

Developing and implementing your net zero strategy and sustainability roadmap

Bryan McCourt


30 November 2023



Why is this an important topic?

- + Summer of 2023:
Hottest ever recorded
- + September 2023
Joint hottest ever recorded
- + October 2023
Hottest ever recorded
- + Extreme weather events from wildfires
to flash flooding

+

 The Guardian

[‘Era of global boiling has arrived,’ says UN chief as July set to be hottest month on record](#)

'Era of global boiling has arrived,' says UN chief as July set to be hottest month on record ... The era of global warming has ended and "the era...

27 Jul 2023

... BBC

[Global heat: Extreme autumn sets up 2023 to break records](#)

Climate scientists say it is now "virtually certain" year will be the warmest on record.

 The Telegraph

[England had warmest September on record](#)

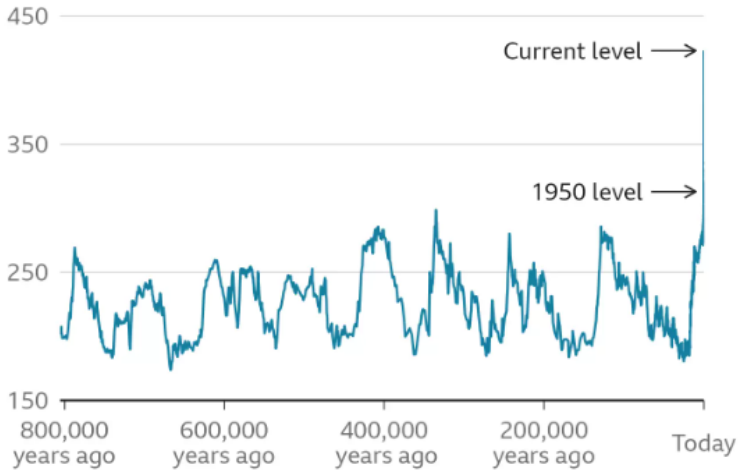
Heatwave early in month brought year's hottest day, with temperatures reaching 33.2C at Kew Gardens in London.

1 month ago

Why is this an important topic?

Carbon dioxide levels are higher than any time in the last 800,000 years

Atmospheric CO2 concentrations, parts per million

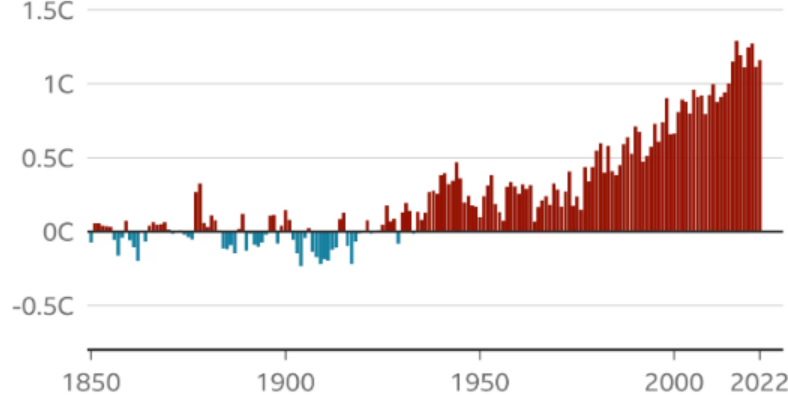


Source: NOAA/Bereiter et al., 2015

BBC

The world has been getting warmer

Change in annual average global temperature from pre-industrial levels (1850-1900) in degrees C



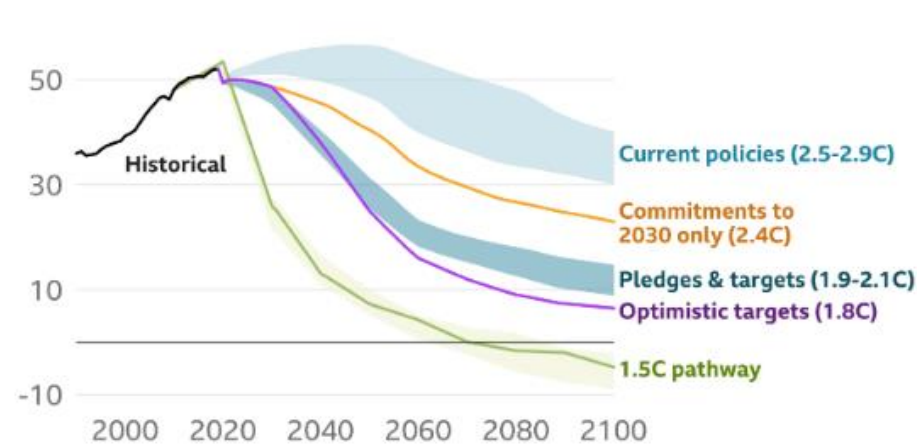
Note: Average calculated from HadCRUT5, NOAA GlobalTemp, GISTEMP, ERA5, JRA-55 and Berkeley Earth climate datasets

