CARBON REDUCTION REPORT

SEDA Pharmaceutical Development Services

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INTERNAL QUALITY CHECK

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Contents

1. SCOPE OF THE SURVEY AND BACKGROUND TO THE BUSINESS

1.1 DATE AND FOCUS OF SURVEY:

13 February 2025 – Resource Efficiency Site Review.

1.2 COMPANY DESCRIPTION

Seda Pharmaceutical Development Services provide Pharmaceutical Development and Clinical Pharmacology services and consultancy to the Pharma and Biotechnology industry. The Company was established around 10 years ago. Company turnover is approximately £4.9M and there are 50 employees. The Organisation has significant growth plans, having recently opened a new arm to the company, SEDA CMS, with the new site focusing on clinical manufacturing services. It is expected that 120 new jobs will be created in the next 3 years.

1.3 EXISTING ENVIRONMENTAL GOALS

SEDA is facing customer requirements around carbon reporting and environmental accreditations. Specifically, the Organisation has been asked to:

- provide a recognised ESG report (e.g. EcoVadis)
- report its carbon footprint to the Carbon Disclosure Project (CDP)
- commit to the Science Based Targets initiative (SBTi)
- reduce use of resources and reduce greenhouse gas emissions by 50% by the end of 2030.

SEDA is at the start of their sustainability journey, although they have taken some steps e.g. the building has a good energy efficiency rating, and they have joined my green lab as an ambassador.

1.4 SITE DESCRIPTION

The Organisation has two sites (PDS and CMS) which are located close to each other in Cheadle. This report covers a site review of SEDA PDS site only.

The site is a modern two storey building housing the lab on the ground floor, and office on the first floor. The site is located at Cheadle Royal Business Park. The site is company owned and SEDA have been at this site for around 3 years.

Typical site operating hours are 07:30 – 17:30, Monday to Friday.

The site has no gas, and heating is provided by a heat pump/air conditioning system. Lighting is LED throughout, with sensors.

Monthly energy consumption data has been provided for FY 2023-2024. This follows a typical pattern with higher demand in the colder months as can be seen in the chart below.

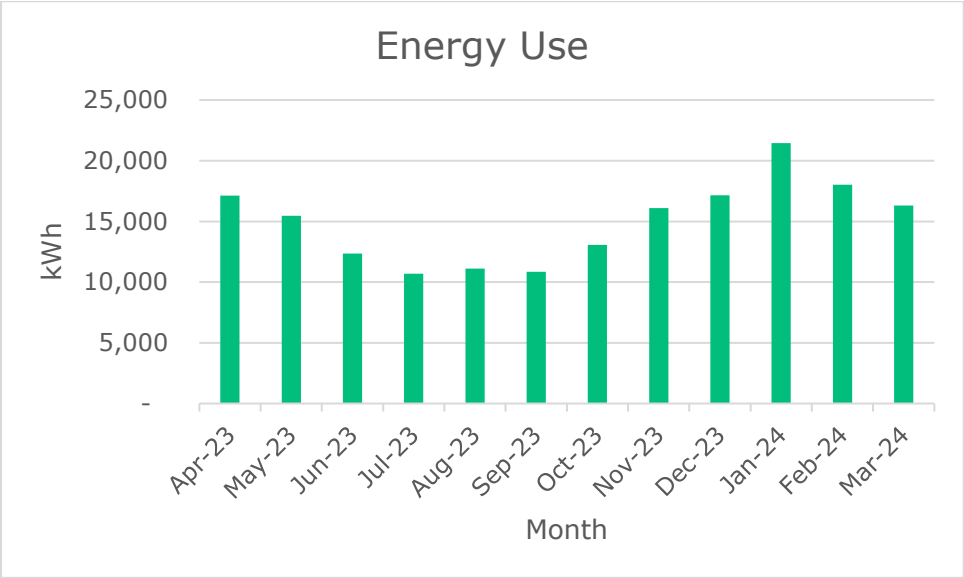

Chart 1. Monthly energy use

2. CARBON REDUCTION OPPORTUNITIES

Following a site survey by Green Economy, the following carbon reduction measures and projects have been identified:

2.1 Investigate Feasibility of Solar Panels

The building has a flat roof with approximately 524m^2 of suitable area for solar panels (highlighted in green in image below).

