Sustainability – it's big and it's clever

Sustainability definitions from the big picture to the technical detail

The world of sustainability consists of a variety of terms ranging from the philosophical to the technical. In our resources we seek to explain the relevant terms within the text, footnotes or through a glossary. However the entry level for many of our customers is through the introduction, as well as the project and report pages of our website.

This document explains the most commonly used terms found on our website and where required, what the SWM working definition and interpretation is. We start with the big picture definitions and end with the technical detail.

Sustainability and Sustainable Development

Sustainability – the destination

Sustainability is the overall goal or destination of sustainable development. The UK Government definition of sustainability is:

> "The goal of sustainable development is to enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life, without compromising the quality of life of future generations"[1]

Sustainability - our definition

In the West Midlands we can play our part and have defined the UK goal as:

> *"**By 2020 businesses and communities are thriving in a West Midlands that is environmentally sustainable and socially just.** By 2015 our leaders are working together to make significant progress on the roadmap towards the 2020 vision."*

This goal is explored in more depth in 'A low-carbon vision for the West Midlands in 2020'[2] and clear targets are set in our roadmap[3] which states that by 2020:

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[1] Securing the Future, UK Government, March 2005 (https://www.gov.uk/government/publications/securing-the-future-delivering-uk-sustainable-development-strategy)

[2] A low-carbon vision for the West Midlands in 2020, Forum for the Future & Sustainability West Midlands, 2009(www.sustainabilitywestmidlands.org.uk/resources/reports/?/A%20low%20carbon%20vision%20for%20the%20West%20Midlands%20in%202020/836)

- Thriving businesses means that the West Midlands is a hub for low-carbon technology innovation and an international supplier, increasing productivity by 30%
- Thriving and socially just communities means that the life expectancy gap between the worst and best areas in the West Midlands has fallen to 6 years as a result of employment, less pollution and healthier lifestyles
- Environmentally sustainable means that regional direct carbon emissions are reduced by around 30% from energy efficiency actions and 20% of electricity from renewable sources

Sustainable development – the journey

Sustainable development is the journey required to achieve sustainability. The mostly widely used international definition is:

> "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs"[4]

The UK Government definition is that:

> "Sustainable development means making the necessary decisions now to realise our vision of stimulating economic growth and tackling the deficit, maximising wellbeing and protecting our environment, without negatively impacting on the ability of future generations to do the same"[5]

One problem with definitions of sustainable development is that they often imply that it is a trade-off between the economy, society and the environment. In reality there is a clear hierarchy of the natural world supporting the economy, which in turn provides a means of converting natural resources to meet the needs of society. Our SWM logo of concentric circles reflects this hierarchy. As consequence, at SWM we prefer to use Forum for the Future's definition of sustainable development:

> "A dynamic process which enables all people to realise their potential and improve their quality of life in ways which simultaneously protect and enhance the Earth's life support systems"

Sustainable Development – our journey

In the West Midlands we have defined the journey towards our goal and hope that:

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[3] West Midlands Roadmap to a Sustainable Future in 2020, SWM, May 2013 (www.sustainabilitywestmidlands.org.uk/resources/reports/?/West%20Midlands%20Roadmap%20to%20a%20Low%20Carbon%20Future%20in%202020/1555)

[4] Brundtland Report

[5] Mainstreaming Sustainable Development , Defra, February 2011. (http://sd.defra.gov.uk/documents/mainstreaming-sustainable-development.pdf)

"By 2020 businesses and communities are thriving in a West Midlands that is environmentally sustainable and socially just. ***By 2015 our leaders are working together to make significant progress on the roadmap towards the 2020 vision."***

This journey is explored in more depth in our 'West Midlands Roadmap to a Sustainable Future in 2020' which covers the period from 2010 to 2020. Our roadmap identifies priority actions where working together will produce the most progress. These are around the areas of jobs, procurement, waste, buildings, energy, transport, the environment.

We are measuring progress on this journey through a range of measures such as our annual customer survey, research, and case studies which we report back at our annual conference.

Other sub-brands of sustainable development

Sustainability and sustainable development are broad and often contested terms. As consequence, a range of sub-brands have emerged which often focus on one aspect of sustainable development or provide more acceptable language to engage different audiences.