Source: Met Office

BBC

Projected trends in emissions and warming

Global greenhouse gas emissions in gigatonnes of carbon dioxide equivalent



Source: Climate Action Tracker

BBC

Sustainability obligations for schools are growing...

By 2025...

- + Every education setting will have a nominated sustainability lead
- + Sustainability leads will receive carbon literacy training and be responsible for implementing Climate Action Plans
- + Schools will eradicate single-use plastic
- + A natural history GCSE will be introduced



Sustainability and climate change strategy

The DfE's vision is for the UK to be the world-leading education sector in sustainability and climate change by 2030. Achieved by 4 strategic aims:

1. Excellence in education and skills for a changing world: **curriculum**
2. **Net zero**: reducing direct and indirect emissions from buildings, driving innovation to meet legislative targets and providing children engagement in the transition to net zero.
3. **Resilient to climate change**: adapting our buildings and system to prepare for the effects of climate change.
4. **A better environment for future generations**: enhancing biodiversity, improving air quality and increasing access to, and connection with, nature in and around education and care settings.



Understanding sustainability

Show of hands...

- + Whose school has a Climate Action Plan?
- + Whose school has appointed a sustainability lead?
... is it you?
- + How sustainable is your school from 5 (very) to 1 (low)?

5
4
3
2
1

+



Sustainability exercise: How do you rank?



| | Measuring and reducing wasted energy | Tackling electricity use with technology | Tackling fossil fuel for heating/ cooking/ company cars | Improving wildlife |
|----------|---|--|--|--|
| 0 points | We don't monitor our usage | We have old inefficient lighting and electrical equipment and haven't tackled anything | We haven't got a plan for carbon reduction | The school grounds are not good for wildlife |
| 1 point | We measure our energy We review our usage annually and sometimes have a switch off day for raising awareness | We have less than half our site(s) lit via LED lighting and/or some Solar PV | We have a plan and have started preparation of our buildings such as insulating them and removing gas cooking or gas-fired hot water | The school has minimal wildlife |
| 2 points | We observe our usage trends monthly, and we actively investigate spikes in usage and share with our progress with students / colleagues | We have full LED but no solar or time switches on heating | All buildings are as good as they can be prior to installing a decarbonised heating system and/or providing EV charging facilities | We're good with wildlife, encouraging areas of wilding, trees hedgerows |
| 3 points | As above and we understand where our energy is consumed and have rationalised as far as practically possible | LED lights throughout, time switches used and solar PV installed | As above but have started installing decarbonised heating systems / EV salary sacrifice car scheme | We're excellent at encouraging wildlife, we have lots of thick hedgerows, tree plantations, a school pond area, we maintain a grass meadow |

Sustainability in practice

Where do you start?

How do you start?



