



Northern Ireland
Executive

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THE PATH TO NET ZERO ENERGY

**SECURE.
AFFORDABLE.
CLEAN.**



DECEMBER 2021

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Ensuring our energy is **secure, affordable** and **clean** for us now and future generations.



Ministerial Foreword

I am delighted to bring forward this Energy Strategy – The Path to Net Zero Energy - on behalf of the Executive. It aims to ensure that our energy is secure, affordable and clean for us now and future generations.

Affordability is front and centre of this strategy. Rising energy bills, driven by our continued reliance on fossil fuels, will have a devastating impact on the affordability of energy for consumers. This Energy Strategy will see us reduce the energy we use by investing in energy efficiency and take advantage of our natural resources to generate clean energy. Our overall goal is to achieve net zero carbon and affordable energy for all, which will end the price volatility associated with fossil fuels and ensure that more of the money we spend on energy stays in the local economy and helps to create jobs and wealth.



This strategy covers almost 60% of our total emissions and forms an important part of Northern Ireland's overall plan to addressing climate change – the Green Growth Strategy. It provides an ambitious pathway to decarbonising energy, demanding change and innovation whilst creating substantial opportunities – building on our unique strengths – for people and businesses to participate in and benefit from a low carbon economy.

Just as our 10X Economic Vision sets out our ambition to place Northern Ireland amongst the elite small open economies in the world, this plan is similarly bold. Decarbonising energy means achieving so much more than carbon reductions. We can continue to be world leaders in integrating renewable electricity generation and we can become world leaders in the new hydrogen economy. We can do all this by communicating and working with people along the way to enable these changes, whilst supporting those who need our help the most. Undoubtedly, the strategy will bring significant changes to the way everyone lives their lives, but together we can build a healthier economy and society.

The Energy Strategy represents almost two years of collaborative working across the Executive and has involved extensive engagement and consultation with many stakeholders including directly with consumers. Proposals put forward in the Options Consultation in March 2021 received overwhelming support and form the basis of the plans outlined here. This strategy has been developed by working together, and its success will rely on continued collaboration and communication.

This strategy is the beginning of our work here. It will be followed by a range of further proposals and consultations on the detail of new policies. This will be a living and breathing strategy that is regularly monitored and updated. We recognise that we simply do not have time to wait to address every uncertainty before taking action and will remain flexible to adapt to changing circumstances. We will also need the collective maturity to accept that the actions we take may sometimes be blunt or imperfect. But the cost of inactivity, for us today and for future generations, is substantially higher than any policy decision that we may take.

We understand the vital need for strategic and sometimes difficult budget decisions in the coming years but recognise that delayed action will only cost more and make it harder to achieve our vision. Addressing this generational challenge cannot be business as usual and we will not achieve it without significant investment starting right now and continuing over the next three decades.

Our vision and the direction of travel is clear. However, there are still questions and uncertainties that neither we, nor others, yet have the answers to. We will need new technologies to be much more readily available and cost effective than at present. We will need to ensure we meet the investment required in a way that minimises impacts on your energy bills and delivers the most benefit to people and businesses. And we are committed to ensuring that everyone is able to adapt to the significant changes this strategy will have on our lives.

Achieving our vision will require substantial changes to our energy system, economy and society. This is not something that can be achieved by government and the energy industry alone. We need every person and business to play their role and we are committed to continuing our collaborative approach. A major work programme is already underway to progress supporting policies and interventions and we welcome your ongoing input as we shape the detail of these.

I would like to thank all who have contributed to and supported the development of this Energy Strategy so far.



Gordon Lyons MLA
Minister for the Economy

Endorsements



Expert Panel on the Future of Energy (Laura Sandys CBE, John Fitzgerald, David Green OBE, Paul Allen B.Eng (Hons) FRSA, Jillian Anable)

The Expert Panel endorses this new Energy Strategy to address the Climate Emergency. It sets out an ambitious and evidence-driven pathway to reduce carbon emissions from energy, putting people at the heart of the transition and delivering more affordable energy, a better society and capturing the opportunities of a green economy. We believe it shows strong leadership and look forward to its delivery and implementation across Northern Ireland. ””



Steven Agnew, Head of RenewableNI

RenewableNI fully supports this strategy's ambition to deliver wholly decarbonised electricity as a core enabler of a net zero carbon and affordable energy system. Our members are committed to building on the renewable electricity successes of the last decade and surpassing targets in this strategy. ””



Noyona Chundur, Chief Executive, Consumer Council of Northern Ireland

The Consumer Council believes that achieving net zero emissions from energy is essential for long term consumer protection. We support the Executive's new Energy Strategy and are committed to working in partnership to deliver it, and the consumer education, support and empowerment needed to help our citizens through their changing energy future. ””



John French, Chief Executive of the Utility Regulator

This strategy provides a real opportunity for Northern Ireland to contribute to the decarbonisation agenda goals whilst ensuring energy bills are affordable for everyone. This will require a revolution in how we use and generate energy. As energy regulator, the Utility Regulator will work with government and industry, to help consumers make the changes needed and ensure the transition to net zero is affordable, fair and inclusive for all. ””



Pat Austin, Director, National Energy Action

We support this new Energy Strategy and we hope that it will be the catalyst for change, ending fuel poverty and shaping a more equitable energy future in Northern Ireland. ””



Northern Ireland Business Alliance (Angela McGowan - CBI, Ann McGregor - NI Chamber of Commerce, Kirsty McManus - IoD, Bob Barbour - Centre for Competitiveness)

Businesses across Northern Ireland are already embracing low carbon opportunities and will have a significant role in maximising new greener technologies, placing us at the very heart of global change. We welcome the Executive taking a strong lead on this Energy Strategy. This is just the beginning, but we are fully prepared to play our part in taking forward its ambitious vision. ””

Executive Summary

Our Vision

Energy must be affordable for consumers. Despite the success we have had at using our world-leading wind resource to generate renewable electricity, our continued reliance on fossil fuels across heat, power and transport brings with it substantial price volatility. When global prices rise, our energy bills increase and this money is lost to the local economy. We want to reduce our reliance on fossil fuels and become more self-sufficient, strengthening our energy security.

This Path to Net Zero Energy is the Energy Strategy for Northern Ireland. We have set a long-term vision of **net zero carbon and affordable energy** for Northern Ireland. This will lead to the highest levels of energy efficiency, thus reducing the amount of energy we need, whilst making sure the energy we do use comes from clean renewable sources. At this point, we are setting two targets to drive these changes:

1. **Energy Efficiency:** Deliver energy savings of 25% from buildings and industry by 2030; and
2. **Renewables:** Meet at least 70% of electricity consumption from a diverse mix of renewable sources by 2030.

This Energy Strategy is also about growing our economy and supporting the 10X Economic Vision. Our investments in clean energy can deliver substantial economic benefits, attracting investment to Northern Ireland and positioning our companies to compete for the global investment being made in low carbon energy technologies. We have therefore set a further economic target to:

3. **Green Economy:** Double the size of our low carbon and renewable energy economy to a turnover of more than £2 billion by 2030.

Energy accounts for almost 60% of Northern Ireland's greenhouse gas emissions. The Energy Strategy sets out a pathway for energy to 2030 that will mobilise the skills, technologies and behaviours needed to take us towards our vision of net zero carbon and affordable energy by 2050. In doing so we will make a major contribution to the Climate Change Committee's (CCC) pathway to net zero carbon by 2050 and the Northern Ireland Green Growth Strategy.

We are now over the half-way point on a 60 year journey from 1990 to 2050 and yet only 25% of energy-related emissions have been tackled. This demonstrates the scale and pace of action that will be required. We aim to reduce energy-related emissions by 56% by 2030 relative to 1990 levels in line with the Climate Change Committee's (CCC) Carbon Budget.

Our Strategy

The Energy Strategy is centred around delivering on five key principles:



Placing you at the heart of our energy future: We will make energy as simple as possible for everyone in society and develop policies that enable and protect consumers through the energy transition. Affordability and fairness will be key considerations in all our policy decisions.



Grow the green economy: We will create new jobs and grow a skills base for the low carbon economy through innovation, support and focusing on our competitive strengths.



Do more with less: We will set clear targets, standards and regulations that drive improvements in energy efficiency, provide support to invest in improvements to buildings and help consumers make changes that reduce their energy use.



Replace fossil fuels with renewable energy: We will phase out fossil fuels by growing our indigenous renewable base, supported by sustainable renewable imports and use these to decarbonise power, heat and transport.



Create a flexible, resilient and integrated energy system: We will create a flexible, smart and digitised energy system that integrates renewables across heat, power and transport, creates value for consumers and enhances security of supply.

Delivering on these principles will require wide-ranging changes to our energy landscape. The Energy Strategy puts forward a roadmap for 21 key supporting policies and enablers that, when developed further, will transform the energy landscape in Northern Ireland. More detail on both our strategic framework and policy roadmap are provided in this document.

The initial investment required to deliver on our objectives is substantial but this will deliver substantial savings that the CCC advises will lead to a cheaper energy system overall. Taking into account these savings, the net cost of meeting our 2050 objectives is small – estimated to be less than 1% of the costs that are associated with maintaining our current fossil-fuel based system. Nonetheless, difficult decisions will need to be made on how costs are distributed to ensure affordability for consumers.

By implementing this Path to Net Zero Energy, energy in Northern Ireland will have changed considerably by 2030. Carbon emissions will have reduced significantly through energy efficiency measures, consumer engagement, changed transport patterns and a system that delivers a much greater proportion of our energy from renewable and lower carbon sources.

Greater uncertainty lies beyond 2030 and we present two illustrative scenarios to demonstrate potential futures – one driven primarily by electrification and another with a more diverse range of solutions. These are not attempts to set policy intent or predict the future, but to explore potential energy pathways. Our focus in the coming years will be to ensure that we act swiftly to reduce energy-related emissions while retaining the flexibility to adapt and respond to new circumstances and evidence.

Our Commitment to Delivery

This strategy has been developed with very significant collaboration and engagement across government, industry, domestic and business energy consumers. We are committed to continuing this engagement. We will focus on affordability for consumers and we will continue to develop the frameworks to support and protect them through this energy transition.

The 10X Economic Vision targets a decade of innovation, and the Energy Strategy will support this by driving a decade of delivery. It will develop our low carbon technology cluster and support businesses to become more sustainable as part of an economy that is greener, more sustainable and ten times better. We can drive success and inclusion while also achieving a fairer distribution of opportunities for people to participate in and benefit from low carbon growth.

While this strategy sets out the direction of travel to reach net zero carbon energy, we will bring forward more detailed policy proposals in a number of areas that will be accompanied by the required assessments and subject to consultation and engagement in their own right. A targeted action plan, outlining initial priorities for the year ahead, will be published shortly after this strategy.

We will provide the necessary leadership and coordination across all levels of government. Key to our success will be the establishment of a “one stop shop” to act as the focal point for all consumers during this journey. We will identify where new energy legislation is required and develop the mandate for the Utility Regulator and others as needed to support this. We also commit to an on-going energy evidence programme to support and inform all aspects of this strategy.

