

Powering Sustainability



Energy Management



Measure



Monitor



Reduce

Company Overview

digrenenergy.ie



Energy Management

ENVIRONMENTAL

Waste & pollution, efficiency of resources (water, energy, etc), CO2 emissions, deforestation, climate change. Minimise the use of non-recyclable products, use clean renewable electricity



SOCIAL

Equal opportunities, health & safety, life/work balance, human rights, product responsibility, working conditions, employee relations and diversity, data and privacy



GOVERNANCE

Ethical business practices, compliance, board diversity, anti bribery and corruption, responsible procurement, transparency, risk management



DIGREN'S ESG KEY PRINCIPLES

SUSTAINABILITY



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Digren

COMPANY PROFILE



Digren Ltd is an energy management consultancy. We provide a complete energy management service to all business sectors, public and private and local authorities. **Our focus is on consumption reduction** and energy efficiency. We provide a unique energy management consultancy service tailored to our clients specific requirements and budgets.

2012

Digren was formed as a consultancy specialising in HVAC and controls.

2013

Added Indoor Air Quality (IAQ) and Indoor Environmental Quality (IEQ) testing and monitoring services.

2014

Added energy procurement and report analysis.

2015

Added energy monitoring & project management services.

2016

Added project management for large energy users

2017

Established UK subsidiary - Digren Energy Limited

2018

Developing EV charging solutions

2019

Achieved EN ISO 9001:2015 Quality management system certification

2020

Added an Electrical Contracting division to our services focused on energy efficiency projects.

2022

Partnered with Ar barr Electronics to deliver off-grid and hybrid energy storage solutions.

2023

Achieved EN ISO 14001:2015 Environmental Management System certification.

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COMPANY OBJECTIVES



To provide organisations with cost effective, PRACTICAL energy management solutions.



To assist organisations in developing their own Energy Management Plan (EMP) and to implement it.



To create lasting **partnerships** with these organisations with the shared objective to reduce energy consumption and improve efficiency.



To create an 'Energy Awareness' environment within these organisations to allow them sustainably maintain their energy efficiency measures.



To assist organisations with their ESG obligations in regard to energy management and in particular the traceability of their energy source.

The **greenest** unit of energy is the energy you didn't have to use.

Digren

OUR CORE VALUES

Honesty

We deal with all clients in an open and honest way. We will give you all the advice possible for you to make an informed decision. We are praised by clients for our customer service levels.

Respect

Digren Energy will ensure all of our employees and agents respect the thoughts and wishes of all of our internal and external stakeholders.

Accuracy

Digren Energy's team of professional consultants ensure all client offers and services are accurately presented and are suited to their business needs.

Environmental, Social & Governance (ESG)

Digren Energy is built by our dedicated employees and their valuable contribution to the success of our business. We are committed to giving our employees equal rights, opportunity, and compensation across the board. We incorporate environmental, social, and governance criteria into our daily operations which reflect our commitment to our clients, partners, employees and the communities in which we operate. We are equally committed to positively impacting on the environment, in particular by contributing to and supporting organisations involved with removing plastics and ghost nets from the oceans.

Digren Energy is proud of our strong corporate ESG policies. Our code of business conduct requires all Digren directors, employees, agents and contractors to act with integrity and adhere to the highest standards of honest and ethical conduct. We encourage and support the ongoing development and education of all our employees.

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It is our opinion that ESG is an ongoing process of continuously aligning our business operations and systems with our core values. Our ESG commitments are structured around four key areas relevant to our business: Our People, Our Products & Services and Communities, Our Environment, and Our Corporate Governance.

Transparency

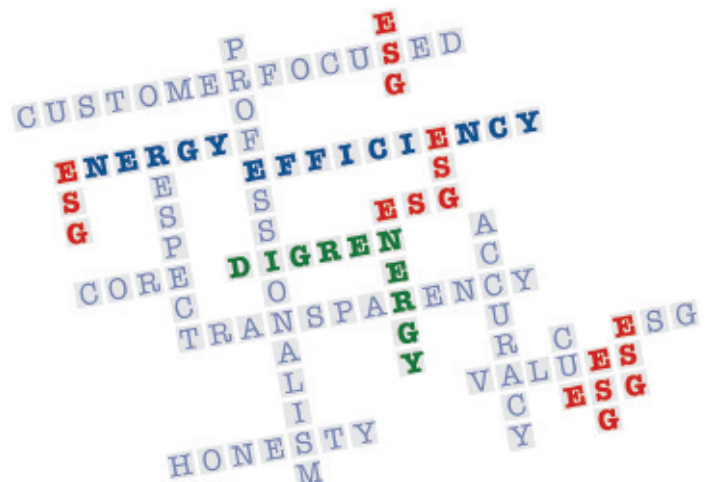
Digren Energy ensures transparency in our interaction with our customers to ensure they are aware of the benefits that provide sustainability to their business. We gain no benefit from leaving our customers unaware of the true potential of what they can achieve.

Professionalism

Digren Energy ensures all staff are adequately trained for dealing with customers. We operate and maintain an Employee Code of Conduct which all employees are required to abide by.

Customer Focused

Our customer focus is integral to the culture of our business and the management of a good customer journey is key to our continued growth.



Digren

PROCUREMENT

Our Approach

Understanding

We start by taking the time to understand your business, your energy habits and what plans you have going forward that might impact your utilities. We then speak to your supplier and networks to ask them for all the intricate details in your contract you might not currently understand or be aware of.

Analyse

Once we have received all the necessary information from you, your supplier and networks we will check to make sure all aspects of your service is sustainable and economical. We're also able to provide added analysis (if required) through services such as energy monitoring and energy audits.

Negotiate

If changes need to be made to your utilities Digren Energy can work on your behalf to secure the best possible supply at an optimum price. We're an independent consultancy, which means alongside the preferential rates we get from our partners we can also look at the whole market to make sure you're getting the right service.

Support

At Digren Energy we value the ongoing relationships with our clients. Once we've ensured you're getting the most out of your utilities, we keep you updated on changes in the industry and how they might affect you. We also provide you with regular updates on your energy usage and can alert you if any usage changes might affect your service.

'Greenwashing' Vs. Complete Traceability

Purchasing green energy can result in a bit of greenwashing, whereby a provider issues a line item saying that the power is being generated from a renewable source. Whereas, in many cases the power has been sourced from the wholesale market which includes are generated power - renewable and fossil fuel based.



The infographic features the Digren Energy Management logo at the top left. The main title is "5 Step Procurement Strategy" in white text on a blue background with a power line graphic. Below the title, there is a paragraph of text explaining the complexity of energy management and Digren's role as an independent Irish-owned consultancy. To the right of this text is a bar chart with a ruler below it, showing a significant difference between unit rates and actual costs. Below the bar chart, there are two sections: "What is the difference between energy management and energy awareness?" and "Where do I start?". The "Where do I start?" section includes a detailed explanation of how to calculate the real cost of energy by dividing total bill consumption by unit rate, noting that the real figure is often higher than the quoted unit rate.

5 Step Procurement Strategy

Energy management can be complex and time consuming. There is an abundance of information available which in many cases only complicates the issue. Digren Energy is an independent Irish owned energy consultancy practice who's objective is to help you implement an energy plan for your organisation.

What is the difference between energy management and energy awareness?

Energy Awareness is simply applying a common sense strategy to energy - turning off lights and equipment that are not needed. Energy management is assessing all your energy requirements and implementing an energy plan to allow you to control your energy, to reduce consumption where possible and ultimately to eliminate energy wastage.

Where do I start?

In putting together an energy management plan the first place to start is to examine the rates you are currently on. Most providers and brokers focus on your unit rate when providing you with contractual quotes. However, the unit rate is not what you pay. What you pay is the total cost on your bill divided by your consumption (kWh) for that month. That real figure is significantly higher than the unit rate quoted. The reason for this is simple - the provider is only responsible for the rate. All of the other charges are from networks or are government set.

