THE SUSTAINABLE RESTAURANT ASSOCIATION
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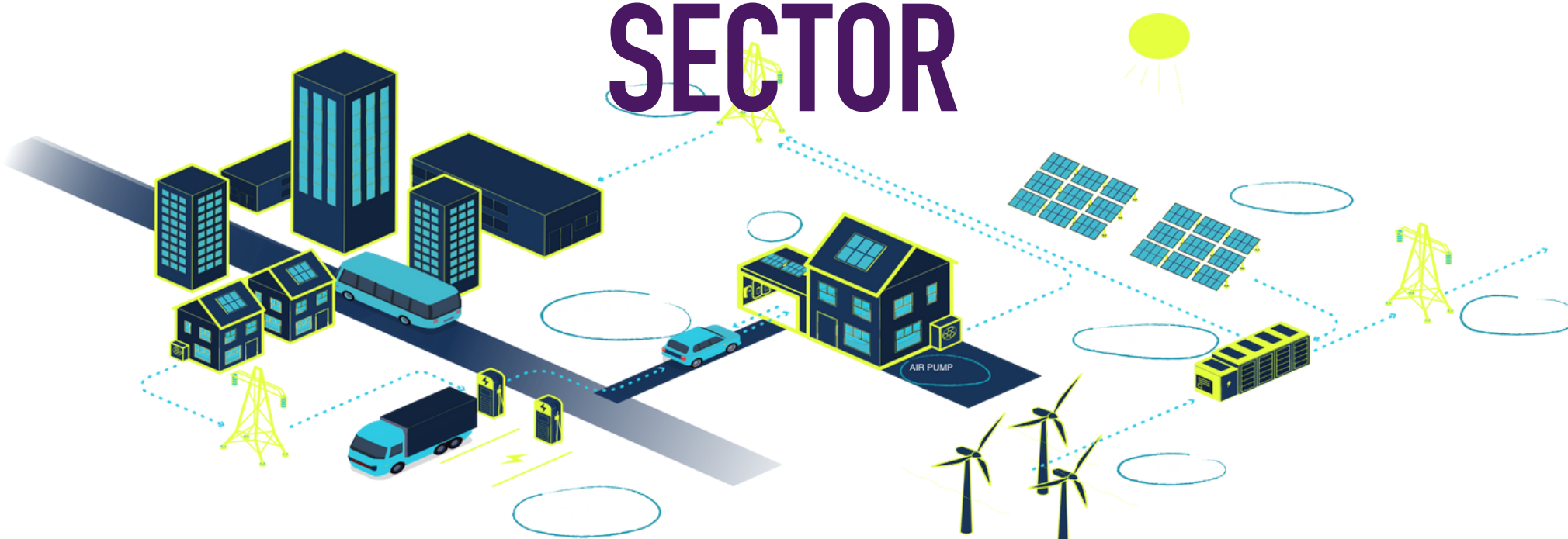
INTEGRATE TO ZERO

Renewable Energy Solutions

A TOOLKIT FOR THE UK FOOD & DRINK SECTOR



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INTRO

In the wake of COVID-19 and Brexit and with geopolitical turmoil, civil unrest and increasingly extreme weather events at play, food and drink businesses in the UK face unprecedented challenges. The effects of supply chain disruptions have been felt across the sector; ingredient inflation is easing but costs still rose by 10% in the last year [ref]; and gas and electricity prices are around 60% and 40% (respectively) higher than in the previous two years [ref]. As a result and with ongoing staffing shortages, restaurants, bars, cafés and pubs are facing closure. Some have increased prices to recoup some costs, but this in turn affects sales.

For the most part, food and drink businesses are victims of these developments, but with approximately 25% of global GHG emissions stemming from food production, it's clear that the industry is not only at risk from the climate crisis, but also a significant driver of it – and therefore must play a major role in addressing it.

Renewable energy solutions have reached the mainstream and been hugely successful in efforts to address rising temperatures. Despite this, we remain somewhat reliant on fossil fuels at peak times and, with a simultaneous and growing urgency to address climate change and gain a level of control over energy bills, the case for their next growth phase is building. More distributed, local solutions are needed, alongside installed appliances that are ready to use energy in this form. This would help balance supply and demand, channel more renewable energy into the system and further reduce consumer bills. The UK's Net Zero commitments and subsequent legislation add urgency and consequence to these actions, and lead to funding and grant options. However, it's also true that recent UK Government changes have weakened some aspects of climate change policy.