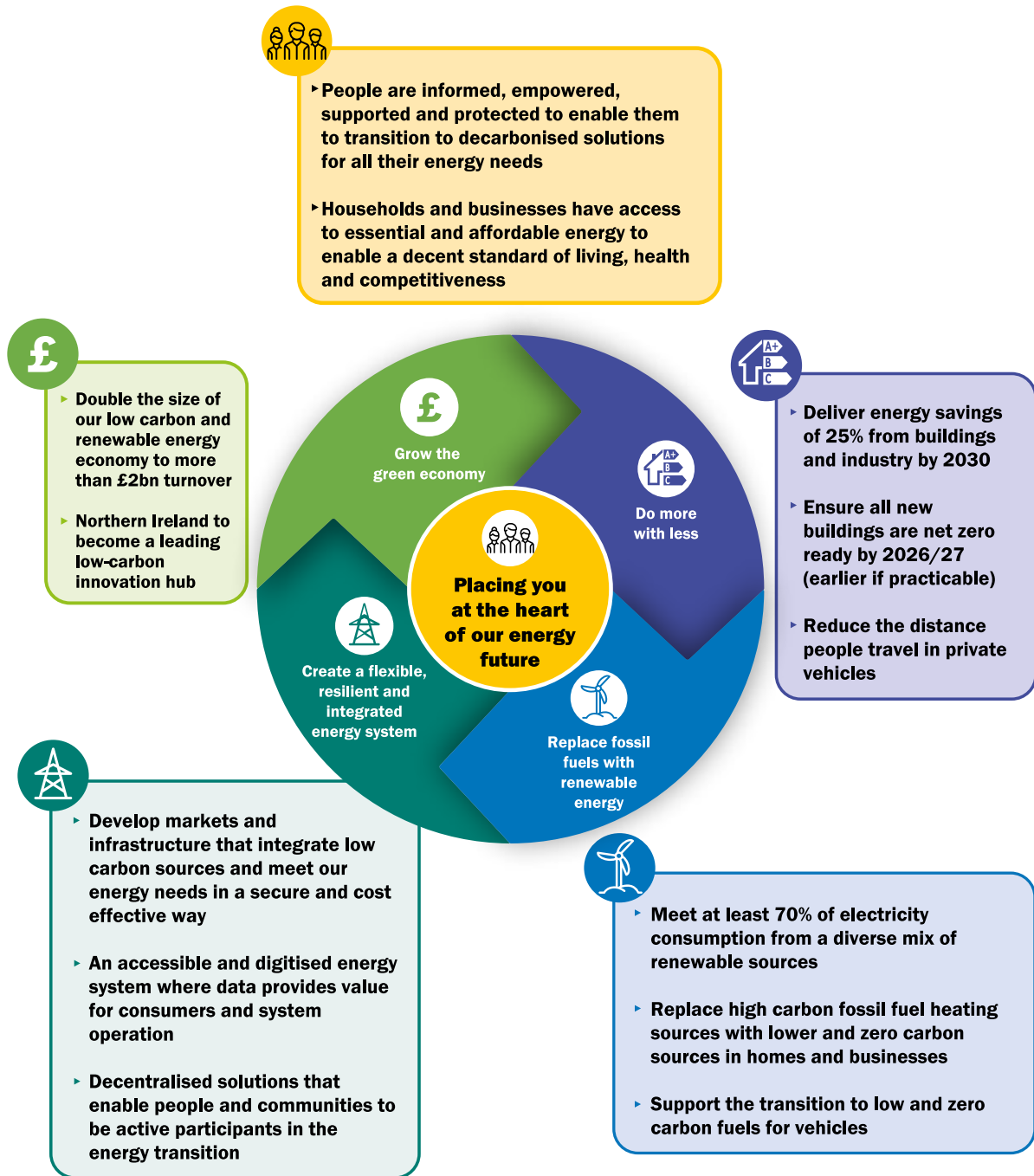
We will monitor and report on this strategy on an annual basis. The first progress report will cover the period ending March 2023 and will be updated each year thereafter. A major strategic update review will also take place every five years, with the first in 2025, with targets being reviewed and updated as necessary.

ENERGY STRATEGY FRAMEWORK

OUR VISION Net zero carbon and affordable energy

Draft Programme for Government Outcomes

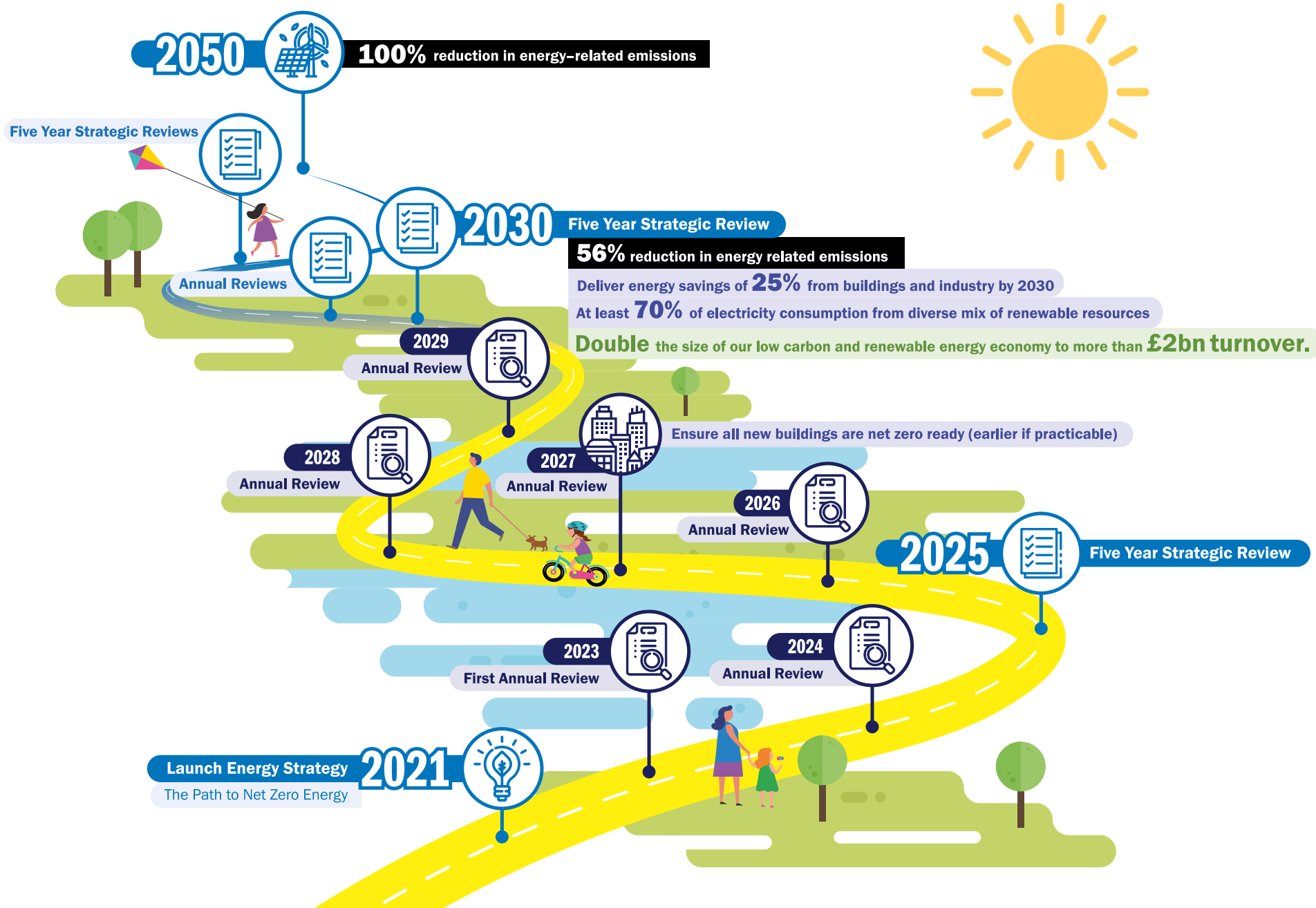
We live and work sustainably – protecting the environment
Our economy is regionally-balanced, globally competitive and carbon neutral
We all enjoy long, active, healthy lives



Indicators We Will Use to Monitor Progress

- Energy-related greenhouse gas emissions
- Household energy expenditure relative to all expenditure
- Households in fuel poverty
- Business energy purchases relative to turnover

ENERGY STRATEGY MILESTONES



POLICY FRAMEWORK



Placing You at the Heart of our Energy Future

- Run information and awareness campaigns on energy decarbonisation
- Establish a one stop shop to deliver trusted information advice and support to consumers
- Ensure robust protection and redress measures are in place for energy consumers
- Implement a new support framework for energy affordability



Grow the Green Economy

- Create a hydrogen centre of excellence in research and innovation
- Identify and address key skills needs for the low carbon and renewable energy sector
- Invest in green innovation and low carbon technologies



Do More with Less

- Introduce minimum standards for the energy efficiency of buildings
- Substantially increase funding and support for retrofitting buildings
- Uplift building regulations for new buildings
- Develop and deliver a Local Transport Strategy



Replace Fossil Fuels with Renewable Energy

- Implement a support scheme to bring forward investment in renewable electricity generation
- Phase out fossil fuel heating oil
- Phase out coal and certain solid fuels for home heating
- Introduce support for low carbon heat technologies including heat pumps
- Run trials and demonstrations on emerging heat solutions
- Create a roadmap to a cleaner, greener transport system



Create a Flexible, Resilient and Integrated Energy System

- Closely review and monitor the security and resilience of our changing energy system
- Implement measures on system flexibility services, energy storage, data and electromobility
- Introduce smart measures as part of a wider digitisation and data framework
- Adopt policies that facilitate active consumers and energy communities

DELIVERING THE STRATEGY

Provide leadership across the central and local energy governance landscape

Review and implement necessary legislative and regulatory changes

Produce a comprehensive energy evidence programme to inform policy decisions

1. Introduction

This Path to Net Zero Energy is the Energy Strategy for Northern Ireland. It aims to ensure we have an affordable, secure, and clean energy system for current and future generations. It specifically targets net zero carbon and affordable energy as part of our wider action to address climate change and deliver an economy that is ten times better than today through innovation.

Development of the Energy Strategy began in December 2019 with a Call for Evidence. The Executive has worked collectively since then to gather and assess further evidence alongside extensive stakeholder engagement. In July 2021, we completed a consultation on policy options for a new Energy Strategy spanning the full breadth of energy policy responsibilities across the Executive.

Throughout the development of this strategy we have worked closely with a broad cross-section of consumers, business, government and the energy industry. An Expert Panel on the Future of Energy, bringing together expertise from across the UK and Republic of Ireland, has also supported this work. This is not just our strategy, it is your strategy too.

Our commitment to collaboration is reflected in the high level of response to the options consultation. In that consultation we asked for your feedback. We have now considered your responses¹ and reflected these in Northern Ireland's new Energy Strategy.

This document sets out our roadmap to 2030 as part of the longer-term pathway to 2050. This will provide the confidence to invest in infrastructure and the workforce and give clear signals for industry and consumers. It is structured as follows:

- **Chapter 2** outlines the long term goal that we are seeking to achieve and the strategic framework we will work within;
- **Chapter 3** provides a high level overview of the roadmap to 2030;
- **Chapter 4** presents the overarching investment, costs and benefits;
- **Chapters 5-9** detail our ambition and delivery for each of the five principles;
- **Chapter 10** visualises the longer-term journey to 2050; and
- **Chapter 11** outlines the key issues for delivering on the new strategy.

Whilst our vision of net zero carbon and affordable energy is clear, there will be many uncertainties along the way. We also need to take account of and learn from new policies, technologies and developments, including those taking place in other jurisdictions. This is why the Energy Strategy will be a live document which will be regularly reviewed and updated.