However, it is possible to obtain certified power sources. This is where a turbine or solar farm is generated for a specific client. Even if it is only possible to generate a percentage of a client's power requirement this goes a long way toward ESG reporting. This may allow, for example, a company to report that 60% of their electricity is certified from a specific renewable source and the remaining 40% is provider based renewable allocation sourced through the market.

Digren

ENERGY PROCUREMENT MANAGEMENT

Energy Procurement

Reviewing your entire utility services can be time intensive, confusing and complex. No two businesses are the same, so Digren Energy take the time to understand your company and utilise years of market insight and experience, couple with outstanding industry relationships to advise on the best options available.

Energy Management

It's not just the price of your utility tariffs which can cause excessive bills. Variables such as building heat loss, ineffective light & heating systems, waste energy or an incorrect substation power allocation could all inflate your annual utility costs. Digren Energy use our expertise to review all aspects of your utility consumption and advise on how to keep your utility costs to a minimum.

Energy Efficiency

Digren Energy are heavily invested in helping clients understand and unlock the potential in the next generation of utility technology. Focusing on conservation, clean energy and sustainability, we help businesses to stay ahead of the curve and invest in long term, profitable alternatives to the inefficient products and services currently used.

Risk Management

Today's energy markets can be convoluted and unstable. With cost reduction being a key indicator it is important to implement a purchasing strategy which spotlights risk management. Digren Energy focuses on providing cost effective energy procurement with protection in surging markets.

Powering Sustainability

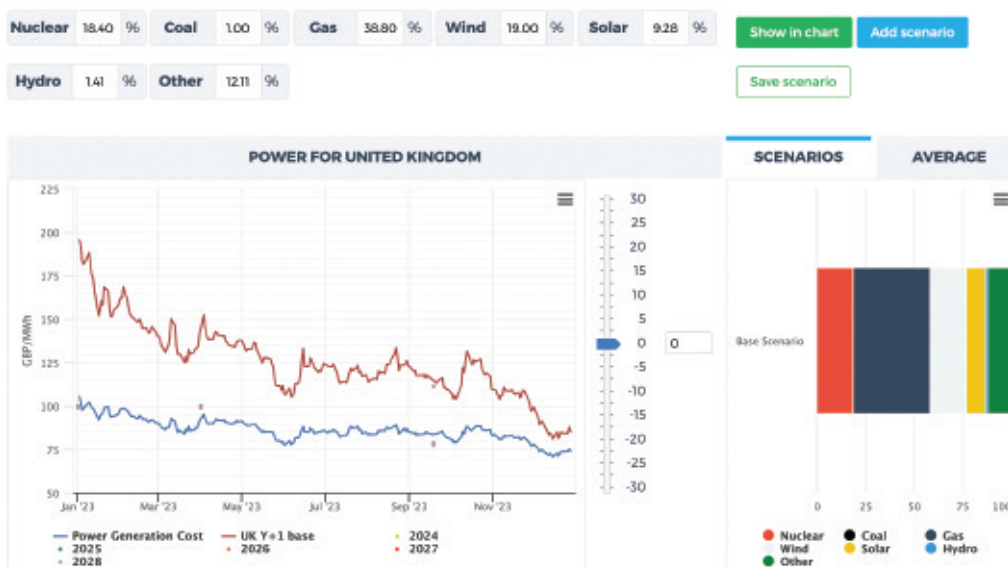
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Digren’s market intelligence software provides our analyst’s with the data required to make informative hedging trades. Market intelligence is not just about the price of gas or electricity in a specific market. Market intelligence requires all the granular data that drives gas prices such as nuclear, coal, gas, wind, solar and hydro. Even more crucial from a sustainability perspective is the data required to verify any Renewable Energy Guarantee of Origin (REGO).

One year forecast for power in Ireland



One year forecast for power in England



Digren METER PROFILING

A key part of a profile audit is to identify the quick fix. Ensuring an organisation is on the correct tariff and has the correct load capacity is essential.

A detailed profile analysis is necessary to assess a clients' current position in the energy market and to determine the best purchase strategy moving forward.

Energy Profile Analysis

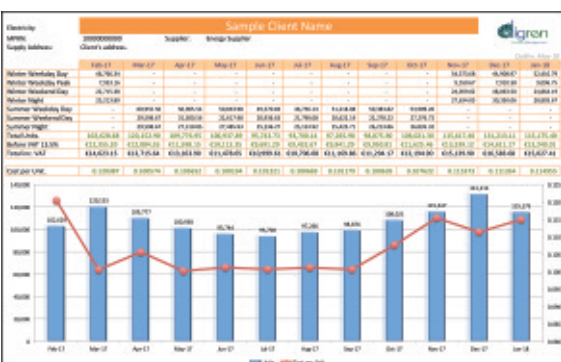
Deregulation of the energy market in Ireland provided customers with options. There are now a number of providers on the Irish Market. The main Providers being Bord Gais, Electric Ireland, Energia and SSE Airtricity. In addition, there are some smaller providers in Ireland and more recently an influx of UK and Canadian Brokers offering Gas and Electricity contracts on behalf of the Providers.

However, it is important to understand that the Providers are only responsible for selling the end of use product. They are not responsible for the transmission or distribution. The responsibility for this lies with ESB Networks (Electricity) and GAS Networks (GAS).

The transmission and distribution costs are dictated by the relevant responsible networks and the provider has no influence over these.

The providers are responsible for the unit rate only. The providers are responsible for the collection of transmission and distribution charges for the Networks which is why they appear on your energy bill.

ENERGY ASSESSMENT		Client Company Ltd	
Company Details			
Company Name	Client's address	1234567890	
Company ID	1234	1234567890	
Monthly Energy Spend	€ 1,000.00	€ 1,000.00	
Annual Energy Spend	€ 12,000.00	€ 12,000.00	
Current Consumption			
Summer Day Units	31,880 kWh	31,880 kWh	
Winter Day Units	30,880 kWh	30,880 kWh	
Winter Peak Units	80 kWh (132 days)	80 kWh (132 days)	
Winter Peak Units	21,880 kWh	21,880 kWh	
Current Tariffs			
Current Summer Day Rate	€ 4.8000	-28.41%	€ 6.7000
Proposed Summer Day Rate	€ 4.8000	-	€ 4.8000
Current Winter Day Rate	€ 4.8000	-23.11%	€ 6.2000
Proposed Winter Day Rate	€ 4.8000	-	€ 4.8000
Current Winter Peak Rate	€ 4.8000	-	€ 4.8000
Proposed Winter Peak Rate	€ 4.8000	-	€ 4.8000
Current Night Rate	€ 4.8000	-23.11%	€ 6.2000
Proposed Night Rate	€ 4.8000	-	€ 4.8000
Load Information			
Current Maximum Demand	€ 2,000	-3.99%	€ 2,080
Proposed Maximum Demand	€ 2,000	-	€ 2,000
Current kW	30 kW	30 kW	30 kW
Proposed kW	30 kW	30 kW	30 kW
Current Energy (kWh)	€ 1,500.00	-15.00%	€ 1,750.00
Proposed Energy (kWh)	€ 1,500.00	-	€ 1,500.00
Current Service Capacity	30 kW	-21.43%	€ 38.500
Proposed Service Capacity	30 kW	-	€ 30.000
Summary			
Current Annual Spend	€ 12,000.00		
Digren Proposed Spend	€ 2,612.16		
	Term Saving		
	34 month Commercial		
	€ 5,224.31		
	Term Difference		
	-21.77%		



Digren REPORTING

Accurate reporting is key to any monitoring system. The reports need to be easily read and understood by key personnel within an organisation. Key reports should include the following data:

-  Daily Electricity and Gas Load Profile
-  Daily Electricity and Gas Use Over a Month
-  Organisation Comparative Report Across Various Time Periods (day, month, year)
-  Electricity and Gas consumption breakdown
-  Organisation Systems vs External parameters (Temperature, etc)
-  Weather Normalised Year Over Year Energy Use



REPORTING



Our energy management solutions give you visibility of where and when energy is being used, providing you with the ability to implement and realise energy savings within your organisation.