While the initial investment in renewable energy infrastructure may seem daunting, there are many entry-level options and, with careful planning, a strategic shift in energy sourcing and infrastructure can not only reduce monthly bills and emissions, but also enhance the overall financial resilience of the food and drink sector.

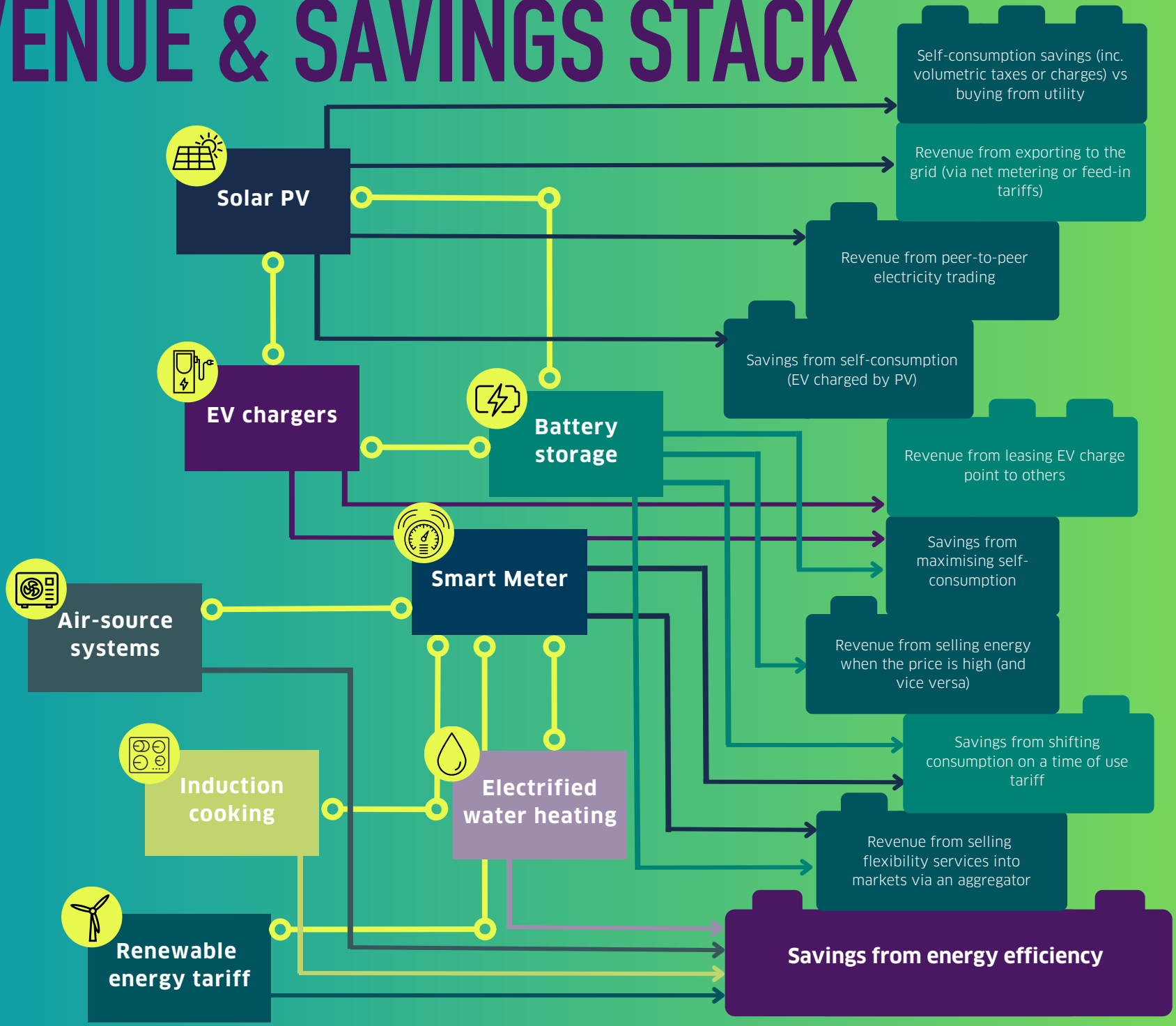
As well as individual solutions, this toolkit explores the multiplying benefits of integrated renewable energy systems, where solutions are stacked and work together. We'll also hear from restaurants and chefs who've made a start in this space and have generously shared their insights for others to learn from.