Reducing direct and indirect emissions from buildings

Direct Emissions: Scope 1

CO₂ emitted by the school – burning fossil fuels

Indirect Emissions: Scope 2

CO₂ emitted by the actions of the school – Electricity & water consumption



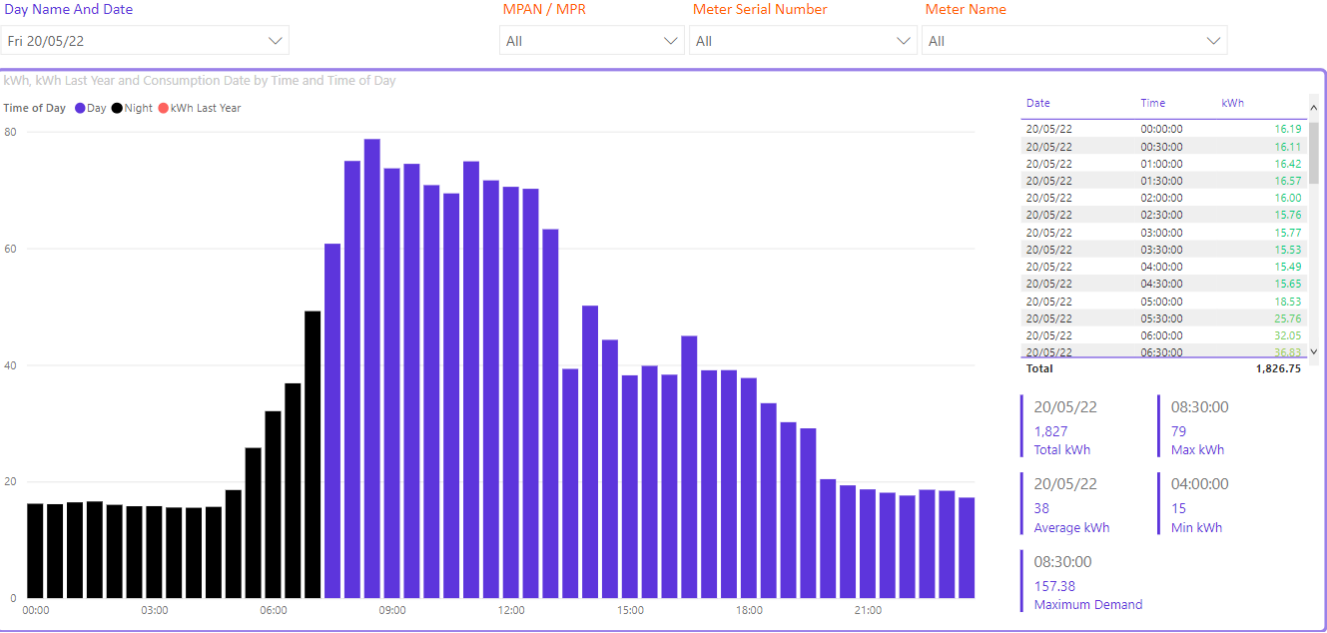
Net zero plan

ZEN
ZERØ



Measure, Benchmark & Troubleshoot

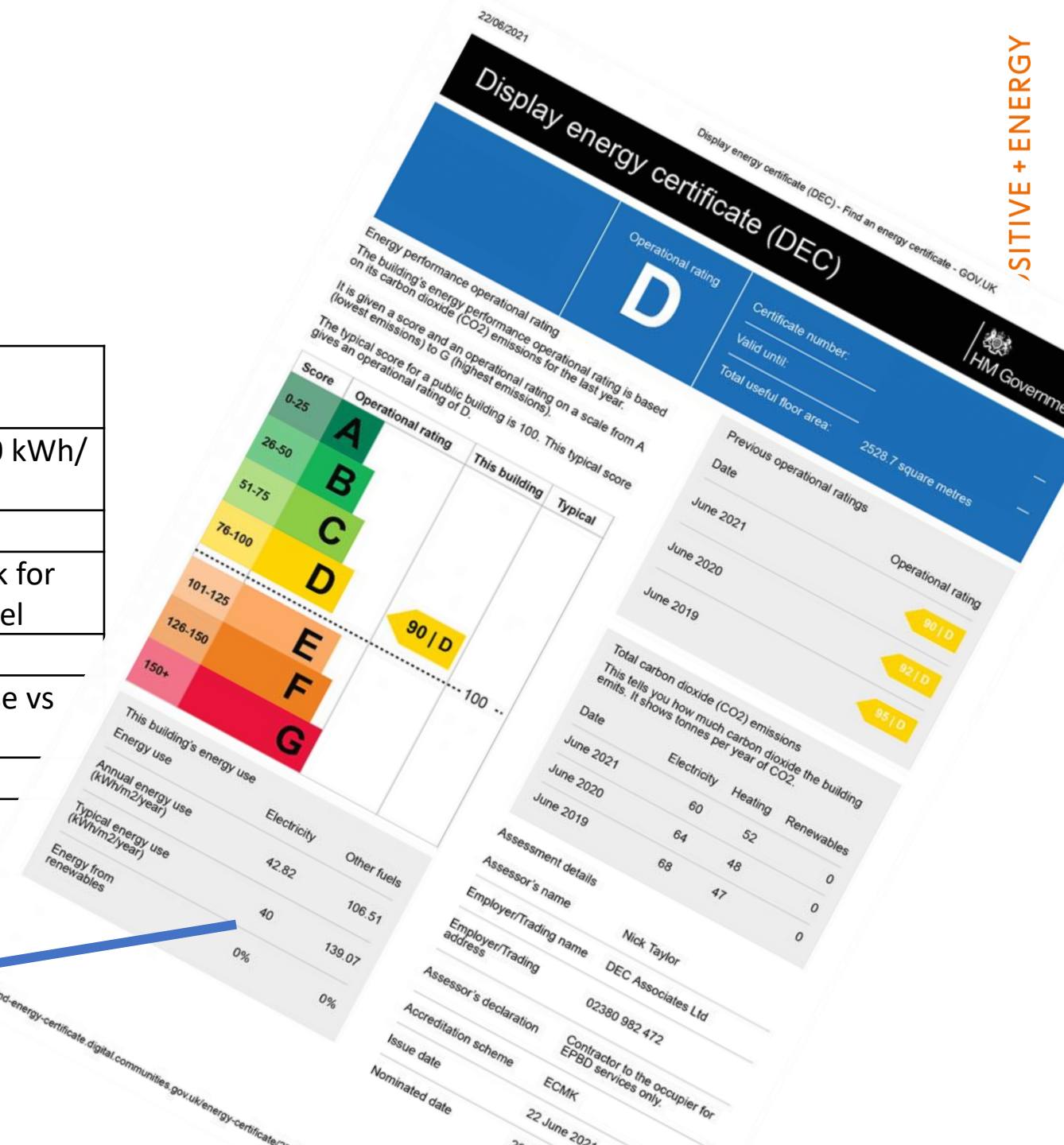
Half hourly data... most of us have it



Benchmark

| Organisation | Floor area | Operational Rating | Comments |
|--------------|------------|--------------------|---|
| School A | 1751 | C | Low fossil fuel heating 60 kWh/m ² |
| School B | 2136 | D | |
| School C | 2718 | C | Better than benchmark for electricity & fossil fuel |
| School D | 1622 | D | |
| School E | 1909 | F | Very poor fossil fuel use vs benchmark |
| School F | 1763 | E | |

| This building's energy use | | |
|---|-------------|-------------|
| Energy use | Electricity | Other fuels |
| Annual energy use (kWh/m ² /year) | 42.82 | 106.51 |
| Typical energy use (kWh/m ² /year) | 40 | 139.07 |



Reducing Wastage

- + Reduce thermostats for heating/ increase set points for A/C
- + Insulate cavity walls, loft voids & uninsulated pipework
- + Non-operating hours checks
- + Review logistics/ timetabled use of buildings to minimise usage
- + 24/7 time switches on electrical appliances not needed to be on out of hours
- + Hot water flush to avoid Legionella
- + Look for faults/ leaks/ breakages
- + Have professional audits undertaken

+



Energy audits and heat decarbonisation plans

- + Understand your route to decarbonisation
- + Increasingly, schools will need a Heat Decarbonisation Plan (HDP) to access government funding

You can't manage it if you don't measure it



Vaughan Primary School

Energy audit builds the case for LED lighting to improve the school environment while offering energy, carbon and cost savings.

- + The audit identified several opportunities to improve the energy performance of the buildings and reduce carbon emissions
- + Implementation of no-cost and low-cost energy management initiatives and further behavioural change would offer an annual saving of more than £3,000, recouping the cost of the audit.
- + The report provided a roadmap to support stakeholder agreement of the estate priorities, with a project register of opportunities alongside estimated carbon, energy and cost savings, and estimated implementation costs and ROI.
- + Vaughan Primary School proceeded with the LED lighting project which was estimated to deliver an annual saving of £2,950.



Wellington School

Energy Audit identifies an annual reduction in energy costs of £5,000+, representing a reduction in carbon of 15.3 tCO₂e and ROI within a year.