ENERGY MANAGEMENT REPORTS
Energy management data is key to an effective energy efficiency strategy. Digren Energy ensure that your organisation has the necessary resources in place to collect energy consumption data. We then provide a number of tailored reports and online profile data to identify wastage and improve energy efficiency within your organisation.

Combined with exceptional reporting to highlight efficiency issues as quickly as possible, our energy use data analysis methods give you the power to accurately monitor and control your energy consumption.

ENERGY MONITORING SOFTWARE
Energy data on demand gives you insight into how your organisation is performing. We provide online access to our energy monitoring software for our clients that shows real time consumption at site level.

Data is critical to better energy efficiency, Digren Energy give you the ability to see where and when you use your energy.



Digren EV CHARGING

“Driving” Sustainability


Electric vehicles are becoming more and more popular and consequently the national infrastructure is increasing.

Digren Energy are focused on delivering turnkey engineered commercial EV charging solutions. Environmental awareness and legislation are driving the EV market and in our opinion it is essential that businesses are given the right information and options to enable them achieve what is the best fit for their business.

Digren can help you on this journey from general enquiry to installation.

Digren Hybrid Grid & Battery Chargers

Supplies up to 240Kw rapid charge from a 50Kw grid connection



**ULTRAFAST
EV CHARGERS**

INNOVATIVE COMBINATION GRID & BATTERY EV CHARGERS

Supplies up to 240kW Rapid Charge from a 50kW Grid connection

100Km range in approximately 5 minutes charging time.

Issue No. 05/2022-I-LR

Digren Energy Management

The advertisement features a hand plugging a charging cable into a white EV charging station. In the foreground, there are three smartphones displaying charging status. The background shows a blurred green landscape.

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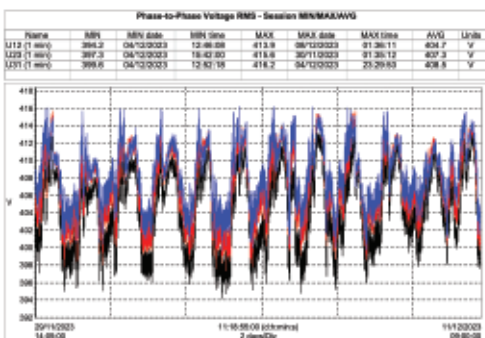
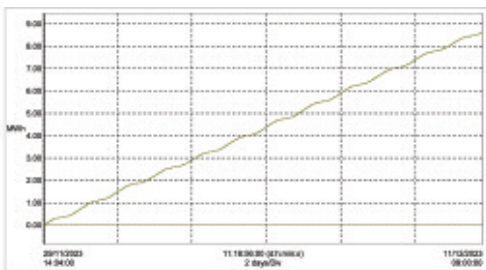
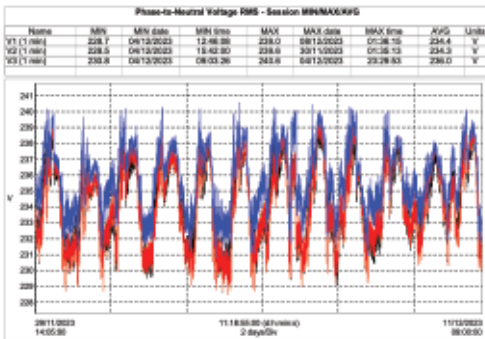


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VOLTAGE OPTIMISATION

A part of an energy audit is to carry out a voltage survey.

These results indicate whether or not the organisation would benefit from voltage optimisation (power factor correction).



AN OVERVIEW TO

Voltage Optimisation



Reducing energy consumption is key to cutting bills, lowering carbon emissions and reducing exposure to fluctuating energy prices.



About voltage optimisation

Voltage optimisation is the reduction and stabilisation of incoming electricity supply voltage to a level that the equipment in a building requires.

Historically, the supply voltage in Ireland and the UK has been set at 240VAC +/- 6%, effectively giving a supply voltage spread of 226VAC to 254VAC. For three-phase supplies the voltage was 415VAC +/- 6%, the spread being from 390 V to 440V.

All generation, distribution and transmission equipment has been set up to deliver this voltage, within this tolerance.

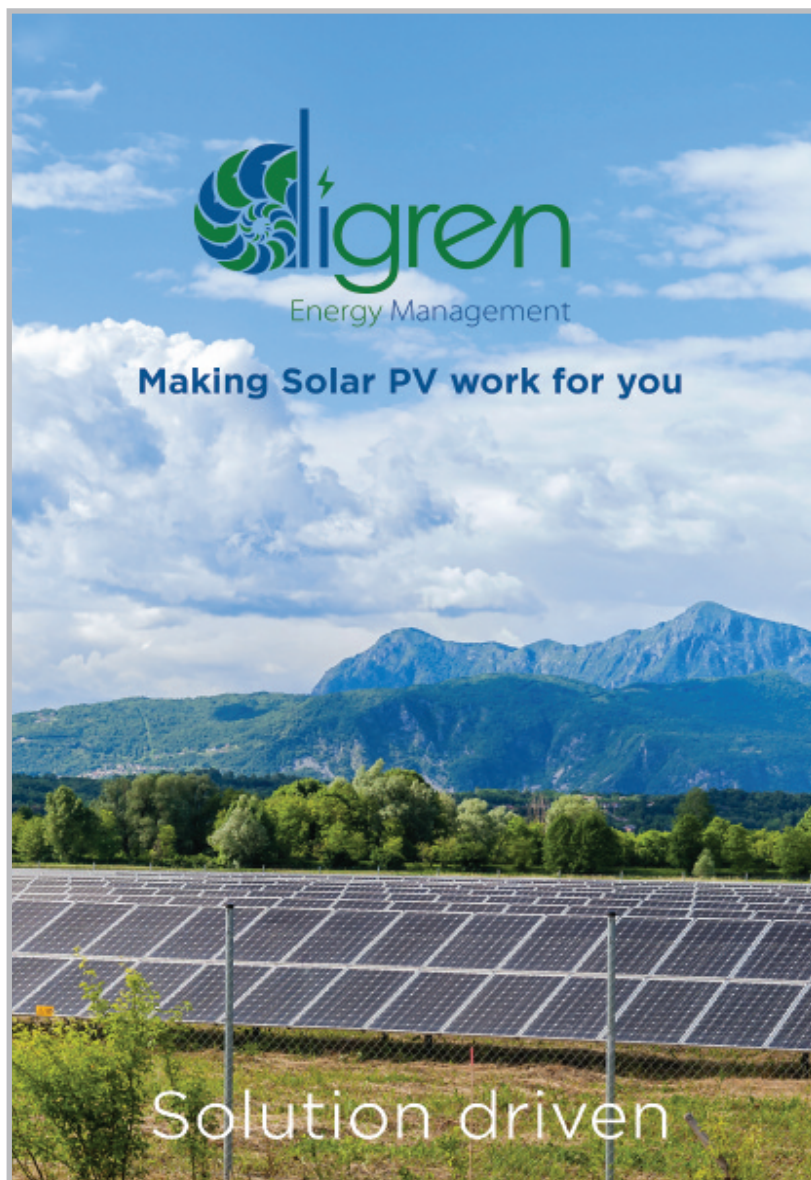
European Harmonisation (EN 50160:2007) has seen the supply voltage standardised across the EU at 230VAC +/- 10%, giving a supply voltage range of 207V to 253V. For three-phase supplies the voltage is 400VAC +/- 6%, the spread being from 360VAC to 440VAC.

What is photovoltaic (PV) technology and how does it work?