Image 1. Potential area for rooftop solar panels

This area could host an 85.7 kWp solar PV array. The solar panels could be placed flat on the roof, but ideally, they would be installed on a tilted frame so that the panels face South. The kWh of energy generated from PV arrays depends on the location in the UK, the orientation the panels face, and the inclination of the roof. Knowing these three factors allows accurate estimates of energy generation. Panels facing South with the ideal roof pitch of 30° will have greater energy generation. This calculation has been made assuming that the panels would be fitted on frames facing South.

An 85.7kWp solar array on SEDA's roof could generate 73,655 kWh per year. It has been assumed that the business could use 70% of this and 30% would be exported (i.e. at weekends when site is not occupied). The estimated cost savings from reduced grid consumption are £15,467.62 (assuming 30p/kWh).

The estimated carbon savings to the business would be 11.62 tonnes of CO_2e per year.

British Gas are currently offering customers an export tariff of 15.1p/kWh for excess energy generated which is sent to the grid (Our Best Smart Export Guarantee (SEG) Tariffs - British Gas). This could provide additional income of £3,336.59 per year.

The estimated cost for an 85.7 kWp array is £85,700 (based on rough rule of thumb of £1,000 per kWp installed). This gives a simple payback period of 4.56 years.

The cost of solar panels depends on roof type, size of system, specification of materials, access etc. Every install is different and it is recommended to obtain at least 3 quotes.

Green Economy can assist the Company to find suppliers to quote via our online Green Marketplace: Green Economy | Marketplace: Find green products & services

Please see Appendices for full calculations.

2.2 Laboratory Recommendations:

1. Close fume hood sashes when not in use.

Closing your fume hood sash is one of the most impactful things you can do to save energy in the laboratory. Variable air velocity fume hoods can be very energy intensive. Constant air velocity fume hoods use the same amount of energy whether they're open or closed, whereas variable air velocity fume hoods, when open, can use up to 110 kWh/day.

Fume hoods have fans within their exhaust systems that help air flow through the lab and the fume hood itself. When a sash is open, these fans suck in and exhaust a lot of the lab's heated or cooled air. The constant reheating and recooling of air that will only get sucked in again by the fume hood consumes a lot of energy. By shutting the sash, you'll reduce the amount of air being wasted, thus saving energy.

2. Put autoclaves in standby mode when not in use & only run them when full

Autoclaves are another energy intensive piece of equipment. Specifically, large, steam-jacketed or medical grade autoclaves are massive energy consumers. Ensure you're putting them into an energy conserving or stand-by mode when not in use, and only run them when they are full.

3. Set ultra-low temperature freezers to -70 C instead of -80 C

Ultra-low temperature (ULT) freezers, particularly older models, can be very energy intensive. Setting ULT freezers to -70°C instead of -80°C will save 30% of this energy.

4. Turn off equipment when not in use

Equipment that has big fan components (like biosafety cabinets), equipment that has heating or cooling elements (like drying ovens, incubators, or water baths), and equipment that pulls a vacuum (like vacuum pumps) tend to be the highest energy consumers in the lab. Turning this equipment off when it's not in use, or on nights and weekends, can have a big impact on energy usage.

Plug load makes up about 20% of energy consumption in a lab.

There are various ways to ensure equipment is turned off. You can simply unplug it, or invest in:

- Power strips - make it easy to turn multiple small pieces of equipment off all at once.
- Outlet timers - if you need certain equipment to be ready for use when you walk into the lab, timers will ensure equipment auto-turns off at night and auto-turns on at the beginning of the day.

