## **Delivering Net Zero For Manufacturing**

Understanding Your Net Zero Journey

Digital Twin - Maximising Energy Efficiencies Through Technology

auditel

THE COST, PROCUREMENT & CARBON SOLUTIONS COMPANY

Helping companies become Carbon Neutral and plan for Net Zero



Associate

bsi

#### AGENDA

- Intro to Auditel
- Carbon The Basics
- Why the business drivers
- Options so many choices
- Typical carbon programme
- Digital Twin

#### **KEY INFO**

- 60 minute webinar including 10 minutes Q&A
- Questions will be answered at the end

   questions in the chat as we go through

## **YOUR PRESENTERS**

#### John Gerard – Auditel Carbon Solutions Specialist

#### Laurie McKelvie – IES Senior Operations Consultant



#### Who are Auditel?

## 2000

#### **Full scope Procurement**

Expanded to 80 consultants, delivering full scope procurement on over 100 cost areas

2013

projects

**Energy Savings team** 

Launched specialist ESOS lead

delivering client energy reduction

assessor team. Started

## 2017

#### **Carbon Solutions**

#### Helping SME's buy and manage energy supplies

**Company Founded** 

## Our Mission...

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1994

To help organisations manage Carbon in a measurable, meaningful and potentially self-funding way.

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## 2023

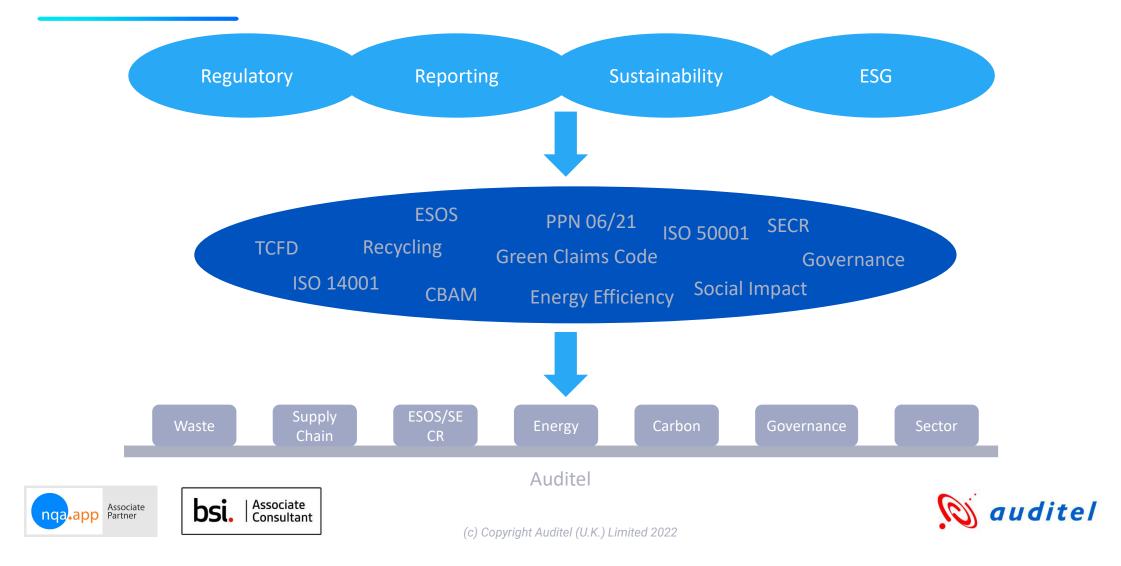
#### **80 qualified Carbon Auditors**

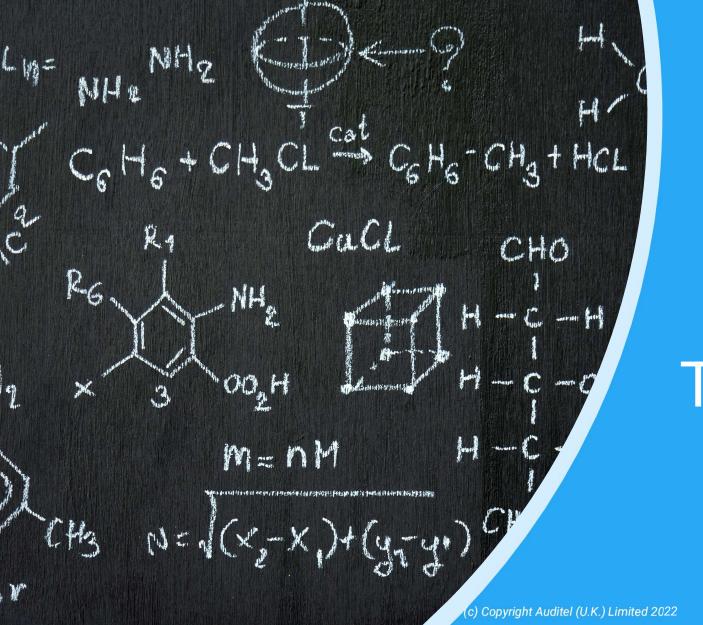
Now with network of over 100 consultants UK wide, 80 of whom are formally gualified in Carbon Solutions work

auditel