PV materials and devices convert sunlight into electrical energy. A single PV device is known as a cell. An individual PV cell is usually small, typically producing about 1 or 2 watts of power. These cells are made of different semiconductor materials and are often less than the thickness of four human hairs. In order to withstand the outdoors for many years, cells are sandwiched between protective materials in a combination of glass and/or plastics.

To boost the power output of PV cells, they are connected together in chains to form larger units known as modules or panels. Modules can be used individually, or several can be connected to form arrays. One or more arrays is then connected to the electrical grid as part of a complete PV system. Because of this modular structure, PV systems can be built to meet almost any electric power need, small or large.

PV modules and arrays are just one part of a PV system. Systems also include mounting structures that point panels toward the sun, along with the components that take the direct-current (DC) electricity produced by modules and convert it to the alternating-current (AC) electricity used to power all of the appliances in your home.



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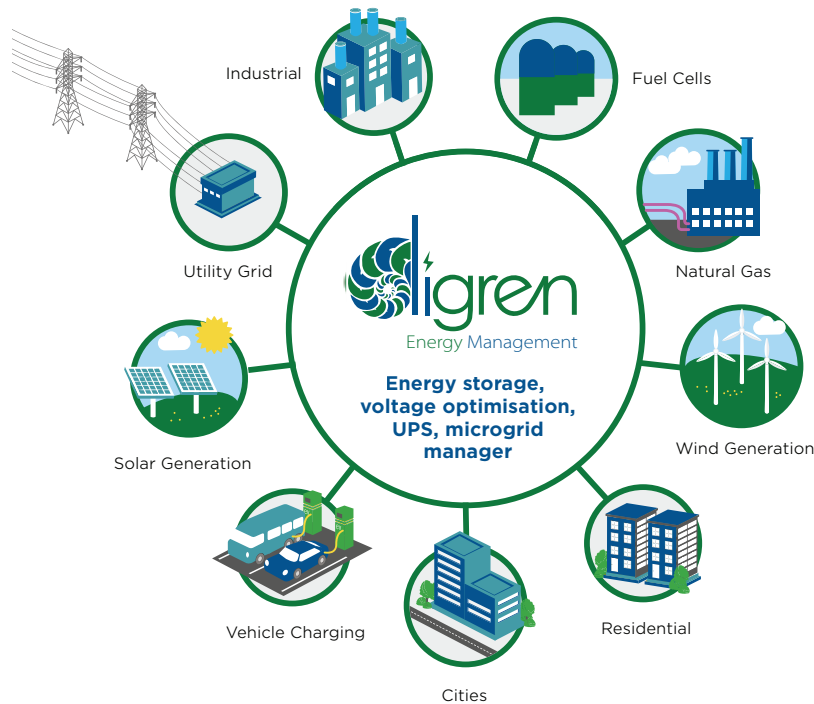
ENERGY STORAGE SOLUTIONS



Driven by advances in technology and communications, the way we supply and consume electricity will look very different in the future.

The traditional model of large thermal power stations will be replaced by the Internet of Energy: a highly connected system of responsive power generation from both suppliers and consumers resulting in clean, secure and reliable electricity to power the homes, businesses and vehicles of tomorrow.

THE INTERNET OF THINGS



COST SAVINGS

- Minimise transmission costs (Triads)
- Minimise distribution costs (red DUoS)
- Maximum demand control
- Reduction of reactive power charges
- Average reduction of 24%* off your electricity bill (to increase to 40% by 2020)

*24% savings figures from Ofgem



POTENTIAL REVENUES

- National Grid incentives (FFR, EFR)
- Export at peak market prices
- Maximise renewable generation incomes



GENERAL BENEFITS

- Control of maximum demand
- Storing excess renewable energy
- Charging electric vehicles
- Full UPS capabilities

Digren

BATTERY ENERGY STORAGE SYSTEMS (BESS)

10kWh - 40kWh ESS for Wind and Solar Power Shifting and Emergency Back Up Off-Grid Applications

Ideal for Facility Managers, Sports Grounds, Farms & Remote Dwellings, Healthcare, Event Management, Warehousing, Large Domestic and Small Industrial Premises, Office Spaces and more!



50kWh - 1MWh ESS for Off-Grid Emergency Back Up & High Power Applications

Ideal for Remote Grid, Emergency Relief Camps, Oil & Gas Plants, Data Centers, Uninterrupted Power Supply for Heavy Industries, Large Scale Energy Storage Systems and more!



Reduce your Carbon Foot Print

.....

Reduced Overheads Vs Traditional On-Grid Prices!



Stay cool, save money and reduce your business' carbon emissions

We can deliver up to 40% electricity savings without getting hot

We help businesses to make big energy and carbon savings without changing cooling needs so that your building users are kept comfortable, equipment stays cool and your produce remains chilled.

COOLNOMIX is a UK designed technology that is maintenance free and can be easily installed by our qualified engineers with no disruption to your operation. You can expect up to 40% energy saving on your air-conditioning and up to 30% on your refrigeration without your cooling output being affected.



Applications

AIR-CONDITIONING

- Commercial split type air-conditioners e.g. wall-mounted and cassette based
- Package based and double expansion DX units up to the largest sizes
- Ducted air-conditioners with AHUs
- Inverter based VRV and VRF air-conditioners

REFRIGERATION

- Industrial refrigerators used in the manufacturing sector e.g. food processing and pharmaceuticals
- Walk-in refrigerators used in the food and beverage sector
- Retail sector refrigerators e.g. vegetable and dairy display units, cold drink cabinets, wine warehousing refrigeration

COOLING

- Data Centres
- Comms Rooms
- Server Rooms

Digren GAS OPTIMISATION



in partnership with



Benefits

Fossil fuels, which include natural gas, propane and oil, are used to produce roughly 85 percent of all of the energy we consume. However, they are a non-renewable resource that produce 21.3 billion tons of emissions a year. Nearly half of that cannot be absorbed by nature, therefore, this now becomes one of the leading causes of climate change.

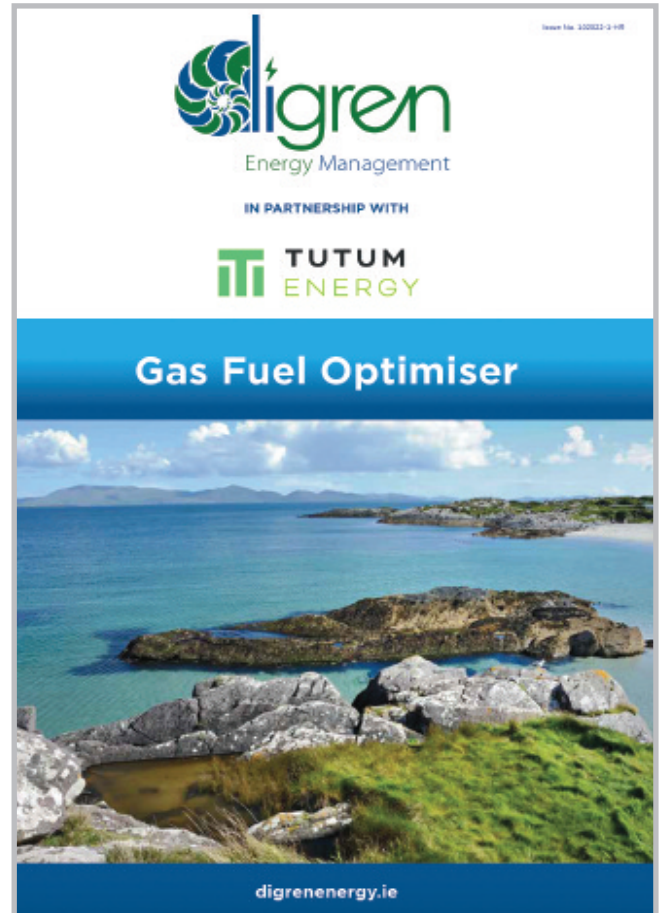
The Gas Fuel Optimiser improves the combustion of fossil fuels for commercial and residential systems and appliances, thus helping the environment by reducing the amount of fossil fuels been used.