- + Our audit identified that the school has an opportunity to reduce its energy use by 34% through a combination of measures, including a number of low cost and no cost measures that would generate annual savings of £17,000 for an investment of £49,000 and return on investment in 2.8 years.
- + Some immediate savings were identified where payback is within one year. These measures would equate to annual reduction of £5,185 in energy costs for a capital spend of £2,000 and deliver a carbon reduction of 15.3 tCO₂e.
- + Short term savings where payback would be seen within six years were estimated to deliver an annual reduction of £12,063 in energy costs for a capital spend of £46,800, delivering a carbon reduction of 16.7 tCO₂e

| | |
|--|---|
| <p>Wellington School</p> <p>Energy Audit identifies an annual reduction in energy costs of £5,000+, representing a reduction in carbon of 15.3 tCO₂e and ROI within a year.</p> <p>Wellington School in Timperley, Altrincham, is a secondary school with around 1,400 pupils who it aims to develop into happy and successful young people who fulfil their academic potential and develop the skills and attributes to live, contribute to, and work in tomorrow's global society.</p> | <p>Like many schools we visit, the building was originally constructed in the 1930s when energy use was not a consideration. To overcome this, the school had already begun a programme of replacing inefficient boilers with modern condensing boilers and replacing older light fittings with low energy LED units. To support the further realisation of energy savings, the school engaged Zenergi technical division, Briar, to undertake an energy audit to gain insight into the areas where cost effective energy saving and carbon savings can be achieved. The aim was to identify opportunities for reducing carbon emissions through a strategic plan of works, while delivering immediate cost savings.</p> <p>What did we find in Wellington School's two-day audit?</p> <p>Our audit identified that the school has an opportunity to reduce its energy use by 34% through a combination of measures, including a number of low cost and no cost measures that would generate annual savings of £17,000 for an investment of £49,000 and return on investment in 2.8 years.</p> <p>Some immediate savings were identified where payback is within one year, including reducing energy use through improved management around heating temperatures, adjusting heating times to match building occupancy, better management of door and window openings, and energy awareness training to embed good practice around energy use/savings. These measures would equate to annual reduction of £5,185 in energy costs for a capital spend of £2,000 and deliver a carbon reduction of 15.3 tCO₂e.</p> <p>Short term savings where payback would be seen within six years included repairs to thermostatic valves and further lighting upgraded to LED. These measures were estimated to deliver an annual reduction of £12,063 in energy costs for a capital spend of £46,800, delivering a carbon reduction of 16.7 tCO₂e.</p> <p>Engaging pupils in energy saving</p> <p>Wellington School has a highly engaged eco-committee and we were delighted to be invited to deliver the findings of our energy audit in one of their sessions. The school recognises the value in engaging the energy users of the future in the critical dialogue around energy saving for the protection of the planet and we were pleased to support the delivery of this message. The eco-committee are now actively looking at initiatives.</p> |
|  | <p>"The energy audit has been an incredibly valuable exercise for our school, and a perfect starting point in the development of our whole school approach to environmental sustainability. The audit has helped us to identify and prioritise our energy saving opportunities. The consultants from Briar have delivered a high-quality technical report which not only serves our trustees and senior leaders, but can also be used as a powerful learning opportunity for our pupils. We are excited to see how our pupils will participate in the implementation of new energy saving measures, we hope the experience they will gain from seeing sustainability brought to life in the buildings around them will enhance and contextualise their learning."</p> <p>Gemma Timball Finance and Business Manager Wellington School</p> |
| <p>briar part of zenergi</p> | <p>For more information contact us at briar@zenergi.co.uk 020 80 285 300 zenergi.co.uk</p> |

Investment opportunity?