RENEWABLE ENERGY *OPTION PATHWAYS*

Renewable energy tariff	Smart Meter	Induction cooking	Electrified water heating	Air-source systems	EV chargers	Battery storage	Solar PV
Q: Do you have say over the energy utility you sign up to?	Q: Do you have or could you install a smart meter with your utility or specialist provider?	Q: Are you and your chefs / team open to induction hobs?	Q: Do you own or have control over the building you operate in?	Q: Are you able to add a pump to your building exterior?	Q: Do you have - or are you developing site(s) with - a car-park?	Q: Have you got storage space roughly the size of a large wardrobe?	Q: Do you have - or are you developing site(s) with - roof space?
+	=	+	+	+	+	+	+
Q: Are you not yet on a renewable energy tariff?	A: Sign up to a Demand Flexibility programme (DFP) with your energy provider	Q: Do you have any new sites under development + / or electrical capacity at existing sites?	Q: Do you have any new sites under development + / or electrical capacity at existing sites?	Q: Is your internal heating / cooling system compatible with heat pumps?	Q: Do you own the land it sits on or can you get written permission from the owner?	Q: Do you typically use a lot of energy at peak times (9-5pm)	Q: Do you own the roof space or can you get written permission from the owner?
=	+	=	=	=	=	=	=
A: Gather quotes + switch to a reputable supplier - also see case study on pg4	A: Add smart meters (plugs) for appliances + gain more control over energy use	A: Make the switch at existing sites or plan them into new ones + see case study on pg6	A: Make the switch at existing sites or plan them into new ones + use DFPs + time of use tariffs	A: Read more about these systems on pg7 + see appendix A for details of the Green Heat Fund	A: See case study on pg 7 + install chargers for your EVs or offer PayGo for customers + the public	A: Install + use your battery in DFPs, time of use tariffs or even to export excess energy	A: Install PV to generate on-site then use, store or export your energy

Combine any or all of these to optimise your energy assets

REVENUE & SAVINGS STACK



THE OPTIONS EXPLAINED

Renewable energy tariffs

The easiest action, with no upfront costs and immediate savings, is to switch your energy tariff to a renewable one. Most suppliers now offer this but, if not, it is also simple to switch to a new supplier. Do make sure your tariff guarantees that 100% of your energy will come from renewable sources, and it's not the case that the supplier is partially providing energy from non-renewable sources and 'offsetting' the associated emissions.

Despite supply chain and inflationary pressures on wind and solar, these sources of energy remain the cheapest way to generate electricity in the UK and therefore your tariff should be cheaper than – or at least the same as – fossil fuel-based tariffs. If you also use gas and are not able to install air-source heat pumps and induction hobs, you can also switch to renewable sources of gas. This is harder to come by, generally more expensive, and most providers will only be able to cover around 10% of your usage from renewable sources such as anaerobically digested food or farm waste.

CASE STUDY: Heart with Smart Group

Franchise operators of: Pizza Hut Restaurants, itsu

Pizza Hut have been quietly working away on sustainability for many years and have been members of The Sustainable Restaurant Association since 2021. We spoke to Steven Packer, Chief Infrastructure & Sustainability Officer at Heart with Smart about their decision to switch to renewable energy in 2012 and its impact to date.

When and why did you make the switch?

We've been purchasing REGO-backed renewable energy longer than we can remember. The process itself was quick and painless: it just involved ticking one additional box on our contract renewal. It's one of the simplest and most cost-efficient investments in reducing carbon footprint, especially for brands where on-site generation isn't practical or possible. Given the larger long-term challenges around decarbonising complicated food supply chains, making an investment in certified renewable energy will be one of the easiest and most affordable decisions a business can make as part of their sustainability ambitions.