Reduces Carbon Use and Cost

The Gas Fuel Optimiser is a proven way to reduce Industrial, Commercial and Residential Fuel Costs.

Our Gas Fuel Optimisers save money and reduces emissions by increasing the combustion efficiency of the fossil fuels (such as propane and natural gas) that power our home furnaces, water heaters and other household appliances. Boilers, plant, equipment, engines and water heaters.

More efficient combustion means the gas burns hotter and cleaner; this means your appliances don't have to work as hard to provide heat, and when they don't work as hard they require less maintenance.



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Digren BOILER OPTIMISATION



in partnership with



M2G Cloud - Unique in the market

Visible Savings Dashboard in real time Savings & Analytics for new and existing installations.

Military Grade encrypted GSM transmission. No client network complexities

Directly address the 92% of non- electrical energy consumption attributed to space heating / hot water in commercial buildings

M2G

Digital temperature sensors installation:

The M2G measures the boiler flow and return temperatures individually on each boilers, these are a surface mount method that is completely non intrusive to the system pipe work. The sensors are fixed mechanically and system “drain down” is not required.



Suitable Applications:

Suitable for low temperature hot water boilers, fired with high/low forced draught burners, single stage, two stage and most modulating burners, with gas and oil firing applications.

Suitable for atmospheric boilers, using the above firing methods.



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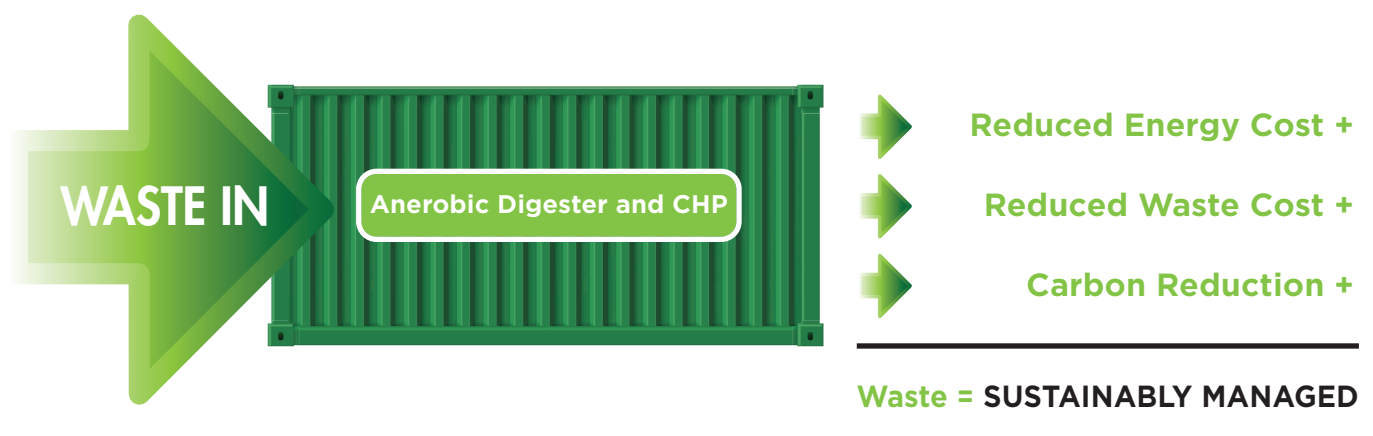
DIGREN ORGANIC WASTE TO ENERGY

The Seab units are available to convert organic waste to energy. The food chain produces a lot of waste material which needs managing. Traditional ways of dealing with this waste are not sustainable. The increasing pressure on landfill sites is driving the cost of waste management up. Hauling this waste from the point of production to centralised facilities adds cost and increases the carbon footprint of the waste.

A Sustainable solution has been designed to provide a logical and sustainable way of capturing the energy that remains in food waste. Instead of paying for this waste to be taken away and processed somewhere else, you can turn that waste into free energy and heat on-site? The containerised anaerobic digesters (AD) are fully automated and remotely monitored. You tip your food waste into the mouth at one end and simply leave the rest to the unit. State-of-the-art sensors and controls will automatically prepare this material for digestion and control the flow of the material through the system.

Their patented process extracts maximum energy from the waste stream in the form of Biogas which is then used to fuel a CHP engine to provide electricity and heat. Because of the built-in pasteurisation process, the AD can process a wide range of feed-stocks in a completely safe, odour free environment.

- Turns food waste into energy
- Small scale: Handles between 500kg and 2500kg per day
- Cost - effective renewable energy generation and waste management
- Modular design
- Rapid install
- Remote monitoring
- Low maintenance, rugged and reliable design



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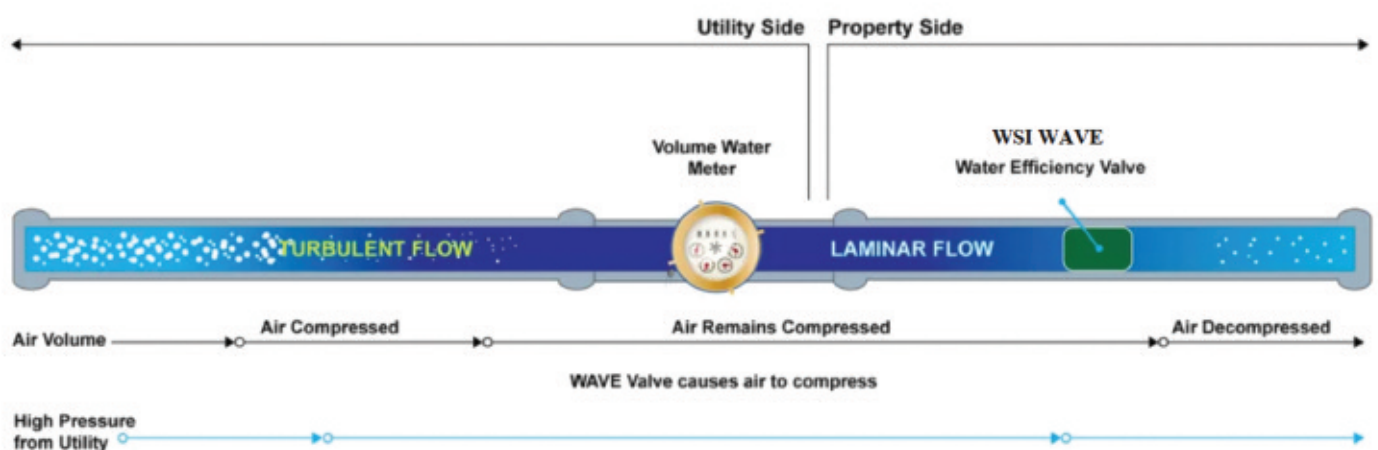
WATER SUSTAINABILITY

From a sustainability perspective water like energy is a resource. However, there is less water available than energy and the cost of drinkable water is rising and will continue to rise with demand. Unlike energy, currently the water market is not deregulated and as such there are no options to select different suppliers who may offer efficiency rewards or other incentives. Obviously, if you use less water you will save money. However, if you are committed to an ESG journey your objective should be to reduce water consumption for a positive impact on the environment.

Using WSI's CFV's can help reduce water consumption by 6% to 9% throughout your facility including landscaping, kitchen, HVAC, food preparation, restrooms, and everywhere water is used. Water Sustainability WSI's Intelligent Water Management System enables business, industry and government to reach your sustainability goals by saving water, while at the same time lowering water bills by up to 30%.

How does it work?

- **Compressible Flow Valve.** Compresses the accumulated air in the water line, reducing the volume of air prior to flowing through the water meter.
- **Adjustable Pressure-Regulating Valve.** Regulates water pressure to reduce water usage by 6% to 9%. This saves water, increases the service life of plumbing system components, and reduces risks of water leaks.
- **Check Valve.** The single-coil spring mechanism uses a consistent spring-force design that responds rapidly to flow variation.



