.201 | n/a |
| Scrap Metal | Kgs | 3 | Dave | Weigh scrap | 0.001 | n/a |
| Business Travel | | | | | | |
| Mini | Miles | 3 | Lisa | Mileage Claims | 0.173416 | 0.17071 |
| Supermini (FOF) | Miles | 3 | Lisa | Mileage Claims | 0.212676 | 0.20997 |
| Lower medium | Miles | 3 | Lisa | Mileage Claims | 0.230876 | 0.22817 |
| Upper medium | Miles | 3 | Lisa | Mileage Claims | 0.258296 | 0.25559 |
| Executive | Miles | 3 | Lisa | Mileage Claims | 0.278586 | 0.27588 |
| Luxury | Miles | 3 | Lisa | Mileage Claims | 0.339896 | 0.33719 |
| Sports | Miles | 3 | Lisa | Mileage Claims | 0.272686 | 0.26998 |
| Dual purpose 4X4 | Miles | 3 | Steve | Mileage Claims | 0.325006 | 0.3223 |
| MPV | Miles | 3 | Lisa | Mileage Claims | 0.284216 | 0.28151 |
| Train Tickets | https://my.railmiles.me/mileage-engine/ | 3 | Traveller | use link | | |
| National rail | passenger.km | 3 | | | 0.035463 | 0.0351 |
| Light rail and tram | passenger.km | 3 | | | 0.028603 | 0.02832 |
| London Underground | passenger.km | 3 | | | 0.027802 | 0.02753 |
| Flight tickets | https://www.airmilescalculator.com | 3 | Traveller | use link | | |
| Domestic, to/from UK | passenger.km | 3 | | | 0.27258 | 0.27101 |
| Short-haul, to/from UK | passenger.km | 3 | | | 0.18592 | 0.18499 |
| Long-haul, to/from UK | passenger.km | 3 | | | 0.26128 | 0.25998 |
| International, to/from non-UK | passenger.km | 3 | | | 0.17580 | 0.17493 |
| Bus tickets | passenger.km | 3 | Traveller | use link | | |

Highly skilled collaborative, ethical teams delivering sustainable, innovative safety critical total life spring solutions

Carbon Accounting

| | A | B | C | D | E | G | H |
|-----------------|---|---|-------|-----------|----------------|-----------------------------------|---|
| | Item | Units | Scope | Who | How | Conversion Factors (2023) kg CO2e | Conversion Factors (2023) kg CO2e of CO2 per unit |
| SCOPE 1 | | | | | | | |
| 3 | Natural Gas | Kwh | 1 | Lisa | Bill | 0.18 | 0.18256 |
| 5 | Passenger Vehicle Miles (Delivering Parts) | | | | | | |
| 6 | Supermini (FOF) Scope 1 | Miles | 1 | Dave | Mileage Claims | 0.212676 | 0.20997 |
| 7 | Freighting goods (G&O Van) | | 1 | | | | |
| 8 | Diesel Miles - Van Class 1 (up to 1.305 tonnes) | Miles | 1 | Dave | Mileage Claims | 0.14212 | 0.14047 |
| SCOPE 2 | | | | | | | |
| 11 | Day Electricity Units | Kwh | 2 | Lisa | Bill | 0.207074 | 0.20496 |
| 12 | Night Electricity Units | Kwh | 2 | Lisa | Bill | 0.207074 | 0.20496 |
| SCOPE 3 | | | | | | | |
| 15 | Water usage | cubic metres | 3 | Lisa | Bill | 0.177 | n/a |
| 16 | Water treatment (waste water) | cubic metres | 3 | Lisa | Bill | 0.201 | n/a |
| 18 | Scrap Metal | Kgs | 3 | Dave | Weigh scrap | 0.001 | n/a |
| Business Travel | | | | | | | |
| 21 | Mini | Miles | 3 | Lisa | Mileage Claims | 0.173416 | 0.17071 |
| 22 | Supermini (FOF) | Miles | 3 | Lisa | Mileage Claims | 0.212676 | 0.20997 |
| 23 | Lower medium | Miles | 3 | Lisa | Mileage Claims | 0.230876 | 0.22817 |
| 24 | Upper medium | Miles | 3 | Lisa | Mileage Claims | 0.258296 | 0.25559 |
| 25 | Executive | Miles | 3 | Lisa | Mileage Claims | 0.278586 | 0.27588 |
| 26 | Luxury | Miles | 3 | Lisa | Mileage Claims | 0.339896 | 0.33719 |
| 27 | Sports | Miles | 3 | Lisa | Mileage Claims | 0.272686 | 0.26998 |
| 28 | Dual purpose 4X4 | Miles | 3 | Steve | Mileage Claims | 0.325006 | 0.3223 |
| 29 | MPV | Miles | 3 | Lisa | Mileage Claims | 0.284216 | 0.28151 |
| 30 | Train Tickets | https://my.railmiles.me/mileage-engine/ | 3 | Traveller | use link | | |
| 31 | National rail | passenger.km | 3 | | | 0.035463 | 0.0351 |
| 32 | Light rail and tram | passenger.km | 3 | | | 0.028603 | 0.02832 |
| 33 | London Underground | passenger.km | 3 | | | 0.027802 | 0.02753 |
| 34 | Flight tickets | https://www.airmilescalculator.com | | Traveller | use link | | |
| 35 | Domestic, to/from UK | passenger.km | 3 | | | 0.27258 | 0.27101 |
| 36 | Short-haul, to/from UK | passenger.km | 3 | | | 0.18592 | 0.18499 |
| 37 | Long-haul, to/from UK | passenger.km | 3 | | | 0.26128 | 0.25998 |
| 38 | International, to/from non-UK | passenger.km | 3 | | | 0.17580 | 0.17493 |
| 39 | Bus tickets | | | Traveller | use link | | |

We thought we had all the data we needed....

The issue is the units required (its all weight related)

So then we had to work out who and how we could easily gather the data internally

Data sources range from:

- Utility Bill (Electric, Gas & Water)
- Mileage Claims
- Weight at Goods in

Carbon Accounting

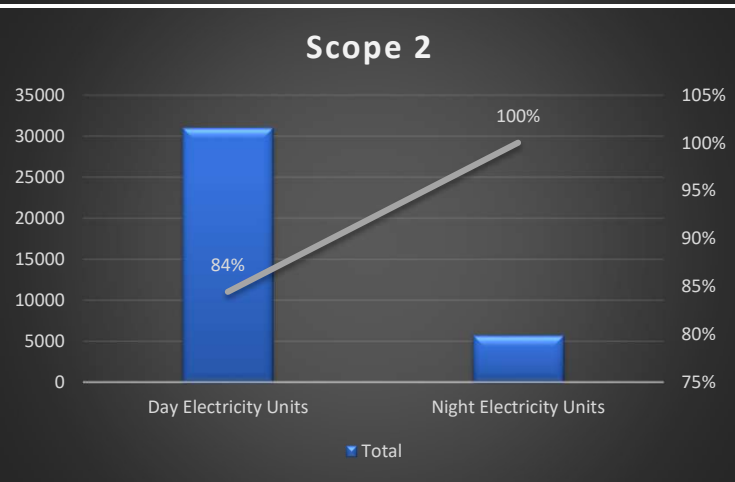
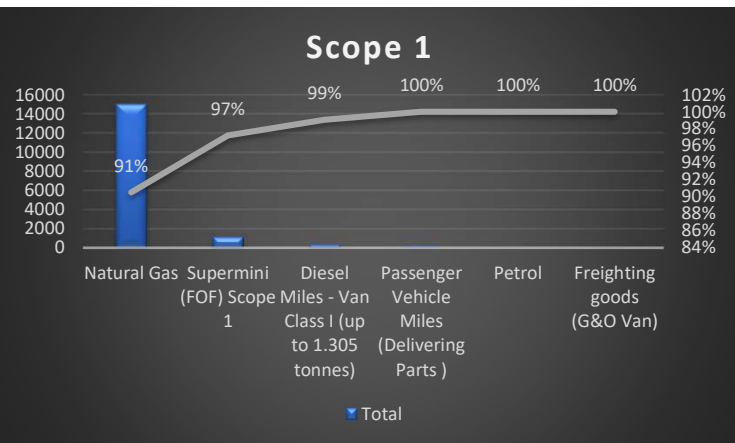
Now we have a simple look up table where logistics enter the qty of goods received and this then calculates the weight, multiplies it by the relevant conversion and gives us the monthly CO2e for that Scope 3 item

| GANO SPRINGS.AERO | | | Jan | Feb |
|---------------------------------|-------------|---------------|-----|-----|
| Item | Weight each | Unit | | |
| Blue Scrap Bin | 35.3 | Total Weight | 0 | 0 |
| Blue Scrap Bin | 35.3 | Total Weight | 0 | 0 |
| Blue Scrap Bin | 35.3 | Total Weight | 0 | 0 |
| Wartsila Scrap Bin | 10.5 | Total Weight | 0 | 0 |
| Red Scrap Bin | 31.5 | Total Weight | 0 | 0 |
| Box of 5 Reams of Paper | 12.4 | | 1 | 3 |
| 102x64mm Printed Labels (Crown) | 1 | PACKS OF 1000 | 10 | |
| Lining Paper (brown Paper) | 7.6 | 1 Roll | | |
| Small 232 x 175 x 115mm | 0.155 | 1000 | | |
| Medium 385 x 250 x 270mm | 0.255 | 1000 | | |
| Large 300 x 225 x 160mm | 0.33 | 1000 | | |
| Jumbo Toilet Rolls, PK6 | 5.2 | 6 ROLLS | 2 | 1 |
| Rolls, Pk6 | 5.455 | 6 ROLLS | 1 | 2 |
| Polo Shirt | 0.2 | Each | 2 | |
| T Shirt | 0.1 | Each | 2 | 4 |
| Hoodies | 0.599 | Each | | 1 |
| Zoodies | 0.595 | Each | 2 | |
| Jumpers | 0.5 | Each | | |
| Fleece | 0.465 | Each | | |
| Trousers | 0.5 | Each | 2 | |
| Beanie Hats | 0.075 | Each | 1 | |
| Shorts | 0.3 | Each | | |
| Shirts | 0.1 | Each | | |
| Economy Rags | 9.8 | 1 BAG | 1 | 2 |
| Bag size 2.25 X 3" | 0.425 | QTY 1000 box | | |
| Bag size 3 X 3.25" | 0.78 | QTY 1000 box | 20 | 40 |
| Bag size 4 X 5.5" | 1.38 | QTY 1000 box | | 10 |
| Bag size 6 X 9" | 3.23 | QTY 1000 box | | 5 |
| Bag size 8 X 11" | 4.86 | QTY 1000 box | | 5 |
| Bag size 10 x 14" | 7.2 | QTY 1000 box | | |
| Bubblewrap | 1.2 | PACK OF 5 | 5 | |
| Jiffy Bags SIZE 1 AND SIZE 3 | 0.037 | 1 BOX OF EACH | 4 | |
| Sellotape | 0.9 | 6 PACK | | |
| Black Refuse Sacks | 8.29 | 200 BOX | 1 | |
| Safety Glasses | 0.045 | 1 PAIR | | |
| Shrinkwrap | 2.7 | 1 ROLL | | |
| Large wallet | 0.3 | 1 BOX OF EACH | | |
| Small wallet | 0.19 | 1 BOX OF EACH | | |
| Plastic Sheets | 11.3 | 1 SHEET | 4 | |
| Pallets euro | 28 | | | |
| Pallets small | 12.6 | | | |
| Water Crate Box | 15.2 | | 2 | |