#### It's not just about a Carbon Footprint





## The Basics



#### What Are Green House Gases?

GHG – 7 main gases Use Govt conversation tables to covert to tCO<sub>2</sub>e

(tonnes of CO<sub>2</sub> equivalent)



**DSi.** Associate Consultant



#### What Are The Scopes?

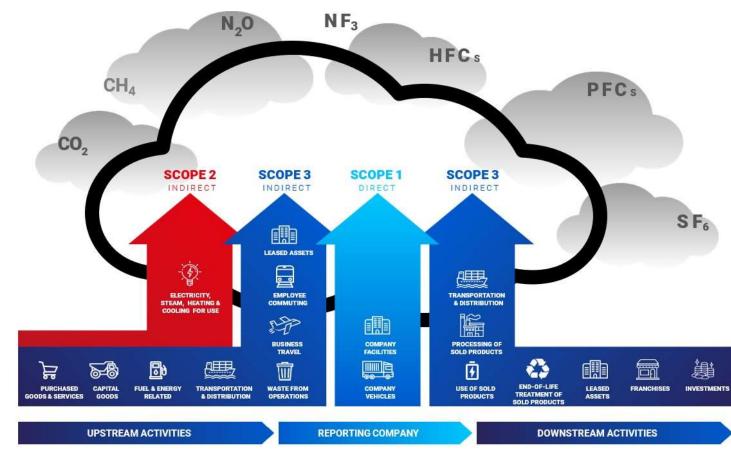
- Scope 1 Direct emissions from owned or controlled sources - for most companies this is gas boiler(s), company vehicles and F-Gas emissions (HFC&PFCs)
- Scope 2 Indirect emissions from generation of purchased electricity, steam, heating and cooling - typically your electricity supply
- Scope 3 ALL other indirect emissions in your value chain - it is multiple sources and, by far, the largest and most complicated scope to calculate

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#### Scope 3 – the real challenge

Typically Scope 3 will form between 85-95% of a company's emissions

but some will be more....

Microsoft's Scope 3 emissions add up to about 50 times the emissions Microsoft is responsible for in its own premises, and the emissions from the electricity it uses (Scope 1 and Scope 2) so a 23 percent increase in this part of Microsoft's footprint is more than 50 times the amount the company saved within Scope 1 and 2.









#### **Carbon Neutral V Net Zero**

#### Carbon Neutral

Means balancing GHG emissions by "offsetting" – or removing from the atmosphere – an equivalent amount of carbon for the amount produced. This can be achieved by buying "carbon credits"

#### Net Zero Carbon

This is reached when the amount of CO2e emitted is matched by the quantity of CO2e removed. It is accompanied by a target date for when this occur. You cannot achieve net zero by offsetting.

