

Future low carbon investment in the UK

Priorities for the government's climate strategy



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Introduction

The UK has a well deserved reputation as a climate leader, showing ambition with its climate goals and legislation, and having notable successes in global low carbon markets.

The present government has taken important steps to maintain this leadership and, in 2017, it will publish two major long term plans on the future of low carbon policy and investment: a carbon plan and an industrial strategy.

This will be an opportunity to set the trajectory of the UK's future low carbon investment. By combining the right policy and fiscal stimulus, the UK could host world class, first of a kind low carbon infrastructure projects which have minimal impact on the natural environment. Such projects would boost jobs and grow UK competitiveness and expertise in low carbon technology, infrastructure and finance which can then be exported to a rapidly decarbonising world.

To achieve this, the government will need to be bold. Its policies, plans and funding will have to match its ambitions. Crucially, its carbon plan and industrial strategy must be integrated, to provide the policy direction and industry support needed to make its aspirations a reality.

As a priority, the government must:

1 Stay ambitious on low carbon power

2 Rethink low carbon heat policy

3 Create a market for innovation in low carbon transport

World leading ambition and strengths

The UK has a strong tradition of global climate leadership:

- It was the first country to set a legally binding goal for reducing greenhouse gas emissions.
- In November 2015 it became the first major economy to set a date to phase out unabated coal.
- It was the first country in the world to establish an investment bank dedicated to the green economy.

The present government has continued this ambition:

- It has approved the fifth carbon budget (for 2027-32).
- The prime minister has announced that the UK will ratify the Paris climate agreement by the end of 2016.

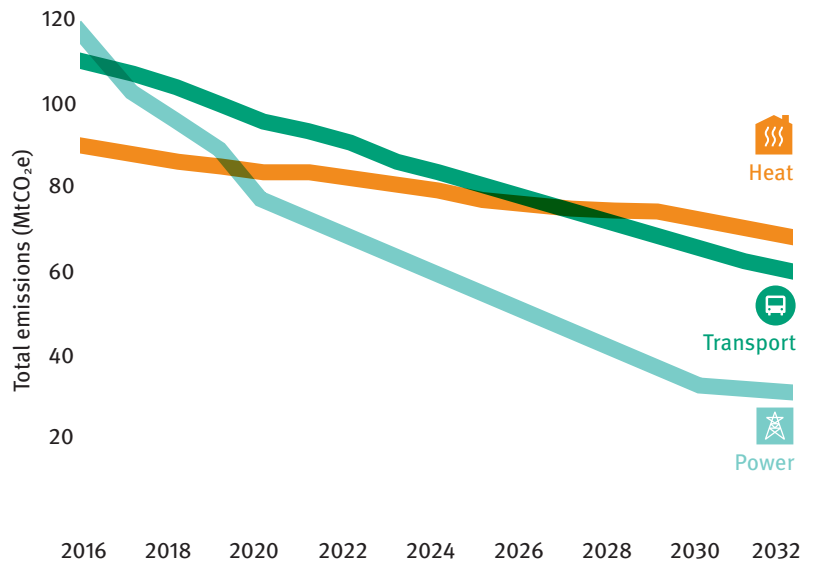
As a result, the UK has developed strengths and opportunities at home and abroad:

- The UK is a key business partner in building low carbon infrastructure abroad. For example, a trade deal with China in 2015 included £2 billion to build emission free buses, and a similar deal with India included £1.2 billion for clean power telecom towers.¹
- A third of new clean energy projects worldwide, from 2007 to 2012, had legal and financial advice from the UK.²

What is the goal?

In July 2016, the UK government approved the fifth carbon budget. This set the UK on a trajectory to reduce its carbon emissions by at least 57 per cent by 2032, compared to 1990 levels, across the whole economy, including rapid progress in the power, heat, transport and industrial sectors. The graph below shows current emissions levels for the power, heat and transport sectors and each sector's most cost effective reduction rate to 2032.