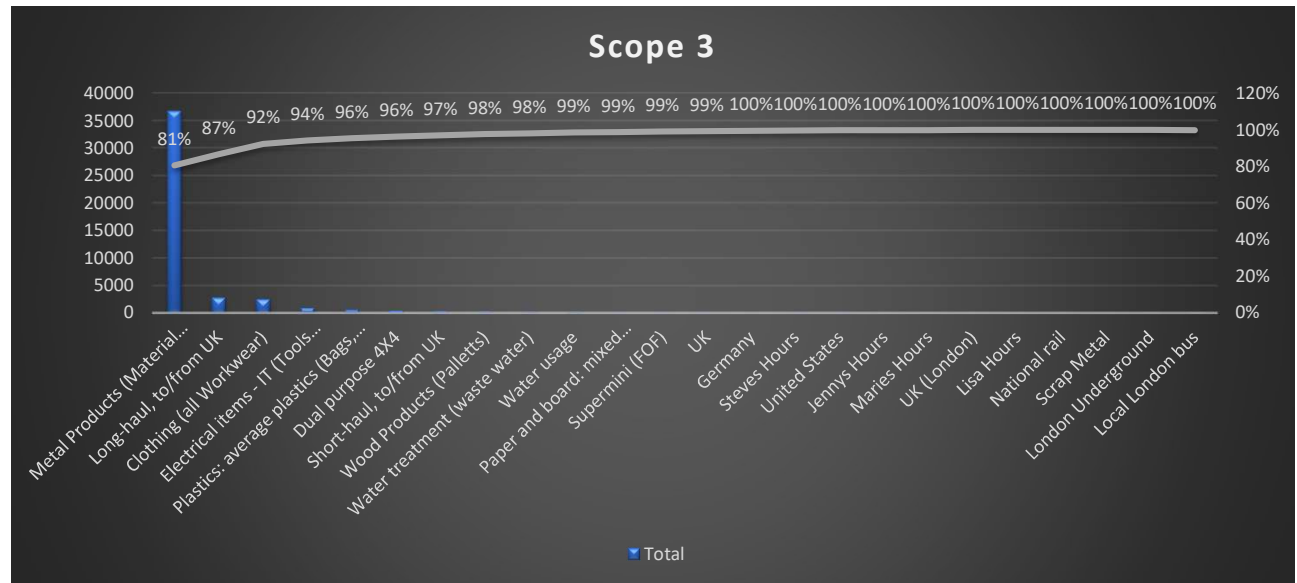


| GANO SPRINGS.AERO | | | Item | November | December | January | February | March | April | May | June | July | August | September | October | Total | Average | |
|--|--|--|------|----------|----------|---------|----------|-------|-------|-------|------|------|--------|-----------|---------|-------|---------|------|
| SCOPE 1 | | | | 1222 | 2486 | 2010 | 8676 | 2018 | 180 | 281 | 0 | 0 | 0 | 0 | 0 | 16874 | 1406 | |
| Natural Gas | | | | 890 | 2243 | 1530 | 8325 | 1691 | 11 | 281 | 0 | 0 | 0 | 0 | 0 | 14972 | 1248 | |
| Passenger Vehicle Miles (Delivering Parts) | | | | 0 | 0 | 159 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 159 | 13 | |
| Supermini (FOF) Scope 1 | | | | 181 | 141 | 179 | 242 | 238 | 129 | 0 | 0 | 0 | 0 | 0 | 0 | 1111 | 93 | |
| Freighting goods (G&O Van) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Diesel Miles - Van Class 1 (up to 1.305 tonnes) | | | | 61 | 31 | 39 | 44 | 89 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 304 | 25 | |
| SCOPE 2 | | | | 3270 | 3335 | 3461 | 3140 | 2848 | 2622 | 3944 | 8136 | 0 | 0 | 0 | 0 | 0 | 36756 | 3063 |
| Day Electricity Units | | | | 2876 | 2929 | 2991 | 2775 | 2487 | 2187 | 8273 | 8517 | 0 | 0 | 0 | 0 | 31035 | 2586 | |
| Night Electricity Units | | | | 394 | 406 | 470 | 366 | 361 | 435 | 1670 | 1619 | 0 | 0 | 0 | 0 | 0 | 5721 | 477 |
| SCOPE 3 | | | | 3570 | 345 | 5320 | 9213 | 11465 | 1270 | 12835 | 1396 | 83 | 0 | 0 | 0 | 0 | 45498 | 3792 |
| Water usage | | | | 6 | 7 | 7 | 43 | 6 | 54 | 43 | 33 | 0 | 0 | 0 | 0 | 0 | 198 | 17 |
| Water treatment (waste water) | | | | 7 | 7 | 7 | 43 | 6 | 54 | 43 | 33 | 0 | 0 | 0 | 0 | 202 | 17 | |
| Scrap Metal | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 1 | 0 | |
| Business Travel | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Transport / Freight (external to G&O) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Road Freight (HGV) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Rigid (>3.5 - 7.5 tonnes) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Rigid (>7.5 tonnes-17 tonnes) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Articulated (>3.5 - 33t) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Materials Inventory | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Paper and board: mixed (including Cardboard Boxes) | | | | 0 | 0 | 33 | 46 | 9 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 129 | 11 | |
| Clothing | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Clothing (all Workwear) | | | | 0 | 0 | 283 | 460 | 453 | 437 | 437 | 437 | 0 | 0 | 0 | 0 | 2507 | 209 | |
| Plastics: average plastics (Bags, Bubblewrap, Jiffy Bags, Shrinkwrap, document holders) | | | | 0 | 0 | 233 | 265 | 69 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 588 | 49 | |
| Metal Products (Material Received) | | | | 3288 | 183 | 1806 | 8195 | 10809 | 81 | 12312 | 0 | 0 | 0 | 0 | 0 | 36674 | 3056 | |
| Wood Products (Pallets) | | | | 257 | 0 | 10 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 271 | 23 | |
| Capital Goods | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Electrical items - IT (Tools Laptops Screens) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 893 | 0 | 0 | 0 | 0 | 893 | 74 | |
| Services | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Home working | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Home working (office equipment + heating) | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Stevens Hours | | | | 12 | 9 | 15 | 15 | 12 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 72 | 6 | |
| Jennys Hours | | | | 0 | 0 | 8 | 7 | 5 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 3 | |
| Maries Hours | | | | 0 | 0 | 5 | 7 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 2 | |
| Lisa Hours | | | | 0 | 0 | 0 | 6 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 1 | |
| Employee Commuting | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | | 10791 | 21029 | 16331 | 4072 | 23060 | 9532 | 83 | 0 | 0 | 0 | 0 | 0 | | | |

Carbon Accounting



We have a simple pareto style graph for each scope showing us our big CO2e use



Its still early days for Scope 3 but at least we can now measure it to see the impact of any changes on a monthly basis

Where are we now?





We have embedded Environmental social responsibility into our Vision & Mission



Vision:

Highly skilled, collaborative, **ethical** teams delivering **sustainable**, innovative, safety critical total life spring solutions

Company Mission:

Serving International safety critical OEM's need for class leading quality, on time delivery, prompt and accurate service.

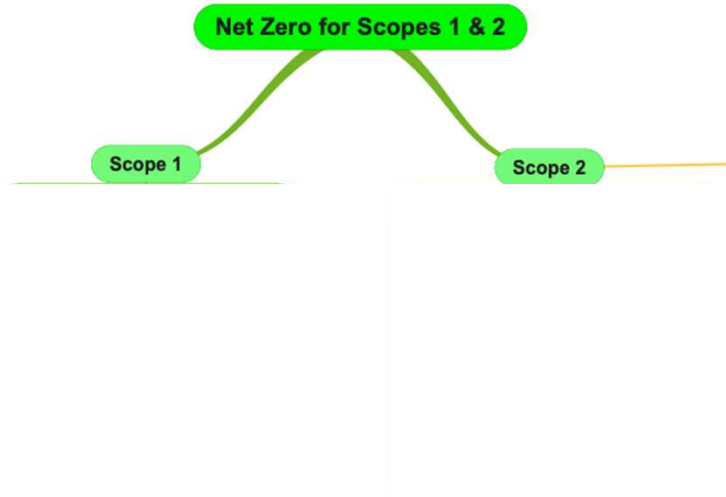
At the forefront of spring design our industry leading team is committed to driving cost out and innovation in to the products and capabilities we provide while **embracing environmental social responsibility**.

Investing in and utilising the latest quality tools, techniques and CNC technology with a focus on **minimising our environmental impact**.

Our empowered, **ethical** and highly specialised team collaborate using open, transparent and honest communications to offer cradle to grave support through proof of concept to design, manufacture and testing.

By integrating environmental and social responsibility into our core values, we strive to make a positive impact on both our industry and the world

Highly skilled collaborative, ethical teams delivering sustainable, innovative safety critical total life spring solutions



Where next?



Distribution board based energy sub metering (low cost!)



'Each Certificate of Conformity to state actual product based carbon emissions based on actual batch data'

| Comments | Unit | Qty | Energy rating | CO2e | Total |
|---|---------------------------------------|--------|------------------------------|-----------------------------|-------|
| SCOP 1 | | | | | |
| Natural Gas | By Tripnet | 0.17 | 18,200 | Approved based on | 3094 |
| Passenger Vehicle Miles (Delivering Parts) | 1 delivery per month = 25,355 kg CO2e | 0.0000 | 0.0000 | per delivery (using factor) | 0 |
| Freighting goods (S&B Van) | 38.1 Miles to Colton (1x2) | 0.0000 | 0.0000 | per delivery | 0 |
| Freighter Emissions | | | | | |
| AC Units | N/A | | | | |
| Coffee | N/A | | | | |
| Environmental Testing | N/A | | | | |
| Compressed Fluid & Gas | N/A | | | | |
| Stored Fluid (eg. Gas Forklift) | N/A | | | | |
| Bin Mics | N/A | | | | |
| SCOP 2 | | | | | |
| Dry Electricity Units | 0.0000 | 21,500 | Approved based on 100 per m3 | 21500 | 21500 |
| Wet Electricity Units | 0.0000 | 1,000 | Approved based on 100 per m3 | 1000 | 1000 |
| EV Charging | N/A | | | | |
| Disturbed Heat & Steam | N/A | | | | |
| SCOP 3 | | | | | |
| Water usage | | | | | |
| Water treatment (drinking water) | 0.000 | 0.000 | Approved based on 100 per m3 | 0 | 0 |

Individual Staff Training



Watch this space!

<https://www.brainboxes.com>

<https://carbonliteracy.com>

Thank you for
your time



Supply Chain Case Studies

Arrowsmith an ASG Group Company

Jason Aldridge
Managing Director

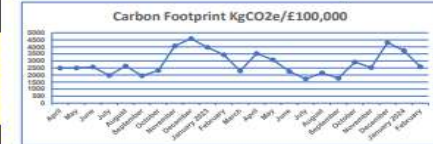
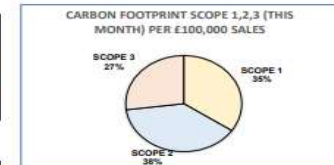


Case Study: Arrowsmith Sustainability in the supply chain...data!!!!



| SUMMARY (All data linked automatically to 'Measures' page) | | | Feb'24 | |
|--|------------------------------|-------------------------|--------------|------------------|
| SCOPE | MEASURES | CARBON FOOTPRINT KgCO2e | TOTALS | TOTALS per SCOPE |
| SCOPE 1 (Direct emissions) | | | per £100,000 | per £100,000 |
| Delivery vehicles company owned | Mileage Km | 136.07 | | |
| Natural gas | KwhHrs | 653.20 | | |
| Diesel for company assets | Litres | 101.81 | | |
| | | | 891.02 | 891.02 |
| SCOPE 2 (Indirect emissions) | | | | |
| UK Electricity used by the organisation | KwhHrs | 993.44 | | |
| Electricity for EV's - Public charging station only | Mileage Km | 0.00 | 993.44 | 993.44 |
| SCOPE 3 (Other indirect emissions) | | | | |
| Water supply | Cubic Mtrs | 2.82 | | 5.59 |
| Water treatment - water returned to sewage via mains drains | Cubic Mtrs | 2.97 | | |
| T&D Electricity Losses - (Transmission & Distribution) | KwhHrs | 86.97 | | 86.97 |
| T&D Electricity EV's - public charging station | Mileage Km | 0.00 | | |
| Business Travel - Land - e.g. employees commuting | Mileage | 169.88 | | 169.88 |
| Business travel - flights | Passenger Kms | 0.00 | | 169.88 |
| Hotel stay | Room per night (see comment) | 0.00 | | 0.00 |
| MATERIAL USE | | | | |
| Packaging & Paper | Tonnes | 12.37 | | 12.37 |
| WASTE DISPOSAL | | | | |
| Metals | Tonnes | 6.13 | | |
| Packaging & Paper | Tonnes | 0.00 | | 6.13 |
| WTT (Well-to-tank) upstream: extraction, refining & transportation of fuels - | | | | |
| Natural gas | KwhHrs | 109.63 | | |
| WTT Electricity - generation | KwhHrs | 239.26 | | |
| WTT Diesel - company assets | Filling station - Litres | 24.78 | | |
| WTT - Business travel - Land - employees | Mileage Km | 44.48 | | |
| WTT - flights | Passenger Kms | 0.00 | | 418.14 |
| WTT Shipping Land/Sea/Air - | | | | |
| | | | | 686.08 |
| | | | | 2,882.54 |
| | | | | 2,882.54 |
| | | | | 25,901.47 |
| | | | | 25,901.47 |

| Carbon Footprint SCOPE 1,2,3 (This month) per £100,000 sales | |
|--|----------|
| SCOPE 1 | 891.02 |
| SCOPE 2 | 993.44 |
| SCOPE 3 | 898.08 |
| TOTAL this month | 2,682.54 |



| Manual entry for each month | |
|-----------------------------|----------------------------------|
| Month | Carbon Footprint KgCO2e/£100,000 |
| Mar'22 | 2,401.49 |
| Apr | 2,496.35 |
| May | 2,572.80 |
| June | 1,999.77 |
| July | 2,642.10 |
| August | 1,945.30 |
| September | 2,322.93 |
| October | 4,065.40 |
| November | 4,588.88 |
| December | 3,969.82 |
| January 2023 | 3,436.31 |
| February | 2,290.05 |
| March | 3,657.36 |
| April | 3,882.88 |
| May | 2,293.29 |
| June | 1,718.95 |
| July | 2,150.61 |
| August | 1,789.54 |
| September | 2,917.31 |
| October | 2,528.60 |
| November | 4,308.39 |
| December | 3,751.94 |
| January 2024 | 2,882.54 |
| February | |
| March | |
| April | |
| May | |
| June | |
| July | |
| August | |
| September | |
| October | |
| November | |
| December | |

Ref quote: UK Government GHG Conversion Factors for Company Reporting:-
 "We annually publish a new set of factors at the end of May / start of June. Compared to the previous year's factors, changes may be made due to new data availability, methodology improvements or corrections to errors in methodology".

