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UK experience in green growth

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Green economy, low carbon economy, green growth, circular economy. What is it?

Economic value	Environmental quality	Well-being
Resource (incl energy) security/stability	Sustainability	Quality of life
Resilience	Natural capital	Community
Efficiency	Virgin resources	Human capital
Innovation	Conservation	Poverty alleviation
Recycling / re-use	Biodiversity	Health
Waste reduction	Pollution reduction	Social inclusion
Resource efficiency	Decontamination	Empowerment
Industrial symbiosis		Job creation
Investment		
Correcting market failures		
Job creation		

Importance of competitiveness

Green innovation index	Green and uncompetitive (at risk)	Green and competitive (strategic advantage)
	Dirty and uncompetitive (very risky)	Dirty and competitive (at risk)
	Revealed comparative advantage index	

Not just about climate change.

Economic benefits of green growth

- > **Energy security** - renewables reduce dependency on increasingly expensive fossil fuel imports and give prospect of energy cost reduction (as renewables technologies advance and are more widely used).
- > **Resource efficiency and waste reduction** - reduces impacts of dependence on limited commodities (with volatile prices).
- > Earlier **mitigation is cheaper** – net cost of CO2 abatement increases over time.
- > Avoid **carbon lock-in** and stranded brown infrastructure assets.
- > **Export opportunities** in green technology. Demand for green goods and services growing faster than general economy – market valued at c£3.4 trillion in 11-12 and projected to continue growth of c4% in medium term. UK currently 6th.
- > New high quality **jobs**. In the UK the green economy supported almost 940,000 jobs in 2011/12: around 3% of all UK jobs.
- > Reduced exposure to **climate risk** and its very significant costs
- > Removing **inefficient subsidies** - fossil fuel subsidies exceed spending on health and education and are increasing.
- > Reduction in pollution.

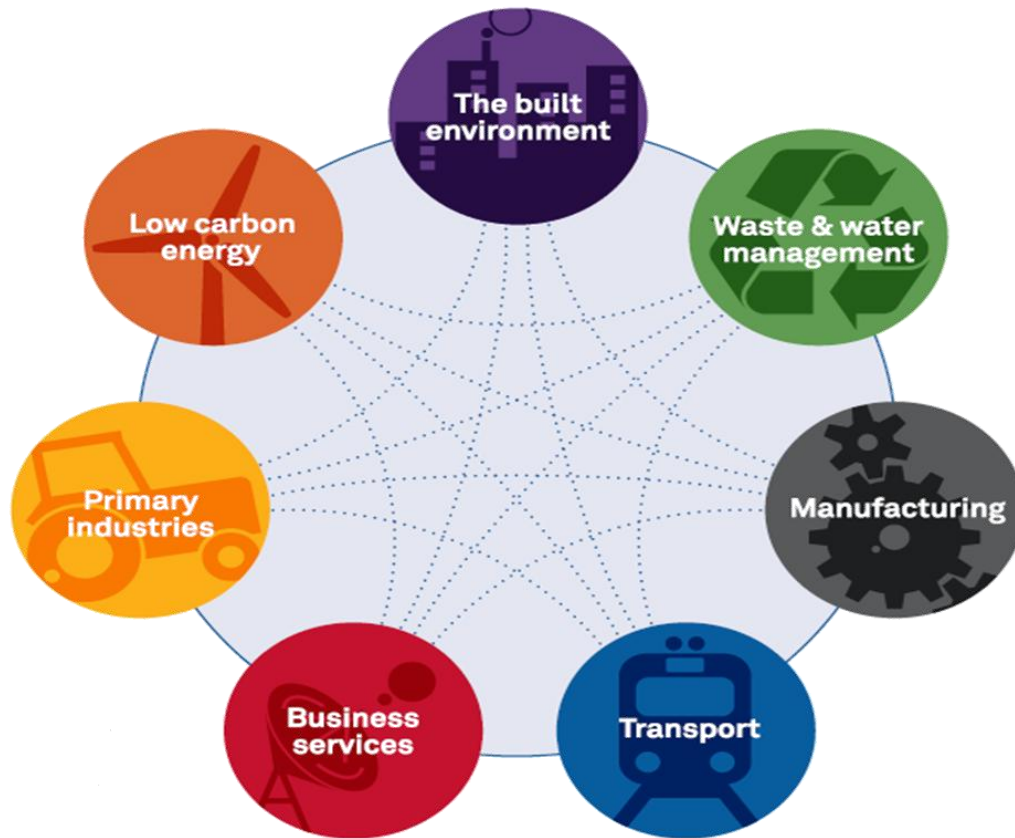
Business benefits : Sustainability is good for profits