2. Our Energy Vision

Ambition

Below we set out our overarching vision for energy. In the next 10 years we want to make significant progress towards achieving this vision. This will ensure a meaningful contribution to the UK's net zero strategy, the Green Growth strategy and the following draft Programme for Government² outcomes:

- We live and work sustainably - protecting the environment
- Our economy is regionally balanced, globally competitive and carbon neutral
- We all enjoy long, healthy, active lives

Table 1: Energy Strategy Vision and Success Measurements

Vision	
Net zero carbon and affordable energy	
Net Zero Carbon Energy	Affordable Energy
What this means	What this means
Net zero carbon energy means that overall greenhouse gas emissions from energy are zero. It means reducing emissions from the energy we use for transport, electricity generation, industry and our built environment, as well as removing any remaining emissions with schemes that offset an equivalent amount from the atmosphere.	Energy provides value in enabling our comfort, leisure and basic needs. However, affordable energy can mean different things to different groups of consumers, for example energy bills can be a major concern for households on lower incomes, or help to ensure that businesses can be competitive in challenging markets.
How we will measure success	How we will measure success
We will monitor greenhouse gas emissions from energy-related sectors: <ul style="list-style-type: none"> • Business • Energy Supply • Industrial Process • Public • Residential • Transport 	We will measure three key indicators to support our assessment of affordability: <ul style="list-style-type: none"> • Household energy expenditure relative to all expenditure • Households in fuel poverty • Business energy purchases relative to turnover
How we will develop this further	How we will develop this further
We will improve our evidence base on emissions from all energy sectors to support monitoring of our policy impact. We will report on sector-specific energy decarbonisation targets that will be set out in Northern Ireland Climate Action Plans.	We will review the drivers and definitions of energy affordability. This will include the balance of upfront investment and long-term energy bills as well as data development. Through sustained engagement we will assess their impacts on our identified consumer populations.

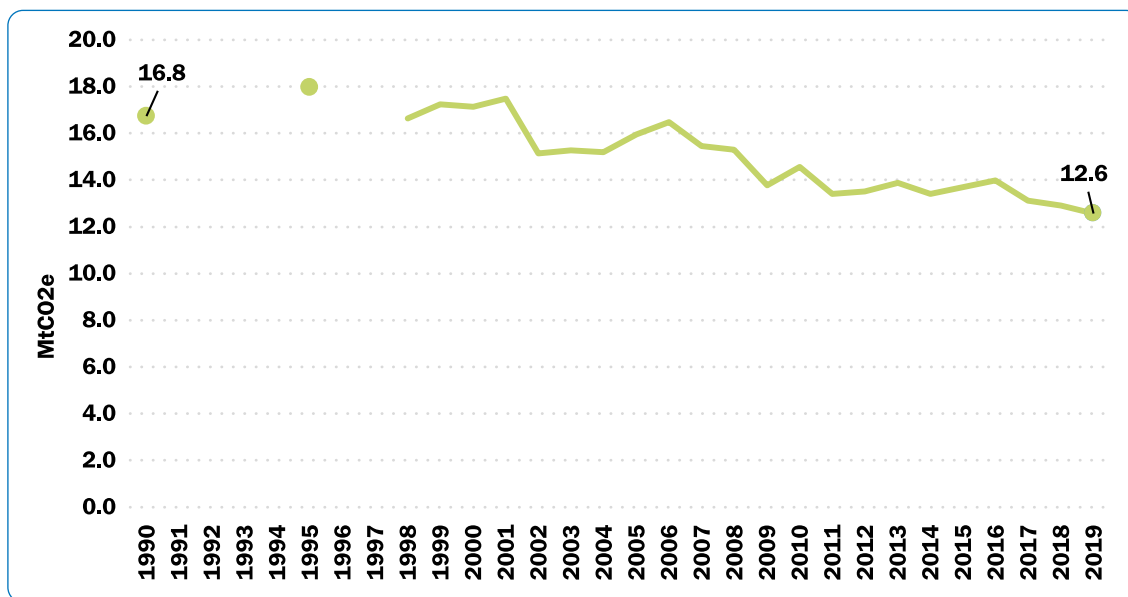
Current Position

Energy-related emissions

While this strategy addresses all greenhouse gas emissions from energy-related sectors in Northern Ireland, we primarily refer to ‘carbon emissions’ because we measure greenhouse gas emissions using million tonnes of carbon dioxide equivalent (MtCO₂e). In addition, 96% of emissions from energy-related sectors are carbon dioxide.³

Energy-related emissions have fallen by 25% since 1990. The main driver has been energy supply, where emissions have decreased by 48%. Overall, energy-related sectors accounted for 59% of total emissions in 2019. The largest sectors are heat (38%), transport (33%) and power (22%).

Figure 1: Greenhouse gas emissions for energy-related sectors in Northern Ireland, 1990, 1995, 1998 to 2019⁴



Affordability

In a whole system approach we need to think about all our energy costs and how these relate to their affordability, as well as the value of energy in our lives. We have engaged with consumer groups in developing this strategy and it is clear that affordability is a key issue for them.⁵

Whilst there is broad recognition that there will be costs, domestic and business consumers both have concerns on the allocation of these costs and the concept of fairness. This includes tailoring financial help depending on different consumer needs and the importance of leadership, information and direction from government.

³ <https://www.daera-ni.gov.uk/publications/northern-ireland-greenhouse-gas-inventory-1990-2019-statistical-bulletin>

⁴ [Devolved Administrations - Greenhouse Gas Reports - NAEI, UK \(beis.gov.uk\)](https://www.beis.gov.uk/government/uploads/system/uploads/attachment_data/file/682222/Devolved_Administrations_-_Greenhouse_Gas_Reports_-_NAEI_UK.pdf)

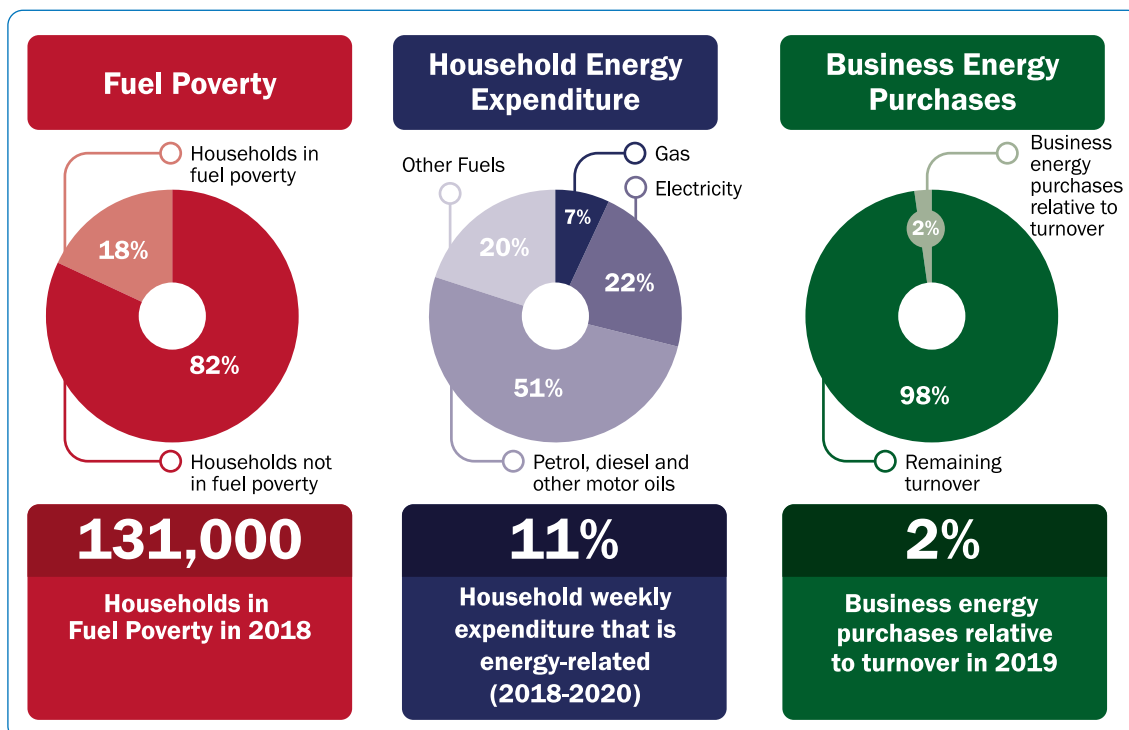
⁵ [Energy Strategy business and consumer virtual insight and awareness consultation](#)

Three key metrics on consumer affordability have been identified that will be tracked as part of the Energy Strategy; the most recent available information on these metrics is below. We will continue to refine our definition of energy affordability in a way that helps us measure progress, refine policies and interventions and makes sense to how we live our lives.

Table 2: Description of Affordability Metrics

Metric	Description
Household energy expenditure relative to all expenditure	This means total household spend on energy as a proportion of all average weekly household expenditure, transfers and savings. It includes electricity, gas, other fuels (including home heating oil) and petrol/diesel.
Households in fuel poverty	In Northern Ireland, a household is said to be in fuel poverty if it needs to spend more than 10 per cent of its income on energy costs.
Business energy purchases relative to turnover	This measures business energy purchases as a proportion of business turnover and will allow further analysis to assess energy cost pressures in specific sectors. It excludes business involved in the generation, distribution and supply of energy. ⁶

Figure 2: Summary of Affordability Metrics⁷



Information on energy indicators, available comparisons with other parts of the UK, historical trends and associated data sources is published alongside this strategy.⁸

⁶ The removal of these businesses is to ensure that the focus of the measure is on businesses as end consumers of energy and not including businesses involved in the energy supply chain.

⁷ [The House Condition Survey](#) (Fuel poverty - modelled data in 2018), [Northern Ireland Household Domestic Energy Expenditure](#) (Household Energy Expenditure - Financial Years Ending 2018-2020), [Annual Business Inquiry \(ABI\)](#) (Business Energy Purchases - 2019).

⁸ [Energy Strategy Metrics – A Statistical Methodology Report and Dashboard](#)

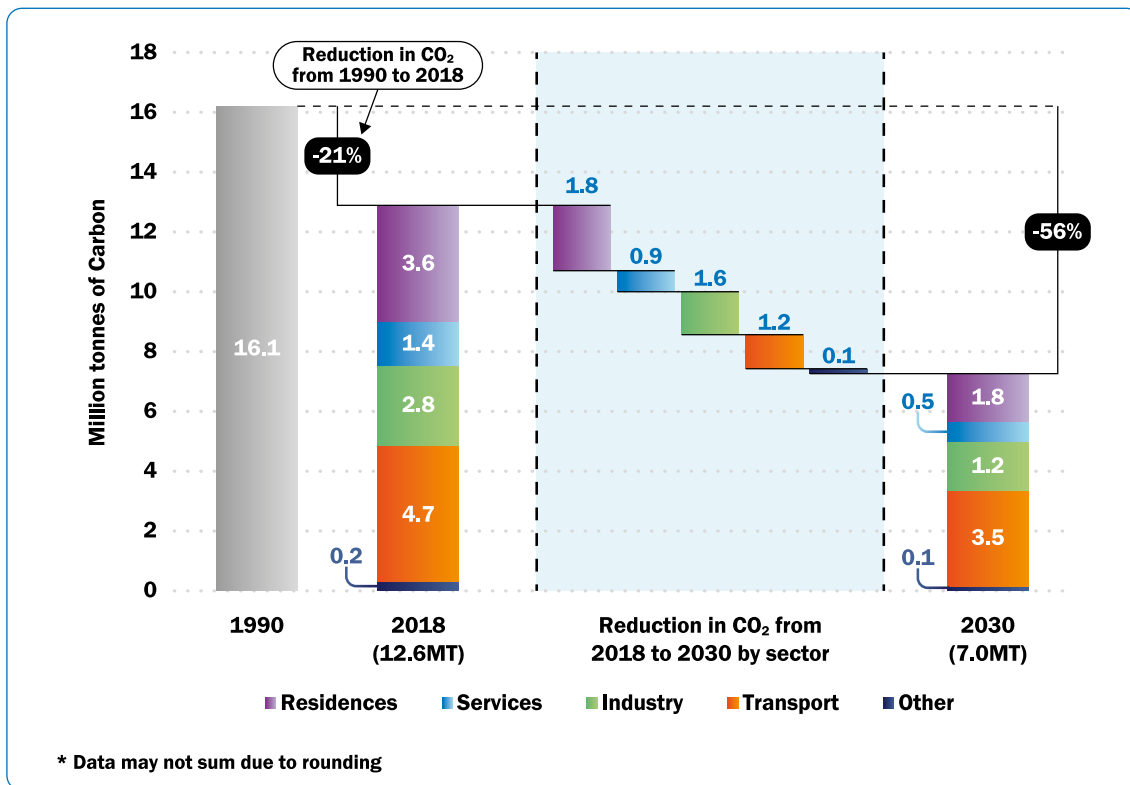
3. Roadmap to 2030

Carbon Emission Pathway

The Energy Strategy targets a 56% reduction in energy-related carbon emissions relative to 1990 levels by 2030. This is in line with the CCC’s recommended pathway for Northern Ireland to arrive at net zero carbon energy by 2050 and is consistent with the 6th Carbon Budget.⁹