Estimated emissions savings: c. 190,400 tCO2e avoided between 2012-2022

Smart meters

Energy reduction is a natural next – or simultaneous – step, and the simplest way to do this is installing a smart meter. Most energy providers will supply you a basic version for free and, with a bit of research and applying knowledge of your operation, you should be able to pinpoint which of your appliances are likely using the most energy. You can then target reduction efforts around these appliances and track how this affects your overall usage.

If you have a kitchen on-site, then gas cookers, extraction fans and refrigeration are likely to be using the most energy, so exploring ways to use these less will be most impactful. Check the temperatures your fridges and freezers are set to; if you can safely increase the temperature by even just 0.5˚C without affecting the quality of food stored, then this will make a difference.

A slightly more expensive option, but easily accessible, would be to install appliance-level monitoring. This would tell you exactly which appliances are using most energy and allow you to make more targeted reductions. You can buy individual plug-in power meters and check the usage consistently, or explore more advanced business energy monitors that allow you to track and cap energy usage from apps or single monitors.

With any of these solutions installed and capable of sending half-hourly readings, you can sign up to the Demand Flexibility Service over winter and help the UK better handle peak electricity demand. This means, collectively, we're able to rely less on back-up fossil fuel power generators by channelling demand to times of the day when renewables are generating a greater proportion of our electricity.

You can participate in Demand Flexibility Services at the restaurant level without knowing or controlling specific appliance usage and doing so unlocks cheaper tariffs at certain times of the day. They also facilitate the export of energy, for example if you have excess on-site generation or storage to sell.

SYSTEMS INTEGRATION

An increasingly electrified restaurant is one that is increasingly integrated, with energy able to flow bi-directionally and with each connected device able to help the overall system. For example, a smart water heater can heat the water when electricity costs are lower and store it in its thermally efficient cylinder for usage when tariffs are higher.

Electrified delivery vehicles can plug into restaurants and share electricity back into the building. Whilst not yet mainstream, these solutions are in the marketplace and open up opportunities for consumers such as restaurants to move from being passive purchasers of kWh to active energy users, storers, generators and savers.

<u>Electrified, induction cooking</u>

In most kitchens, gas cookers will be significantly contributing to energy bills and Scope 2 emissions. Ensuring that all new-build sites are designed around induction cooking – that relies on (renewable) electricity rather than gas – is a great way to reduce emissions and spend on bills long-term. Make sure to research the amount of electricity needed for the specification of induction hob you plan to use and install a substation that can supply enough electricity to match this.

Retrofitting existing kitchens with induction is more difficult and likely more expensive, but will still pay for itself in the long term.

CASE STUDY: HAWKSMOOR

Hawksmoor have been involved with The Sustainable Restaurant Association for a long time and hold a three-star accreditation in the Food Made Good Standard. We spoke to Patrick Urey, the Head of Operations at Hawksmoor, about their experience of adopting renewable energy systems, hoping this will help others do the same.

How did you make a start in reducing your energy usage and upgrading to renewable systems?

We have the ability to measure energy use on an appliance level with the use of smart meters, so we started by auditing our procedures, trying to identify the times where energy was being used unnecessarily and the behaviours that could be changed to address this. Our kitchens were using the most energy, so our focus has been here, making sure nothing was being left on overnight through the creation of new protocols and accompanying training programmes. We have leaderboards that shows how each site is performing and incentive schemes to reward these efforts.

We also updated our fit-out plans so that all new sites from 2022 were built to enable the use of induction hobs rather than gas cookers. Our first site with induction hobs opened in Liverpool last year and we've since opened another one in Dublin. There were some teething issues as we tried to apply our recipes in this new setting; for example, the fact that the kitchen is cooler means food in the kitchen doesn't stay hot for as long, once it's been plated. This just means we had to review our processes and improve the time food spends between the kitchen and table. Overall, the switch has been welcomed by all and there have been no discrepancies between gas sites and induction in the quality and consistency of the food being plated.

Where are you focusing your efforts now and what are the main challenges?

We already had ambitions to retrofit existing sites with induction hobs, but learnings and data from our new sites are helping us make the case for this internally. It's a case of weighing up the up-front costs with the long-term reduction in energy bills. We've found out it's a lot easier and cheaper if your site's available supply capacity can cover the additional electrical load of induction, but retrofitting is still a longer process than fitting out new builds, so starting the process sooner rather than later is a good idea. We're planning to buy our equipment, but there are leasing options out there.