- > **DuPont** cut costs by \$2 billion over 10 years by investing in energy efficiency equipment while reducing greenhouse gas emissions by 75 percent.
- > **Marks & Spencer** made £185m in net benefits from an integrated sustainability plan over five years, a 29% year-on-year increase in net benefit
- > **Unilever** cut more than 1 million tons of CO2 from its manufacturing and logistics operations in 5 years leading to cuts in the company's operating costs \$395 million over which the company also has grown sales by 26%.
- > **Sainsbury's** initiatives have reduced electricity use in stores by 17.3%, which has allowed Sainsbury's to increase its estate without increasing overall use of energy.
- > **Tesco's** zero carbon store costs 10–15% more to build but cut energy use by 45%, paying back the additional investment in just a few years. In 2012 the company saved £270m in avoided energy costs.

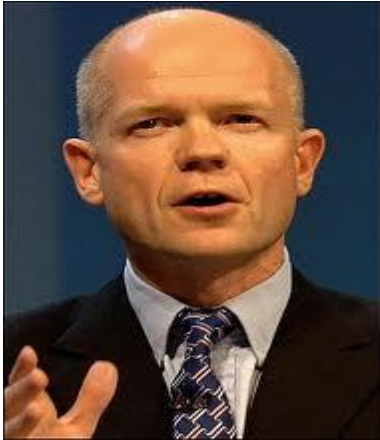
Enhancing productivity, reducing waste and increasing efficiency make obvious business sense.

The UK's Low Carbon Proposition

The UK takes a whole economy approach to low carbon goods and services:



Climate Change is a UK Foreign Policy Priority



“Climate change is perhaps the twenty first century’s biggest foreign policy challenge” William Hague, Foreign Secretary

Climate change is probably the greatest non- traditional threat that we face in the 21st century. It requires us to think and operate beyond our traditional boundaries and to bring together experts from diverse fields from policy and defence to science and development.”

UK Climate Change Act 2008

Political consensus in UK in 2008 led to passing of Climate Change Act with:

- > statutory target 80% reduction in GHG emissions (based on 1990 levels) by 2050 – enacted through series of 5 year carbon budgets.
- > **independent oversight by Committee on Climate Change (CCC)**
- > **Low-Carbon Transition Plan** (July 2009) setting out policies to cut emissions across energy, heavy industry, transport, buildings, agriculture, land use and waste management;
- > excludes aviation and shipping emissions
- > CCC also oversees **UK National Adaptation Strategy** and Plan
- > CCC reports annually on Govt performance on mitigation and adaptation plans and also produces a range of other influential commentary.

David Cameron became PM in 2010 wanting to lead ‘the greenest Government ever’.

- > In 2011 UK Government published ‘Enabling the Transition to a Green Economy’ laying out the roadmap to 2050 for Government and business working together.

Importance of EU Climate Change Programme

- > This climate and energy package is a set of binding legislation which aims to ensure the EU meets ambitious climate and energy targets for 2020.
- > These targets, known as the "**20-20-20**" targets, set three key objectives for 2020 and have a very significant impact on UK energy policies:
 - > **20% reduction in EU greenhouse gas emissions** from 1990 levels;
 - > Raising the share of EU energy consumption produced from **renewable resources to 20%**;
 - > 20% improvement in the EU's **energy efficiency**.
- > EU also has significant innovation investment funds eg Horizon 2020 to assist 'clean-tech'.
- > The **EU Emissions Trading System (EU ETS)** puts price and overall cap on GHG emissions from the EU. Businesses can trade emissions allowances and make energy efficiency savings to meet their emissions reductions targets. The EU ETS covers 1,100 large industrial emitters in the UK (approx. 46% of UK emissions).
- > Alongside the EU ETS, the UK **Carbon Price Floor** tops up the carbon price to a set level (working up to a target of £30/ tonne in 2020) to further penalise the combustion of fossil fuels for the generation of electricity.
- > Draft 2030 framework is currently under discussion which has target of 40% GHG emission reduction and EU-wide renewable target of 27%.