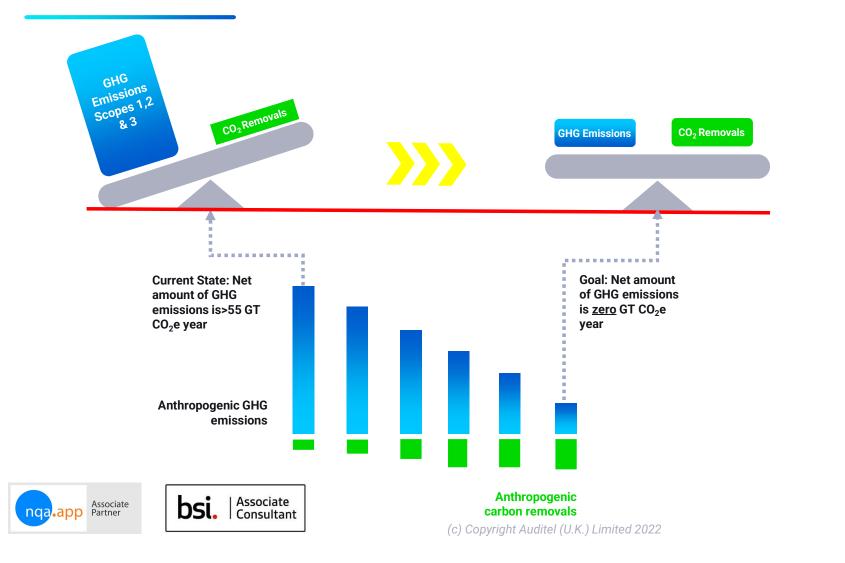
- Carbon Reduction
- Carbon Removal/Capture







#### What does Net Zero really mean?



To limit global warming to 1.5'C, we must reach netzero carbon emissions no later than 2050





Greenwashing is when a company purports to be environmentally conscious for marketing purposes but actually isn't making any notable sustainability efforts.

#### CMA Green Claims Code

- claims must be truthful and accurate
- claims must be clear and unambiguous
- claims must not omit or hide important relevant information
- comparisons must be fair and meaningful
- •claims must consider the full life cycle of the product or service
- claims must be substantiated

#### New EU Regulations – adopted March 2023

The proposal on green claims aims to •make green claims reliable, comparable and verifiable across the EU

protect consumers from greenwashing
contribute to creating a circular and green EU economy by enabling consumers to make informed purchasing decisions
help establish a level playing field when it comes to environmental performance of products

#### UK Regulators Crack Down on 'Greenwashing'

The CMA has warned businesses they have until the New Year to make sure their environmental claims comply with the law.

The CMA interim Chief Executive warned that if these businesses have used misleading green claims, "[the CMA] won't hesitate to take enforcement action – through the courts if necessary".

40%

## **0** 53%

53% of green claims give vague, 40% of cl misleading or unfounded evidence information

40% of claims have no supporting Half of all green labels offer weak evidence or non-existent verification

1/2

There are 230 sustainability labels and 100 green energy labels in the EU, with vastly different levels of transparency

230

The FCA's Sustainability Disclosure Requirements (SDR) proposes an "anti-greenwashing" rule, applicable to all FCA-regulated firms, which will require all sustainability-related claims to be clear, fair, and not misleading i.e., proportionate and not exaggerated. The rule is due to come into effect from Q4 2023.

#### Why? Market Forces & Challenges

...research <u>by Totaljobs</u> ...26% of British workers would be willing to take a pay cut in exchange for working for a business which acted responsibly in terms of the environment... 28% would actually consider quitting their current role and transitioning into one which was offered

# Reducing costs & doing the right thing





#### **Options** Which is best for me?

#### Only Internationally Recognised Carbon Neutrality Standard



SCIENCE BASED TARGETS

GHG Protocol establishes comprehensive global standardized

frameworks to measure and manage greenhouse gas (GHG)

emissions from private and public sector operations, value

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

Science-based targets provide a clearly-defined pathway for companies to reduce greenhouse gas (GHG) emissions, helping prevent the worst impacts of climate change and futureproof business growth.