Despite a 22% increase in Jan'24 sales over Jan'23 sales, Jan'24 saw a decrease in net CO2 footprint of 6% compared to Jan'23
 Comparing period April 22-Feb 23 with period April 23 - Feb 24 Net CO2 footprint has decreased by 6%



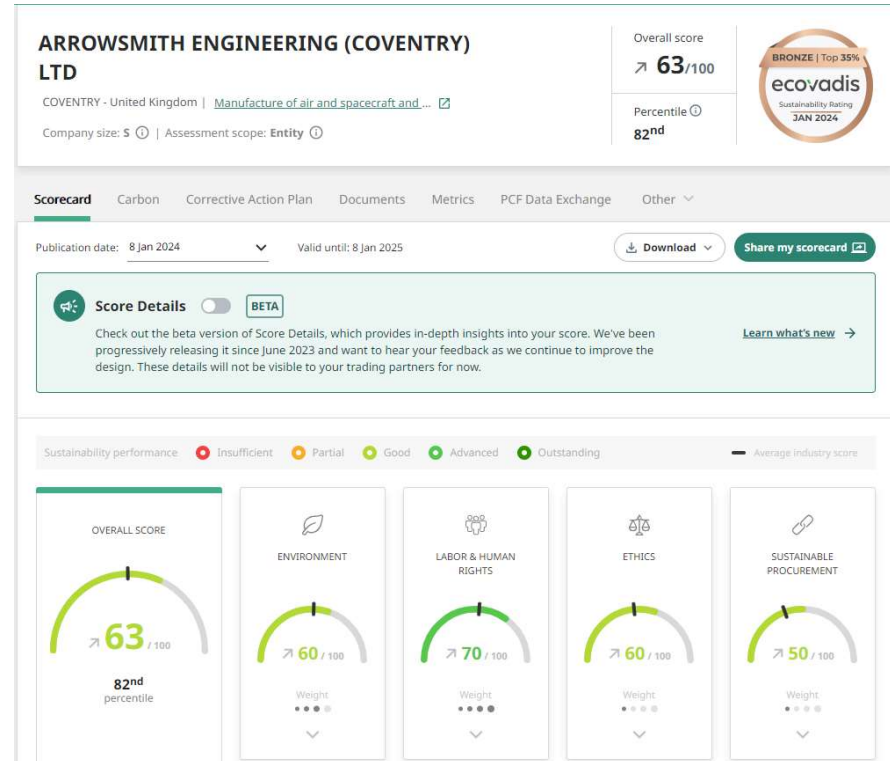
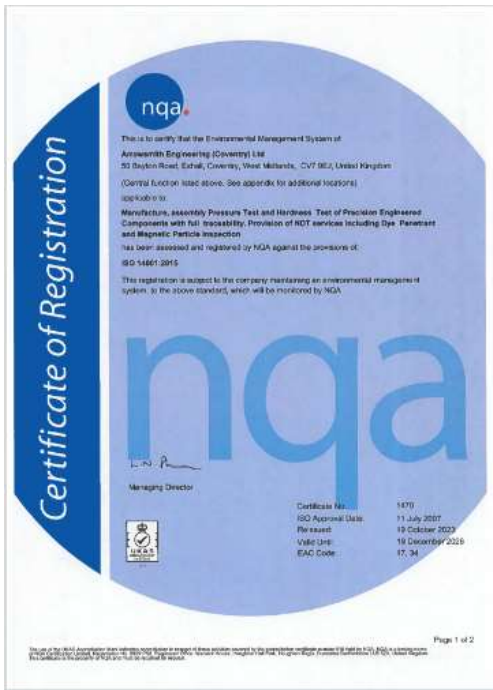
Monthly spread sheet is prepared, collating scope 1, 2 & 3 data at a glance.

CO₂ reduction of 6% over period Apr-Feb 23 compared to period Apr-Feb 24.



IUK DESNZ Local Industrial Decarbonisation Plans: Decarbonising the Midlands Aerospace Cluster (DMAC) Innovate UK Project No: 10090207

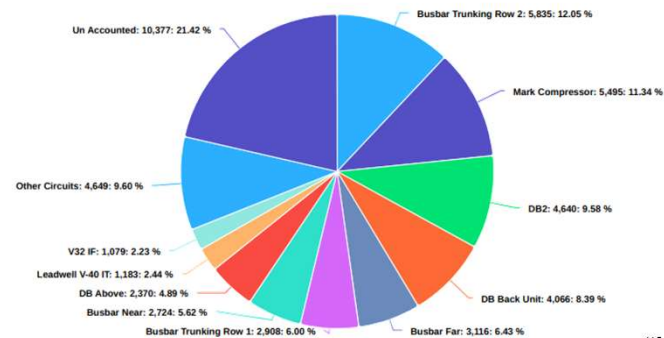
Case Study: Arrowsmith cont'd Accreditation schemes available



IUK DESNZ Local Industrial Decarbonisation Plans: Decarbonising the Midlands Aerospace Cluster (DMAC) Innovate UK Project No: 10090207

Case Study: Arrowsmith cont'd Moving forward...

- Arrowsmith has selected Clear.VUE as a digital platform for monitoring energy utilisation and GHG emissions.



Graph 2. Circuit Consumption in kWh for 01/02/2024 - 29/02/2024

EMC100i transformer Voltage Optimisation Unit



PowerDown220's portal:

"I can see a total reduction of power over that period of 10.2% which equates to a saving of £764"

This database allows us to recognise opportunities for improvement and comply with ESOS



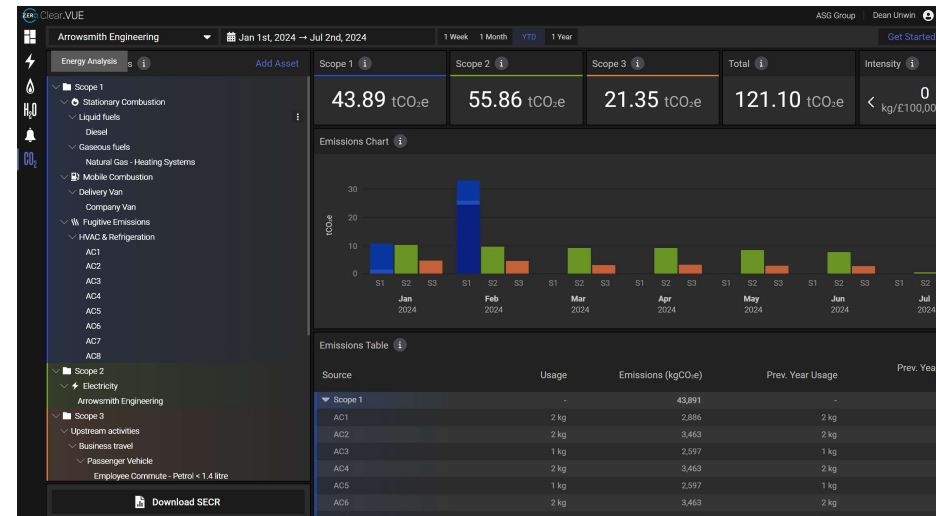
Case Study: Arrowsmith cont'd

Moving forward...Carbon Stream Mapping (By Part)



| asg Arrowsmith | | Comments | Conversion Factors (2022) kg CO2e | Conversion Factors (2023) kg CO2e of CO2 per unit | LK74916(7) +1.5% of total time booked? | Month Average | Unit | |
|---|--|---|-----------------------------------|---|--|---------------|----------------|--|
| SCOPE 1 | | | | | | | | |
| Natural Gas | | By Season | 0.28 | 0.18256 | 12.4200 | 24242 | Parts Supplied | LK74916 545.220 minutes value add 360000 minutes value add total 0.15% of total booked time Batch of 30 per annum |
| Petrol | | | n/a | n/a | | 46000 | kWh | |
| Passenger Vehicle Miles (Delivering Parts) | | | | | | | | |
| Supermarket (PDF) | | | 0.2112676 | 0.20997 | 0.0000 | | | |
| Freighting goods (G&O Van) | | | | | | | | |
| Diesel Miles - Van Class 1 (up to 1.305 tonnes) | | Plating - Robert Stewart (Essex 112 miles E/W) n77 - Walkwork (117 miles E/W) Plating - Robert Stewart (112 miles E/W) Plating - Ashton & Moore (12 miles E/W) Delivery - insons (17 miles E/W) 840 miles total 1 delivery = 40 parts | | | | 840 | miles | |
| Fugitive Emissions | | | 0.14212 | 0.14047 | 13.9384 | | | |
| AC Units | | | | | 3.0642 | 2,044,166 | 1 CO2e | |
| Chiller | | | | | | | | |
| Environmental, Testing | | | | | | | | |
| Combined heat & power | | | | | | | | |
| Stored Fuel (eg Gas Forklift) | | | | | | 500 | kg | |
| Bio Mass | | | | | 0.7500 | | | |
| SCOPE 2 | | | | | | | | |
| Day Electricity Units | | | 0.207074 | 0.20496 | 14.9093 | 48000 | kWh | |
| Night Electricity Units | | | 0.207074 | 0.20496 | | | | |
| EV Charging | | | | | | | | |
| Purchased Heat & Steam | | | | | | | | |
| SCOPE 3 | | | | | | | | |
| Water usage | | | 0.177 | n/a | 0.4151 | 1566,152 | kWh | |
| Water treatment (waste water) | | | 0.201 | n/a | | | | |
| Scrap Metal | | Assumption for call: 2.98% | 0.001 | n/a | 0.0002876 | 980 | grams | |

Automating our Scope 1, 2 and 3 data population through ClearVUE



Carbon Stream Mapping at part / component level – Value add time to manufacture part over total value add time in the period provides an “overhead %” that can be calculated across the Scope 1, 2 and 3 of the site



Decarbonising the Midlands
Aerospace Cluster



TECHNO GROUP

Precision Engineered Solutions since 1978

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KEVAN KANE
Group Managing Director

OUR MANUFACTURING SITES



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 26



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 30

 22





**UK Research
and Innovation**



**Department for
Energy Security
& Net Zero**



MAA DMAC

- **STAY AHEAD OF CURRENT AND FUTURE REGULATIONS**
- **ENHANCE CORPORATE SOCIAL RESPONSIBILITY (CSR)**
- **INCREASED CUSTOMER DEMAND FOR OMISSIONS DATA**
- **UNDERSTAND THE MOVE TO MORE ENERGY-EFFICIENT TECHNOLOGIES AND PROCESSES**
- **IMPROVE OVERALL OPERATIONAL EFFICIENCY AND PRODUCTIVITY**



SME CLIMATE HUB



Emissions report
Technoset Ltd
1 Jan 2023 - 31 Dec 2023

Business Carbon Calculator
by Normative

Estimated total emissions tonnes CO₂e

2,300

Country
United Kingdom of Great Britain and Northern Ireland

Sector
Metal products manufacturing

| Scope 1 | % of emissions | tonnes CO ₂ e |
|-----------------|----------------|--------------------------|
| Fuel combustion | 100.0 % | 5.89 |

| Scope 2 | % of emissions | tonnes CO ₂ e |
|-------------|----------------|--------------------------|
| Electricity | 0.0 % | 0 |

| Scope 3 | % of emissions | tonnes CO ₂ e |
|--|----------------|--------------------------|
| Business travel | 0.1 % | 3.3 |
| Upstream transportation and distribution | 0.5 % | 11.4 |
| Purchased goods and services | 88.2 % | 2,020 |
| Capital goods | 11.1 % | 255 |



RESOURCE EFFICIENCY AUDIT REPORT



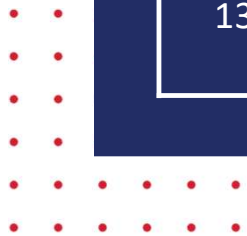
This project is part funded by the UK Government through the UK Shared Prosperity Fund and Warwickshire County Council, in association with the Pilot Business Energy Advice Service.