Emission reduction targets³



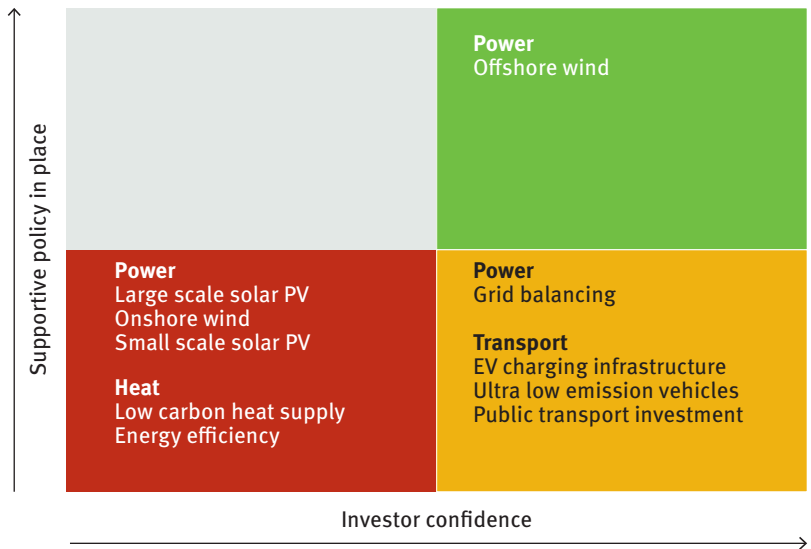
Where are we now?

Government policies kept the UK on track to meet its carbon budgets and attract investment up to 2015. Its focus was on securing low carbon power, and this resulted in strong policy, particularly on offshore wind, leading to significant emissions reductions.⁴

However, policies planned for the future are mixed, with significant gaps in key sectors. In particular, the government's efforts to target low carbon heat and transport investment have been limited. Recently, the UK has slipped behind on power sector investment as well. Failing to fill these policy gaps will lead to dwindling investor confidence and hinder growth in the UK's low carbon sector.

Where are the policy gaps?⁶

In May 2016, the UK fell from 11th to 13th place in the EY renewable energy attractiveness index, below developing countries like Mexico and South Africa.⁵





Low carbon power progress so far Good, but a mixed future⁷

Low carbon option	Policy up to:		
	2015	2020	2030
Onshore wind and large scale solar PV (mature renewables)	Renewables Obligation (closed April 2016)	No planned auctions for mature renewables under contracts for difference (CfDs)	No planned auctions for mature renewables under CfDs
Small scale renewables	Feed-in tariff (FIT)	FIT to close April 2019 under current proposals	Unclear route to market for small scale renewables
Carbon capture and storage (CCS)	CCS demonstration programme	Cancellation of commercialisation programme	Cancellation of commercialisation programme
Offshore wind	Renewables Obligation (closed April 2016)	CfD funding for emerging technologies to mid-2020s	Uncertainty from mid-2020s

Investment in new renewables is projected to peak at £7.7 billion in 2017-18. However, without clear government policy from the end of the decade onwards it is anticipated it will drop by 96 per cent to below £0.3 billion by 2020-21.¹²

Renewables have become a core part of the power system, generating a quarter of the UK's electricity in 2015.⁸

Supportive policies up to 2015 contributed to the development of a thriving industry, with the UK taking the global lead in offshore wind power, and the costs of onshore wind falling so far that new projects are now cheaper than new gas plants.⁹

The offshore wind sector received a boost in the March 2016 budget, when the then-chancellor pledged £730 million in government support for new offshore wind for the early 2020s.¹⁰

Policy on electricity grid balancing services is also evolving to take advantage of rapid advances in the development of smart technologies, batteries, demand side response software and business models.¹¹

However, a raft of policy changes in 2015, many unexpected, shook the small scale renewable and onshore wind industries. Reductions to feed-in tariffs for renewable energy, a local veto on planning consent for onshore wind turbines and the decision to make renewable generators pay the Climate Change Levy all had a negative impact on investor confidence and jobs. This has led to a policy gap from the end of the decade.