GREENHOUSE GAS PROTOCOL



the first consensus-based and internationally applicable standard on product carbon footprinting that has been used as the basis for the development of other standards internationally.

requirements for quantifying and reporting

The international standard specifies

organization-level principles and

**GHG** emissions and removals

#### ISO/FDIS 14068 – In Development

ISO 14068 is a comprehensive standard for verifying when carbon neutral is reached and being maintained. It brings 'carbon neutral' and 'net zero' together properly for avoidance of doubt and provides a clear structure in one place which supports a pathway to carbon neutral/net zero

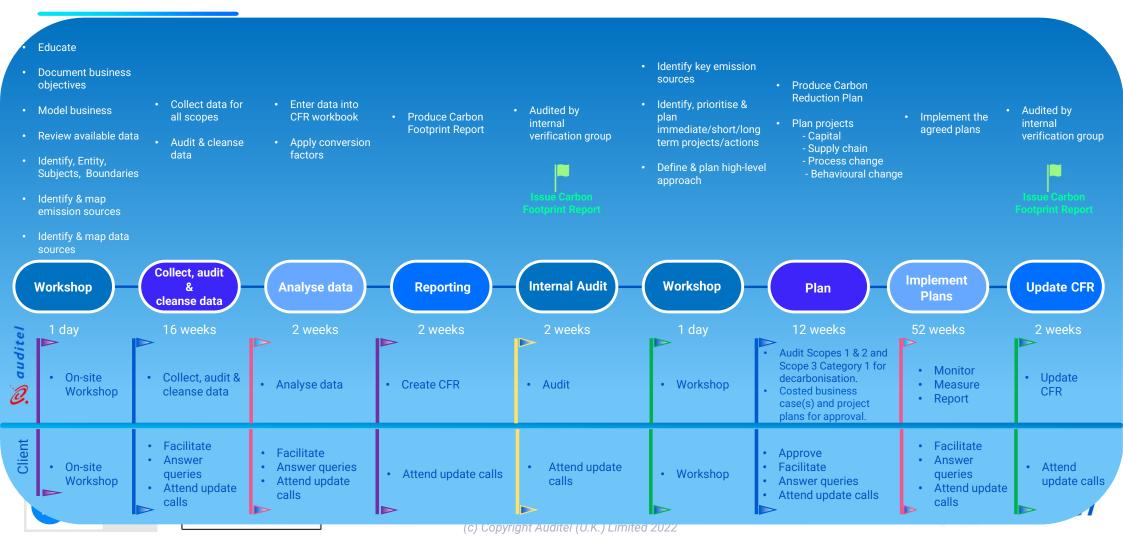






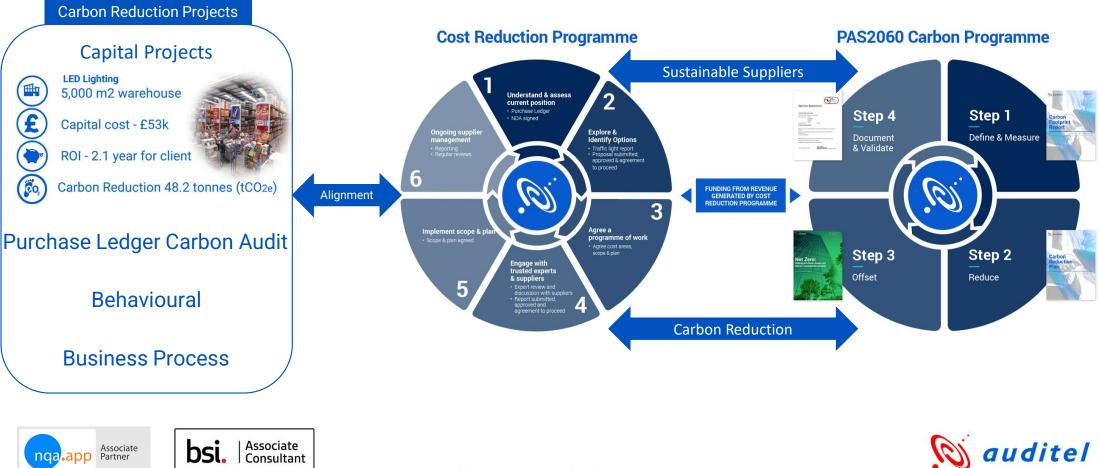
chains and mitigation actions.