RECOMMENDATION 1 -

UPGRADE COMPRESSOR

| Estimated Annual Energy Saving (kWh/yr) | Estimated Annual Saving (£ exc. VAT/yr) | Estimated Cost to Implement (£ excl. VAT) | Payback Period | Estimated Annual Carbon Saving (tCO2e/yr) |
|---|---|---|----------------|---|
| 13,376 kWh | £5,444 | £25,000 | 4.6 Years | 3 Tonnes |



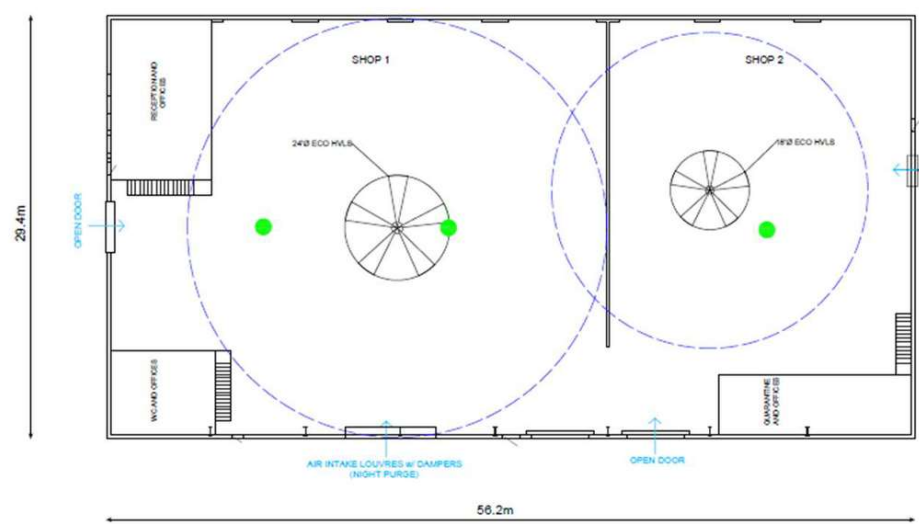
RECOMMENDATION 2 -

INSULATE ROOF

| Estimated Annual Energy Saving (kWh/yr) | Estimated Annual Saving (£ exc. VAT/yr) | Estimated Cost to Implement (£ excl. VAT) | Payback Period | Estimated Annual Carbon Saving (tCO2e/yr) |
|---|---|---|----------------|---|
| 28,879 kWh | £2,726 | £55,000 (depending on option chosen) | 20 years | 5.28 Tonnes |



ALL DIMS IN MM DO NOT SCALE IF IN DOUBT, ASK



AIR INTAKE LOUVERES w/ DAMPERS

| LEGEND | |
|--------|---|
| | EP900 HYBRID EXTRACTION: w/ Type 5 Damper |
| | ECO HVLB FANS |
| | HVLB AREA OF INFLUENCE |

| TECHNICAL SPECIFICATION | |
|---------------------------------|-----------------------|
| Power Requirements per EP900: | 230V / 1Ph / 50Hz |
| Max Power Usage per EP900: | 260 W |
| Max Running Current per EP900: | 1.26 A |
| Power Requirements per Damper: | 230V / 1Ph / 50Hz |
| Max Power Usage per Damper: | 1 W |
| Max Running Current per Damper: | 2 A |
| Power Requirements per ECO 24: | 220-240V / 1Ph / 50Hz |
| Max Power Usage per ECO 24: | 0.47 kW |
| Max Running Current per ECO 24: | 6.3 A |
| Power Requirements per ECO 18: | 220-240V / 1Ph / 50Hz |
| Max Power Usage per ECO 18: | 0.47 kW |
| Max Running Current per ECO 18: | 4.9 A |

FLOOR PLAN

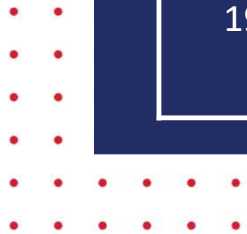
| | | | |
|------------|--|---|--|
| CPA | CPA Engineering Solutions Ltd 50 Cathedral Road Shuttle North Lanarkshire ML7 4EQ | Customer: Technigroup Rugby Date: 15/06/2024 | File: VENTILATE & CIRCULATE SOLUTION WITH NIGHT PURGE |
| | Project No: 15062024 | Project Name: | Project Location: |



RECOMMENDATION 3 -

UPGRADE ROLLER SHUTTER DOOR(S)

| Estimated Annual Energy Saving (kWh/yr) | Estimated Annual Saving (£ exc. VAT/yr) | Estimated Cost to Implement (£ excl. VAT) | Payback Period | Estimated Annual Carbon Saving (tCO2e/yr) |
|---|---|---|----------------|---|
| 19,690 kWh | £1,859 | £18,000 | 9.7 years | 3.6 Tonnes |



RECOMMENDATION 4 -

UPDATE MACHINERY

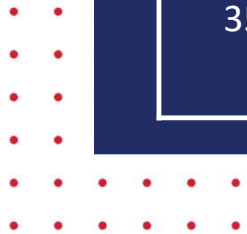
| Estimated Annual Energy Saving (kWh/yr) | Estimated Annual Saving (£ exc. VAT/yr) | Estimated Cost to Implement (£ excl. VAT) | Payback Period | Estimated Annual Carbon Saving (tCO2e/yr) |
|---|---|---|----------------|---|
| 29,941 kWh | £12,186 | £150,000 | 12.3 years | 6.74 Tonnes |



RECOMMENDATION 5 -

INSTALL SOLAR PV ARRAY

| Estimated Annual Energy Saving (kWh/yr) | Estimated Annual Saving (£ exc. VAT/yr) | Estimated Cost to Implement (£ excl. VAT) | Payback Period | Estimated Annual Carbon Saving (tCO2e/yr) |
|---|---|---|----------------|---|
| 35,324 kWh | £14,376 | £50,000 | 3.48 years | 9.93 Tonnes |



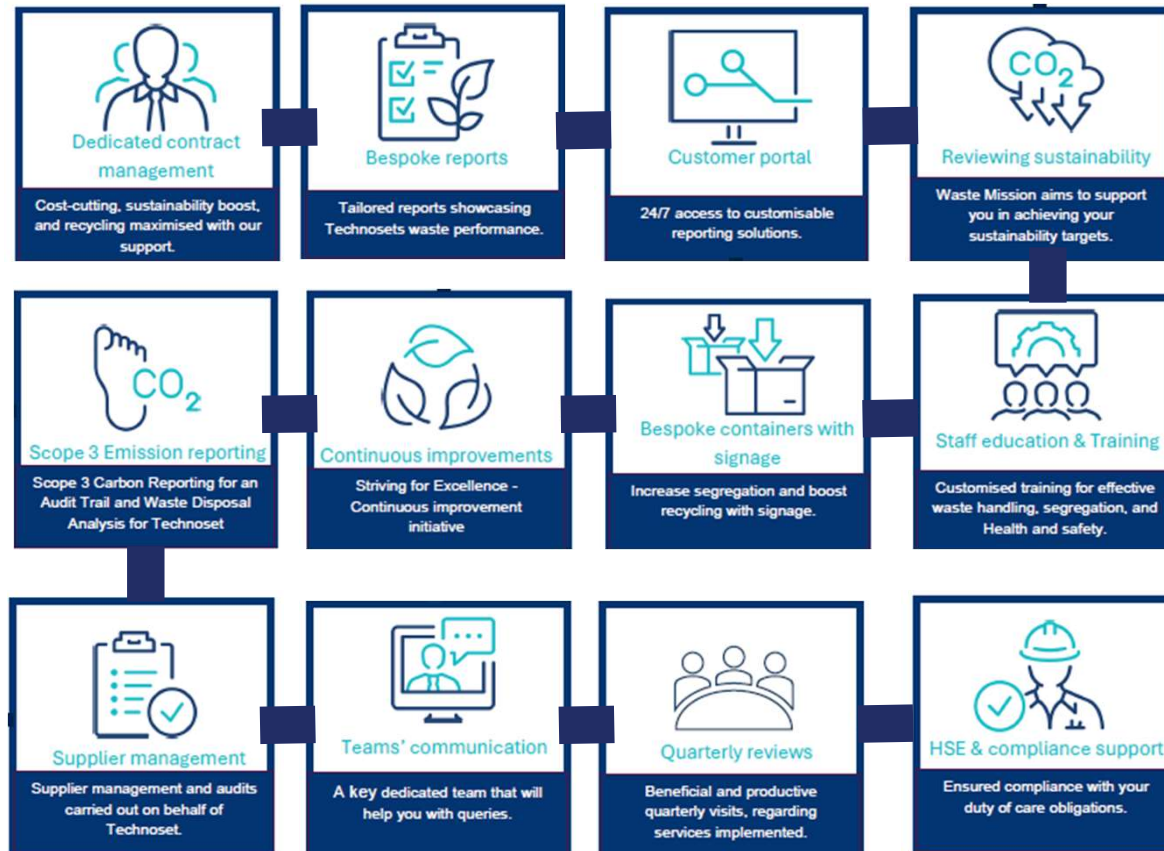
RECOMMENDATION 6 -

ENERGY MANAGEMENT

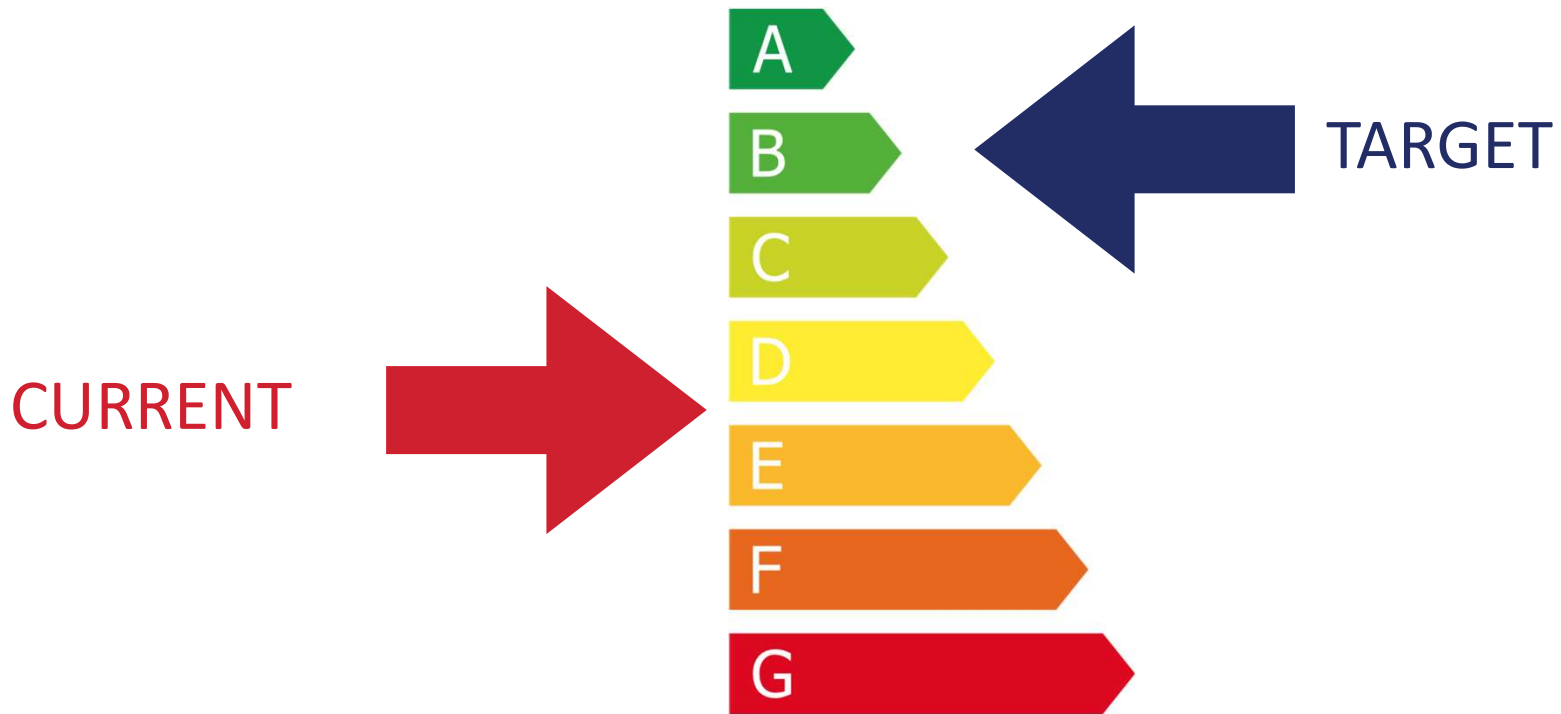
| Estimated Annual Energy Saving (kWh/yr) | Estimated Annual Saving (£ exc. VAT/yr) | Estimated Cost to Implement (£ excl. VAT) | Payback Period | Estimated Annual Carbon Saving (tCO2e/yr) |
|---|---|---|----------------|---|
| 17,390 kWh electricity, 4135 kWh gas | £4,721 | Low/No Cost | Instant | 4.67 Tonnes |



