



## SECR - Streamlined Energy and Carbon Reporting

**The global effort to reduce manmade carbon dioxide (CO<sub>2</sub>) emissions from our energy requirements is idealised by a two-pronged approach. Energy usage is firstly reduced by efficiency improvements and then decarbonised through renewable sources.**

The recent analysis of the competing sectors' relative contributions has shown that in the UK, since 2005, energy efficiency has contributed a 103 TWh reduction in energy demand, while renewable energy production has displaced 95 TWh of fossil fuel energy. Energy efficiencies largely go unnoticed, while renewable energy tends to hog the limelight. This is because it involves sizeable and visible hardware, e.g. solar panels, wind turbines, tidal barrages, etc. which can polarise opinion; renewables have also enjoyed larger incentives, until recently.

However, reduced-energy technology upgrades can present valuable investment opportunities for any business, often with demonstrably lower costs, high benefits and short paybacks. It is no surprise, therefore, that energy efficiency has also

been the subject of incentives and legislation. One of these is the Energy Savings Opportunity Scheme (ESOS), which we have reported on recently. ESOS is mandatory for larger businesses but comes with a fully costed audit of tailored potential projects. And, in 2020, we will see an impact of the Streamlined Energy and Carbon Reporting (SECR), which will affect more businesses.

### What is SECR?

The SECR scheme is part of a government initiative to make the UK carbon neutral by 2050. It came into effect on 01 April 2019, replacing the Carbon Reduction Commitment (CRC) Energy Efficiency Scheme, in order to simplify and align policies relating to energy efficiency. SECR builds on ESOS, Greenhouse Gas (GHG) emissions reporting, and the EU Emissions Trading System (EU ETS).

### Who is affected by SECR?

Whether you are a listed company, unlisted or a limited liability partnership, you will need to report if you meet **any two** of the following three criteria:

- More than 250 employees
- Turnover greater than £36 million
- Balance sheet value greater than £18 million

### When is SECR reporting required?

Your first report will relate to your first full financial year starting on, or after, 01 April 2019 and will form part of your company's annual report. Although that means this first report will not be due until April 2020, it's important to be sure your record-keeping is fit for purpose. This includes details of energy use relating to electricity, gas and transport, as well as the associated greenhouse gas (GHG) emissions. Crucially, it is reporting what you have done to reduce energy and carbon emissions.

### How do I prepare for SECR?

If you have been, or are, reporting under CRC or ESOS, you are likely to be collecting most of the information needed for SECR already, but you may need to prepare additional disclosures or commentary, as SECR is an **annual obligation**.

# CO<sub>2</sub> from biomass

Many growers will be familiar with the need to supplement their crops with carbon dioxide to raise ambient levels to a target concentration, usually measured in parts per million (ppm). Traditionally, the options have been:

- Buy liquid CO<sub>2</sub> from an external supplier and store on site
- Use the flue gas from natural gas combustion (boiler, CHP, etc.)

Both methods rely on fossil fuels as the source of CO<sub>2</sub>.

Capturing and using CO<sub>2</sub> from biomass systems has generally been avoided, due, in large part, to the necessary after-treatment of the flue gas to extract the CO<sub>2</sub> and make it usable for horticultural applications. However, recent developments in technology could mean this is about to change, offering significant potential to reduce the environmental impact of carbon emissions within the industry (See guide, **Energy management in protected cropping: Management of CO<sub>2</sub> enrichment**).

## Case study

Three growers on the Dutch island of Zeeland have joined forces to make their combined 22 hectares of aubergine and tomato production sustainable and protect themselves against volatile gas prices. The partnership has invested in a plant which takes regional green waste, previously being exported to Germany, and processes it into woodchips for use in the site's 8 MW biomass boiler. The boiler provides hot water for use in the glasshouses. So far, so normal... However, to benefit from recent advancements, the CO<sub>2</sub> is extracted for use too ([youtube.com/watch?v=zbyK1B5jbzs](https://www.youtube.com/watch?v=zbyK1B5jbzs)).

The combustion gases pass through a condenser, where they are dissolved in an environmentally friendly solvent which absorbs CO<sub>2</sub>. The amine wash technology captures and purifies the CO<sub>2</sub>, while the other gases are exhausted as normal. The solvent is recovered and heated to 140°C, regenerating it and releasing the CO<sub>2</sub> and water vapour in the process. This gaseous mixture is then dried and cleaned.