5. Properly maintain cold storage

Preventative maintenance can help keep cold storage running efficiently. Here are a few tips:

- Clean heat exchange coils and clean or replace filters help to make sure cold storage can exchange heat efficiently. This will save 10% of energy.
- Ensure you're defrosting regularly so that space is used efficiently and so you don't get ice build up (which can make it so the door doesn't shut properly - a common issue in laboratories).
- Check door seals. Cracks and tears can let hot air in and make the compressor run more to maintain low temperatures.

6. Share equipment among labs and turn off or unplug duplicate equipment

Equipment sharing has a similar energy saving impact as turning off equipment when it's not in use. "Sharing" equipment can be useful even for labs that are using their own equipment. Here's where scheduling comes in handy. Figuring out how often your lab is using equipment can allow you to optimize the time that it's in use. Say your lab has two HPLCs that are only used, on average, 40% of the time. Through simple scheduling, you can consolidate use on the first and unplug the second. You'll save energy and have the second HPLC ready to bring back online if the first one breaks.

7. Turn off the lights when the last person leaves the lab

Lighting makes up around 15% of energy in the lab. Simply turning off the lights when you leave the lab or support rooms can have a significant impact. Turning off the lights during the day when ambient light is sufficient can even further reduce energy consumption. A small LED task light can provide additional illumination if needed and uses much less energy than overhead lights.

8. Utilize green chemistry techniques

The ACS Green Chemistry Institute is a great resource for learning about green chemistry techniques. Their guide on designing for energy efficiency offers two main points that can help improve efficiency in your lab:

- Look for reaction conditions that are at ambient temperatures and ambient pressures.
- One of the big places, specifically in organic chemistry, where a lot of energy is consumed is in the removal of solvents or the purification of materials after the reaction is done. If you can design your chemistry to minimize the need for these steps, then you will be helping to save energy in your lab.

9. Share your sustainability efforts with your colleagues

Sharing your successes and best practices in the lab is a crucial element to improving efficiency. Be sure to share how you are reducing energy as often, and as broadly, as you can!

Source: Top 9 Actions To Take in the Lab to Improve Energy Efficiency (My Green Lab)

10. Investigate options for pipette waste

During the lab tour it was reported that the biggest source of plastic waste is pipette tip boxes. There are a few options to consider to address this issue:

1. Can the boxes be re-used? For example, could they be used for storage in the lab?
2. If they can't be re-used, ensure they are recycled. There are a couple of organisations offering pipette tip box recycling services, e.g.:
    - Terracycle: Recycle Pipette tip boxes
    - Polycarbin: Pipette Tip Box Recycling for Labs | Polycarbin
3. Investigate purchasing 'greener' pipette tip boxes, such as biodegradable options and recycled content, e.g.:
    - Mettler Toledo: Biodegradable Pipette Tip Box | Bio-Based Pipette Tip Containers
    - Starlab: The greenest products - Starlab UK

My Green Lab has a useful guide on reducing plastic waste in the lab, with lots of helpful tips: Sustainable Pipetting: Tips for Reducing Plastic Usage in the Lab - My Green Lab

2.3 Office Recommendations

Lighting

- Maximise sunlight from windows by raising blinds and relocating any blocking objects if required.
- Minimise lighting in non-working areas such as corridors by removing surplus bulbs where appropriate.

Heating & Cooling

- Make sure timers are set to the right date and time, especially when the clocks change, and take working hours, weekends and Bank Holidays into account.
- Check thermostat settings. Reducing the temperature by just one degree can result in savings of 8% from reduced energy for heating.
- Ensure heating/air conditioning is turned off in unoccupied rooms.
- Make sure heaters and vents are free from obstructions and regularly cleaned.
- Install draught excluders to any windows or doors that are draughty.
- Check the location of thermostats – ensure they aren't affected by heating or cooling from A/C units, draughts or direct sunlight.

Office equipment

- Staff should turn their computer monitors off if they are away from their desks for more than 10 minutes and ensure both computers and monitors are turned off at the end of the day.
- Ensure infrequently used printers and photocopiers are only turned on when required and are set to go to sleep after a few minutes of inactivity.

- Switch to recycled paper for printing, rather than virgin paper.
- Put a procurement policy in place to ensure the lifetime costs of any new equipment is considered when purchasing, rather than just looking at upfront costs.