WASTE MANAGEMENT AUDIT



EPC RATING



FUTURE STATE



THANK YOU FOR YOUR TIME



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KEVAN KANE

Group Managing Director

07827 242880

KEVAN.KANE@TECHNO-GROUP.CO.UK

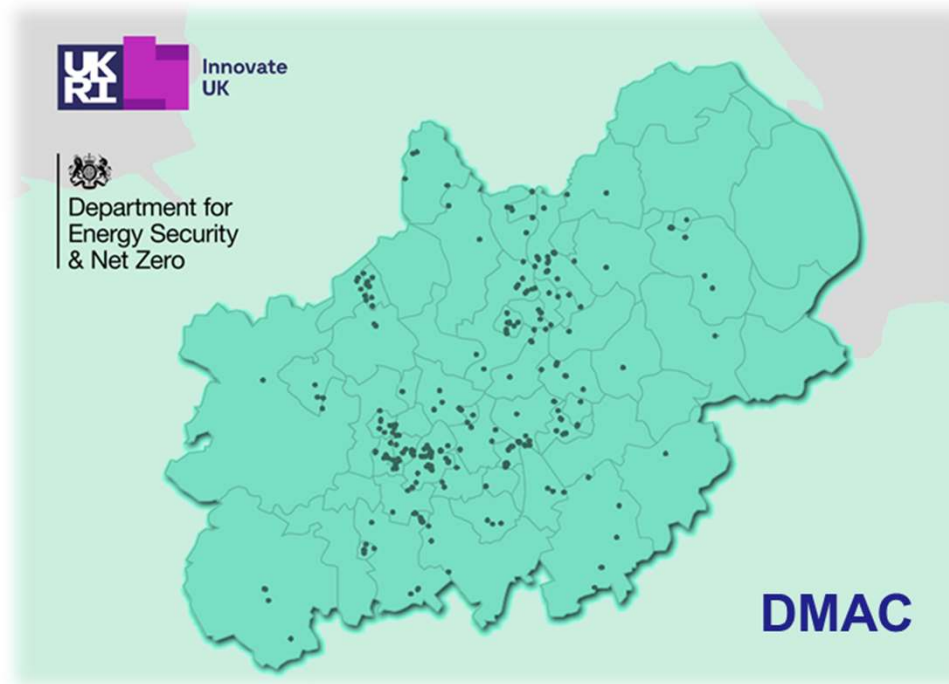
Panel Session #2

Supply Chain experience on emissions reduction & reporting

- **Steve Boyd**
Managing Director, G&O Springs
- **Jason Aldridge**
Managing Director, Arrowsmith (an ASG Group Company)
- **Kevan Kane**
Group Managing Director, Techno-Group
- **Chair:** Chris Weir, MAA



Getting involved in DMAC



DMAC Survey Questionnaire

We are gathering data for use in DMAC reporting and will use it to generate a picture of overall GHG emissions and energy usage across the Midlands Aerospace supply chain.

No direct links to companies or individuals will be published.

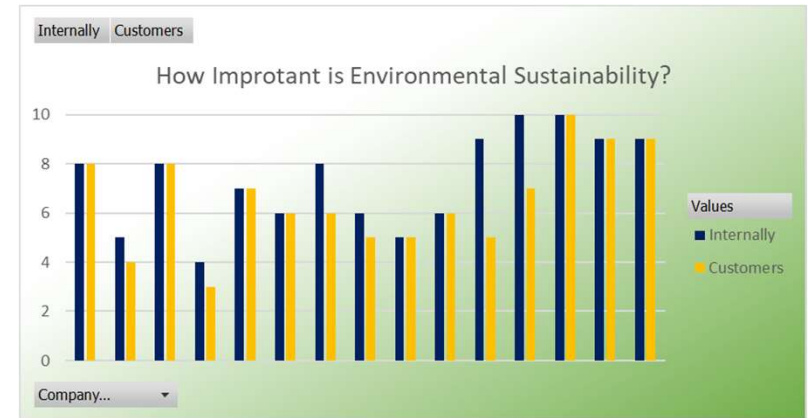
For help completing contact tim.holmes@midlandsaerospace.org.uk

<https://forms.office.com/e/2kSSFdcydJ>



DMAC Survey – 15 responses to date

- 2 large (>500), 2 medium (<500 >100), 11 smaller (<100)
- 100% know natural gas and electricity usage (KWH/PA)
- 60% measure Scope 1 – 7 data points for total CO2e/PA
- 87% measure Scope 2 – 9 data points for total CO2e/PA
- 60% measure Scope 3 – 7 data points for total CO2e/PA



All participants are considering or using alternative or sustainable energy supplies

Most popular are solar, green tariffs, and installation of voltage optimisation transformers

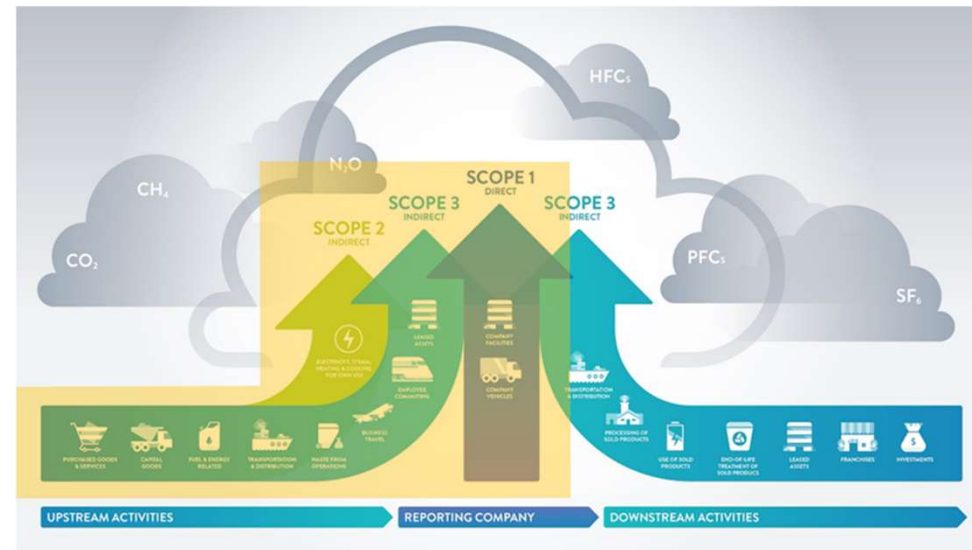
Main issues: distribution network operators (DNO), rising costs, and local infrastructure challenges (age of buildings, roof construction, and landlord's permission)

Agenda

Networking Break and visit the stalls.

Please be ready to
restart at 15:10 to hear
about support and funding
opportunities for
decarbonisation.

DMAC: Decarbonising the Midlands Aerospace Cluster



Agenda

| Start Time | Topic | Presenter |
|------------|---|----------------------------|
| 08:30 | Registration & Networking | |
| 09:00 | Welcome | Dr Andrew Mair, MAA |
| 09:05 | Overview of today and the DMAC Programme | Chris Weir, MAA |
| 09:50 | Networking & Stands | |
| 10:20 | OEM - (Emissions) Sustainability in the Supply-chain - VoC | Alan Seed, Rolls-Royce |
| 10:40 | Tier 1 - (Emissions) Sustainability in the Supply-chain - VoC | Dr Dawn Pope, Collins Aero |
| 11:00 | Legislation coming your way - CBAM | Dr Russ Hall, WMG |
| 11:30 | Panel Q&A: Morning Session - expectations of the supply-chain | Presenters |
| 12:00 | Lunch, Networking & Stands | |
| 13:00 | Intro afternoon session on case studies, solutions & support | Tim Holmes, MAA |
| 13:10 | Case Study 1 - G & O Springs | Steve Boyd, G&O Springs |
| 13:30 | Case Study 2 - Arrowsmith | Jason Aldridge, Arrowsmith |
| 13:50 | Case Study 3 - Technoset | Kevan Kane, Technoset |
| 14:10 | Panel Discussion & Q&A then close formal session | Presenters |
| 14:40 | Get involved in DMAC | Tim Holmes, MAA |
| 14:55 | Networking & Stands | |
| 15:10 | Support & Funding Opportunities Clinic | Dr Pamela Farries, MAA |
| 16:00 | Close | |



DMAC Decarbonising the Midlands Aerospace Cluster

AMTC

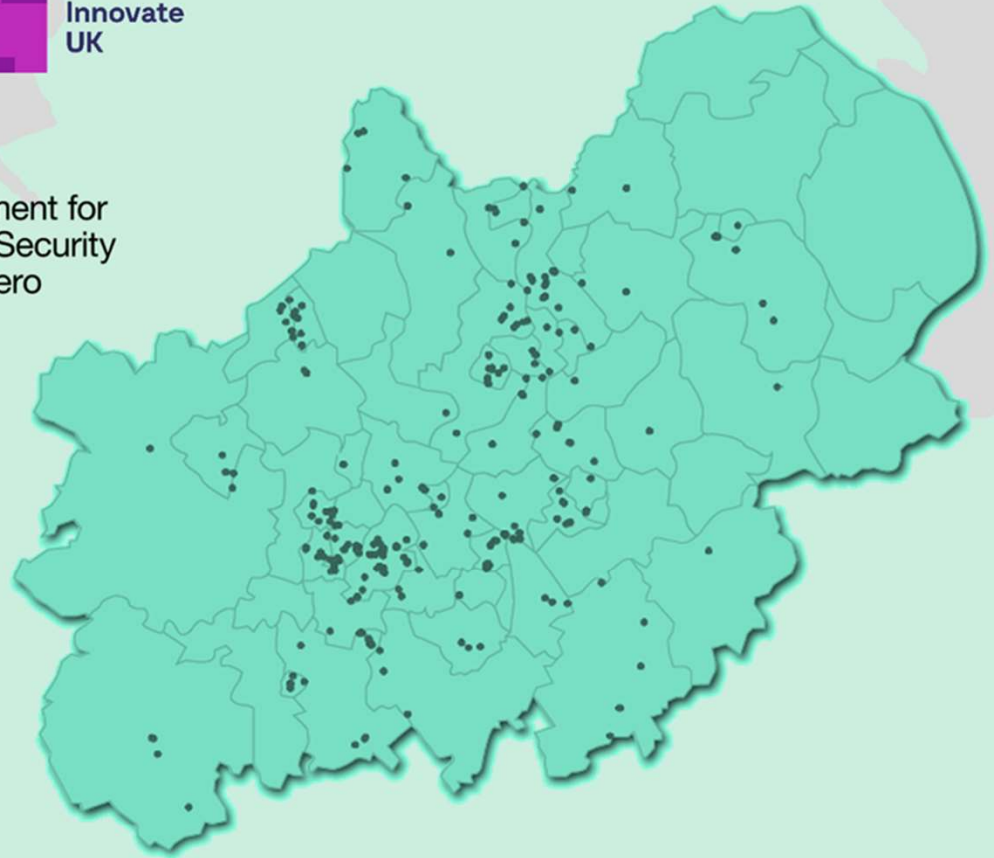
Advanced Manufacturing
Training Centre, Coventry

11th July 2024

Funding & Support



Department for
Energy Security
& Net Zero



IUK DESNZ Local Industrial Decarbonisation Plans: **Decarbonising the Midlands Aerospace Cluster (DMAC)** Innovate UK Project No: 10090207

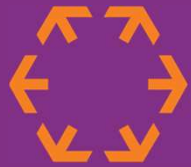
Sustainability Grants and Support

- Business Energy Advice Service - MTC
- Coventry City Council
- Birmingham City Council
- Sustainability West Midlands
- Net Zero Innovation Network (NZIN) – WMG
- EmVide
- Green Advantage- Skills Bootcamp in Sustainability – Aston University
- Industrial Energy Transformation Fund
- Supply Chain Transition Project – MAA for WMCA





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Business Growth
West Midlands

Business Energy Advice Service

West Midlands Pilot 2024-25



What does BEAS offer?