Solar PV Examples of the numbers

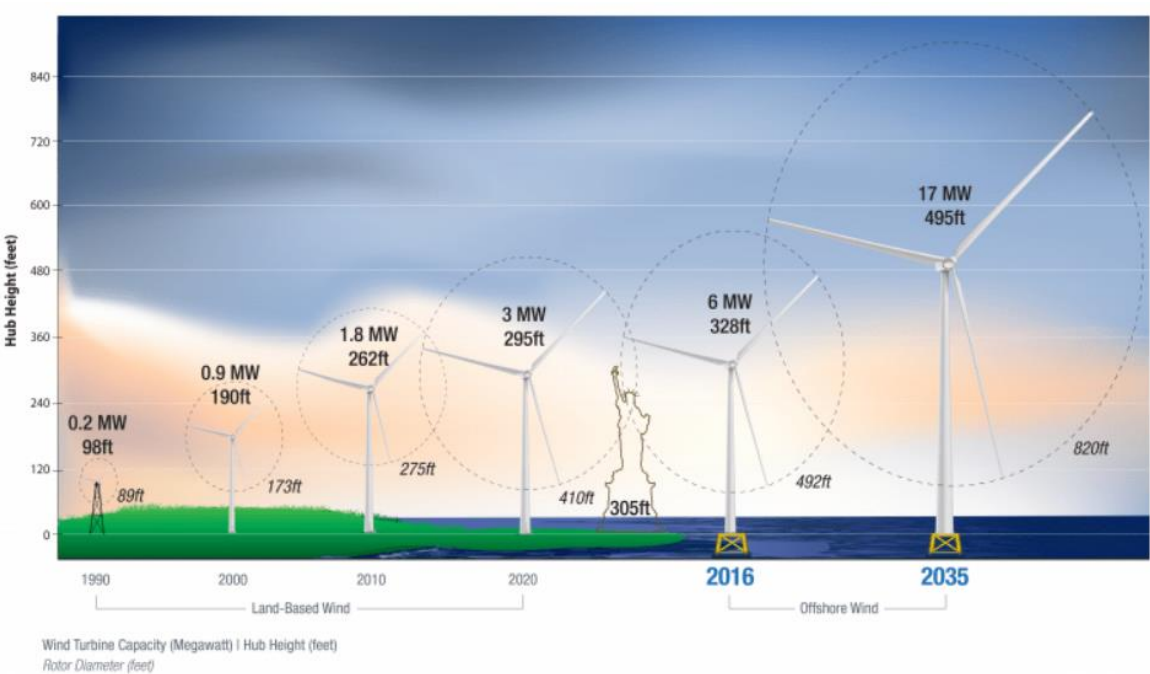
| | Est. Cost | kWh Electricity offset | Equivalent Value @ 30p/kWh | Simple ROI |
|-------------------------------------|-----------|------------------------|----------------------------|------------|
| Small install (100 m ²) | £12,375 | 11,250 | £3,375 | 3.7 |
| Medium install (200m ²) | £24,500 | 22,500 | £6,750 | 3.65 |
| Larger install (500m ²) | £120,000 | 112,500 | £33,750 | 3.5 |

We've designed and project managed over 40,000 m² (7 football pitches) of solar across medium to large businesses, schools, medical centres, council buildings and bus depots – rising quickly!

Wind power: costs, sizes & ROI



| Size of Wind Turbine kW | Estimated Capital Cost (https://www.cheekatrade.com/blog/cost-guides/wind-turbine-cost/) | Estimated Generation (kWh) | Value of generation if offsetting grid electricity (£) @30p/kWh | ROI |
|-------------------------|---|----------------------------|---|-------|
| 5 | £23,500 | 7,500 | £2,250 | 10.44 |
| 15 | £70,000 | 22,500 | £6,750 | 10.37 |
| 100 | £345,000 | 150,000 | £45,000 | 7.67 |
| 3,500 | £3,130,000 | 5,250,000 | £1,575,000 | 1.99 |