WHAT IS SUSTAINABLE ENERGY MANAGEMENT?

Digren is focused on sustainability. We have committed ourselves to this journey and as such we engaged Ethical Edge, an ESG consulting firm, to help guide us through the setup and implementation of our ESG roadmap. Although Digren is immersed in sustainability in our day to day operations, this is only in the energy sector. We engaged Ethical Edge as our consultants to assist us on our journey with all other aspects of ESG and ensuring all areas are compliant.

In regards to sustainable energy, firstly we need to define what sustainability is - sustainability is the key to meeting present needs without compromising the ability of future generations to meet their own. Sustainability covers an organisations economic, environmental and social impacts.

When we look at energy procurement from a sustainability aspect we must look at all three components:

1 Energy - Environmental:

- Is our energy coming from a renewable source?
 - What impact on the environment does a particular renewable energy have?
 - Is the energy generated fully traceable?
-

2 Energy - Economic:

- Is the cost per kWh more for market based renewable energy? If yes, as an organisation can we bear the increase?
 - Should we invest in our own renewable micro generation, If yes, what are benefits and possible negative impacts, if any?
-

3 Energy - Social:

- Does our energy supplier have an ESG road map? If not, can they produce evidence or policies indicating their position in regard to traceability, and ethical and fair employee conditions for their direct staff and their suppliers supply chain?
-

Digren Energy can help ensure that you obtain the most efficient and sustainable energy product possible to suit your organisations energy load profile.

The term NET ZERO is being over used. Marketing and media posts use the term quiet loosely and this can take from its importance. Below is the Wikipedia definition of Net Zero.

Global net zero emissions describes the state where emissions of carbon dioxide due to human activities and removals of these gases are in balance over a given period. It is often called simply net zero. In some cases, "emissions" refers to emissions of all greenhouse gases, and in others it refers only to emissions of carbon dioxide (CO₂).

To reach net zero targets requires actions to reduce emissions. One example would be by shifting from fossil fuel energy to sustainable energy sources. Organizations often offset their residual emissions by buying carbon credits. People often switch between the terms net zero emissions, carbon neutrality, and climate neutrality with the same meaning. However in some cases, these terms have different meanings from each other. Some standards for carbon neutral certification allow heavy carbon offsetting, however net zero standards require reducing emissions to >90% and then only offsetting the remaining <10% to fall in line with 1.5°C targets.

In the last few years, net zero has become the main framework for climate ambition. Both countries and organizations are setting net

zero targets. Today more than 140 countries have a net zero emissions target. They include some countries that were resistant to climate action in previous decades. Country-level net zero targets now cover 92% of global GDP, 88% of emissions and 89% of the world population. 65% of the largest 2,000 publicly traded companies by annual revenue have net zero targets. Among Fortune 500 companies the percentage is 63%. Company targets can result from both voluntary action and government regulation.

Net zero claims vary enormously in how credible they are. Most have low credibility. This is despite the increasing number of commitments and targets. While 61% of global carbon dioxide emissions are covered by some sort of net zero target, credible targets cover only 7% of emissions. This low credibility reflects a lack of binding regulation. It is also due to the need for continued innovation and investment to make decarbonization possible.

To date, 27 countries have enacted domestic net zero legislation. These are laws that legislatures have passed which contain net zero targets or equivalent. There is currently no national regulation in place that legally requires companies based in that country to achieve net zero. Several countries including Switzerland are developing such legislation. *Source Wikipedia*



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CARBON OFF-SETTING

What is Carbon Offsetting?

Living in the modern world has left a carbon impact on each and every one of us. We generate emissions when we eat, shop and travel. Alternatively, if we operate a firm, our carbon footprint is influenced by activities like shipping, electricity generating, manufacturing and farming.

We must drastically cut our carbon emissions if we hope to avert a global warming catastrophe and meet the climate goals outlined in the Paris Agreement. However, there would still be too much carbon in the atmosphere even if we completely stopped all emissions today. We must make up for this by funding initiatives that elsewhere cut or eliminate emissions.

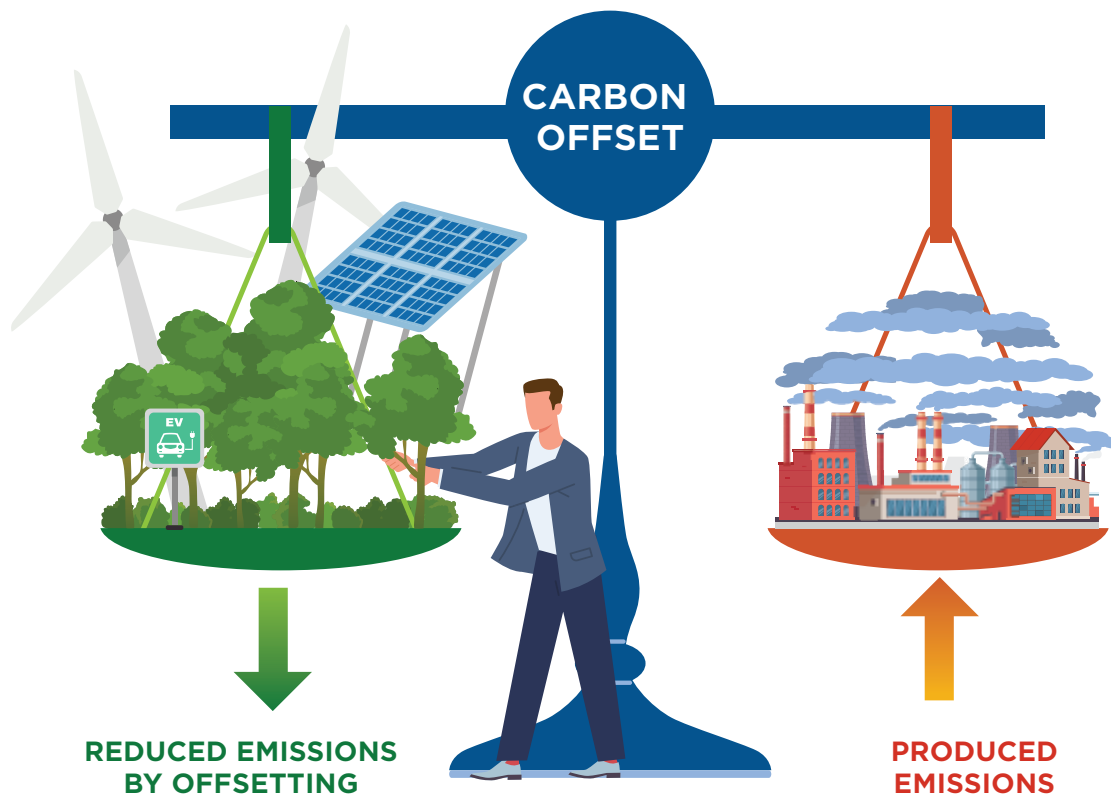
Is carbon offsetting cheating?

Both sustainability and various climatic claims and marketing strategies are on the rise. Unfortunately, there is a lot of greenwashing going on because of this.

However, merely calling carbon offsetting cheating undervalues its potential significantly. Effective carbon offsetting can have a significant influence on the climate, biodiversity, and human rights.

It is crucial to support initiatives that are informed by science and carried out with integrity if carbon offsetting is to be effective. So no one is deceiving anyone.

Digren Energy will outline exactly how your carbon offsetting is being obtained so that you can decide whether or not the proposed offsets are simply greenwashing or have a positive impact on climate change.