Based on the objectives and policies put forward in this strategy, we have modelled expected changes to emissions from residential buildings, transport, services and industry using the Northern Ireland Energy Transition Model.¹⁰ Successfully achieving our objectives means that by 2030 there will be significant reductions in energy demand and lower carbon emissions from energy across all sectors.¹¹

Figure 3: Modelled Carbon Emission reductions by sector from 2018 to 2030 (MtCO₂)*



Supporting Principles

We have adopted five principles to support and guide our pathway towards achieving these reductions and our overall vision. These will allow us to assess how we are contributing to the Northern Ireland Executive’s vision for the future for all citizens and businesses. Delivering decarbonised, affordable energy will be a central driver for all other government priorities.

9 Sixth Carbon Budget - Climate Change Committee (theccc.org.uk)

10 The ETM focuses on certain activities that produce carbon emissions; however, the strategy will be monitored based on the Greenhouse Gas Inventory.

11 <https://pro.energytransitionmodel.com/scenarios/864140>

Table 3: Energy Strategy Principles



Placing you at the heart of our energy future: We will make energy as simple as possible for everyone in society and develop policies that enable and protect consumers through the energy transition. Affordability and fairness will be key considerations in all our policy decisions.



Grow the green economy: We will create new jobs and grow a skills base for the low carbon economy through innovation, support and focusing on our competitive strengths.



Do more with less: We will set clear targets, standards and regulations that drive improvements in energy efficiency, provide support to invest in improvements to buildings and help consumers make changes that reduce their energy use.



Replace fossil fuels with renewable energy: We will phase out fossil fuels by growing our indigenous renewable base, supported by sustainable renewable imports and using these to decarbonise heat, power and transport.



Create a flexible, resilient and integrated energy system: We will create a flexible, smart and digitised energy system that integrates renewables across heat, power and transport, creates value for consumers and enhances security of supply.

We expand upon each of these principles in Chapters 5-9 and provide further detail on the objectives and policies underpinning them. Some principles include high-level objectives while others include specific targets. In future we will use our monitoring framework to assess and, if necessary, set other targets to support progress towards the overarching vision.

4. Investing for our Future

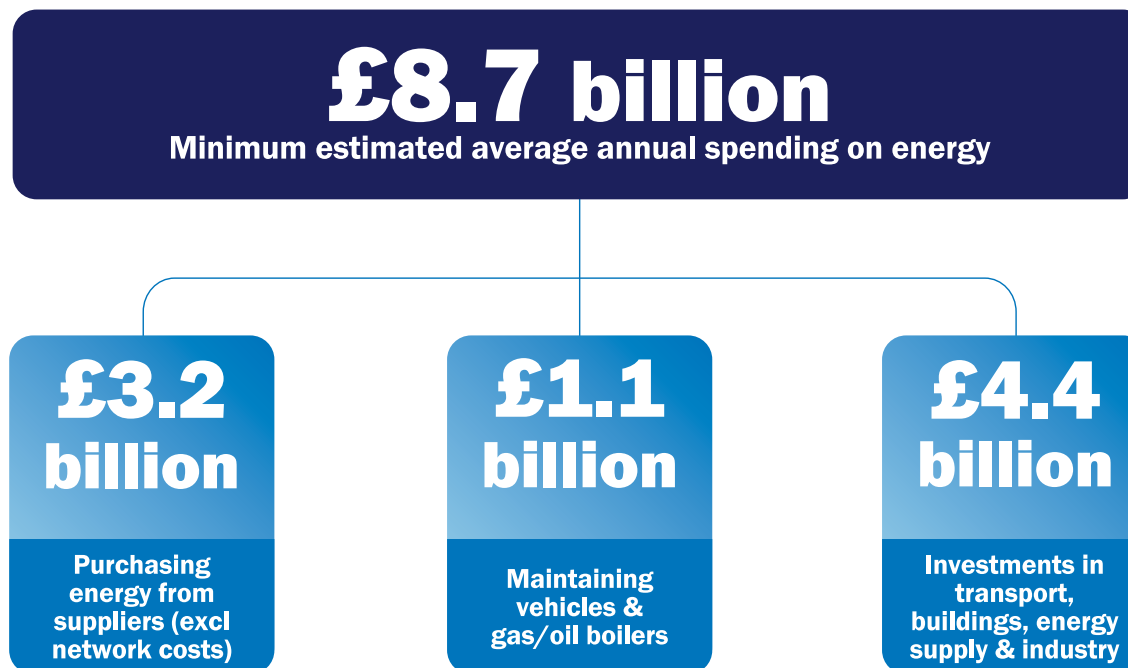
Changing the Status Quo

Northern Ireland has been hugely successful at utilising its natural resources – particularly wind – to meet its electricity needs. With 45% of electricity consumption coming from indigenous renewable sources, the remaining 55% still comes from fossil fuels and, looking more broadly, power accounts for just 14% of total energy consumption. Heat and transport are therefore the biggest drivers of our overall energy system, and these are almost entirely fossil fuel dominated.

Our current energy system involves buying fossil fuel commodities, such as oil, gas or coal, from international markets and burning these to meet our immediate energy needs. We invest in buying and maintaining fossil fuel infrastructure, such as power stations, networks, oil/gas boilers, buildings and vehicles.

Given the volatility of fossil fuel prices, it is not possible to forecast what the total cost of continuing to run such a system would be in the future. However, by using existing data on the costs of purchasing energy from suppliers, along with forecasts around the infrastructure investment required to maintain it, we estimate a potential baseline cost of at least £8.7 billion on an annual basis; this is before taking into account the record fossil fuel price increases observed during 2021.

Figure 4: Average Annual Energy Spending on Existing Energy System

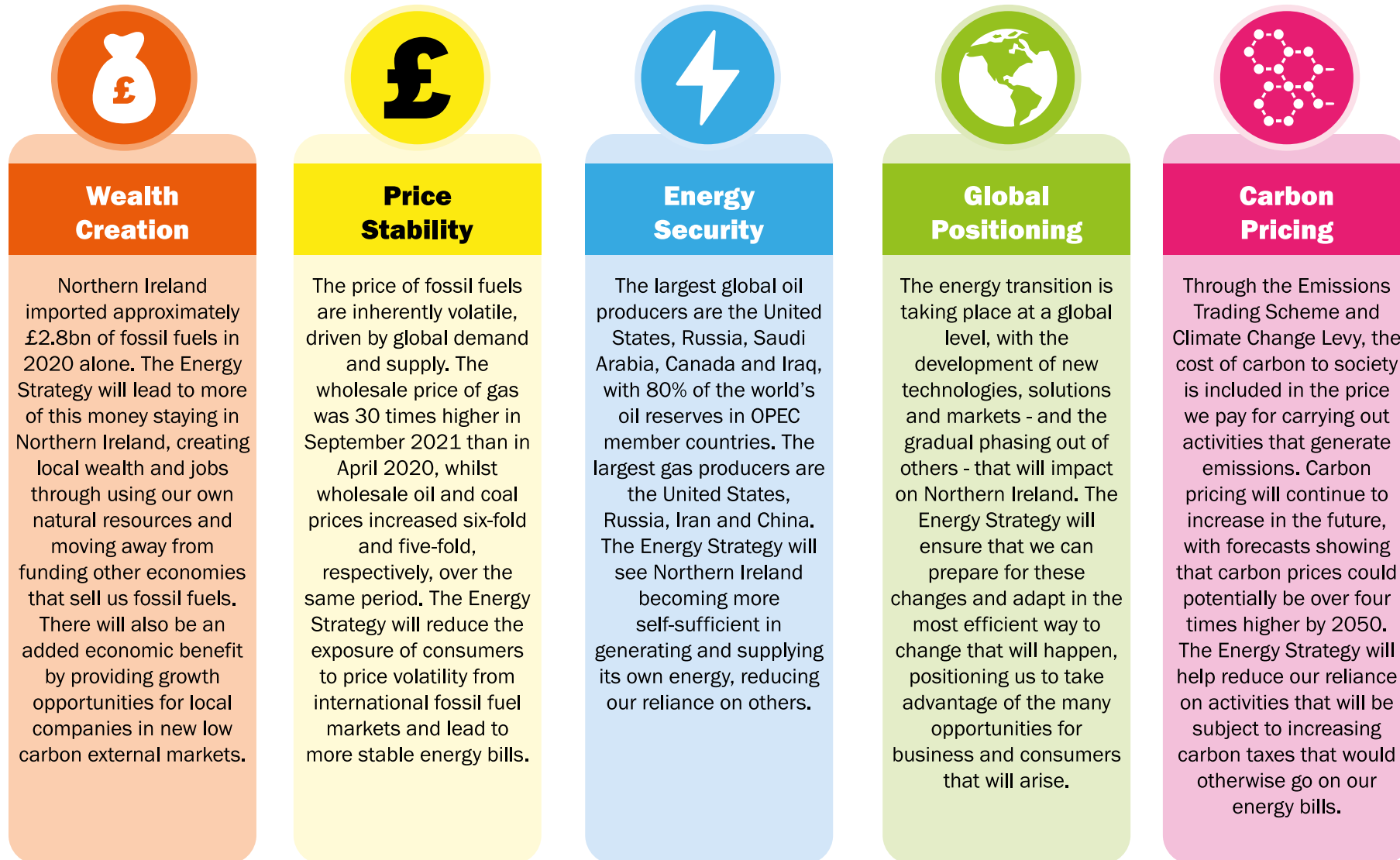


Source: CCC; DfE estimates

Note: Energy purchases and maintenance figures estimated using Living Costs and Food Survey data for 2018-20, Annual Business Inquiry data for 2018 and Energy Management Annual Energy Progress Report data for 2016/17 to 2018/19, with a proportion of electricity & gas costs removed in line with the percentage of bills accounted for by network costs to avoid double counting. Investment figures estimated using the CCC baseline position for Northern Ireland in 2021-50. Expenditure estimates not included due to lack of data are: transport fuel costs for the public sector; maintenance costs of vehicles & boilers for public sector; and all energy spending for local government.

The transition to a new energy system based around renewables, which is taking place on a global level, presents many opportunities. We aim to ensure that Northern Ireland is well positioned to take advantage of these through the Energy Strategy.