Ed Hardy  
GrowSave Consultant

The facility is able to produce 2.2 tonnes of 99.8% pure CO<sub>2</sub> per hour, which is stored in two large tanks for distribution

to the glasshouses to enrich the growing environment. The quality of the CO<sub>2</sub> is analysed, checking specifically for NO<sub>x</sub> and ethylene. This carbon capture and utilisation (CCU) system also provides 1.7 MW of heat for use in the greenhouse.

The use of biomass and the production and processing of CO<sub>2</sub> in this way has led to an annual reduction of 12,000 tonnes of CO<sub>2</sub> from fossil fuels and a saving of approximately 6,700 MWh of natural gas.

The cost of CO<sub>2</sub> production is claimed by the operators to be about half the market price of buying liquid CO<sub>2</sub>, after taking depreciation and operating costs into account (Bioénergie International n°62 – Été 2019, pp. 16–17).



Figure 1. Biomass boiler



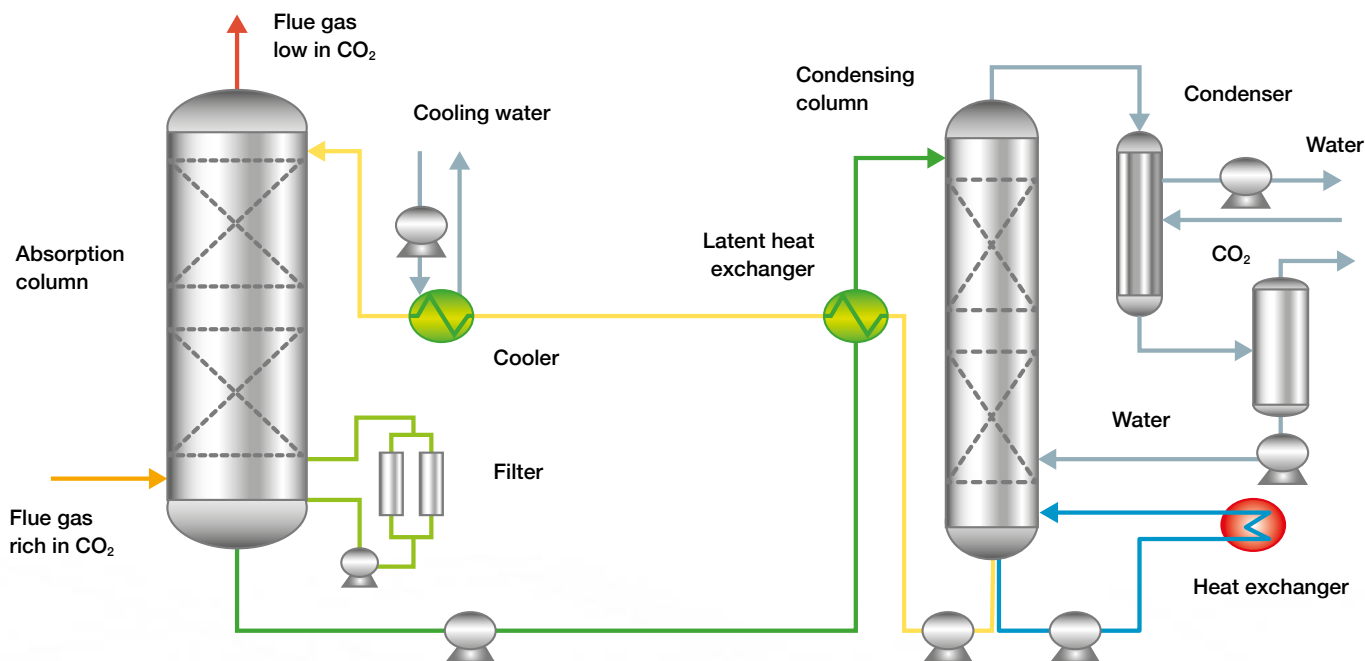


Figure 2. CO<sub>2</sub> from biomass – the system

Of course, CO<sub>2</sub> isn't only produced through combustion. It is a by-product of many processes, including anaerobic digestion, for example, a tomato grower in Evesham has used CO<sub>2</sub> from the co-located AD plant for several years. Ideally, to help improve the circularity of the process, crop waste would be sent to the AD plant. A collaboration in Newmarket, meanwhile, has also adopted a 'waste as resource' approach.

### Case study

In Newmarket, famous for its horse racing, manure and straw from the races is sent to a local gas plant with an anaerobic digester. The biomass material is digested (in a way similar to how a stomach works), producing methane and carbon dioxide in the process. Like many AD plants, the methane gas is exported to the grid, where it can be used for domestic heating or gas stoves, for example. Where the Newmarket plant differs, however, is in its utilisation

of the CO<sub>2</sub>. Instead of venting it to the atmosphere, as is common practice, it is captured, liquefied and sold to a local brewery, where it is used to carbonate beer ([bbc.in/2UXCxDS](https://www.bbc.com/news/health-56888888)).