#### Carbon Footprint & Reduction Plan Typical Delivery Plan



#### **Carbon Neutrality Does Not Need To Cost The Earth**

**Smart Procurement** 





## The ICL Digital Twin

The Power of Digital Twins to Decarbonise Manufacturing and Industry

Laurie McKelvie

ICL Senior Operations Consultant

## About IES

#### Home to the largest building physics analytics team in the world



## **Our Clients Include**



**Building and Construction Authority** 

## IES

## ICL for Manufacturing & Industry

ICL Digital Twins help you identify and deliver:

Energy use reductions Energy cost reductions Carbon reductions and Net-Zero road mapping Manufacturing process efficiency improvements Building efficiency improvements

Increase production efficiency, reduce energy use, lower energy costs & divest from fossil fuels with Net Zero road mapping

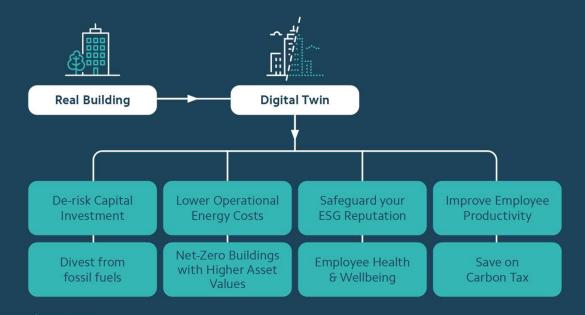


## Navigating the Energy Crisis

- Energy cost is now the number one boardroom issue for eight out of ten companies
- Energy Trilema cost, carbon, self sufficiency all now pulling in the same direction
- IES can help you save over 20% off your energy bill with carefully targeted energy efficiency measures
- Your initial Return on Investment can be within 1 year.
- The resulting Digital Twin is a lifetime asset for your organisation, enabling quantifiable and qualifiable Net-Zero road mapping and monitoring with associated additional energy and cost savings.

## **Our Digital Twin Solution**

- The IES Digital Twin is a detailed, calibrated digital representation of your built environment asset, infrastructure, occupancy and manufacturing processes across it's lifecycle
- It's a Lifetime Digital Asset for monitoring, energy cost risk reduction and net-zero investment road-mapping





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## Holistic Approach to Manufacturing Modelling

#### Key Issue: Building Building Shell Services Building Building Shell Services Lack of ICL Integration Manufacturing Manufacturing Manufacturing Plant Manufacturing Processes Processes Plant

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Reference: Dr Michael Oates, IES Ltd, PhD Thesis - https://www.dora.dmu.ac.uk/handle/2086/2388/browse?value=Oates%2C+Michael&type=author

Solution:

## How We Cut Energy Costs

#### Data Gathering

Together, we will identify and gather energy consumption and metering data, system performance data, manufacturing process data, building performance and building use data including occupancy profiles.

Accurate Modelling & Identification of Energy Savings We put the available data sets through our world renowned Digital Twinning software to provide insights into energy wastage. We then identify key energy saving measures with accurate forecasting of potential savings and payback periods.