Figure 5: Opportunities from Energy Strategy

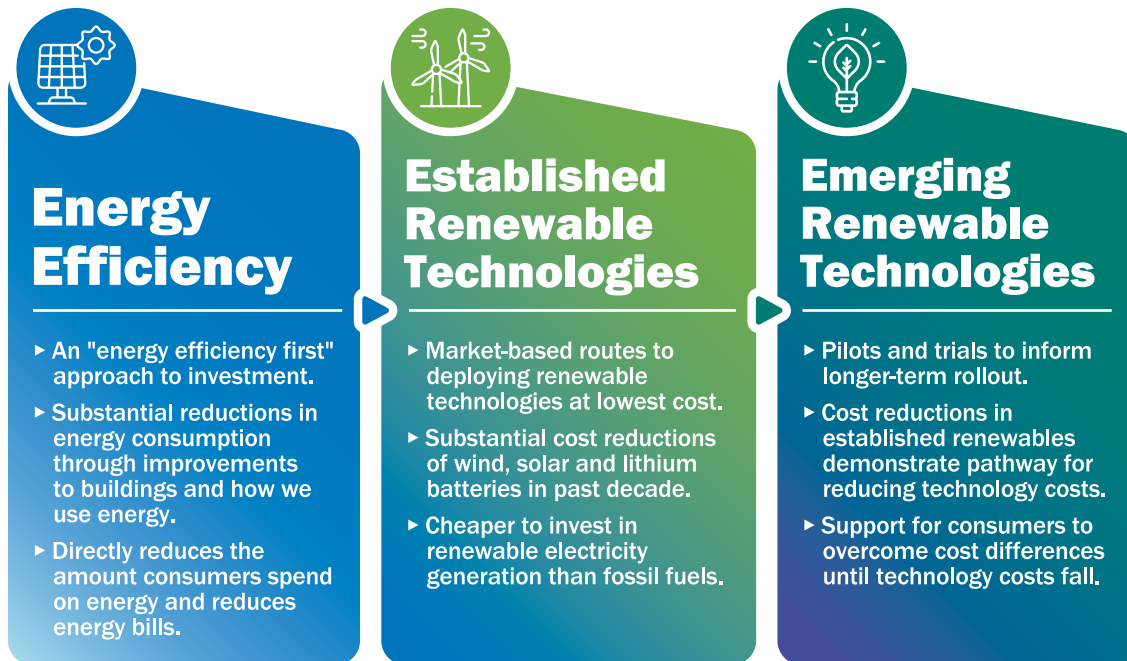


Sources: DfE Estimates; [US Energy Information Administration](#); [Statistica](#); [Enerdata](#); [BEIS](#); Oil Market Journal

Investing in Clean Energy

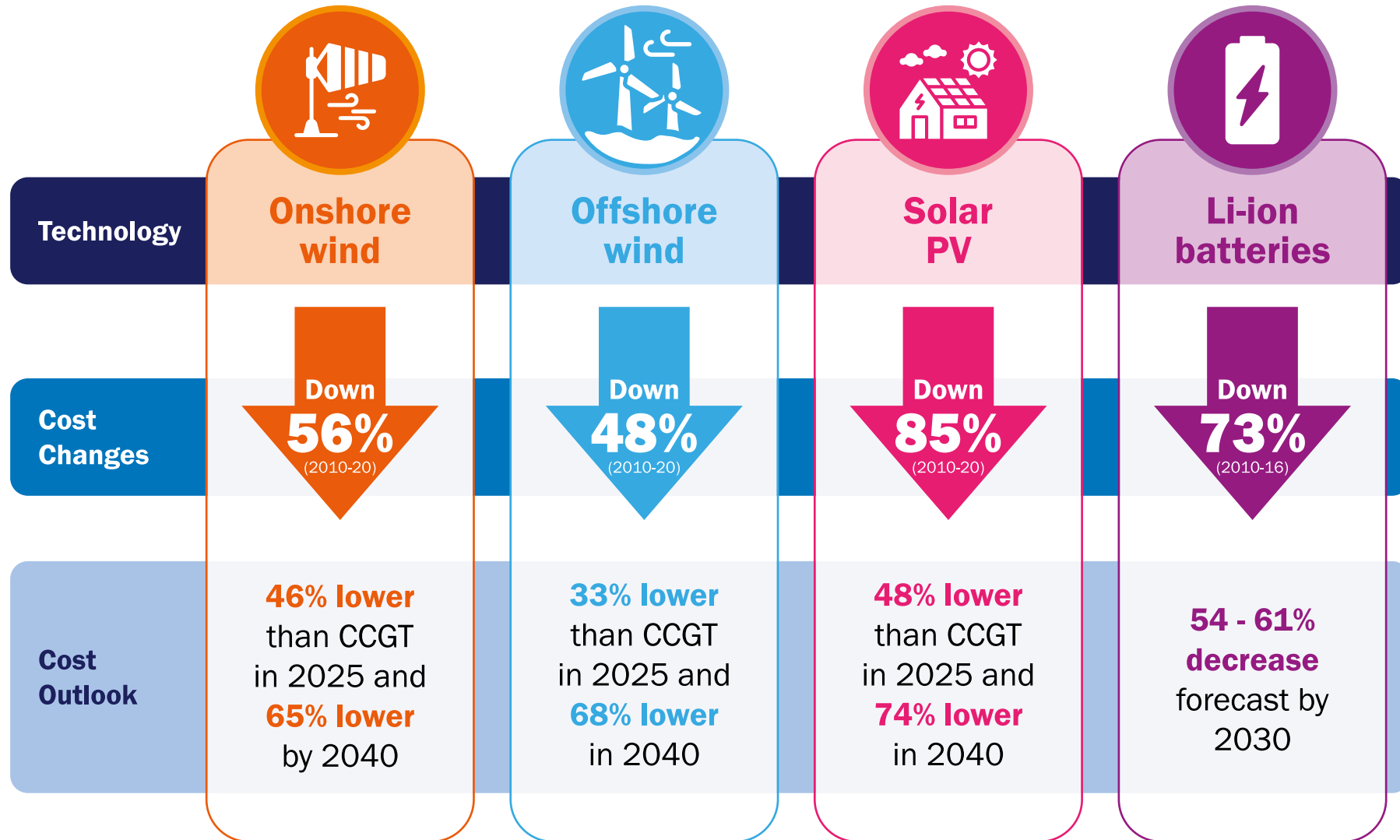
The Energy Strategy will create an energy system based on efficient and low carbon networks, technologies, buildings, vehicles, industry and infrastructure. Achieving this will require upfront investment but will unlock cost savings that the CCC advises will lead to a lower cost energy system in the long-term. Making these investments in a cost-effective manner that focuses on ensuring affordability for consumers is paramount in our approach.

Figure 6: Energy Strategy Investment Approach



Central to our approach is investing in energy efficiency, with the cheapest unit of energy being the one we do not use. This investment will directly benefit consumers through lower bills and leave us with warmer and more efficient buildings to live and work in. Where we do need to use energy, we will initially focus on established renewables, diversifying these where possible, and then bringing on new and emerging renewable technologies as these mature and costs fall. There also needs to be ongoing investment in thermal energy generation, currently from fossil fuels but with the potential for decarbonisation, to support renewables.

Figure 7: Costs of Renewables



Sources: [IRENA Renewable Power Generation Costs 2020](#); [BEIS Electricity Generation Costs 2020](#); [IRENA Electricity storage and renewables: Costs and markets to 2030](#)

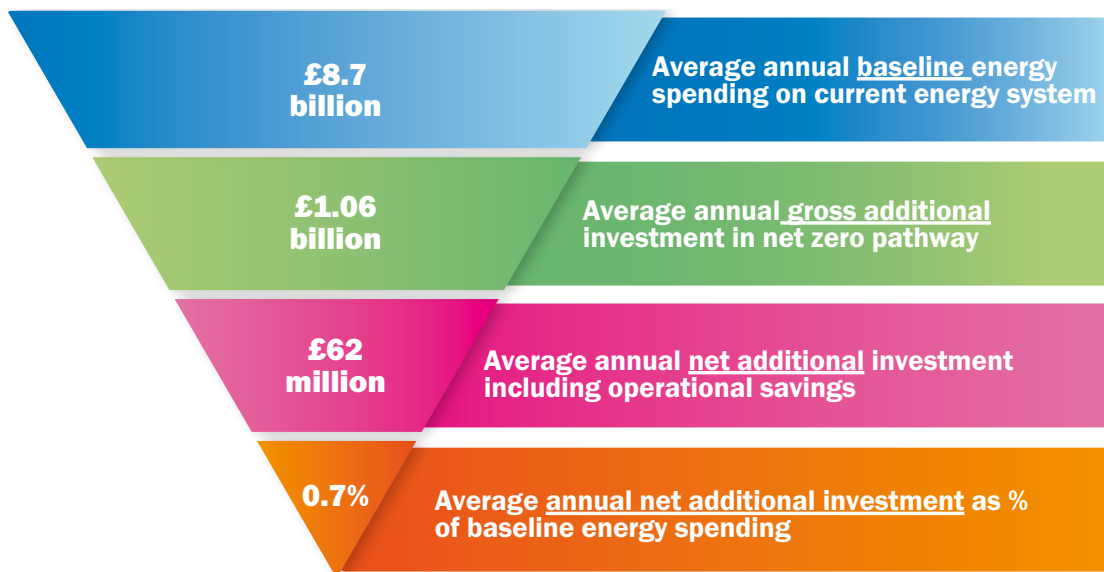
Note: CCGT refers to Combined Cycle Gas Turbine

The new energy system will be one based around infrastructure and assets rather than commodities. Reducing the costs associated with purchasing fossil fuels will require additional upfront investment but, unlike our current system, it will leave us with assets that give us ongoing benefits, both in generating clean energy and growing the local economy.

It is impossible to say for certain what the total cost of the energy transition will be and where exactly these costs will fall. The CCC has advised on the investment needs for Northern Ireland to achieve overall net zero carbon emissions by 2050. This represents the most robust and credible evidence in regards to investment costs and operational savings available to us at this stage.

Focusing on energy-related sectors, the scale of capital investment required to meet net zero emissions to 2050 is substantial. However, the CCC advises that these investments also deliver substantial operational savings in the medium to long term; by 2050, it is estimated that 94% of the total investment in clean energy will have been recouped. Taking into account these operational savings, the net annual cost of meeting net zero energy emissions from 2021 to 2050 is £62m, which is equivalent to around 0.7% of baseline estimated annual energy spending.