UK green policies – achieving the cost-effective path

Energy policy	Innovation	Finance	Business – energy efficiency	Households – energy efficiency	Waste	Transport
Renewables Obligation	Carbon Capture and Storage Commercialisation Competition	Green Investment Bank	Climate Change Levy – encourage energy efficiency	Green Deal	EU Landfill Directive	Ultra-low emission vehicle strategy
Feed in tariff for micro-generators	Technology Strategy Board	International Climate Fund	Climate Change Agreements	Energy Companies Obligation	UK Landfill Tax	Plugged-in places
Electricity Market Reform	Catapults (wind energy, transport, future cities)	Capital Markets Climate Initiative	Carbon Reduction Commitment	Renewable Heat Premium Payment	Waste Reduction Action Plan	Plug-in car and van grants
Energy Act	Energy Technology Institute	Climate Public Private Partnership	Renewable Heat Incentive	Smart meters	National Industrial Symbiosis Programme	UKH2 Mobility (Hydrogen vehicles)
	Industrial Strategies	Mandatory emission disclosure for LSE listed UK companies	Green Economy Business Advisory Council			Local sustainable transport fund

Current UK energy mix

Since 1 October 2005, UK electricity suppliers must provide customers with details of the mix of fuels used to produce the electricity supplied to them.

UK fuel mix (for comparison)

Energy source	%
Coal	38.4
Natural Gas	27.7
Nuclear	20.6
Renewables	11.3
Other	2.0

Source: DECC, 2013

Offshore Wind

- > UK is world leader in offshore wind technology and has largest offshore wind farm in world (the London Array).
- > UK is 6th largest producer of wind power.
- > Green Investment Bank has invested £1bn in offshore wind projects
- > Sector has potential to create 33,000 jobs and contribute £7bn to economy by 2020.
- > Offshore wind catapult has innovation funding of £46m.



Technology Innovation

- > £600m Government support for **8 great technologies**: Bulk Energy Storage, Big Data, Space Technology, Robotics, Synthetic Biology, Regenerative Medicine, Agri-science, and Advanced Materials and Nanotechnology.
- > **7 Catapult Technology and Innovation Centres**: Offshore Renewable Energy, Future Cities, Transport Systems, High Value Manufacturing, Cell Therapy, Satellite Applications and Connected Digital Economy.
- > Catapults help bridge gap from R&D to commercialisation.
- > All potentially relevant to smart, resource efficiency and well-being.
- > Energy sector strategies (with supply chain support) for nuclear, oil and gas and offshore wind.

Investment : Green Investment Bank

- > First of its kind in the world. Set up in 2012.
- > UK Govt funding of **£3.8bn** to invest in sustainable projects.
- > Aim to create genuine **public-private** joint investment opportunities.
- > So far have leveraged average ratio of **3 (private sector) : 1 (Govt)**.
- > Priority sectors wind energy, energy efficiency and waste reduction.
- > Most of investment to date is in large scale offshore wind.
- > The edge they offer on commercial banks is 70 technical experts who make sure the deals are well conceived and have credibility - which has then encouraged other lenders to come in.
- > Now attracting co-funding from overseas.
- > Has generated a lot of interest internationally. Some other countries are now establishing green banks.

Climate Finance

- > Levels of investment needed to meet 2 degree limit need to come from both public and private finance.
- > According to the Global Energy Assessment, global investment in **energy efficiency and low-carbon energy generation** will need to increase to between **USD 1.7–2.2 trillion pa** .
- > Governments in developed countries have committed to mobilising **\$100 billion of climate finance a year by 2020** to flow to developing countries, from both public and private sources.
- > The UK has **£3.87 billion International Climate Fund** – we are using some to mobilise and support private sector investment into low carbon projects in emerging economies.
- > Governments in developing countries also have a key role in creating markets for low carbon investment and addressing specific barriers and constraints inhibiting investment.

Sustainable Finance

- > **Carbon Disclosure.** In Oct 13 UK introduced mandatory GHG emission declaration for listed UK registered companies.
- > Shanghai Stock Exchange to sign up to Sustainable Stock Exchange Initiative and launch **carbon efficiency index** and **disclosure guidelines** for listed companies
- > Carbon Tracker Report on stranded fossil fuel assets published June 2013.
- > **UNEP 'Inquiry into the design of a sustainable finance system'** which will report in autumn. Need to move to systems where carbon risk is priced more effectively.
- > **Green Bond** market growing rapidly. Set to more than double to US\$25bn in 2014 and become much more mainstream. London as a global financial centre keen to be key player in green investment.