Frequently used terms and definitions

Climate Change

Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity. Sustainable behaviour is often associated with this term and includes reducing greenhouse gases through renewable energy sources and reducing overall energy use.[6]

The term climate change has been made popular over the last 15 years, but recently has decreased in popularity due to debate over climate science. As such, the term is not being used in the same way to 'sell' the sustainability agenda.

Circular economy

The circular economy is an alternative to a traditional linear economy which is to make > use > dispose. In a circular economy we keep resources in use for as long as possible, extracting the maximum value and then recover and regenerate materials at the end of the cycle. This term has emerged in recent years and has been adopted by many large manufacturing companies seeking to maximise the value from their supply and disposal chains. However it is more difficult to apply the term to economic development, which often relies on wider

[6] International Energy Agency

global trade to tackle poverty or drive efficiencies in production for some products and services.[7]

Low carbon economy

A low carbon economy is an economy which is less carbon-intensive than present models.

Our definition is:

> "An economy that produces goods and services of increasing value whilst reducing associated greenhouse gas emissions to meet UK climate change targets of reducing CO_2 emissions by 80% by 2050 based on 1990 levels"[8]

Low-carbon goods, services and skills are related to achieve this outcome and can be specialist such as wind turbine manufacture or change within mainstream processes for example a food manufacturer learning how to install solar heating.

The low carbon economy concept requires a whole economy approach to improve productivity while reducing carbon. This is often missed in government definitions which tend to focus either only on overall carbon reduction whilst neglecting economic productivity, or a specific specialist green technology sector of the economy.

SWM has focused on the term 'low carbon economy' to help sell sustainability to a manufacturing and public sector region looking to support the creation of jobs and growth.

However the low carbon economy does not explicitly cover the natural environment, social issues or adapting to future changes such as extreme weather, resource shortages and population changes.

We are aware of these shortcomings and perform boarder sustainability revisions to cover these issues.

The Green Economy

The UK Government defines the green economy as one in which value and growth are maximised across the whole economy, while natural assets are managed sustainably. Such an economy would be supported and enabled by a thriving low carbon and environmental

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[7] WRAP

[8] Based on the definition developed by SWM for 'Connecting to Success', page 89, Advantage West Midlands, 2007. The full story behind this definition and approach can be found in 'Evidence of success – developing the Uk's first low carbon regional economic strategy', Advantage West Midlands, 2009 (www.sustainabilitywestmidlands.org.uk/resources/presentations/?/Evidence%20of%20Success:%20Low%20Carbon%20Regional%20Economic%20Strategy/715)

goods and services sector. Environmental damage would be reduced, while energy security, resource efficiency and resilience to climate change would all be increased.

This definition emerged in 2011 with the publication of 'Enabling the transition to a Green economy'[9] and 'Skills for a Green Economy' which provided a restatement of existing Government research and policies for business in this area.

The term 'green economy' puts a greater emphasis on a whole economy approach, recognising the role of the specialist sectors, the natural environment, resources, and adapting to a changing climate. However similarly to the low carbon economy, this term does not include the role of the economy to support a more socially just society. In addition, this definition does not have specific targets linked to carbon reduction.

As a result SWM prefers to use the term 'low carbon economy and recognise the broader sustainability issues.

Sustainability common technical terms A-Z

Affordable Warmth Obligation

The Affordable Warmth Obligation is a means-tested scheme which provides heating and insulation improvements for low income and vulnerable households. It is one of three components in the Energy Company's Obligation (see below).[10]

Anaerobic digestion

Anaerobic digestion is the natural breakdown of organic materials into methane, carbon dioxide gas and fertiliser. This takes place naturally, or in an anaerobic digester in which bacteria act without oxygen. Biogas is produced through this process, which can be used to generate electricity.[11]

Biodegradable

The term given to a substance that is capable of being decomposed by bacteria or other living organisms, thereby avoiding pollution.[12]

Biodiversity

Biodiversity is used to describe the number, variety and variability of living organisms.[13]

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[9] Enabling the transition to a green economy – Government and Business Working Together, UK Government 2011. Also 'Skills for A Green Economy – report on the evidence', UK Government 2011 (www.bis.gov.uk/assets/biscore/further-education-skills/docs/s/11-1315-skills-for-a-green-economy.pdf)