Figure 8: Estimated Average Annual Costs of Balanced Net Zero Pathway

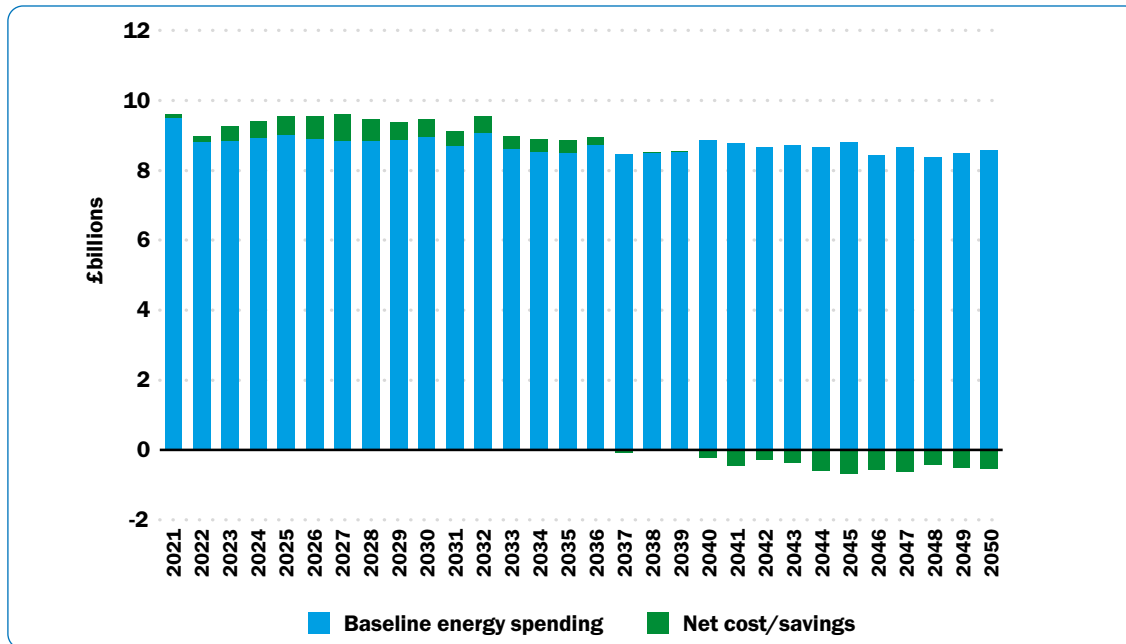


Sources: CCC; DfE estimates

Note: The baseline annual spending on energy will likely be higher than this estimate due to the lack of data on spending in certain areas, which means the actual % net investment figure may be lower than shown.

Much of the net investment cost must be made upfront before the substantial operational savings can be unlocked. The largest additional net cost is expected to come in the 2020s and early 2030s, albeit this is still relatively small in proportion to our baseline energy spending.

Figure 9: Annual Net Cost/Savings of Net Zero Pathway, 2021 to 2050



Source: CCC; DfE estimates

Note: Baseline energy spending includes existing spending on purchasing energy and maintaining vehicles & boilers (based on costs at the time of latest available data) and is purely for illustrative purposes; it is not a forecast of what future energy spending on fossil fuels would be. It also includes the CCC forecasts of baseline capital investment required without implementing the net zero balanced pathway scenario to maintain the current energy system.

Distribution of Investment Costs

With an energy system that the CCC advises will be lower cost in the long-term, the key issue relates to how we meet the additional investment costs until then and where these are distributed. There is a net additional annual investment cost of around £483m per annum over the period to 2030.

Although these net costs are small relative to the size of our spending on energy, the scale of gross investment needed to deliver the savings is substantial. In some cases this investment will be driven by commercial forces; however, in a significant number of cases it will need support from government and/or consumers.

In making these investments, the focus must be on cost-effectiveness, fairness and the distribution of costs across the following broad groups:

- **Private investors:** individuals or institutions who will buy these things for themselves or invest to make a return;
- **End consumers:** where impacts are felt on electricity, gas, oil or transport fuel bills; and
- **Taxpayers:** funded through public expenditure.

The majority of anticipated additional investment to 2030 will be in transport, energy supply and buildings. For industry, the net additional annual investment to 2030 is estimated to be £23m, due to investment in energy efficiency measures, coupled with the introduction of low carbon fuels.

Table 4: Estimated Capital Investment and Savings for Northern Ireland by Energy Sector from 2021 to 2030¹²

Transport	Energy supply	Buildings
Baseline spending	Baseline spending	Baseline spending
£4.8 bn/year	£1.2 bn/year	£2.4 bn/year
Reason	Reason	Reason
Purchasing petrol & diesel fuels along with the costs of maintaining vehicles and buying new vehicles.	Buying electricity including investment in networks and power stations.	Purchasing heating fuels, maintaining boilers and investing in buildings.
Additional capital investment	Additional capital investment	Additional capital investment
£264m/year	£231m/year	£266m/year
Reason	Reason	Reason
Higher upfront purchase price of zero-emission vehicles. Supporting charging/refuelling infrastructure. The large-scale rollout of low carbon cars and vans by 2030.	Building capital-intensive low-carbon capacity e.g. wind farms. Investment in gas-fired power plants Infrastructure investment in electricity networks. ¹³	Investment in energy efficiency measures, such as insulation, are prioritised between 2020 and 2030. Introduction of low carbon heating for domestic homes.
Who typically pays?	Who typically pays?	Who typically pays?
Private individuals, businesses and public bodies who buy new and used vehicles. End consumer and taxpayer through subsidies and public transport upgrades.	Private investors directly pay for generation projects but these are typically underwritten by end consumers. Electricity networks investment is also passed onto consumer electricity bills.	Private individuals, investors and public bodies who own buildings but with an important and substantial role for support from government and consumer energy bills.
Additional operational savings	Additional operational savings	Additional operational savings
£231m/year	£45m/year	£25m/year
Reason	Reason	Reason
Deployment of more efficient zero-emission vehicles, low maintenance costs and eliminating the need to purchase petrol and diesel for road vehicles.	Capital intensive low carbon electricity means higher upfront costs but lower operational costs due to replacement of high carbon fuels.	Energy efficiency measures, including behaviour change. Investment in low carbon heat results in operational savings.
Who saves?	Who saves?	Who saves?
End consumers, both domestic and non-domestic.	Private investors given lower operational costs and end consumers who pay for less fossil fuel generation.	End consumers, both domestic and non-domestic.
Net additional investment required	Net additional investment required	Net additional investment required
£33m/year	£186m/year	£242m/year
Net investment as a % of baseline spending	Net investment as a % of baseline spending	Net investment as a % of baseline spending
1%	16%	10%

Sources: CCC; DfE estimates

12 Figures sourced from the [CCC Sixth Carbon Budget Dataset](#)

13 This excludes network balancing costs (e.g. storage and frequency management)

Note: Current estimated spending is not a forecast and is purely for illustrative purposes. Industry baseline investment spending (£605m) and over the period 2021-2030 additional average annual investment (£20m) and operational costs (£3.2m) are not included in the table above. A proportion of the figures included in the table are likely to be attributable to industry.

Delivering this necessary investment will require multiple policy levers and the right market frameworks to encourage competition and drive down costs. Although we will always aim to focus on the most cost effective actions and policies there are important decisions to be made about who bears the costs. Where this falls on consumers' energy bills, we need to strike the right balance between households and between domestic and non-domestic consumers, including large energy users, with sufficient protections in place where necessary.

Carbon pricing is also likely to be a significant driver towards decarbonisation and this will become increasingly relevant with the expected continued rise in carbon price as the UK Emissions Trading Scheme (ETS) cap on carbon allowances is reviewed. Placing a price on carbon creates the incentive for emissions to be reduced in a cost effective and technology-neutral way while encouraging private sector investment in emissions reduction technologies and measures.

A dual system of carbon pricing is currently in operation in Northern Ireland. The majority of installations participate in the UK ETS, while installations which generate electricity continue to participate in the EU ETS to ensure the continued functioning of the Single Electricity Market.

We will take carbon price into account when developing decarbonisation policies for energy. A review of the UK ETS will be conducted from 2023 to assess whole system performance during the first half of phase I (2021-2025) with any necessary changes to design features implemented by 2026. The potential for decarbonisation funding opportunities arising from both schemes will also be explored.



5. Placing You at the Heart of Our Energy Future

VISION

We will make energy as simple as possible for everyone in society and develop policies that enable and protect consumers through the energy transition. Affordability and fairness will be key considerations in all our policy decisions.

OBJECTIVES

People are informed, empowered, supported and protected to enable them to transition to decarbonised solutions for all their energy needs.

Households and businesses have access to essential and affordable energy to enable a decent standard of living, health and competitiveness.

Introduction

People in Northern Ireland want to take action in response to the threat of climate change. However, they have concerns about certain aspects of the energy transition, particularly regarding the costs of investment and changes to their everyday lives, and some worries about any potential local environmental impacts.¹⁴ We recognise that changing behaviours may be challenging and it is important that we explain the reasons for and support people through these changes. Both domestic and business consumers have also highlighted costs and fairness as key considerations.

It is the responsibility of government to help by clearly setting out the changes that are coming and introduce measures that will enable and protect people throughout the energy transition. Our consumer engagement has also helped us understand the types of support and information that people want to help them through these changes. It is vital that we continue to engage with people throughout to continue to understand and respond to consumer needs. Our approach will also play a role in ensuring that the overall transition to a more sustainable economy is managed fairly and is just for everyone.

We will support the public on the journey to affordable, net zero carbon energy by 2050 and in doing so enable the economic, social and environmental benefits that it will bring. Support means accessible information, independent and trusted advice and the right level of protection. Enabling consumers and communities to actively participate in the energy transition is addressed in Chapter 9.

Key Policies

Run information and awareness campaigns on energy decarbonisation

As we develop and implement new energy efficiency standards, shift away from fossil fuel for heating and transport and increase our energy supply from renewable sources, we need to support people to understand the changes that will take place. The Executive will run information and awareness campaigns to introduce new technologies and encourage standards and behaviours that can be adopted in homes, businesses and communities.

¹⁴ UR Energy Strategy Consumer Research, April 2021



This engagement will also support learning about the new developments that will be needed for our net zero carbon future and ensure access to accurate, trusted information. We will use a range of methods to support citizen learning and inform, educate and encourage people to be part of this transition, including the changing behaviours that may take time to embed in our daily lives.

Establish a ‘one stop shop’ to deliver trusted information, advice and support to consumers

We will adopt a ‘one stop shop’ approach to delivering trusted information, advice and support to consumers through their journey to net zero. This will build on existing energy support and ensure consumers have access to a single point of contact that aligns with the principles that consumers have asked for through our engagement with them.

Figure 10: Principles underpinning a One Stop Shop approach



This one stop shop will support people and businesses through each step of their journey towards net zero in heat, power, transport and energy efficiency, with local solutions that fit their needs and budget. The services offered could include initial assessments; guidance on decarbonisation options and costs; advice on access to finance; support during the implementation phase; quality assurance; and monitoring of performance. An initial focus will be energy efficiency – an urgent priority of the Energy Strategy – and will subsequently evolve over time to provide a wider spectrum of support, interventions and advice.

We will consult separately on the specific routes to developing this one stop shop and coordinate with other future climate and environmental advice initiatives. We recognise some potential routes will take time and in the interim we will identify gaps in current provision and fill these through an energy advice pilot scheme.



Ensure robust protection and redress measures are in place for energy consumers

We expect there to be multiple benefits in transitioning to zero carbon systems and products. However, certain groups are at risk of being left behind at different points along the way, particularly vulnerable populations and small businesses. Electricity and gas energy consumers benefit from an existing regulatory protection framework and we need to establish new frameworks that will provide appropriate protections for all consumers. We will:

- Review existing energy consumer protection and redress frameworks and identify gaps to ensure that they remain effective;
- Introduce additional frameworks for new services where relevant; and
- Involve key consumer representatives in reviewing new energy policies developed across government to address any consumer impact identified.

Implement a new support framework for energy affordability

Energy is essential for all of us and enables access to digital services, comfort and travel. However, affordability can be a major concern for consumers and particularly for those on low incomes. To support our vision of affordable energy we commit to:

- Consider where specific financial assistance may be required to support vulnerable consumers, particularly those on low incomes;
- Assess the cost of energy policies by identifying who pays for and who benefits from them, adopting measures to address inequities; and
- Consider and implement appropriate financial support schemes when implementing our policies to ensure consumer uptake, particularly amongst those who are vulnerable and on low incomes.



CASE STUDY:

Belfast Warm and Well

The Belfast Warm and Well Project is coordinated by National Energy Action and is supported by Community Planning Partners. It is one of several signature projects developed under the Living Here Board as part of Belfast’s collective efforts to address health inequalities within the city.