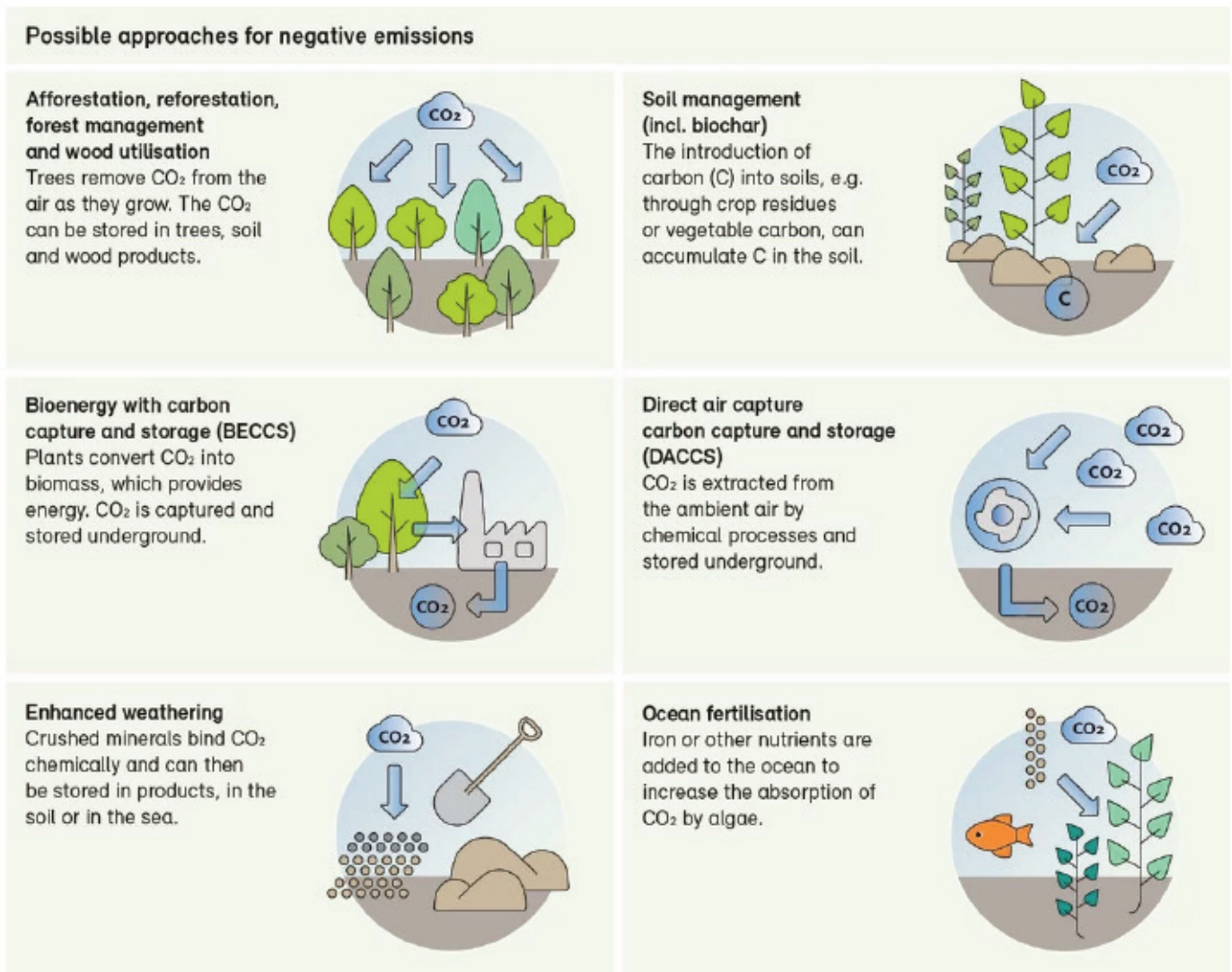
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CARBON DIOXIDE REMOVAL (CDR)

To reach **"zero net emissions"** and limit global warming to 1.5°C, it is necessary to remove and permanently store CO₂ from the atmosphere. This is called Carbon Dioxide Removal (CDR). As it is the opposite of emissions, these practices or technologies are often described as achieving "negative emissions", "sinks" or "removals". There is a direct link between radically reducing CO₂ emissions and CDR: The earlier net zero

emissions are achieved, the less CDR is necessary. Therefore, the projected amount of required CDR over the 21st century varies from 100 to 1,000 Gt CO₂.

CDR - also known as "carbon removals" - can be divided into the three main groups: biological, technological and geochemical processes.



Source: FOEN representation based on Mercator Research Institute on Global Commons and Climate Change (MCC).

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CARBON COLLECT - DIRECT AIR CAPTURE (DAC) CO₂

Carbon Collect is a pioneer in the battle against carbon emissions. The company's cutting edge technology, the MechanicalTree™, represents a new paradigm for Direct Air Capture (DAC). The company is the first to prove passive collection of CO₂ from ambient air in a Direct Air Capture system - negating the need for energy intensive forced convection employed in all other DAC solutions. We refer to this as Passive Direct Air Capture, or PDAC.

With the MechanicalTree™, we have set a new benchmark in capturing CO₂ from the atmosphere. By dispensing with energy-intensive forced convection techniques and harnessing wind delivery, we have revolutionized the field of Direct Air Capture. This unique approach offers a more sustainable and efficient method for combating climate change.

Designed and engineered by Carbon Collect, the MechanicalTree™ stands as a testament to our commitment to innovation. Overcoming significant limitations in other Direct Air Capture (DAC) approaches, our modular technology sets new benchmarks for scalability (gigaton capable) and energy efficiency.

Each MechanicalTree™ is over 10 meters tall when extended to capture CO₂ and contains sorbent tiles that extend and retract on a constant capture and regeneration cycle. MechanicalTree™ farms are best suited to addressing hard to abate carbon emissions.

Over the next decade, Carbon Collect aims to deploy its technology globally, starting in the United States. The company will partner with large corporations and governments seeking to mitigate carbon emissions.



Carbon Collect will begin deploying small scale MechanicalTree™ implementations whilst preparing for mass production and larger scale deployment. The company plans to deploy MechanicalTree™ farms with an annual capacity of up to 4m tons annually per farm within the next ten years. The technology's flexibility will enable deployment ranging from a single MechanicalTree™ up to around 120,000 units at maximum configuration.

Digren first came across Carbon Collect in early 2023 and have been closely following all test data and trials that have been taking place in the US. Of all the carbon collection technologies available they really stand out.

For more information go directly to their website www.carboncollect.com

A REVOLUTIONARY COOLING SOLUTION FOR THE CHALLENGES OF A WARMING PLANET

*Turn up cooling performance and
turn down energy consumption....*

HT Materials Science has developed the first truly innovative heat transfer fluid for commercial and industrial cooling and heating applications. The patented nanofluid Maxwell™ is proven to increase thermal energy transfer by 15% or more, for closed-loop hydronic cooling and heating systems. Some of the major benefits of Maxwell™ are:

- Significant **reduction in annual energy consumption and carbon emissions**
- **Immediate energy saving** from the time Maxwell™ is installed
- **Increased cooling and heating capacity** for HVAC and other systems
- **Payback period of 1 to 3 years** (dependent upon utilisation rates and energy costs)
- **Safe, non-toxic and non-corrosive additive** at only a **2% system concentration**

Typical Applications for Maxwell™

CHILLERS / HEAT PUMPS:

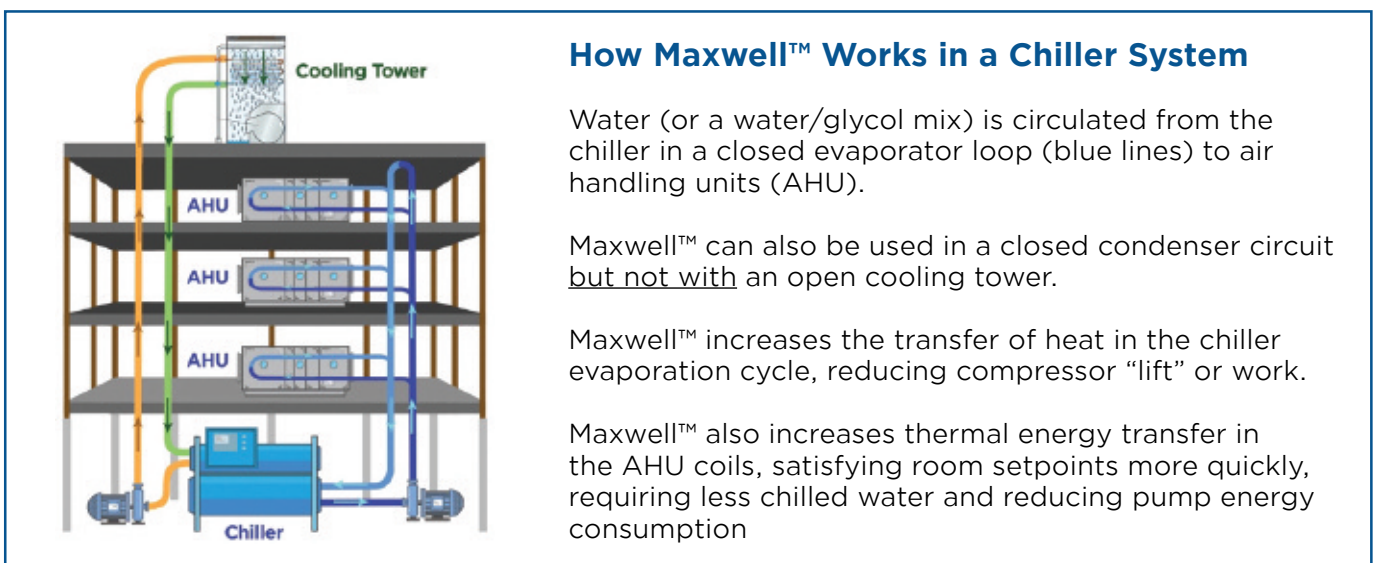
Maxwell™ increases heat transfer in the evaporator between fluid and refrigerant, reducing compressor lift and energy consumption.

PUMPS, FANS AND TERMINAL UNITS:

Maxwell™ increases thermal energy transfer throughout a hydronic system. Fan coil and air handling units, system pumps and supply fans can operate on lower power while maintaining comfort.

ENERGY RECOVERY SYSTEMS:

Maxwell™ when added to the runaround loop increases heat transfer at the exhaust recovery coil and the air handler pre-heat/cool coil, allowing a lower flow rate in the loop and reduced pumping power.



Typical Industries for Maxwell™

Commercial buildings	Healthcare
Residential buildings	Manufacturing - process cooling
Data centers	Food & Beverage - process cooling

How Maxwell™ Increases Heat Transfer

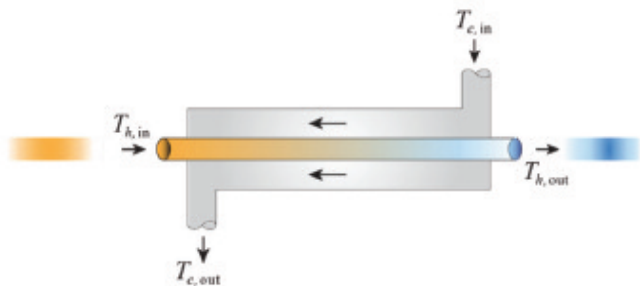
Thermal conductivity or the ability to transfer heat is dependent upon the conducting material utilised. Maxwell™ is a nanofluid using sub-micron particles of aluminum oxide (Al2O3) which as a pure metal provides superior heat transfer capacity versus water or water/glycol. Therefore, when Maxwell™ is added to a hydronic system’s base fluid, it materially increases the heat transfer capacity of the system.

In a typical heat exchanger, fluids of different temperatures exchange heat according to the following equation:

$$Q[kW] = hA(T_s - T_f) = [\dot{m}c_p(T_{out} - T_{in})]_h = \dot{m}c_p(T_{out} - T_{in})_c$$

where:

- $Q[kW]$ = heat transfer
- h = convective heat transfer co-efficient, proportional to thermal conductivity
- A = surface area of the heat exchanger
- T_s = average surface temperature of the heat exchanger walls
- T_f = average fluid temperature within the heat exchanger
- \dot{m} = mass flow rate
- C_p = specific heat capacity



At a given rate of heat transfer ($Q[kw]$), the temperature of the fluid within the heat exchanger with Maxwell™ (T_f) will be closer to the temperature of the walls of the heat exchanger (T_s) demonstrating heat being exchanged more efficiently – a higher heat transfer coefficient (h)

Furthermore, because of the higher density of Maxwell™, the mass flow rate (m) is higher when compared to the base fluid, which further reduces the temperature differential between the inlet and outlet fluids (or between the fluid and air) at the same rate of heat transfer.

Digren Energy are Ireland's distributor for the Advanced Heat Transfer Fluids (AHTF).

Fuel Efficiency

Cleaner Environment

Energy Cost Savings

Easy to Install

Non-Invasive Product

Lower Carbon + Emissions

AHTF is an energy saving nano technology based heat transfer fluid for various industries and environments worldwide. The product increases in efficiency and saves energy in all hydronic applications. The applications include systems using water, ethylene or propylene glycol.



TECHNOLOGY

Nano technology is science, engineering and technology conducted at the nanoscale level which is 1 to 100 nanometers. At present nano technology is used in medicine, agriculture, cosmetics, clothing, aerospace, solar and batteries.

CHILLER EFFICIENCY

Reduces the pressure difference on operating chiller units, therefore increasing the efficiency of the chiller.

INSTALLATION PROCESS / PRODUCT OFFER

Our product is introduced to the system after survey based on calculated system litres to provide maximum efficiency. The fluid is introduced via a mixing system based on a skid based design on 1:6 ratio.

Application	Results include
Commercial/industrial HVAC systems	Lower operating cost
Data centres	Lower power usage, reduced cost
Power generation plants	Decrease parasitic load
Pharmaceutical	Increased energy recovery
Oil and gas	Increased heat recovery
Food processing	Increased heat recovery
Co-gen plans	Increased waste heat utilisation
Health care / hospitals	Lower operating costs
Care homes	Lower operating costs
Cold storage	Lower operating costs



IN ASSOCIATION WITH



Digren

PROJECT FUNDING

Finding funding for a project can be a minefield. There are many options available to clients ranging from fully funded projects to grant assisted. As with projects each option carries pros and cons. We present each option clearly and make recommendations to best suit a clients specific requirements - both short term and long term.

The types of projects considered, but are not limited to are:

- General Energy Reduction Projects
- Lighting
- HVAC
- Energy Stotrage
- Voltage Optimisation
- Energy Generation

Power generators, distributors and suppliers of gas and electricity have a common objective to reduce consumption.

This means to reduce consumption to efficient levels - effectively eliminating waste.

Power Purchase Agreements (PPA) & Funding

PPA's have become increasingly popular and are used extensively on micro generation projects including but not limited to Solar PV, BESS and turbines. Globally there is a huge demand for energy efficiency and with that comes a huge supply of funding options. It is important to find the right fit for your organisation. Therefore all funding options should be given thorough consideration to ensure the right fit. Nothing is free, all funding is ultimately paid for by the consumer so it is important to ensure the offering is suited to your requirements. Digren will guide you through the various offerings and ensure you have all the information to allow you to make an informed decision.





Powering Sustainability



NOTE:

Being a sustainable company we strive to produce all our literature digitally. However, we realise that there is still a requirement for hardcopy. We print very limited low quantity amounts of hard copy.

In line with Digren Energy's sustainability policies, this brochure is printed on Recyclable paper. Certificate No.CBP022723

digrenenergy.ie

“ The **GREENEST** unit of energy is the energy you didn't have to use ”



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