[10] Energy Saving Trust

[11] Organic Power

[12] Oxford English Dictionary

[13] World Conservation Monitoring Centre

Bio-energy

Bio-energy is energy derived from the conversion of biomass. This may be used directly as fuel or can be processed into liquids and gases. [6]

Biomass

Biomass can come from any organic matter, including trees, food crops, algae, agricultural and forestry by-products and methane from landfill. Biomass resources provide fuels, power production and bio-products (including plastics, insulation, adhesives and fabric). [14, 6]

BREEAM rating

The environmental assessment BREEAM gives buildings a rating that shows the level of low-carbon specification, design, construction, and use. The measures used represent a broad range of categories and criteria from energy to ecology. They include aspects related to energy and water use, the internal environment (health and well-being), pollution, transport, materials, waste, ecology and management processes.[15]

Carbon equivalent (Co2e)

This is where the measurement is in the equivalent units of carbon dioxide for reporting purposes, but which cover the six greenhouse gases covered by the Kyoto Protocol which includes carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, hydrofluorocarbons, and perfluorocarbons. This is important because some Government and business support schemes in the past have focused on carbon dioxide reduction rather than Co2e which means cost effective measures around methane from waste reduction are often missed.[16]

Carbon footprint

The amount of carbon dioxide emissions associated with the daily activities of a person, organisation, or country. It is usually expressed as tonnes of CO_2 per year.[17]

Carbon management

The measurement and management of emissions of the six greenhouse gases covered by the Kyoto Protocol which includes carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, hydrofluorocarbons, and perfluorocarbons.[18]

Carbon neutral

A person, organisation, or country is described as 'carbon neutral' if the sum total of their activities do not bring about any net increase in the amount of carbon dioxide emissions. This can be achieved either by a direct reduction in emissions, or via the purchase of offsets equivalent to the carbon emissions associated with their activities.[17]

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[14] National Geographic
[15] BREEAM
[16] OECD
[17] Ebsco Host
[18] University of Cambridge

Carbon offsetting
Carbon offsetting allows individuals and companies to compensate for, or 'offset' the emissions of carbon dioxide that are caused by their own activities. A typical carbon offset transaction involves calculating carbon dioxide produced by a particular activity or operation, and then paying someone else to reduce the equivalent amount of carbon dioxide through their own activities or operations.[17]

Cavity wall insulation
In some homes the external walls are made of two layers of brick with a gap or cavity between them. Cavity wall insulation is designed to fill that gap, keeping the warmth in to save energy. The insulation can be made out of mineral wool, beans or granules, or foamed insulants.[10]

Climate adaptation
Climate adaptation involves changing our behaviour to respond to both the projected and current impacts of climate change.[19]

Climate change
Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity.[6]

Climate Change Act
The Climate Change Act became UK law in November 2008. It is a long-term, legally binding framework to tackle the causes and consequences of climate change.[18]

Climate change potential
Climate change potential concerns the changes in the global average surface-air temperature and the subsequent change of various climate parameters and their effects. Examples of these parameters include storm frequency and intensity, rainfall intensity, and the frequency of flooding.[20]

Combined heat and power
Combined heat and power (CHP) integrates the production of heat and power (electricity), in one single, highly efficient process. This involves the generation of electricity alongside the capturing of the usable heat that is produced in this process. CHP methods contrast with conventional ways of generating electricity where vast amounts of heat is wasted.[21]

Conservation
Conservation is the action of conserving a resource. In particular preserving, protecting or restoring the natural environment, and the prevention of the wasteful use of resources.[12]

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[19] Defra
[20] European Commission Joint Research Centre
[21] Combined Heat and Power Association (CHPA)

Contingency Planning
Development and maintenance of agreed procedures to prevent, reduce, control, and mitigate in the event of an emergency.[19]

Cradle-to-grave
A 'Cradle-to-grave' assessment considers environmental impacts at each stage of a product's life-cycle from extraction and processing, through each subsequent stage of the life-cycle, including manufacture, transportation, product use, recycling, and disposal.[20]

Decentralised energy
Decentralised energy is produced close to where it will be used, rather being sent through the national grid from a large plant. This local generation reduces transmission losses and lowers carbon emissions. Security of supply is increased nationally as customers do not have to share a supply or rely on the relatively fewer, large and remote power stations.[22]

Eco-efficiency
Eco-efficiency involves the joint analysis of the environmental and economic implications of a product or technology. The life-cycle of an eco-efficient product will typically involve optimal conservation of resources, minimal emission and waste generation and a low overall cost.[20]