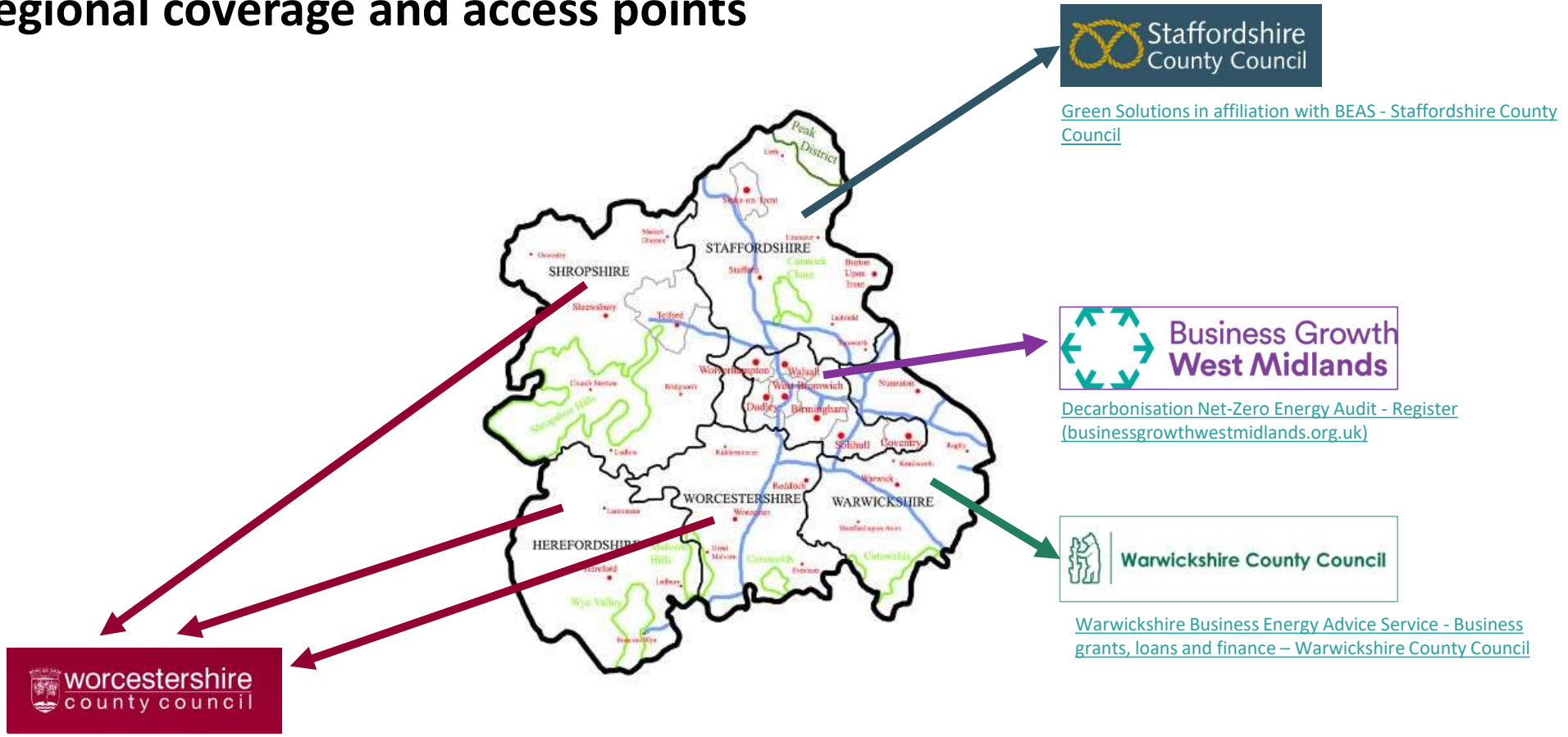
- Fully funded Business Energy Assessment for commercial and Industrial SMEs
- Specialised in-depth assessment is available for manufacturers with high levels of energy consumption and grant application support
- Comprehensive report covering recommendations for energy demand reduction with estimated savings and payback
- Opportunity to apply for grant funding to implement recommendations



On completion of an assessment, businesses can apply for grants of between £1,000 - £100,000 to improve energy efficiencies.

Scan the **QR code** or visit wmca.org.uk/BEAS

Regional coverage and access points



 **Staffordshire County Council**

[Green Solutions in affiliation with BEAS - Staffordshire County Council](#)

 **Business Growth West Midlands**

[Decarbonisation Net-Zero Energy Audit - Register \(businessgrowthwestmidlands.org.uk\)](#)

 **Warwickshire County Council**

[Warwickshire Business Energy Advice Service - Business grants, loans and finance – Warwickshire County Council](#)

 **worcestershire county council**

[Net Zero Worcestershire grants | Worcestershire County Council](#)



Recent examples



Alucast

Sand, Gravity and Pressure casting
Manufacturer

Identified potential annual savings of

- c.1,083,000 kWh
- c. £148,000

“Our company were helped by Pro-Enviro which offered comprehensive advice to the company. They took an analysis of unproductive energy use and monitored half hourly data. This gave a clear indication of significant wasted energy. They also helped us in the grant application process which made the whole process of application for funding rather painless.”

Tony Sartorius, Chairman.

Brock house

Closed die-hammer and upset forgings

Identified potential annual savings of:

- c. 585,000 kWh
- c. £30,000

“The programme is a fantastic opportunity to get independent advice as to what are the best options for energy and cost reduction for your business.”

Steve Walters, Director and Owner

Alpha Rowen

Austempering, oil hardening and stress relieving services

Identified potential annual savings of:

- c. 283,000 kWh
- c. £55,000

“I was delighted by the depth of insights gained from the free business energy assessment provided by the Black Country delivery team (Pro Enviro) for the BEAS Decarbonisation Net Zero Programme. The recommendations the assessment provided were not only practical but should also lead to a noticeable reduction in our energy costs. The added benefit is that the quantified opportunity it generated made grant applications far more straightforward”.

Mike Leach, Managing Director

Grant eligibility - Technology

| Cross-sectional technologies | Process heat generation from renewable energies | Measurement, control and regulation technology, sensors and energy management software | Energy and resource-related optimisation of systems and processes |
|---|---|--|---|
| <ul style="list-style-type: none"> • Lighting (LED, controls, sensors) • Electric motors and drives • Electrically driven pumps • Fans • Compressed air generators and their higher-level control • Heat exchanger for waste heat utilization or heat recovery • Thermal insulation/thermal insulation of industrial plants or parts of plants | <ul style="list-style-type: none"> • Solar collector systems for the direct generation of heat from solar radiation • Heat pumps that extract the usable heat from renewable energies • Systems for the development and utilisation of geothermal energy • Installations for firing solid biomass • Combined heat and power plants for the generation/provision of heat and electrical energy through the use of solid plant biomass, solar radiation or geothermal energy | <ul style="list-style-type: none"> • Systems for monitoring and for the efficient control of energy and material flows for integration into an energy or environmental management system • Energy management software including training costs | <ul style="list-style-type: none"> • Process and procedure changes that lead to energy and resource savings, in particular energy and resource-efficient technologies as well as energy and resource-oriented optimisation of production processes • Measures to use waste heat • Measures to increase the energy and/or resource efficiency of systems for heating, cooling and ventilation if these are clearly and predominantly used directly for production processes • Measures for the energy and/or resource-efficient provision of process heat or cold • Measures to avoid energy and/or resource losses in the production process • Measures that lead to the use of a renewable energy source instead of a fossil fuel • Measures to electrify processes |

Grant eligibility - Overview

- Match funded up to 50%
- Capital equipment
- Support services related to project (can include consultancy)
- Ongoing monitoring
- Excludes – software, training (except where specifically related to implementation)
- Pay back: more than 2 years

Applications through regional grant teams depending on business address:

- [West Midlands Region](#)
- [Worcestershire](#)
- [Staffordshire](#)



Introduction

DNZ PROGRAMME

The Decarbonisation Net Zero Programme aims to provide information and expert advice and support to businesses enabling them to make significant decarbonization and money-saving changes to their business.

This Programme is part of the wider West Midlands Business Support activity funded through the UK Shared Prosperity Fund (UKSPF).

OBJECTIVES

What We Aim to Achieve?

- Support decarbonisation efforts in local businesses while improving the natural environment
- Align with the UK government's legally binding climate target to reduce carbon emissions to Net Zero by 2050
- Provide immediate support to businesses to enhance their competitiveness and sustainability





Our Commitment

A Sustainable Future

- We are fully committed to delivering Energy Audits for small and medium-sized enterprises (SMEs) by March 2025
- Capital grants of between £1,000 to £100,000, to fund up to 50% of the cost of installing energy efficiency measures
- Our commitment includes supporting a wide range of small businesses, from sole traders and micro-businesses to manufacturing companies in the Birmingham, Solihull, Coventry, Black Country and Warwickshire regions *depending on eligibility



The Journey Ahead

What to Expect in Your Decarbonisation Journey?

Register

Audit Triage

Energy Assessment

Recommendations

Grant Application



Start by completing the [registration form](#) on BGWM's website or by contacting our team.



After registration, our Business Engagement Managers will reach out to you to complete the audit triage and check your eligibility.



We will then conduct a FREE assessment, examining your energy usage and operations.



Based on the assessment, we'll provide you with recommendations for cost-effective energy saving measures.



Your business has the opportunity to apply for grants of up to £100,000 to implement the energy efficiency recommendations.

Is Your Business Ready to Make the Change?

EMAIL ADDRESS

decarb@aston.ac.uk

PHONE NUMBER

0121 204 4828

TO REGISTER

West Midlands: bit.ly/DNZ-Audit-Register

Warwickshire: <https://bit.ly/3skX34q>



Learn more about the programme

Other resources

Green Business Network

The Green Business Network allows businesses to come together, share ideas and promote energy, resource, waste and water efficiency as well as engage on low carbon, environmental and green sustainability initiatives.

- Free to join
- Over 3,000 members
- Networking opportunities
- Free newsletter
- Be the first one to find out more about events and grant support opportunities
- [Join now](#)



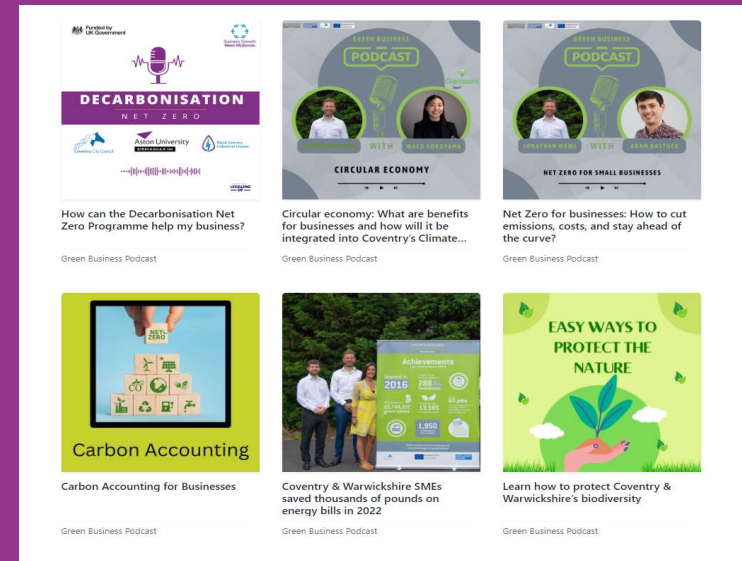
Use this QR code to join

Other resources

Green Business Podcast

Listen to our monthly podcast to learn more about energy, resource, waste and water efficiency as well as engage in low carbon, environmental and green sustainability initiatives.

- New episodes every month
- Over 10 episodes so far discussing solar PV, heat pumps and sustainable business practices
- Use the QR code [or this link to subscribe](#)



Other resources

Green Business Directory

Find a list of local suppliers and installers who can help you improve your business .

- Over 100 companies
- 20 categories including solar PV, roofing services and water management
- If you are a local installer or supplier please get in touch and we will add you to [the directory](#)

Information on Green Business Directory

- Battery Storage
- Compressor Systems
- Computer and Mobile Recycling
- Construction Products
- Electric Vehicles and EV Charging
- Electrical Installations
- Energy Performance Certificates (Domestic & Commercial)
- Environmental management / ISO14001:2015
- Heating, Ventilation & Air Conditioning
- Insulation
- Lighting
- Low Energy Infrared Heating
- Power Factor Correction
- Renewables
- Roller Shutters
- Roofing services
- Smart Buildings
- Solar PV
- Water Management
- Windows

Business Support

UK Shared Prosperity Fund (UKSPF)

Support SMEs within the Coventry area with both non-financial support and financial support*

- Capital grants up to a 50% intervention rate:
- Start-up grants - £2,500 - £7,500
- SME Capital grant - £2,500 - £25,000*

*(maximum amount dependent on project investment value and outputs)

Contact us for further information
business@coventry.gov.uk

*subject to eligibility



Use this QR code for online enquiry



Business Energy Efficiency Grant Programme

The Business Energy Efficiency Grant Programme (BEEGP) has launched – effective January 2024

The Department of Energy Security and Net Zero (DESNZ) and the Department for Levelling Up Housing and Communities (DLUHC) are looking to support businesses in the West Midlands Region.