3. CARBON FOOTPRINT

3.1 CARBON FOOTPRINT DATA:

SCOPE 1: 0 tonnes CO_2e

SCOPE 2: 37.21 tonnes CO_2e

SCOPE 3: 344.30 tonnes CO_2e (measured to date)

It is recommended that the following Scope 3 categories are measured and included in the Company's total carbon footprint:

- Category 1: Purchased Goods and Services – partial spend data has been gathered and 196.02 tonnes of CO_2e measured
- Category 2: Capital Goods - partial spend data has been gathered and 136.78 tonnes of CO_2e measured
- Category 4: Upstream Transportation and Distribution – no data has been gathered to date
- Category 5: Waste Generated in Operations – no data has been gathered to date
- Category 6: Business Travel – no data has been gathered to date
- Category 7: Employee Commuting – data has been collected for 26 members of staff and 11.50 tonnes of CO_2e measured
- Category 9: Downstream Transportation and Distribution – no data has been gathered to date

3.2 EMISSIONS REDUCTION TARGETS

To continue progress to achieving Net Zero, the Organisation has adopted the following carbon reduction targets.

The Company is committed to reducing greenhouse gas emissions by 50% by the end of 2030.

4. APPENDICES

4.1 SUPPORTING INFORMATION & CALCULATIONS

Solar PV Calculation					
Generation Capacity					
Total roof area:	714	m^2			
Area suitable for panels:	524	m^2	Excluding the heating/ ventilation units on the roof		
Area available for panels:	472	m^2	10% of area has been taken off to account for edges		
Max generation capacity:	**85.7**	**kW peak**			
Average Energy Load					
Annual electricity consumption:	179,691	kWh	Operating hours:	2,500	Hours/Year
Average energy load:	**71.88**	**kW**			
Solar PV Savings Calculator					
Size of system required:	85.7	kWp	Daytime electricity rate:	30	p/kWh
Direction panels face:	South		Roof pitch:	30	°
% of electricity that will be used by business:			70%		
% of electricity sold back to grid:			30%		
Estimated generation in year 1:	73,655	kWh			
Generated energy used on site	51,559	kWh			
Annual carbon savings	11.62	tonnes CO2e			
Income from export tariff @	15.1	p/kWh	£3,336.59		
Electricity bill savings @	30	p/kWh	£15,467.62		
		Total benefit:	**£18,804.21**		
Estimated investment:	**£85,745**				
Simple payback*:	**4.56**	**years**			

*Payback does not take into account future increases in energy prices

4.2 USEFUL LINKS AND RESOURCES

- **Business Growth Hub**
  Access support from Business Advisors specialising in the health innovation sector. Green Economy can make a referral to the Business Growth Hub for innovation/ growth support.
  Health Innovation | GM Business Growth Hub

- **Net Zero Toolkit**
  Access resources and step-by-step guides to help you make change to your business.
  Explore resources

- **Green Intelligence**
  A monthly round up of environmental business news, views and insights straight to your inbox.
  Sign up

- **Green Economy Events and Training**
  Access a series of events, training and workshops to support your decarbonisation journey.
  View events calendar

- **EcoVadis Sustainability Assessments**
  The leading sustainability intelligence platform for global supply chains | EcoVadis

- **Carbon Disclosure Project**
  CDP: Turning Transparency to Action

- **Science Based Targets initative**
  Ambitious corporate climate action - Science Based Targets Initiative

- **My Green Lab**
  Resources - My Green Lab

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6. YOUR COMMITMENT

While Green Economy provides support and advice to client organisations, the client organisation itself will be ultimately responsible for ensuring these actions are completed.

Since Green Economy is required to demonstrate its impact, it expects that client organisations provide in return any evidence that demonstrates positive impacts as a result of the support provided, including but not limited to:

1. Carbon and cost savings to which the support has contributed
2. Carbon reduction targets & plans set
3. Investment in green products & services

This evidence will only be used for internal purposes, unless the organisation confirms otherwise.

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