Once we have the business case together, the main stakeholder we need to win over will be our CFO. We're lucky in that our Group Head Chef, Phillip Branch, is a big supporter of induction cooking, here's what he had to say about it:

"The switch to electric ovens has allowed us to improve how we operate in kitchens, giving us pinpoint control of cooking temperatures for both slow cooking and fast reheating. It's much easier to keep clean, safer to work on and without the excess heat it provides us with a much more comfortable work environment for our chefs. This has also allowed us to decrease our extraction power providing further reduction in energy use and reduced excess kitchen noise."

Electrified water heating

Traditional hot water systems constantly circulate water throughout buildings, returning unused water to be reheated. Water is also over-heated to compensate for losses as it circulates. Electrified water heaters are far more efficient, using only the power that is necessary to maintain targeted temperatures when it is actually needed. The water also runs instantly hot, meaning that less water is wasted as users wait for it to reach temperature.

As with electrified cooking (induction), it's a great idea to design and build new sites with the capacity to power electric water heaters, which will first involve deciding what specification of heater is needed to assess the power requirements. Retrofitting existing kitchens with electric heaters will, again, be more difficult (and likely more expensive), but will still pay for itself in the long term.

Air-source heating and cooling

Air-source heat pumps transfer heat from outside air to water or indoor air, which then heats and cools rooms as required. It can also heat water for your taps, but not on demand, so a water cylinder is needed to store heated water. You'll also need space outside for a unit to be fitted and for air to flow around it.

The cost of a heat pump varies depending on the size of the pump, size of the building, whether it's a new build and whether you'll need to change the way you distribute heat around the site as a result. A commercial air source heat pump will cost between £6,000-18,000 [ref]. In England and Wales, small businesses can get £7,500 towards this cost with the Boiler Upgrade Scheme, see appendix C.

EV Chargers

If your site has parking space and you own the land it sits on, EV chargers could be a great way to attract customers, contribute to wider industry change and even profit. Most, if not all, EV charging companies will oversee and cover the cost of installation, upkeep and customer service, but otherwise vary:

- Some buy land and bring in service providers like restaurants.
- Some pay rent for the land on which they install chargers.
- Some share the profits from customer payments.

In most cases, this can become an additional revenue stream and potentially fund other renewable energy solutions. Be sure to check how the supplier sources their energy and that it is 100% renewable – this is typically not the case with big oil companies. If your operation involves a fleet of vehicles or company cars, it might be worth exploring electric options to get ahead of the 2035 ban on petrol and diesel vehicles.

CASE STUDY: fooditude

FEED YOURSELF HAPPY

Fooditude – also long-term friends of The Sustainable Restaurant Association with a three-star Food Made Good accreditation – have left almost no stone unturned as they map out their pathway to Net Zero. We spoke to Sustainability Manager Anouk Dijkman about their plans to electrify their fleet by 2030.

Can you outline your ambitions in EV?

We're working towards Net Zero 2040, but within that are committed to Net Zero scope 1+2 emissions by 2030.

To get there, we're conducting energy audits of our Central Production Unit and vehicle fleet, which will give us the data to make high impact decisions. With a fleet of 12 vans though, we already know we need to make progress and electrify. We've commissioned our first electric van and on-site EV charger which will be in place in Q1 2024 and hope to have a fully electric fleet by 2030.

Have there been any key learnings so far?

We already use mostly induction hobs and are close to the electrical capacity of our site. To continue to reduce our reliance on oil, we're exploring retrofitting, upgrading our power supply and installing a battery and solar panels to generate and store our own electricity on-site. In future and with a bidirectional EV charger, we could even use surplus energy from our vehicles. We don't own the building in which we operate, which makes this all a lot trickier, but we're exploring options with our landlord.

Battery Storage

Energy storage on-site via batteries mean businesses can store and discharge electricity at certain times and operate independently of the grid. This gives protection from rising energy costs, prevents supply being mixed with non-renewable sources and can even create revenue when stored power is delivered to the local grid.

Nationally, this technology can replace the need for fossil fuel-fired plants to manage peaks and troughs in supply, and has a key role to play in ensuring homes and businesses can be powered by green energy.