Energy Company Obligation (ECO)
The Energy Company Obligation applies to the six biggest energy suppliers across the UK. Launched in early 2013, it gives responsibility to energy companies to make energy affordable, and reduce carbon emissions. The ECO comprises three different parts: Renewable Heat Incentive, Carbon Saving Obligation, and Carbon Saving Communities Obligation.[10]

Energy efficiency rating
An energy efficiency rating is a score given to properties based on how energy efficient they are. The rating ranges from A (very efficient) to G (inefficient). When investing in a property, it is important to realise that the lower the efficiency, the higher the associated energy costs.[10]

Environmental Impact Assessment (EIA)
A technique used for identifying the environmental effects of development projects. EIA is a legislative procedure which must be applied to certain public and private projects which are likely to have significant effects on the environment.[20]

[22] EON energy

Feed-in-Tariff

Feed-In Tariffs are payments made by the state to ordinary energy users for the renewable electricity which they generate. They provide a financial incentive for microgeneration.[23]

Fuel poverty

Any household that has to spend more than 10% of its income on fuel to maintain a satisfactory heating regime, as well as meeting other fuel needs (to include lighting and appliances, cooking and water heating), is considered to be living in fuel poverty.[24]

Green Deal

The Green Deal is a financing mechanism that lets people pay for energy efficiency improvements through savings made on their energy bills. Green Deal was launched in January 2013 and applies to both the domestic and non-domestic sector. It replaces the Carbon Emissions Reduction Target (CERT) and Community Energy Saving Programme (CESP).[10]

Green Deal Finance Company

The Green Deal Finance Company is a private-sector consortium looking to provide Green Deal finance to a wide customer base. It has submitted a business plan to the government for investment but the service has not been procured by government. Members of the Green Deal Finance Company currently include: British Gas, Carillion, Clifford Chance, E.ON, EDF Energy, Goldman Sachs, HSBC, Insta Group, Kingfisher, Linklaters, Lloyds Bank Corporate Markets, Mark Group, npower, PwC, RBC Capital Markets and SSE.[10]

Green design

Green design is a product design philosophy that treats environmental attributes as a design objective, without compromising performance, quality, functionality and the useful life of an item.[25]

Green infrastructure/Environmental infrastructure

Green Infrastructure (GI) is a strategically planned and delivered network of high quality green spaces and other environmental features including parks, open spaces, playing fields, woodlands, allotments and private gardens. GI is multifunctional resource capable of delivering a wide range of environmental and quality of life benefits for local communities.[26]

Green procurement

Green Procurement (also known as sustainable procurement) is a procurement process, which takes into account environmental elements when buying products and services. An

[23] Fit Tariffs
[24] Office for National Statistics
[25] Businessdictionary.com
[26] Natural England

effective Green Procurement should be based on a life cycle thinking or life cycle assessment.[20]

Ground source heat pump

Ground source heat pumps use buried pipes to extract heat from the ground. This heat can then be transferred for use in buildings. A ground source heat pump circulates a mixture of water and antifreeze around a loop of pipe which is buried underground. Heat from the ground is absorbed into the fluid and then passes through a heat exchanger into the heat pump. The ground stays at a fairly constant temperature under the surface, so the heat pump can be used throughout the year – even in the middle of winter.[10]

Global warming

A gradual increase in the overall temperature of the earth's atmosphere. This is generally attributed to the greenhouse effect caused by increased levels of carbon dioxide, CFCs, and other pollutants.[12]

Housing retrofit

'Retrofit' applies to any work carried out on an existing property that improves energy efficiency or reduces the 'carbon footprint'. In most circumstances, improvement work on the energy efficiency of existing buildings will be more cost effective than demolition and new build, or increasing 'green' generation capacity.