The key aims are to identify people at risk of ill health from living in a cold home, provide a single point of coordination referral service with access to a range of tailored solutions for people living in a cold home; raise awareness of the risks of living in a cold home, including the provision of training for people working within health, community and housing services and to mobilise local networks to refer vulnerable people.

Reported experiences for those who engaged in 2019/20 were overwhelmingly positive, with many people highlighting an improvement in the overall coordination of services to support people vulnerable due to living in a cold home. Evaluation of the second year is underway and some key learning points coming through include a significant increase in both the number of people being referred and in the reach of the service; the impact of Covid; more referrals from middle aged and young families; and the need to further improve coordination of support services in advance of winter 2021/22.





6. Grow the Green Economy

VISION

We will create new jobs and grow a skills base for the low carbon economy through innovation, support and focusing on our competitive strengths.

OBJECTIVES

Double the size of our low carbon and renewable energy economy to more than £2bn turnover.

Northern Ireland to become a leading low-carbon innovation hub.

Introduction

The Green Growth Strategy emphasises that addressing climate change is essential for international competitiveness and attractiveness. 10X Economy: An Economic Vision for a Decade of Innovation outlines an ambitious vision to embrace innovation that delivers a ten times (10X) better economy with benefits for all the people of Northern Ireland.¹⁵ By developing the skills, expertise and technologies in this decade we will be ready to lead future innovations and specialisms in the next and support people into secure, well paid jobs.

The low carbon and renewable energy sector already generates around £1.06bn in turnover annually and provides 5,300 full time equivalent jobs¹⁶. We aim to at least double the size of this sector by generating local market opportunities, in place of importing fossil fuels, and by ensuring our companies can compete for the substantial UK and global opportunities in low carbon energy and technologies that are already becoming available.

The Energy Strategy will be a driver of three of the five areas outlined in 10X – technologies and clusters, talent and funding – and our key policies are shaped within this framework. We also believe that innovation can provide opportunities across all sectors – Diffusion – and we will therefore identify accelerator programmes and clusters of expertise which can support small business enterprises to succeed within a low carbon economy. We will consider geographical location in taking forward energy trials and pilots to ensure a spread of opportunities and investment.

We will focus on the aspects of Northern Ireland that are unique - Place - and that can contribute to this Strategy, including greater use of publicly-owned assets and building on our renewable electricity integration success, our rural agricultural base and our modern gas network. We believe that our location and capabilities will support our industrial capacity and will serve not only Northern Ireland's future offshore ambitions but also offshore renewables projects in neighbouring nations.¹⁷

15 [10X Economy - an economic vision for a decade of innovation | Department for the Economy \(economy-ni.gov.uk\)](https://www.economy-ni.gov.uk/10x-economy)

16 [Low carbon and renewable energy economy, UK - Office for National Statistics \(ons.gov.uk\)](https://ons.gov.uk/economy/green-economy/low-carbon-and-renewable-energy-economy)

17 [Offshore wind: Sector Deal - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/offshore-wind-sector-deal)



Key Policies

Create a hydrogen centre of excellence in research and innovation

Hydrogen is a substantial opportunity for Northern Ireland. We can attract investment into the local economy and position our companies to take advantage of the energy and economic opportunities available on a global scale.

Figure 11: Hydrogen Proposition for Northern Ireland





The expertise in our advanced manufacturing, materials and engineering sector will be at the centre of our low carbon future. We will continue to support agile commercialisation of products and processes and utilise existing strengths in our research base. This will focus on three priority areas where Northern Ireland has unique capabilities.

Table 5: Priorities for Research and Innovation Activities

Sector	Priorities
Hydrogen	In order to take advantage of the unique hydrogen opportunities available to Northern Ireland we will implement a Hydrogen Catapult in partnership with academia. This centre of excellence in research and innovation will bring together key players across the hydrogen economy.
Clean Maritime and Transport Sector	We will support the development and delivery of innovative solutions and products in sectors where we have existing and emerging capabilities such as specialist automotive production and conversion, road haulage, alternative transport fuels and clean maritime technology. This will include maximising opportunities through the UK National Shipbuilding Strategy, Transport Decarbonisation Plan ¹⁸ and North Sea Transition Deal. ¹⁹
Industrial Decarbonisation	<p>We will set out an industrial decarbonisation pathway for 2022-2030. This will include:</p> <ul style="list-style-type: none"> • New carbon capture, usage and storage (CCUS) business models, including the formation of a carbon community forum; • Supporting industry to integrate improved energy efficiency measures; and • Building our evidence base on carbon reduction pathways in high carbon industrial processes and supporting emerging disruptive drivers.

18 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1009448/decarbonising-transport-a-better-greener-britain.pdf

19 [North Sea Transition Deal \(publishing.service.gov.uk\)](#)



Identify and address key skills needs for the low carbon and renewable energy sector

Through the 10X Skills Strategy, we will focus on energy priorities for skills needs to support the creation of well-paid employment opportunities and retain relevant skills and expertise locally. In the short term we will make use of existing training and education pathways to identify and deliver skills needs, including those in the energy efficiency, low-carbon heat and renewable energy sectors.

In the medium to long-term, we will work with the Northern Ireland Skills Forum as proposed in the Skills for a 10X Economy consultation to ensure the skills needs of the energy sector inform their work. This will be supported by formal engagement with the energy sector via a new Energy Skills Forum to identify skills gaps for emerging low carbon technologies. Through these routes, we will ensure appropriate programmes for skills development are in place across all levels, from apprenticeships to re-training and PhD programmes.

Invest in green innovation and low carbon technologies

Innovation will be at the heart of an economy based on low carbon technologies. Substantial funding for innovation for net zero exists across the UK and we are committed to taking advantage of this by ensuring that funding streams are available, suitable and promoted amongst local companies and academia. We will engage with The Department for Business, Energy & Industrial Strategy (BEIS) in the emerging fields of hydrogen, Carbon Capture, Utilisation and Storage and industrial decarbonisation and innovation. We have launched a green funding opportunities e-zine that will provide regular updates on available funding in the low carbon sector.

In 2022 we will initiate a programme of funding for research and development for key activities in the green economy with a focus on:

1. A private sector challenge fund to support implementation of maturing innovative technology at technology readiness level 7+
2. Research and development with a focus on consortia in advanced engineering sectors at technology readiness level 3+
3. Government-led trials and pilots to support implementation of emerging infrastructure technology which may have an impact at a national level

Given the scale of innovation that will happen in our homes and businesses, we will develop pilot schemes to inform future funding approaches and business models for domestic and non-domestic investment to ensure these are appropriately targeted. We will explore the potential for new and innovative funding mechanisms such as the use of the ratings system as an incentive for energy efficiency investment. We will also track new green finance solutions being offered by the private and banking sectors and monitor how consumers will continue to be protected as these emerge.



CASE STUDY:

Artemis Technologies

Artemis technologies, based in Lisburn, are leading on a project to decarbonise the maritime sector by launching the world's first high speed zero emission passenger ferry and developing the technical and operational requirements for a maritime transport system of the future.

Artemis has developed a new electric hydrofoil propulsion system, a wing-like appendage under the hull of a vessel, called the Artemis eFoil™ which lifts a hull out of the water as it moves. It has been developed to be fitted to both new vessels and retrofitted to older vessels. This is a complex endeavour and is truly transformative with the ability to reduce the energy consumption of conventional vessels by up to 90%. The reduction in drag delivered by the hydrofoil, combined with the efficiency savings of the electric drivetrain, means that much less energy is used to propel the vessel forward. Artemis's design makes high speed and high range electric propulsion a commercial viability for the first time and is helping the maritime industry to dramatically cut its carbon footprint.

Working with local universities and companies, comprising experts in the fields of aerospace, motorsport and yacht design, Artemis received £33m funding from the UK Research and Innovation's flagship Strength in Places Fund to fast track the development of this important new technology. This demonstrates how local innovation can help at a global scale by reducing environmental impacts while providing new highly skilled, highly valued jobs.



20



7. Do More With Less

VISION

We will set clear targets, standards and regulations that drive improvements in energy efficiency, provide support to invest in improvements to buildings and help consumers make changes that reduce their energy use.

OBJECTIVES

Deliver energy savings of 25% from buildings and industry by 2030.

Ensure all new buildings are net zero ready by 2026/27 (earlier if practicable).

Reduce the distance people travel in private vehicles.

Ambition

Using less energy and utilising the energy we do use more efficiently will be vital to reduce carbon emissions and lower energy bills. Doing more with less therefore helps to address important societal objectives such as fuel poverty alleviation and improving the health outcomes of our most vulnerable. It also supports business competitiveness by lowering energy demand and therefore bills.

To do more with less means meeting the needs of a successful economy and society whilst achieving energy savings. Northern Ireland's final energy consumption must fall significantly. Heat and power demand in buildings and industry currently equates to around 32,000GWhs per year.²¹ Our target is that we will have implemented measures that deliver annual energy savings, in buildings and industry, of 25% by 2030. Delivering the energy savings needed is both a huge challenge and opportunity. It will require interventions at a scale many times greater than today and will include setting new standards, new ways of living and new consumer support.

Key Policies

Introduce minimum standards for the energy efficiency of buildings

While we expect to see some efficiencies from improvements in technology standards, government will make a significant contribution to the 25% energy savings target by supporting improvements in existing buildings. To drive compliance and improvements in energy efficiency performance, we will set new and ambitious minimum energy efficiency standards as soon as possible.

It is estimated that 70% of buildings in use in 2010 will still exist in 2050.²² We may need to retrofit approximately 50,000 buildings each year – around three times the current level - with an increased whole building approach to retrofit.²³ New standards will initially focus on buildings, sectors and tenures which we see as the greatest priority before extending further across both domestic and non-domestic buildings.

21 <https://www.gov.uk/government/statistics/total-final-energy-consumption-at-regional-and-local-authority-level-2005-to-2018>

22 [retrofit2050 visions report.pdf \(cardiff.ac.uk\)](https://retrofit2050visionsreport.pdf(cardiff.ac.uk))

23 [Research into the future of energy efficiency policy in Northern Ireland \(economy-ni.gov.uk\)](https://research-into-the-future-of-energy-efficiency-policy-in-northern-ireland(economy-ni.gov.uk))

**Table 6: Priorities for Introducing Minimum Standards**

Domestic	Non-domestic
<p>The priority for this sector will be to carry out the necessary work to set standards in sectors such as:</p> <ul style="list-style-type: none"> • The private rented sector, where we have already started to take steps to put in place enabling legislation to set minimum standards; • Social housing, which represents around 15% of the domestic building stock²⁴; and • Domestic owner occupiers, the largest proportion of our domestic stock. 	<p>The priority for this sector is to improve our evidence base on the building stock to inform our approach:</p> <ul style="list-style-type: none"> • We have begun a comprehensive review of the non-domestic building stock and will confirm methodologies for energy profiles and performance; and • We will prioritise new standards on a sector-by-sector basis and expect an initial focus to be on the largest non-domestic energy users.

We intend to begin this work using existing available measures to set standards, including Energy Performance Certificates and Display Energy Certificates. We will, however, review our metrics for energy use in domestic and non-domestic buildings to identify alternative measures if appropriate. A system of regulation, enforcement, appeals and exemptions will be established and embedded at the outset.

Substantially increase funding and support for retrofitting buildings

New standards and regulations will only succeed if accompanied by measures to support consumers to invest, as research indicates that the mean cost of improving homes to at least a Band C is estimated to be £6,200 per dwelling.²⁵ Retrofitting buildings requires a range of support. The Executive will therefore ensure substantially enhanced levels of tailored support are available and that these are aligned with heat decarbonisation measures.