Solar PV

Solar energy is electrical or thermal energy harvested from sunlight and panels can be placed anywhere that has an abundance of light, like rooftops. Space constraints, up-front costs and lengthy installations processes make this one of the less accessible options, but those able to overcome these barriers stand to save considerably on their energy bills over the 25-year lifespan of the panels. Panels can also be ground-mounted, for example over the top of a car park or along a wall.

Other benefits include low maintenance costs, adding value to the property, the ability to sell surplus back, broadly reducing your dependence on fossil fuels and, as mentioned, when integrated with battery storage, a greater level of independence from the grid. Those investing in green energy installations may also benefit from relief of business rates.

If upfront costs are insurmountable, some companies – under a power purchase agreement – will install the panels at no cost and sell the energy back to you at a low rate. At the end of the contract, you can extend, purchase the panels or have them removed.

SYSTEMS INTEGRATION

In most cases, battery storage solutions are integrated with commercial solar panels to capitalise on the energy savings they produce, but can also be installed as a standalone product.

Using self-generated renewable energy to charge batteries saves businesses money on their energy bills by allowing them to avoid using energy from the grid at peak times, which costs more. The main upfront costs will be installing the renewable energy system and battery, but businesses doing so may be eligible for relief on environmental taxes like the Climate Change Levy.

SUMMARY

Thank you for taking the time to read this toolkit; we hope it was helpful and enables action within your organisation. It's important to acknowledge that – while we should feel a responsibility to act and feel empowered by the possibility of a decentralised energy system – we need action at every level. For a swift transition, contracts from energy suppliers that enable participation in the grid, financing from banks or utilities to help with upfront costs, and government policies to regulate pricing, subsidise technology and open up the grid are all essential.

The landscape (including legislative requirements) is constantly evolving, and while this toolkit was designed to be comprehensive, please bear in mind that it is a snapshot of the landscape in late 2023 when it was written and distributed. If you have any questions or comments, please get in touch with our team. We are always here to offer advice and support.

APPENDIX

A - Green Heat Fund - Link

B - MEEF / Greening London Fund - Link

C - Boiler Upgrade Scheme - Link

D - Smart Export Guarantee - Link

RESOURCES

1 - Efficio RES procurement guide - Link

2 - Energy Savings Trust - Link

3 - Guide for Commercial Building Owners and Managers - Link

4 - The Building Decarbonisation Practice Guide - Link

5 - The ULI Blueprint for Green Real Estate - Link

6 - Renewable Energy Procurement for Corporates - Link

GLOSSARY OF TERMS

Renewable energy
Renewable energy is energy derived from natural sources that are replenished at a higher rate than they are consumed. Sunlight and wind, for example, are such sources that are constantly being replenished. Renewable energy sources are plentiful and all around us. (ref)

Carbon dioxide
Carbon dioxide (CO2) is a well-known heat-trapping gas produced by burning fossil fuels (such as coal, oil, and natural gas), wildfires, volcanic eruptions, and respiration. Human activities have raised the atmosphere's carbon dioxide content by 50% in under 200 years, causing global planetary warming of 1.1˚C to date.

There are several other heat-trapping gases – better known as greenhouse gases – like methane and nitrous oxide, which have all seen significant increases. These also contribute to global warming, but not to the same extent. For this reason and for the sake of simplicity, it is common practice to refer to all greenhouse gases as 'CO2'' or CO2e' (meaning 'CO2 equivalent'). We will do the same in this document unless it is necessary to call out a specific gas.

CO2e (Carbon dioxide equivalent)
CO2e is a term for describing different greenhouse gases using a common unit. For any amount and type of greenhouse gas, CO2e signifies the volume of CO2 which would have the equivalent global warming impact.

Scope 1 emissions
Scope 1 emissions are direct emissions from company-owned and controlled resources. In other words, emissions are released into the atmosphere as a direct result of a set of activities.

Scope 2 emissions
Scope 2 emissions are indirect emissions released in the generation of energy purchased from a utility provider. In other words, all CO2 emissions released into the atmosphere from the consumption of purchased electricity, steam, heat, and cooling.

Scope 3 emissions
Scope 3 emissions are all indirect emissions – not included in Scope 2 – that occur in the value chain of the reporting company, including both upstream and downstream emissions. In other words, these emissions are linked to the company's operations.

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Thank you for reading