New economic studies

Three potentially significant projects underway:

- > **New Climate Economy / Global Commission on the Economy and Climate.** Independent international study looking at the economic costs of action, the benefits of action and the costs of inaction – takes forward the Stern Review. Particularly aimed at policy makers having to make the business case for Govt action. Report to be published Sept 14 before UNSG's Climate Summit.
- > **OECD CIRCLE** study. Looking at new economic models which better take into account natural capital and environmental services. 2-3 year study. Also relevant is OECD's new approach to mainstream more climate information into their reporting.
- > **UNEP 'Inquiry into the design of a sustainable financial system'** led by Nick Robbins, Head of Climate Centre at HSBC who is on secondment to UNEP for 18 months. Study to be published before UNFCCC Paris COP in Dec 15. Looking at 'financial rules of the game' in banking, investment, securities and insurance eg capital stewardship for high carbon energy assets and better corporate disclosure of carbon risks.

Green Trade Agreement

- > Number of countries (including China and UK – via EU) have recently agreed to work towards global free trade in environmental goods.
- > Will build on the ground-breaking APEC voluntary agreement to reduce tariffs on 54 environmental goods to below 5% by 2015.
- > Win for environment, development and trade.
- > Many countries (amounting to around 86% of trade in environmental goods) are intending to join the negotiations which may start around June.
- > We would welcome Hong Kong's participation.

UK Projects in China

- > UK is working collaboratively with Chinese Govt on a number of small projects. Examples:
- > **Shanghai Stock Exchange** - development of a **carbon efficiency index** and publishing disclosure guidelines for listed companies.
- > Development of 7 **Emission Trading Scheme pilots** – so far launched in Guangdong and Shanghai.
- > UK/Guangdong Carbon Capture Utilisation and Storage Centre.
- > UK/China **MOU on offshore wind energy**.
- > UK/China MOU for **pilot marine project demonstration** site in Zhoushan
- > Development of **public private partnerships** for investment in hospitals and infrastructure.
- > Working with China's insurance regulator to support the integration of China's **insurance market** into the international market.



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UK climate action

- > **Clean Air Act 1956** following London's Great Smog in 1952 which resulted in 4000 deaths. Led to use of smokeless fuels. First significant environmental legislation in UK.
- > Various environmental protection and pollution control legislation has followed.
- > G8 Summit in Gleneagles 2005 - UK proposed that discussions should focus on the two great challenges of the twenty-first century – fighting poverty in Africa and climate change.
- > On return to London, the Chancellor (Gordon Brown) and his Second Permanent Under Secretary (Nick Stern) asked the question: why had so much progress had been made on Africa – yet not on climate change? They observed that there was a body of analysis of evidence and policy options on Africa that was missing from the climate debate.
- > Led to historic **Stern Review 2006** - report effectively **extended the climate debate from the scientific and political arenas to the economic.**

If we fail to act, global costs of climate change could be 5% - 20% of GDP pa whereas the costs of effective international action are estimated at 1-2% of GDP.

The climate change challenge

- > 141 countries have agreed the Copenhagen Accord to combat climate change and maintain the **2 degree limit**.
- > Global temperature rise since industrial revolution is already **0.8 degrees**
- > According to IPCC, current emissions trajectory will result in global warming of around **4.5 degrees** this century.
- > In emissions terms, the 2 degree limit requires atmospheric concentration of GHG to remain below 550ppm CO₂e. (It is currently around 450ppmCO₂e.)
- > To remain below 550ppmCO₂e requires **annual global emissions to peak by 2020 at the latest**, followed by deep cuts in emissions. But if we agree global deal in 2015 it won't enter into force until 2020 so pre-2020 national measures are critical.
- > 42 industrialised countries including the UK have adopted quantified 2020 emission targets. 45 developing countries have provided details of nationally appropriate mitigation measures.

We all need to achieve a credible global climate change deal in 2015.

‘Cost-effective path’

- > CCA sets ‘cost effective path’ to 2050 through series of 5 year carbon budgets with actions to meet targets detailed in **Low Carbon Transition Plan**.
- > The UK has met its first carbon budget for 2008-2012, with a reduction of 22.5% below base level, well beyond the 12.5% required of us by the Kyoto Protocol.