#### Step towards Net-Zero

We can further develop the Digital Twin to take you to the next stage and test scenarios that moves you to net-zero & energy Self Sufficiency.

2

3

## Your Return on Investment

1 (

#### Immediate Energy Efficiency Gains

The process of gathering and collating your built environment and manufacturing process data itself will identify immediate energy and process efficiency gains hidden within. These simple gains alone often cover the capital cost of your investment

**2** — "What If?" Scenario Planning and Strategic Views

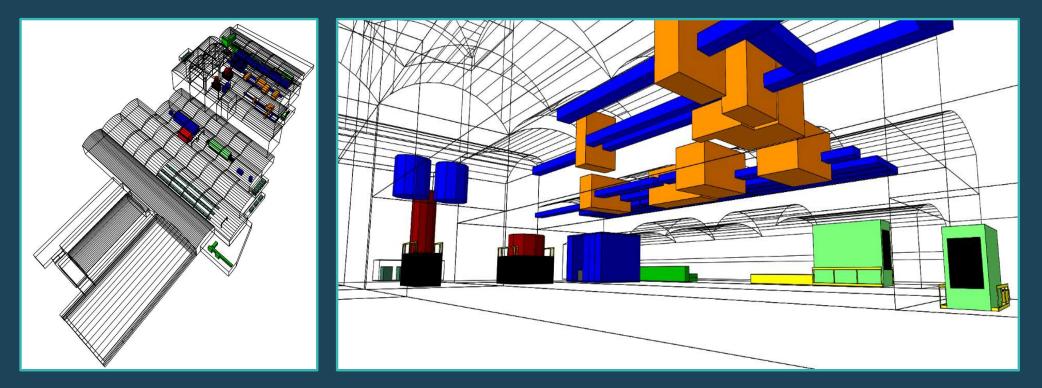
Once the data is collated and your virtual Digital Twin is built, you can run unlimited engineering, control or behavioural scenarios through the model without any risk to the business. You will identify significant and strategic deliverable improvements with fact based analysis.

• A Quantifiable, Measurable and Defined Net Zero Road Map You will have the tools at hand to plan ahead towards your Net Zero targets. Your road map will be fact based, reportable, costed, measurable and robust. Immediate energy and cost savings of up to 20%

Identify and deliver continued additional cost and carbon savings along your Net Zero Road Map

3

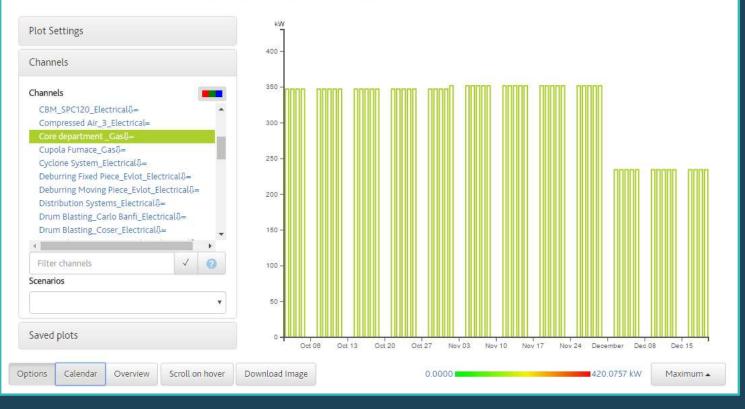
- Add energy efficiency measures to systems to reduce energy consumption
- Create model of foundry:



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#### Import data & create profile of energy demand from different processes:

- Natural gas Monthly bills
- Electricity Yearly bill
- Materials Yearly quantities
- Production Set quantity per hour