Low carbon heat progress so far

False starts and future uncertainty

Low carbon option	Policy up to:		
	2015	2020	2030
Residential energy efficiency, able to pay (insulation)	Green Deal closed	No policy	No policy
Residential energy efficiency, low income (insulation)	Energy Company Obligation (ECO – phase 1 2013-2015)	ECO phase 2 2015-2017; reduced funding from 2017	ECO replacement to end 2022
Building scale low carbon heat supply in existing properties (heat pumps)	Renewable heat incentive (RHI) just sufficient to meet requirements	RHI just sufficient to meet requirements	RHI only committed until 2020-21
Building scale low carbon heat supply in new build	Zero Carbon Homes	Zero Carbon Homes discontinued	No policy
Heat networks	Feasibility studies	£320m capital funding	Funding scheme ends 2021
Hydrogen grid	No policy	Small scale feasibility studies	No policy
Private rented sector (commercial and domestic)	No policy	Minimum energy efficiency standard (EPC E) from 2018	Minimum energy efficiency standard (EPC E)

Total investment in domestic energy efficiency has declined by more than half since its high point in 2012, from £1.5 billion to £0.7 billion in 2015. The number of energy efficiency measures installed in homes correspondingly fell 80 per cent between 2012 and 2015.¹⁴

Progress on heat has lagged behind that of low carbon power.

Policies to boost heat efficiency through insulation and boiler replacements have resulted in gradual improvements. But stop-start government policy, including changes to the Energy Company Obligation and Zero Carbon Homes, combined with the poor uptake of the Green Deal, has dampened investor confidence. Action has stalled in recent years, leaving significant policy gaps. Consequently, fossil-fuel based heating systems are still being installed in new builds, preventing a decrease in emissions over the longer term.¹³

Policy to drive investment in low carbon heat supply shows potential but is at a very early stage. For instance, uptake of the Renewable Heat Incentive has slowed and a lack of government focus has reduced investor certainty.



Low carbon transport progress so far

Technology is overtaking policy

Low carbon option	Policy up to:		
	2015	2020	2030
Ultra-low emission vehicles (electric and hydrogen vehicles)	Plug in car grant scheme; no regulatory driver	Reduced grants; no regulatory driver	No funding or regulatory driver beyond 2018
Electric vehicle charging infrastructure	Grant scheme for charge points; no roll-out plan	Funding for charging infrastructure 2015-2020; no roll-out plan	No funding or roll-out plan beyond 2020
CO2 emission standards for cars and vans	Targets and fiscal incentives in place	Vehicle Excise Duty reformed to favour diesel vehicles	No targets beyond 2020

The automotive industry has called on the government to invest in infrastructure and the skill base for electric vehicles, to secure the £51 billion a year boost it could give the economy by 2030, as well as its position in the global market.¹⁷

The deployment of ultra-low emission vehicles (ULEVs) is on the cusp of a step change.

The 65 per cent decrease in battery costs since 2010 and commitments by leading manufacturers, such as Nissan and Tesla, to accelerate uptake with more affordable and longer range electric vehicle models, are driving new markets and investment.¹⁵

Government policy to support ULEV uptake and invest in charging infrastructure has helped the early development of this market, but policy certainty wanes significantly past the late 2010s. To ensure the UK does not fall behind in the global race to be the market leader, action will need to ramp up swiftly.

Public transport investment is a mixed picture. Significant investments in major infrastructure projects, such as Crossrail in London, are boosting public transport capacity. However, investment in other areas is falling.¹⁶

How do we continue the success?

Attracting investment and making it happen

In the following pages we set out priorities for the carbon plan and industrial strategy that would attract long term investment and fiscal stimulus.

We outline the action needed in this parliament to make it happen, along with examples of the potential opportunities and the world class projects the UK has to offer.