Carbon Budget	Duration	Max emissions (MtCO ₂ e)	% reduction over 1990 levels	Progress
1 st	2008-12	3018	22.5%	Met
2 nd	2013-17	2782	29%	On track
3 rd	2018-22	2544	35%	On track with planned measures
4 th	2023-27	1950	50%	At risk
5 th	2028-32	To be set in 2016		

Traded sector (41%) = energy and heavy industry

Non-traded sector (59%) = everything else eg transport, agriculture, buildings

Energy Policy

- > Specialised Ministry - the Department of Energy & Climate Change (DECC) works to make sure the UK has secure, clean, affordable energy supplies and promote international action to mitigate climate change.
- > **UK energy gap.** 90mkW capacity. Normal peak 60 mkW. Due to lose 20 mkW by 2023. Thus **energy security driver** as well as climate targets.
- > 9 of the UK's fossil fuel power stations are due to close by 2015, (under European anti-pollution directives) and 9 of the UK's 10 existing nuclear power stations are scheduled to close by 2023.
- > Renewable electricity supported at large scale by the **Renewables Obligation (RO)** - requires electricity suppliers to source an annually increasing proportion of electricity from renewable sources (20.6% during the period April 2013-March 2014).
- > Also **Feed-In Tariff (FIT)** at the micro scale (below 5 MW), where producers receive payments for electricity generated from solar PV, wind, hydro, anaerobic digestion and micro-CHP which is then fed back into the grid.

Electricity Market Reform

- > Electricity Market Reform → Energy Act passed Dec 2013.
- > Aim to create market conditions to attract **£110bn of investment** . £75bn for new electricity generation capacity and £35bn for electricity transmission and distribution.
- > Creates **Contracts for Difference** - long term contracts designed to incentivise investment in low carbon electricity generation by stabilising revenues for generators at a fixed price level - the 'strike price'.
- > Below '**strike price**' - Govt makes up difference, above - business reimburses Government.
- > Also creating **capacity market** - a financial incentive to ensure that the lights stay on at times of peak demand or low supply. CM is designed to encourage investment in reliable capacity, and will be implemented if needed to ensure security of supply.
- > The existing **Renewables Obligation** will continue giving financial support to renewable energy plants for the first 20 years of operation.

Domestic incentives – green deal and smart meters

- > Innovative scheme (backed by Green Investment Bank) to supply loans for energy saving improvements in homes.
- > Householder can **get finance for an amount based on what they will be expected to save on their energy bills.**
- > Householder pays back the loan through a **charge added to their electricity bill** but the annual repayments on the loan should not be more than the savings they might make on their energy bills. So **aim is to be cost neutral for term of loan** – then benefit from savings.
- > The Green Deal stays with the property. If person moves, they no longer benefit from the improvements and therefore stop paying for them. But the new owner takes on the deal for the remainder of the term.
- > Energy companies have started installing **smart meters** in homes across Great Britain - most homes should have one by 2020.
- > A smart meter sends an electronic meter reading to the energy supplier, but also enables the customer to see their consumption very clearly in terms of actual cost.
- > **So they learn what uses lots of electricity and can change.**

Reducing waste

- > UK aims to move towards a '**zero waste economy**' where resources are fully valued, financially and environmentally. We reduce, reuse and recycle all we can, and throw things away only as a last resort.
- > **EU regulations** require some businesses to ensure that a proportion of what they sell is recovered and recycled. Covers packaging, electrical goods, batteries and vehicles.
- > Government have also worked with businesses to develop new **voluntary responsibility deals**. This means businesses take responsibility for ensuring that a proportion of the goods they produce are recycled, and for reducing waste.
- > **WRAP** has been very successful in cutting food waste and encouraging high levels of recycling.
- > Landfill tax (expensive) was a prime incentive for change.
- > **National Industrial Symbiosis Programme** has been running for 10 years encouraging businesses to use each others' waste. Scheme pays for itself – success record is high. (Early precursor to circular economy). We have been trialling NISP with Chinese Government in Jiangsu Province.

Transport

- > Our vision is that by 2050 almost every car and van in the UK will be an **ultra low emission vehicle (ULEV)**, with the UK at the forefront of their design, development and manufacture, making us one of the most attractive locations for ULEV-related inward investment in the world.
- > Accompanied by a **funding commitment of over £500 million of new capital investment between 2015 and 2020** to continue to establish the UK as a premier market for ULEVs.
- > Strategy focuses mainly on cars and vans as they present the biggest opportunity for the early adoption of ULEVs.
- > The **Office for Low Emission Vehicles (OLEV)** has been established as a cross Government, industry-endorsed, team combining policy and funding streams to simplify policy development and delivery for ultra low emission vehicles.