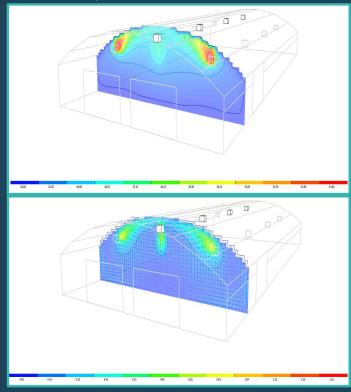


#### Data Plot - SCM - 2013-10-01 to 2013-12-20

- Create energy Sankey diagram to show energy sources and sinks for different processes
- Identify large energy consumers

| Energy (MWh) |  |             |  |   | 1800 MWh   |
|--------------|--|-------------|--|---|--|
| Source       | HVAC Plant Converters                                  | System heat | Use/Demand Sinks<br>Care Blog - Hot Sci - Direc Gris Funer - Gas   | Process Converters  | Sinks<br>Core Erop - Hot Box Urbactored Cores                  |
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|              | Heating - Core Over v Air                              |             |  | Heating - Air Hearers   | Air Heaters Heating Load                                       |
| Welding Gas  | Heating - Hetting - Hadiatt linges - 141//15/16        |             |  | Healing - Di-W  | DHW Hesting Load   |
|              | Heating - Modelling - Hacrant Pices - 1812/3           |             |  | I leating - Radient Pipes   | Rediant Fipes Heating Load                                     |
|              | Heating - Office and Dressing Room - Air Heaters       |             |  |   |  |
| Electricity  | Heating - Pistem - All Heaters - GC1                   |             | Meting - Oupola Pumace - Gas   | Metting - Cupicla Furrace   | Heat removed (weste)   |
|              | Heating - Shipting - Air Homan - GC5                   |             | Pouring - Famete - Line H - Gas (RC)   | Contraction of the second s |  |
|              | Heating - Shor Blasting - Radiant Pipes - 7934         |             | Pouring - Prohost Lodios - Lino A - Gas (RC)   | Pouring - Line ~  | Melting - Cupcla Furnace Molton Metal                          |
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|              |  |             | Core Shop - Drying Cyen - Diover Fans - Decritical   | Frieding Deburng Machine  | Mechanical Workshop Load                                       |
|              |  |             | Core Shop cist: Donat cist: Clectrical   | Fristing Holds  | Melling - Helding Farmace Mallon Metal                         |
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Analysis of heating fans indicates potential savings to be made by adjusting heating fans to run more efficiently:



Run analysis for efficiency measures:

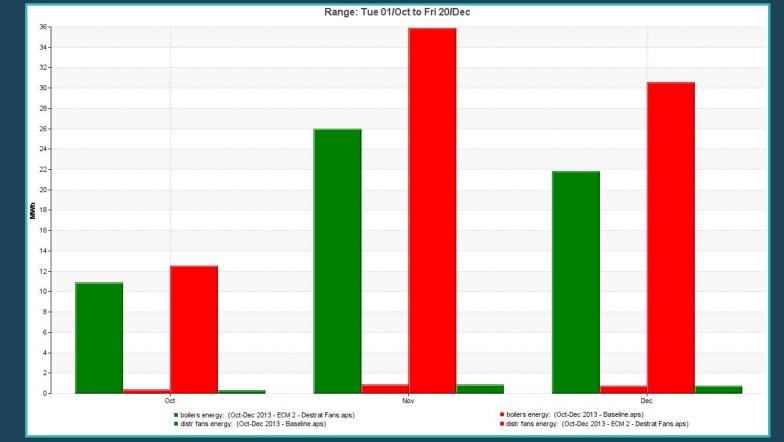
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|   | 8 2 9 LOC: Rep Produzione Anime Shell (Core Shop)<br>8 29 9 LOC: Scansie Placche Modello (Pattern Shop)                 | Run test  |       |

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**Results:** 

Saving of **26%** 

in energy used in heating fans over 3 months:



Red = Baseline Green = Simulated energy efficiency scenario

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### **Thank You**

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> Associate Consultant

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