Although there is a steady supply and demand, the small reduction in carbon emissions at this scale is hardly going to save the planet. However, it is a nice example of how waste from one industry can be a resource to another – a key concept of the circular economy.



## Events

### Advances in Grow Lighting: Industry Workshop – NIAB

GrowSave attended the Advances in Grow Lighting Workshop on the 17 October at NIAB to have a look at what's new in relation to lighting in horticultural applications.

The event was split into two halves – the first being a series of talks from key industry and academic players, followed by technical product demonstrations from equipment manufacturers and providers within NIAB's facility.

It was evident from the event that there is still confusion surrounding what growers should be specifying to lighting providers. Many growers generally allow lighting suppliers to lead on suggesting what type of fitting is most appropriate for their application. This is not a surprise, however, given the close links between research organisations and breakthroughs in grow lighting technologies. The event helped to dispel some of the mystery surrounding lighting and plant behaviour. Some of the key takeaways were:

- Specific average light intensity is normally used for determining light requirements. This is measured in  $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$ , although  $\text{W}\cdot\text{m}^{-2}$  is also commonly used in horticulture

- Attention should be paid to specific plant responses to light frequency profiles (including far red and UV) and the coverage that might be achieved with different fittings (a 10–20% variation in light intensity is generally acceptable)
- Practicality of the fittings should be considered – this includes the expected lifetimes, safety of workers under light fittings, shading, weight, number of fixtures per driver (if LED) and overall load demand (is your electricity supply large enough for significant lighting?)

The second half of the event consisted of demonstrations from several lighting providers. These included various LED and plasma lamps, specific fittings for both regulating flowering and increasing growth, as well as smart controls and tuneable light fittings.

Generally, there have been plenty of improvements in horticultural lighting technology over the past few years. It is very clear that ordinary commercial or domestic lighting is less appropriate, with manufacturers now offering more specialised lighting products depending on the application. Meanwhile, efficiency of fittings to deliver the correct light levels steadily improves (efficacies of fittings are headed towards 3–4  $\mu\text{mol}\cdot\text{J}^{-1}$ , where previously they were between 1–2  $\mu\text{mol}\cdot\text{J}^{-1}$ ).



Jon Swain  
Director at NFU Energy

### Tomato Growers' Association Conference

Tim Pratt, Technical Director at NFU Energy, presented at the 2019 TGA Conference. Covering a range of energy-related topics, Tim touched on the 'net zero' targets set out by the Committee on Climate Change. Other schemes, such as carbon footprints, have come and gone, but with some demonstrable successes around CO<sub>2</sub> emissions within UK horticulture, perhaps the net zero ambition will stand the test of time.

Other topics included energy prices and trends, the economics of combined heat & power (CHP), and an update on incentive schemes for renewables.

Compliance was the other main talking point, with ESOS, SECR and MCPD all rearing their heads in recent months.

## Future plans for GrowSave

### Ed Hardy, GrowSave Consultant

It doesn't seem five minutes since we were celebrating 10 years of GrowSave, but we are now entering our thirteenth year and have embarked on a five-year extension and expansion to the programme. GrowSave has previously been focused solely on horticulture, specifically protected edibles (PE) and protected ornamentals (PO), with soft fruit (SF) included in the programme for the first time last year. To reflect

that energy saving and management is critical across both horticulture and agriculture, we will now also be including AHDB's Cereals, Dairy, Pork and Potato sectors.

While our advice is often tailored specifically for a target audience (e.g. PE, PO or SF), energy saving is important to everyone, and many of the concepts and ideas can be applied to the various sectors. With this in mind, key topics for the next five years are likely to include how agriculture and horticulture can start to move towards becoming 'zero carbon' industries, reducing their environmental impact through the use of energy and other finite resources.

Energy security, whether through self-generation or reduced reliance on fossil fuels (and volatile market prices), is another topic of interest. Obviously, the easiest way to reduce energy usage is to become more efficient, so energy saving will continue to feature heavily in the programme.

As in previous years, our content will be shared through industry-specific publications, online literature and workshops throughout the year. We are always open to ideas for topics of interest, so if you have any suggestions, we'd welcome your input by emailing us at [info@nfuenergy.co.uk](mailto:info@nfuenergy.co.uk)



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