The purpose of BEEGP is to overcome market failures inhibiting energy exposed West Midland businesses, and by doing so:

- lessen the impact of energy cost rises
- support their transition to net zero

The Business Energy Advice Service (BEAS) is piloting the Business Energy Efficiency Grant Programme (BEEGP), which is a £10.5million nationally funded grant programme to be delivered in the West Midlands ITL1 region, that is to say, Birmingham, Coventry, Dudley, Sandwell, Solihull, Walsall and Wolverhampton.

The programme is being administered by Birmingham City Council, with a view to expanding nationally.

If you are not eligible for BEEGP, you may be able to access the [Net Zero Grant Programme](#) or the [West Midlands SME Grant Programme](#).



Business Growth
West Midlands

About the Business
Energy Efficiency
Grant Programme
(BEEGP)



Eligibility criteria for
BEEGP



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3. The West Midlands SME Grant Programme



The WMGP is designed to support start-ups and existing business with their growth plans

- Funded through the UK Shared Prosperity Fund and managed by WMCA
- Capital **only** grants available
- Job creation required (*Solihull not mandatory*).

Main features of the West Midlands SME Grant Programme

- Businesses based or moving into the Birmingham, Solihull MBC, Cannock MBC, or Shropshire local authority areas
- Available to start-up and existing SMEs
- Grants range from £1,000 - £7,500 for Start-ups based in Birmingham, Cannock and Solihull
- Grants range from £1,000 - £100,000 for existing SMEs based in Birmingham, Cannock, Solihull and Shropshire
- 50% match funded

Type of WMGP Eligible Projects Costs

Types of Projects that can be supported:

- **Establishment of new business start-ups** (*Birmingham, Cannock Solihull & Cannock only*)
- **Relocation, expansion and growth** of existing businesses
- **Inward investment**
- Develop new **markets opportunities**
- **Innovation** – Including new product development
- **Capital investment**, e.g., new plant, machinery and equipment
- Increase in **productive capacity** of new and existing premises through new **property builds/refurbishment/extensions**
- **Digital projects**
- Small one-off **apprenticeship grants** (*Cannock only*)

Key website and email addresses

- Eligibility criteria and application guidance is available online www.birmingham.gov.uk/wmgp or www.birmingham.gov.uk/nzgp
- Application forms can be requested from - wmgp@birmingham.gov.uk
- Enquiry email address wmgp@birmingham.gov.uk
- Any questions?

About Us

- Three main areas of work:
 - **Membership:**
 - We are a cross-sector membership organisation with a difference; we connect, promote, and prioritise our members throughout everything we do
 - **Consultancy:**
 - We provide trusted independent, expert advice across all sectors and areas of sustainability
 - **Engagement:**
 - We use the power of storytelling and sharing of best practice to inspire action on sustainability. We use our communications, events and networks as platforms for engagement

Member Support

- Key member management: two meetings a year with dedicated SWM Account Manager
- Promotion of your brand, events, news, achievements, and job opportunities via our communications
- Opportunities to collaborate with SWM events, projects and awards
- Free attendance at our high-profile Annual Conference (Summer 2024) and annual exclusive SWM Members Social (November 2024)
- Use of our membership logo to demonstrate your commitment to sustainability and to enhance your corporate social responsibility.
- Opportunity to work with us to deliver and support the implementation of the regional Roadmap to 2030.
- Twice yearly FREE use of the meeting rooms for up to 14 people based in central Birmingham
- 10% off any SWM consultancy work plus access to the SWM team's in-house expertise

West Midlands Net Zero Business Pledge

What is the pledge?

- Launched by WM Mayor Andy Street in March 2021
- Managed by SWM on behalf of the WMCA
- Free, no technical requirements, for organisations at the start of their sustainability journey or those that are well on their way
- Organisations in the 17 local authorities of [West Midlands Combined Authority](#) (WMCA) are eligible

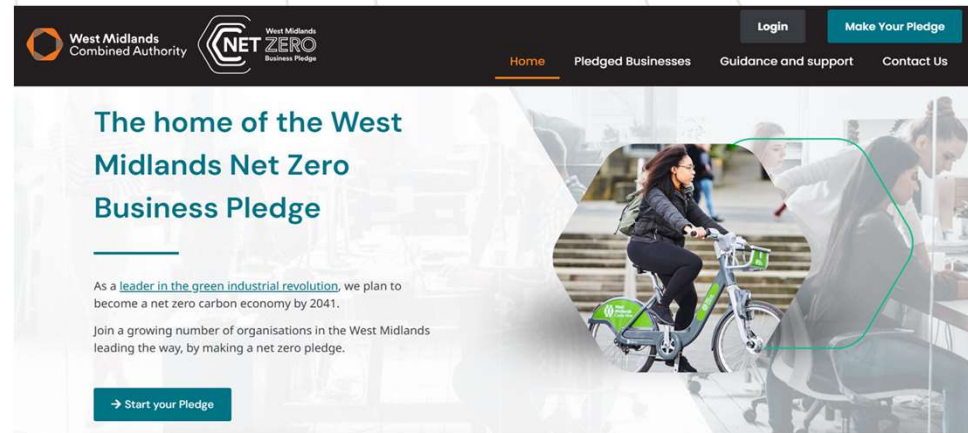


West Midlands Net Zero Business Pledge

Highlights 2023

- Launched new website
- Hosted first in-person event
- Published net zero toolkit

The toolkit process



West Midlands Net Zero Business Pledge



Looking forwards

- Delivering this work for another year.
- Surveying our pledgers to ensure they are getting as much out of the experience as possible
- Connecting with the vast ecosystem of business support organisations, networks and services
- Continued drop-ins
- Getting more organisations signed up – 120 to date!



Scan to find out
more and register
now

WM Innovation Programme (WMIP)

- Innovation Alliance WM is the 'engine' for WMIP
- Virtual Innovation Team experts embedded in sector specific support organisations, connected by a central support team:
 - SWM lead on low carbon and run the [Innovative Zero Carbon Working Group](#)
- A range of sector and cross-sector innovation support :
 - Newsletters featuring funding, events, collaboration opportunities
 - Development of a portfolio of pilot innovation support projects and support to scale successful existing programmes of support
 - Regular thematic and sector-agnostic networks and events bring together businesses, universities, public sector and wider stakeholders
- Collaborate with Innovation Accelerator and other support activity



Partners

UNIVERSITY OF BIRMINGHAM | BCRRE



sustainability west midlands



sustainability west midlands

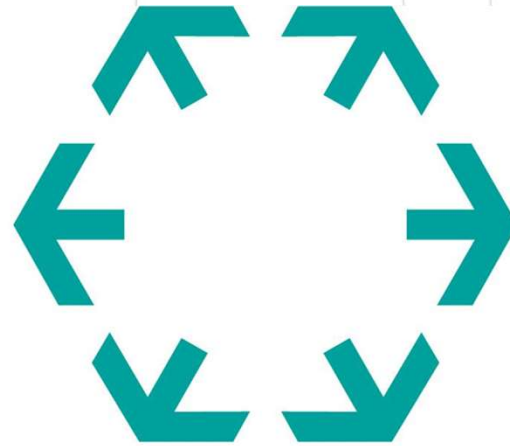
Venturefest West Midlands

- Connects and informs innovators, entrepreneurs, early and growth-stage businesses, investors, universities and support organisations
- Brought to you by IAWM partners and six WM universities
- [Annual event](#) in Birmingham with 600+ attendees: **21 March 2024**:
 - Keynotes and panel discussions
 - Minerva Birmingham PitchUp finals
 - Exhibition and networking
- Venturefest Mobile Hub events targeting local ecosystems:
 - BCIMO (Dudley), 15 November – focus supply chain innovation
 - Coventry University, early Feb – focus on immersive technology
 - Further events in planning for spring/ summer 2024



VENTUREFEST
WEST MIDLANDS 2024





Business Growth West Midlands

[Net Zero \(businessgrowthwestmidlands.org.uk\)](https://businessgrowthwestmidlands.org.uk)



What is Business Growth West Midlands?



WMCA and seven Local Authority partners have developed a new **connected, coordinated business support service** for businesses, which will support and increase productivity, start-ups, job creation and growth for our region.



Business Support

- WMCA is seeking to support businesses to **reduce their environmental impact** and to **reduce the rising energy costs** these companies are experiencing.
- The **WM Decarbonization Net Zero Programme (DNZ)** will provide information, expert advice and support to businesses enabling them to make significant decarbonisation and money saving changes to their business.
- Get in touch now!
- [Decarbonisation Net Zero Programme \(businessgrowthwestmidlands.org.uk\)](https://businessgrowthwestmidlands.org.uk)



DNZ programme will provide:



Information and Advice

Helping businesses to understand how they can get to net zero carbon emissions by 2050, and enable them to take larger/longer term investment decisions.



Energy Audits

On-site carbon reduction surveys supporting businesses to quantify and benchmark their emissions, identify cost-effective energy saving measures, set validated emissions targets, embed low carbon strategy within the company.



Knowledge Transfer

Technical Research and Development (R&D) support aimed at carbon accounting and sustainability software



Grants: [West Midlands Net Zero Grants \(businessgrowthwestmidlands.org.uk\)](https://businessgrowthwestmidlands.org.uk)

£4.5m in net zero grants available (50:50 match funded) through the seven Local Authority partners.

Circular Economy – International Synergies (1)

- The **Circular Economy: Birmingham & Solihull (CEBAS)** project provides free support to **Birmingham and Solihull based SMES** (from both manufacturing industry, service providers and social enterprises).
- Support available includes:
 - One to One support to improve your business resource efficiency, saving you both cost and reducing your carbon footprint
 - Free training events covering topics such as 'basic carbon literacy', 'best practice in waste management' and 'greening your company office'
 - Introduction to new technologies and processes to reduce waste and your company's carbon emissions
 - Free access to our resource matching software to post information on your waste, which others can then seek to use as an alternative raw material input



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UP**



Business Growth
West Midlands
in Birmingham & Solihull

Circular Economy – International Synergies (2)

- Companies receive short diagnostic visit from business experts to identify opportunity to both reduce waste and increase energy efficiency
- Physical resource can then be provided to help you move identified actions onwards
 - Focus on **quick win, no or low cost** improvements
 - Where capital investment may be needed, assistance can be given to identify and apply for regional grant funding
- If interested in reducing your business costs and carbon emissions, then call 0121 4332660 or email: CEBAS@international-synergies.com
 - This FREE support is available **NOW** until March 2025
 - <https://international-synergies.com/ourprojects/cebas-resource-efficiency-project/>



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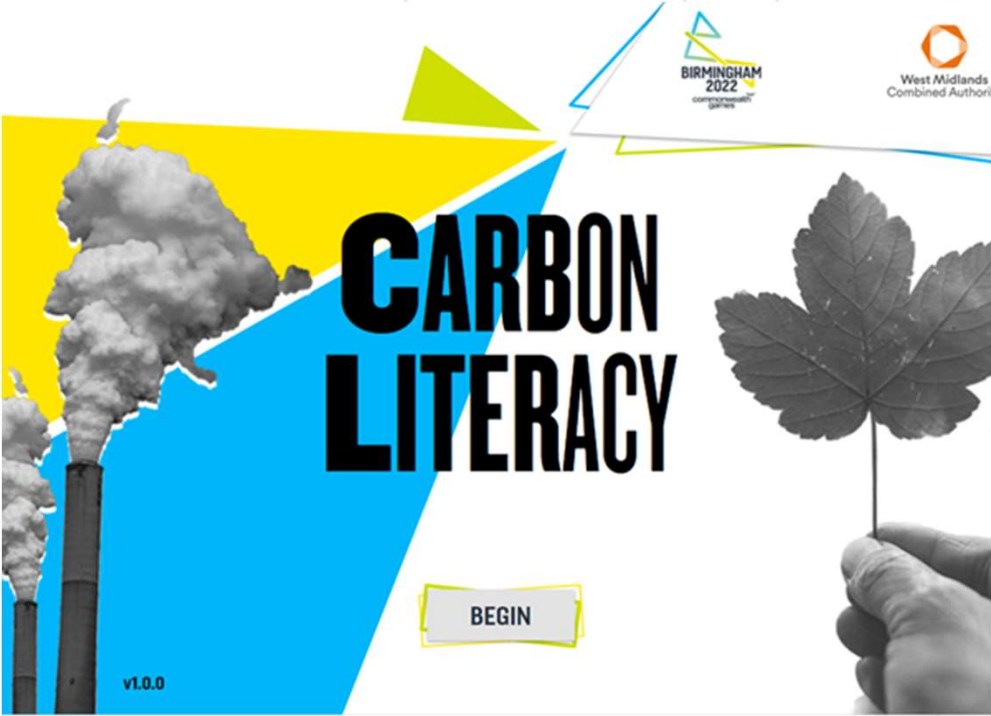
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Business Growth
West Midlands
in Birmingham & Solihull

Carbon Literacy Training

Free training to empower you to make a positive impact on climate change and help to influence others around you to drive action.