The future of low carbon power

Stay ambitious

The opportunity

Investment: Clearer policy on renewables could mobilise nearly £47 billion of investment from 2021 to 2026.¹⁸

Exports: Investing in infrastructure builds expertise in key sectors, paving the way for British technologies and knowledge to be exported to the rest of the world.¹⁹ For example, a recent memorandum of understanding signed by the UK and Kenyan governments, focused on strategic renewable projects in Kenya, will promote opportunities for private sector trade and investment by the UK.²⁰

Jobs: In 2014, the renewable industry employed an estimated 238,500 people.²¹

A subsidy free future: Continued policy certainty would mean that the Levy Control Framework (LCF), via which the government supports renewables, can be two thirds smaller beyond 2020, and would allow more expensive renewables to be completely subsidy free by 2025.²²

World class projects are within reach

Dogger Bank offshore wind farm

The east coast of England already supports some of the best offshore wind resources in the world. Seventy per cent of Europe's offshore wind capacity is installed in the region.²³

The proposed project at Dogger Bank would mean up to 800 new wind turbines. These would generate 4.8 GW of power, enough to supply more than four million homes, provide investment opportunities, estimated between £6 billion and £8 billion, and create up to 5,000 direct and indirect jobs.^{24,25}

Strategic siting of wind farms is necessary for minimal impact on nature and to avoid conflicts that slow down development.

The world's biggest urban solar farm

Of the 3.4 million buildings in London, less than one per cent use solar.²⁶ By taking advantage of the city's underutilised rooftops, the capital could become the world's largest urban solar farm.

Installing solar on the available 147 million square metres of London's rooftops could generate 23 per cent of London's power and support an estimated 6,400 full time jobs a year until 2030.^{27, 28}

Green Alliance analysis shows the least cost route to meeting carbon targets during the early 2020s is to deploy around 2GW of offshore wind per year, 0.5GW of onshore wind or equivalent in large scale solar per year, and energy saving measures of 0.3GW per year.²⁹

What's needed for long term investment?

The carbon plan and industrial strategy need to provide continued policy certainty into the 2020s and 2030s, to enable emerging and mature renewable technologies and markets to flourish. The government should:

- Continue funding under the LCF to at least 2025 and clarify the expected level of funding allocated to mature, emerging and small scale generation technologies.
- Set out the timings and amount of funding for contract for difference (CfD) auctions, which allocate funding for renewables under the LCF, at least three years in advance. This would enable developers to optimise supply chains and reduce costs.
- Produce a clear plan for supporting the deployment of small scale renewables, including the role of emerging storage and smart technologies.

Making it possible in this parliament

HM Treasury (HMT) Allocate £2 billion for low carbon power through the LCF in the 2016 Autumn Statement, for post 2020 funding.

Department for Business, Energy and Industrial Strategy (BEIS) Push down the cost of renewables by setting out a programme for a series of competitive CfD auctions to allocate the LCF funding to emerging and mature technologies from 2016 to 2020.



The future of low carbon heat

Time for a rethink

The opportunity

Fuel poverty: Retrofitting and developing new buildings to be heat efficient will significantly improve the UK's building stock, result in £8.6 billion in energy bill savings per year during the 2020s and help to bring 4.5 million homes out of fuel poverty.³⁰

Health: Warmer homes will cut illnesses caused by cold, inefficient homes. These cost the NHS about £1.3 billion per year and contribute to 44,000 excess winter deaths annually.³¹

Jobs: With long term policy commitments to boost investor confidence, the energy efficiency industry could deliver up to 108,000 jobs per year during the 2020s, across every UK region.³²

Energy security: Home energy improvements make our energy supply more secure, by reducing reliance on fossil fuel imports and lowering demand for energy at peak times.³³

World class programmes are within reach

National insulation infrastructure for fuel poor homes³⁴

The Association for the Conservation of Energy has proposed a national infrastructure scheme to set mandatory energy efficiency targets for residential buildings, increase access to finance and deploy more insulation measures.

Bringing properties up to minimum standards would unlock around £73 billion of investment and support an estimated 86,000 jobs a year.

The work is expected to add £31.4 billion to GDP, with an extra £6.7 billion a year saved on reduced gas imports. These measures would provide an extra £17.5 billion revenue to the government.