Key measures include: insulation of cavity and solid walls, lofts and floors; generation of electricity and heat through photo-voltaic arrays, solar hot water, or ground source heat pumps.[27]

Intergovernmental Panel on Climate Change (IPCC)

The Intergovernmental Panel on Climate Change (IPCC) is the leading international body for the assessment of climate change. It was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) in 1988 to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts.[28]

ISO14000

The ISO14000 family are a series of standards prepared by the International Standards Organisation (ISO), covering a number of environmental management topics. These provide practical tools for companies and organisations looking to identify and control their environmental impact and constantly improve their environmental performance. [29, 20]

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[27] Alliance Procurement
[28] IPCC
[29] International Standards Organisation

Just-in-time

Just-in-time is a demand driven system where materials, parts and support items are delivered at the time they are needed, neither sooner, nor later. This production philosophy reduces waste, and simplifies the production process.[25]

Key performance indicators (KPI)

KPIs are key business statistics which measure a firm's performance in critical areas. They show the firms progress towards meeting objectives or towards the fulfilment of strategic plans by monitoring activity.[25]

Life Cycle Assessment (LCA)

Life-cycle assessment (LCA) is a process of compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle.[20]

Low carbon procurement

Taking carbon into consideration in sourcing products and services right through to the end of the contract.[30]

Low-emission vehicles

Low emissions vehicles do not produce the vast amount of CO_2 emissions as are produced by other forms of transport. Vehicles powered by electric or hydrogen, or those which are plug-in hybrid fall under this category.[31]

Micro-generation

The term 'microgeneration' is used to refer to electricity generation equipment of the smallest capacity which covers generation of electricity up to 50kWh. These levels of generation can be achieved on domestic and small commercial premises.[32]

National Adaptation Programme (NAP)

The National Adaptation Programme (NAP) will set out how government, businesses, communities and civil society should prepare for and adapt to climate change. It is being developed in response to the UK Climate Change Risk Assessment (CCRA), which analysed the potential effects of climate change and the risks and opportunities for the UK.
The NAP involves government partnership with businesses, local authorities and community groups.[31]

Photo-voltaic panels

Photo-voltaic panels (PV), capture the sun's energy using photovoltaic cells. The cells convert the sunlight into electricity, which can be used to run household appliances and lighting.[10]

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[30] Clearaboutcarbon.com
[31] GOV.uk
[32] OFGEM

Pyrolysis
The term pyrolysis refers to decomposition brought about by high temperatures.[12]

Rainwater harvesting
Rainwater harvesting involves the collection, storage and distribution of rainwater from the roof. This can be used both inside and outside of the home or business.[33]

Renewable energy
Renewable energy is energy derived from natural sources (*e.g.* sunlight and wind) which are replenished at a faster rate than they are consumed. Solar, wind, geothermal, hydro, and some forms of biomass are common sources of renewable energy.[6]

Renewable Heat Incentive (RHI)
The Renewable Heat Incentive (RHI) is a UK Government scheme set up to encourage uptake of renewable heat technologies among householders, communities and businesses through the provision of financial incentives.[10]

Renewable resources
Renewable resources are resources that can be regenerated or replenished. Renewable resources include biomass, wind, water, solar and geothermal.[14]

Resilience
Resilience is the ability of a system to absorb disturbances while retaining the same basic structure and ways of functioning; it requires the capacity to adapt to stress and change.[19]

Resource efficiency
Resource Efficiency refers to the measures taken in the supply chain, which tackle inefficiencies such as overuse of resources and wastage in production processes. Being more resource efficient means using less to produce the same level of output.[7]

Smart meter
Smart meters are the next generation of gas and electricity meters. They collect information about energy use in the home electronically without the need to take meter readings. They measure energy use in the same way as a traditional gas or electricity meter, but also have a communication capability that allows data to be read remotely and displayed on a device inside your home, or transmitted securely externally. Smart meters can also receive information remotely from your energy supplier, such as updates on tariff information.[10]

[33] Rainharvesting.com

SME

SME stands for small and medium enterprises. The main factors determining whether a company is an SME are the number of employees, and the turnover of the business.[34]

Solar heating

Solar water heating systems use free heat from the sun to warm domestic hot water. A conventional boiler or immersion heater can be used to make the water hotter, or to provide hot water when solar energy is unavailable.[10]

Supply chain

A network of entities, directly or indirectly interlinked which serve the same end customer.[25]

Sustainable procurement

*See Green Procurement

U-value

A U-value refers to the amount of heat transference across a structure. These vaules are used as a way to quantify the amount of heat energy lost through the external fabric of a building across different materials. The lower the U-value, the higher the thermal efficiency of a material and the less heat loss there will be through the material.[35]

(Last updated July 2013)

[34] European Commission
[35] Propertysolutionsherts.co.uk