NET ZERO INNOVATION NETWORK

WARWICK MANUFACTURING GROUP



NET ZERO INNOVATION NETWORK



- Support businesses on their journey to Net Zero
- Support and de-risk implementation of sustainable manufacturing practices into businesses
- Create the space for shared best practices between companies
- Unpack the complexities that come with sustainability and make it simple

WHAT'S IN IT FOR ME?



► Innovation Project

Work with WMG to introduce technical innovation to your business for a positive impact on both environment and profit



► Collaboration Events

Collaboration events with expert speakers and workshops on sustainability topics relevant to the sector



► Net Zero Readiness Assessment

Online tool to assess how your business is prepared to meet net zero greenhouse gas emissions targets



► Energy Survey

Factory energy assessment and access to grants to part fund any improvements identified



► Road Map

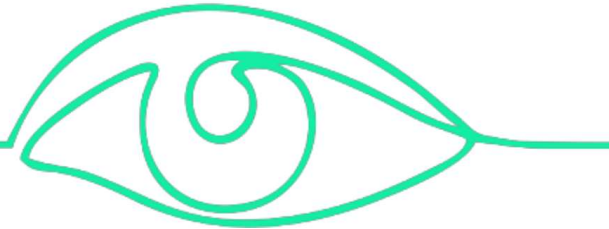
With the cohort, generate a 10 year roadmap and action plan for your business to capitalise on further opportunities



► Best Practice Visit

Observe sustainability innovations in practice at UK Manufacturing businesses.

EmVidé



PRODUCT EMISSIONS FOOTPRINT TOOLBOX

A screenshot of the EmVidé Copilot Playground web application. The interface is light blue and white. On the left is a sidebar with navigation options: Home, Products, Copilot Playground (selected), DEFINITIONS (Facilities, Assets, Emission Profiles), and USER MANAGEMENT (Users, Account). The main area has a header with 'Copilot Playground' and a 'Sign out' button. Below the header are three action buttons: 'COPILOT SEARCH' (purple), 'COPILOT COMPOSE' (pink), and 'CLEAR' (blue). The 'Name' field contains 'Car Door'. The 'Description' field contains 'Mitsubishi Lancer 2018 car door'. The 'Unit Of Measurement' field contains 'car door'. The 'Units' field contains '1'. On the right, a 'Copilot Results' panel shows a JSON response with decomposed materials data.

```
"root": { 5 items
  "decomposed_materials": [ 10 items
    0: { 8 items
      "accuracy": 0.988648313893271
      "co2": 35
      "co2_factor": 14
      "decomposed_material_activity_name": "market for anodising, aluminium sheet"
      "decomposed_material_name": "Aluminium alloy sheet"
      "decomposed_material_similarities": 0.981296627786542
      "decomposed_material_unit_of_measurement": "m2"
      "decomposed_material_units": 2.5
    }
    1: { 8 items
      "accuracy": 0.8719582929708234
```

**ELEVATE YOUR ANALYSIS
FOR SUSTAINABLE PRODUCT
DEVELOPMENT AT SCALE
WITH AI**

The screenshot displays the EmVidé Copilot Playground interface. On the left is a navigation sidebar with sections: Home, Products, Copilot Playground (active), DEFINITIONS (Facilities, Assets, Emission Profiles), and USER MANAGEMENT (Users, Account). The main area is titled 'Copilot Playground' and features three action buttons: 'COPILOT SEARCH', 'COPILOT COMPOSE', and 'CLEAR'. Below these are input fields for 'Name' (Car Door), 'Description' (Mitsubishi Lancer 2018 car door), 'Unit Of Measurement' (car door), and 'Units' (1). A 'Copilot Results' panel on the right shows a JSON response with two items, each containing metadata like accuracy, CO2, and decomposed material details.

```
"root": { 5 items
  "decomposed_materials": [ 10 items
    0: { 8 items
      "accuracy": 0.900648313893271
      "co2": 35
      "co2_factor": 14
      "decomposed_material_activity_name": "market for anodising, aluminium sheet"
      "decomposed_material_name": "Aluminium alloy sheet"
      "decomposed_material_similarities": 0.901296627786542
      "decomposed_material_unit_of_measurement": "m2"
      "decomposed_material_units": 2.5
    }
    1: { 8 items
      "accuracy": 0.8719582929708234
```

**ELEVATE YOUR ANALYSIS
FOR SUSTAINABLE PRODUCT
DEVELOPMENT AT SCALE
WITH AI**

Green Advantage- Skills Bootcamp in Sustainability

Green Advantage - Skills Bootcamp in Sustainability

Managing the sustainability transition for
business leaders and professionals

Express Your Interest →



Supporting your journey to net zero, Industrial Energy Transformation Fund

Jenni McDonnell MBE

Jenni.McDonnell@iuk.ktn-uk.org

www.ktn-uk.org



Department for
Energy Security
& Net Zero

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UK

Industrial Energy Transformation Fund Phase 3

£185m Industrial Energy Transformation Fund Phase 3 will support businesses with high energy use to cut their energy demand and reduce carbon emissions associated with their industrial process. It will provide funding for capital investment for industrial energy efficiency and decarbonisation.

Industrial sites in England, Wales and Northern Ireland can apply for funding for:

- **Feasibility and engineering studies** for potential deployment projects that will deliver energy efficiency or decarbonisation benefits if implemented, enabling decision-makers to make informed investment choices
- **Deployment of mature energy efficiency technologies** that improve industrial energy efficiency and reduce energy demand (TRL 7-9)
- **Deployment of decarbonisation technologies** that reduce carbon emissions associated with the industrial process (TRL 7-9)



Department for
Energy Security
& Net Zero

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UK

Studies

Feasibility studies: to investigate the technical and commercial viability of a future deployment. Options analysis to find the best technologies to deploy are in scope. Studies can also investigate offsite infrastructure requirements subject to clearly defined boundaries

| Minimum threshold | Maximum threshold | Maximum subsidy intensity | Must start by | Must complete by |
|------------------------------------|-----------------------------------|--|---------------|------------------|
| £30K total eligible cost per study | £7m total grant funding per study | 50% Large 60% Medium 70% Small/Micro | 1st July 2025 | 31st March 2028 |

Engineering studies: investigate the technical and commercial viability of a project, including commissioning the project, carbon reduction and other benefits analysis, health and safety, and planning and consent

| Minimum threshold | Maximum threshold | Maximum subsidy intensity | Must start by | Must complete by |
|------------------------------------|------------------------------------|--|---------------|------------------|
| £50K total eligible cost per study | £14m total grant funding per study | 25% Large 35% Medium 45% Small/Micro | 1st July 2025 | 31st March 2028 |

Awaiting outcome of review

Deployment

| Minimum threshold | Maximum subsidy for EE | Maximum subsidy for DD | Must start by | Must complete by |
|---|-------------------------------|-------------------------------|---------------|-----------------------------|
| £100k grant funding per application (large) | 30% Large | 50% Large | 1st July 2025 | 31 st March 2028 |
| £75k grant funding per application (small and medium) | 40% Medium 50% Small/Micro | 60% Medium 70% Small/Micro | 1st July 2025 | |

Awaiting outcome of review

Proposals should **reduce the energy demand** and **emissions produced by industrial processes at site level**.
 At the end of your project (project completion date) you must have installed and begun to operate (or be ready to operate) the technology.

NOTE: There is a grant to support both deployment competitions for sites in assisted areas (tier 1 and tier 2)

IETF Competition support and information

Competition guidance

<https://www.gov.uk/government/publications/industrial-energy-transformation-fund-ietf-phase-3-spring-2024>

Eligibility Check ietf@energysecurity.gov.uk

Networking Platform

Register at <https://ietf-phase3.meeting-mojo.com>

Technology Marketplace

Register at <https://forms.office.com/e/K021v6nMCq>



Department for
Energy Security
& Net Zero

Supported by



Innovate
UK

Supply Chain Transition Programme



SCTP-Aerospace

Supporting manufacturers to move into aerospace sectors

Midlands Aerospace Alliance

SCTP – Aerospace Midlands Aerospace Alliance

Looking to support :

- Those with no foothold in aerospace but with strong potential
- Those with less foothold in aerospace looking to grow
- Those facing uncertain future aerospace market segments
- Those with space interest

Will refer to partners :

- Those Aerospace suppliers looking to diversify and explore new sectors

SCTP – Aerospace Midlands Aerospace Alliance

Support will be tailored to each company's needs with the following available:

- Bespoke Tours of Farnborough Airshow
- 1:1 Support from an Aerospace expert
- Meet the Buyer events and site visits at OEMs and Tier 1 companies
- First year of MAA membership included
- Workshops and webinars on a number of topics to include :
 - Overview of aerospace market niche opportunities, key customers, processes and technology
 - Accreditations, certifications, standards, other requirements: where they are necessary, when they are not.
 - Roadmaps to new sales, marketing strategy development and execution: to include pitching practice
 - Bidding for, winning and managing contracts: what the customers says, what that means, how to respond
 - Risk analysis, mitigation, prevention, planning: customer requirements and internal
 - Management capability and skills requirements: and support available to build these

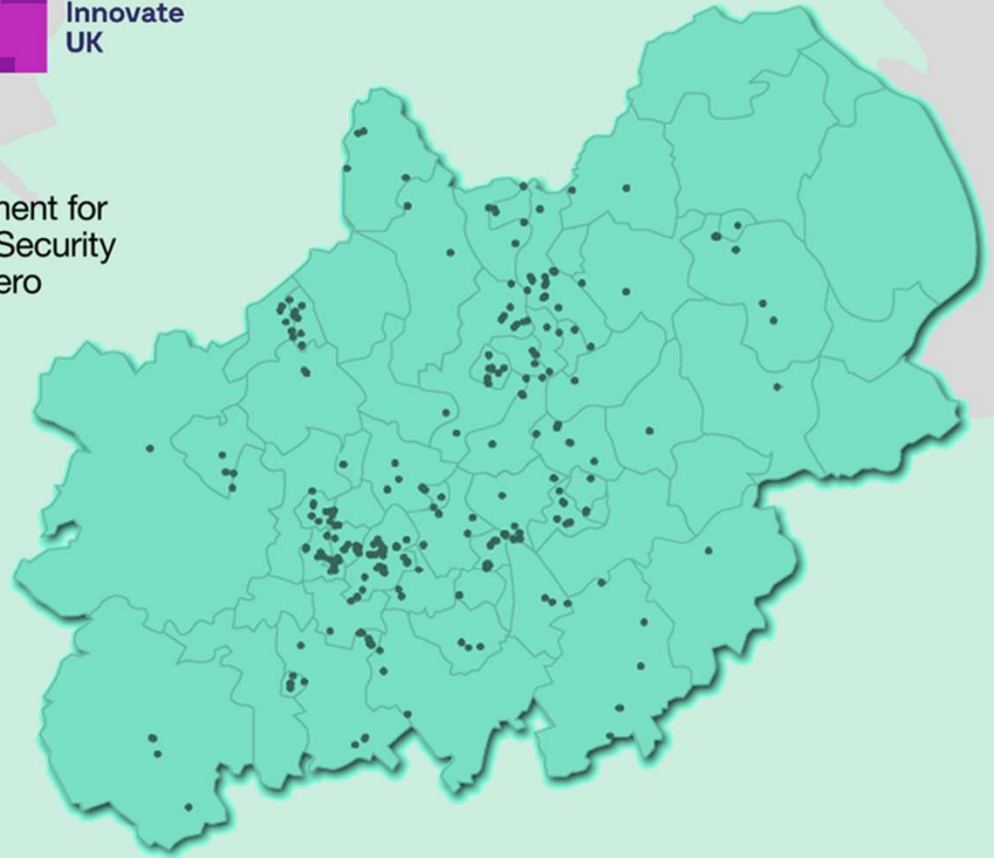
Decarbonising the Midlands Aerospace Supply Chain

AMTC

Advanced Manufacturing Training Centre, Coventry

11th July 2024

8:30 - 16:00



IUK DESNZ Local Industrial Decarbonisation Plans: Decarbonising the Midlands Aerospace Cluster (DMAC) Innovate UK Project No: 10090207