A pilot hydrogen network in Leeds

Thirty per cent of the UK's carbon emissions come from use of the gas network for heating and cooking. Converting the existing natural gas network in Leeds to 100 per cent hydrogen, combined with carbon capture and storage, could reduce emissions by over 70 per cent.³⁵

This project has been scoped and neighbourhood trials are possible soon. To convert the grid and appliances would require an investment of £2 billion. Early neighbourhood scale trials, covering 8,000 customers, provides investment opportunities of between £60 million and £80 million.³⁶

What's needed for long term investment?

It is time to rethink the UK's low carbon heat policy. A clear policy trajectory is needed to instil confidence in the market to invest in heat efficiency and low carbon heat supply solutions. This will need to include:

- Ratcheting energy performance standards for new and existing domestic and commercial buildings to 2030.
- Guidance and support to test which low carbon heat supply solutions are most appropriate in different areas of the UK.
- Measures to make the transition from subsidy based heat efficiency programmes to a market for low carbon heat saving.

Making it possible in this parliament

BEIS Test new market approaches to energy efficiency, such as payment for performance models. These would allow energy services companies to deliver measures, such as home insulation, and maximise the use of smart technologies and data analytics to measure and reward heat savings.

HMT and BEIS Allocate funding to scale up strategic low carbon heat technologies in different locations. Local large scale pilots to test technologies, including hydrogen networks, heat networks and heat pumps, would provide lessons that could be translated into policy at the national level.

Department for Communities and Local Government

Empower local authorities and new city regions to raise building standards for energy efficiency and low carbon energy supply, where there are commercial and local benefits.



The future of low carbon transport

Create a market for innovation

The opportunity

Investment: The investment opportunity in both public and private electric vehicle charging points is estimated to be £18 billion by 2030.³⁷

Jobs: The overall economic and social benefits of electric, connected and autonomous vehicles could be in the region of £51 billion per year by 2030, with the potential for the creation of 320,000 industrial jobs.³⁸

Health: Reducing nitrogen oxide and particulate emissions from vehicles in urban areas, by introducing ultra-low emission vehicles and encouraging walking and cycling, would help to reduce respiratory and heart conditions significantly, and help to reduce the 40,000 premature deaths per year caused by poor air quality.³⁹

World class projects are within reach

A nationwide public charging network for electric vehicles

By 2030, it is predicted there will be more than five million electric and low emission vehicles on Britain's roads. A nationwide scheme, with public and private investment, would support the roll-out of a public network in cities and towns across the UK.⁴⁰

A consistent scheme, available to all, with charging points along major interconnecting routes, would open up investment opportunities of £300-£530 million for 2,200 charging sites, the equivalent to a quarter of the current number of petrol stations in the UK.⁴¹

What's needed for long term investment?

Policy certainty past the late 2010s would increase the confidence of investors and give a boost to the low carbon automotive sector in the UK. It will need to support a market for innovation and keep up with the rapid improvements in low emission vehicle deployment, as well as expanding low carbon public transport schemes. Commitments and support should include:

- Ensuring that all new cars sold are ultra-low emission by 2030 at the latest.
- Phasing out the most polluting cars, buses, vans, HGVs and other vehicles, through road pricing, low emission zones and tax signals.
- Setting out interim standards to improve vehicle efficiency during the 2020s.
- Developing a nationwide network of publicly accessible low carbon charging points, using public and private capital investment.

Making it possible in this parliament

Department for Transport and HMT Continue support for the purchase of ultra-low emission vehicles by confirming supportive grants after 2018.

HMT and BEIS Ensure that small scale local transport infrastructure projects are supported in the Autumn Statement, alongside larger schemes. Schemes to prioritise include local road maintenance, the expansion of hybrid and electric bus routes, reopening train stations and lines, and walking and cycling schemes.

Conclusion

Integrating the carbon plan and industrial strategy can unlock investment in the power, heat and transport sectors into the 2020s.

Public investment in such projects brings significant benefits to the UK. Alongside attracting private investment, low carbon projects generate jobs, improve health and increase the competitiveness needed to export the UK's skills and knowledge to global markets.

The government can address current policy gaps with supportive spending and policy decisions in this parliament that set a clear direction for the future.

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