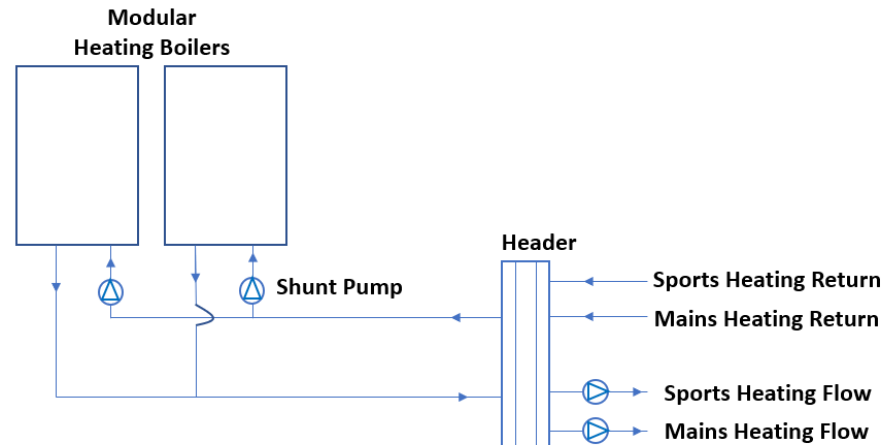
Decarbonising your heating system



Features of a Conventional Boiler System



- + Burn fossil fuels
- + Operate at an efficiency between 60-95%
- + Provide a pipework temperature of 80°C
- + Work well with Radiators, Convactor heaters & blown air
- + Relatively inexpensive to replace



Decarbonisation of heating systems

- + How do you help make your site more viable? Requires a “whole school approach”
- + Insulate your building - Reduce heat losses - Reduce the size and cost of the new system
- + Upgrade heating pipes/radiators
- + Reduce electrical demand – Solar PV, LED, reduce wastage

+

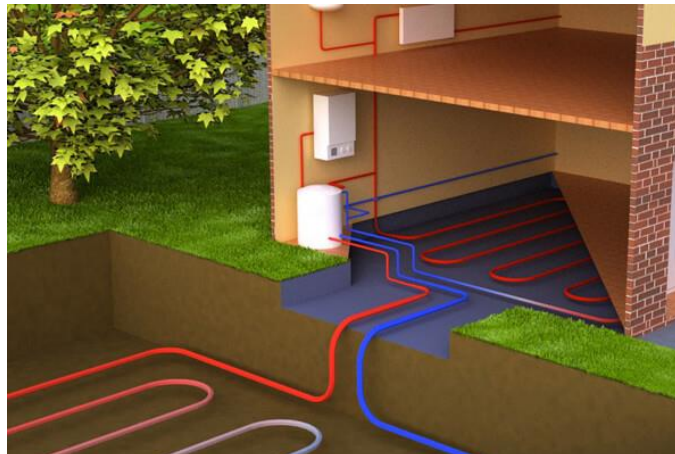


What are the alternatives?

ASHP ?



GSHP ?



Biomass ?



Heat Decarbonisation Plans (HDPs)

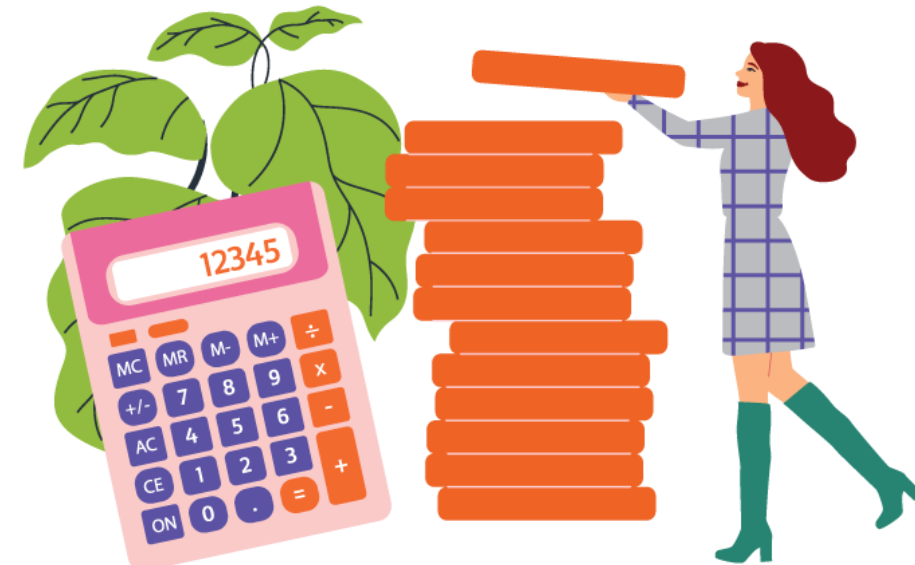
- + Your **strategic plan** to understand your carbon emissions and how to reduce them, creating a holistic whole building action plan and timeline
- + Highlights the key requirements and implications in terms of investment, building, electrical and mechanical plant changes required.
- + Understand **specific costs, running cost impact & carbon impact**
- + Identifies carbon and energy reduction options across electrical/ mechanical/ behavioural / building fabric improvements too
- + A heat decarbonisation plan is key to supporting your application for Salix Public Sector Decarbonisation Scheme



Funding your decarbonisation

- + The Public Sector Decarbonisation Scheme (PSDS) provides grants for public sector bodies to fund heat decarbonisation and energy efficiency measures.
- + The eligibility criteria becomes more stringent in each new round and features fundamental differences.
- + Evidence of savings must be included within the submission (energy data for prior two years)
- + Evidence of aged equipment must be included
- + Applicants are required to contribute funding
- + Only bespoke submissions will be accepted. Previous failed submissions can re-apply but will need to reflect the criteria.

+



Full Design, Tender & PM

- + The prep work is key
- + Currently undertaking this on £6M worth of projects across 3 MATs
- + Already undertaken on 30 schools in Leicestershire
- + Bids prepared free of charge (no win - no fee)
- + 50% of your project value required



Engaging your school community

- + Eco councils
- + Energy warriors
- + Link to curriculum: measuring energy usage in maths lessons
- + Communications: website, assemblies, newsletters

+



How do you keep on track?



Introducing...

Because every school doing a bit is better than one school doing it perfectly!

Together we can help you establish where your school is on the sustainability map and help you accelerate your journey.

- ☐ Register at www.greenerschoolsindex.co.uk
- ☐ Complete the survey
- ☐ Download your results and share with your SLT & Board of Governors
- ☐ Identify your next steps
- ☐ Share your successes and engage with other users

+

GREENER SCHOOLS INDEX



Features

- + Tailored report for next steps
- + One point of access to additional support
- + Easy-to-complete questionnaire
- + Ability to benchmark against other schools

Benefits

- + Create a comprehensive Climate Action Plan
- + Access to free resources
- + Helps celebrate and share success
- + It's free to use!

Get started:



greenerschoolsindex.co.uk

[About](#)
[Greener Schools Index](#)
[Case Studies](#)
[Contact](#)

Welcome to the Greener Schools Index

The journey of a thousand miles starts with a single step. But don't get left behind wondering where your starting point is. Together we can help you establish where your school is on the sustainability map and help you accelerate your journey.

[Learn More](#)

In association with:

How it works

Step 1
Register your Organisation

Step 2
Complete the Greener Schools Index survey

Step 3
See where you stand

Features & Benefits

| Features | Benefits |
|---|--|
| <ul style="list-style-type: none"> Tailored report for next steps One point of access to additional support Easy to complete questionnaire Ability to benchmark against other schools | <ul style="list-style-type: none"> Create a comprehensive Climate Action Plan Access to free resources Helps celebrate and share success It's free to use! |

[About](#)
[Greener Schools Index](#)
[Case Studies](#)
[Contact](#)

Sustainability Survey

The purpose of our sustainability self-assessment is to help schools and colleges assess their current level of climate action and identify areas for further development.

All responses will remain confidential.

Estimated time to complete: 30-40 minutes

Step 1 of 20

Basic Information

1. URN/Reference Number

Not required for Trusts

2. Name of organisation *

3. Number of pupils *

Note - the assessment can be completed on behalf of a single organisation (i.e. by school) or on behalf of a group (i.e. Trust or Federation)

4. Type of organisation *

MAT

[Next](#) [Save and Resume Later](#)

Useful Links

[About](#)
[Greener Schools Index](#)
[Case Studies](#)
[Contact](#)

Contact

No. 3 Benham Road,
University of Southampton Science
Park, Chilworth,
SO16 7QJ

T: 02380 286 300
E: enlightenme@zenergi.co.uk

Copyrights (C) 2023 Zenergi Ltd
Privacy Policy

We're on our own sustainability journey

Highlights

- + Targeting to be net zero for scopes 1 and 2 by 2025
- + Aiming to achieving Zero Waste to Landfill accreditation, whilst removing all single-use plastics by 2025
- + Investing in the next generation of climate change specialists by hiring 100 graduates, or apprentices by 2030
- + Committing to raise £1m for charity and positively impacting 1,000 lives through social value activity by 2030

Learn more at <https://zenergi.co.uk/social-value/>



Start (or continue) your conversation with us

Bryan McCourt
Energy Solutions Consultant

bryan@zenergi.co.uk
07932 015523