Table 7: Support for Key Consumer Groups

Consumer	Approach
Domestic	We will launch a significant pilot domestic retrofit scheme in 2022, the findings of which will inform potential new business models for ramping-up delivery. This will be aligned with other existing energy efficiency schemes and pilot projects and take account of specific requirements for heat pumps.
Business	We will launch a new energy efficiency support scheme through Invest NI in 2022. This will underpin the design of potential further future tailored support schemes.
Government	We are piloting an ‘invest to save’ fund for central government in alignment with the Energy Management Strategy. We will supplement this by piloting an additional investment fund for local Councils.

24 <https://www.communities-ni.gov.uk/publications/northern-ireland-housing-statistics-2019-20>

25 <https://www.nihe.gov.uk/Documents/Research/Single-Downloads/Cost-of-carbon-savings-in-NI-housing.aspx>



We recognise the need to ensure consumers have confidence in work carried out to their buildings. We will therefore identify the best approach to enhancing quality assurance and accreditation of works, building on best practice approaches elsewhere. The proposed pilot retrofit schemes will provide an opportunity to test how quality assurance can best be delivered.

Uplift building regulations for new buildings

We must ensure that new buildings prepare for our 2050 objectives. This means ensuring that new buildings are net zero ready and delivering uplifts in related areas of the Building Regulations. England has outlined Future Homes and Future Building standards with interim uplifts which suggest that new buildings aim to be ‘net zero ready’²⁶ from 2025. Our provisional programme proposes similar phases some 18 months later, in response to the revised assessment methodologies and implementation lessons this will provide.

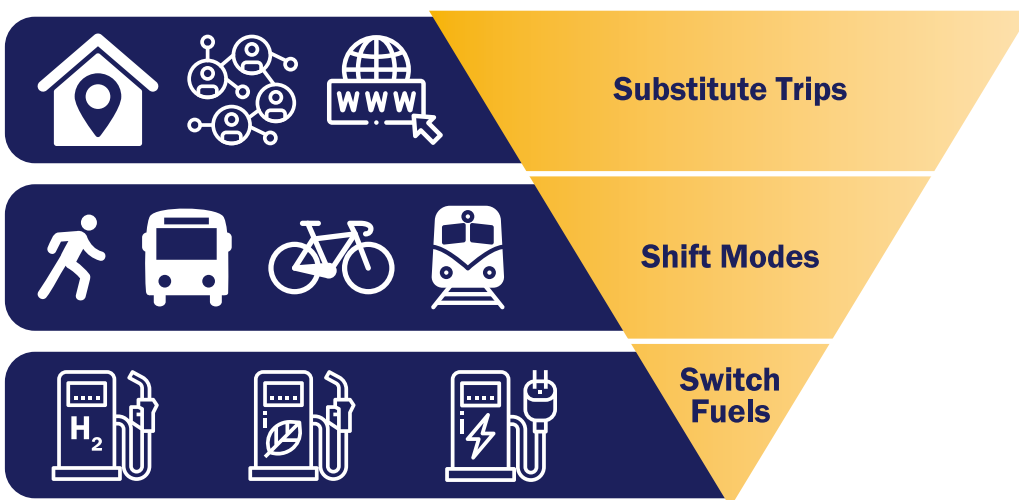
As an interim step, phase 1 consultation proposals to uplift to new build standards were published in October 2021²⁷. A phase 2 discussion exercise will gather evidence, including whether an early introduction of requirements based on low carbon heating could be feasible for the 2023 uplift. Full implementation of ‘net zero ready’ is anticipated no later than 2026/27, assuming England’s proposals remain on track.

These later phases will also address standards for work to existing buildings and in related areas, such as ventilation, overheating and, potentially, electric vehicle charge-point provisions. We will remain alert to emerging developments in areas such as embodied carbon, fuel price assumptions and grid impacts.

Develop and deliver a Local Transport Strategy

We want to reduce the energy that is used for transport and create more space for people to enjoy. We will do this by establishing a sustainable transport hierarchy, the first two steps of which will reduce the amount of travel that people undertake using private vehicles.

Figure 12: Sustainable Travel Hierarchy²⁸



26 In terms of operational emissions and ongoing decarbonisation of electricity
 27 [Consultation Proposals for amendment of Technical Booklet Guidance to Part F \(Conservation of fuel and power\) | Department of Finance \(finance-ni.gov.uk\)](#)
 28 [Planning for the future of Transport \(infrastructure-ni.gov.uk\)](#)



These steps will also bring health and well-being benefits from a reduction in transport emissions and an increase in active travel. To deliver on this, we will publish a Local Transport Strategy by end of 2022/23. This will build upon '*Planning for the Future of Transport – Time for Change*' with a focus on local transport choices and behaviour. This will:

- Encourage flexible working arrangements and promoting online services;
- Create neighbourhoods that provide access to local amenities;
- Continue to invest in infrastructure that supports active travel and public transport provision;
- Implement substantial demand management measures to restrict the use of private cars in town centres and discouraging their use for commuting purposes where viable alternatives exist;
- Progress opportunities to implement micromobility solutions such as scooters and bike schemes, innovative technology and digital solutions to provide alternatives to the private car; and
- Connect our active travel and transport options, including through integrating land use and transport planning and delivery of transport plans.

In order to demonstrate our progress we will develop robust data and undertake evaluation surveys to measure the impacts on energy use and emissions.

Communication will be vital and relevant campaigns will encourage people to walk, wheel or cycle; use public transport and ensure the future of mobility reduces energy use, lowers carbon emissions and benefits our health and well-being. They will also explain the purpose of any demand management measures.



CASE STUDY:

South West College

Energy efficiency and high environmental standards were at the heart of the recently opened state of the art accessible Erne campus in Enniskillen. The campus has been confirmed as the world's first educational and currently the largest, PassivHaus Premium rated building. The 8,200m₂ new build project is also the first UK building to achieve both PassivHaus Premium and BREEAM outstanding sustainable construction accreditations. Building on the success of the PassivHaus Certified CREST Centre, which opened in 2015, and has been delivering PassivHaus training since 2016, the new Further Education campus has achieved some of the highest environmental standards in modern construction.

Compared with the previous campus, which was heated with oil, performance of the new building represents a radical reduction in energy use, emissions and running costs and it is expected that heating energy demand will be 95% lower, saving the College an estimated £54,000 a year in heating bills alone. Not only this, but it generates four times more energy on-site than it uses. The campus will accommodate more than 800 full-time students, 2000 part-time students and 120 staff.





8. Replace Fossil Fuels with Renewable Energy

VISION

We will phase out fossil fuels by growing our indigenous renewable base, supported by sustainable renewable imports and using these to decarbonise heat, power and transport.

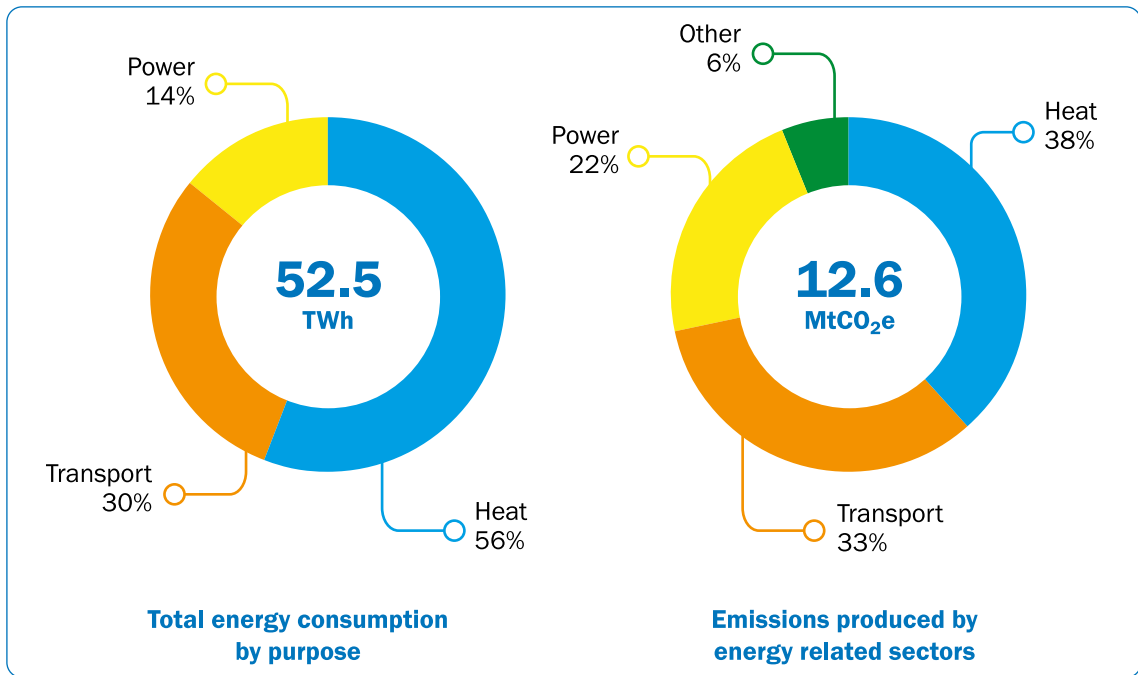
OBJECTIVES

- Meet at least 70% of electricity consumption from a diverse mix of renewable sources.
- Replace high carbon heating sources with lower and zero carbon sources in households and businesses.
- Support the transition to low and zero carbon fuels for vehicles.

Introduction

To date our greatest success in replacing fossil fuels with indigenous renewables has been in the electricity sector, where Northern Ireland exceeded its previous target to achieve 40% of consumption from renewable sources by 2020. Power does, however, account for a relatively small proportion of energy consumption and emissions. This Energy Strategy therefore takes a comprehensive approach to cover all energy used for heat, power and transport.

Figure 13: Emissions and Energy across Heat, Power and Transport in 2019²⁹



²⁹ [Sub-national total final energy consumption statistics](#) assigned using [Annex 5.2 in Energy in Northern Ireland 2020](#) (Energy consumption), [Northern Ireland greenhouse gas inventory](#) (Greenhouse gas emissions). Other includes non-fuel related emissions e.g. emissions from industrial processes and some waste handling activities. Data may not sum to 100% due to rounding.



Moving away from fossil fuels such as coal, oil, gas, petrol and diesel will have a significant disruptive impact on how we all live and work. The transition to low carbon heat and transport technologies, in particular, is likely to be different depending on where people live. Timelines must also be aligned to ensure that affordable new technologies are available to replace old carbon intensive technologies.

Our approach to decarbonising power, heat and transport will be tailored to the specific challenges and opportunities of each sector.

Table 8: Decarbonising Power, Heat and Transport

Sector	Approach
Power	Renewable electricity will become not only more important within the power sector but increasingly central to supplying our other energy needs. A renewable electricity consumption target of at least 70% likely means that we will need to double our renewable generating capacity in order to meet new demands from heating our homes and powering our vehicles. This will involve a more diverse renewables base with back-up from conventional plant, and the introduction of less familiar technologies to homes and businesses.
Heat	Decarbonising heat is one of the biggest challenges in achieving our vision as more than two thirds of homes still use fossil fuel oil fired central heating. The pathway to decarbonise heat is complex and will include a range of low carbon technologies. These will be fully considered to ensure that they do not lead to adverse impacts on human health or the environment. Our focus to 2030 will be ensuring that certain low-regret pathways remain open while focusing on removing the most carbon intensive sources of heating. We will support trials and pilots of lower carbon forms of heating to ensure they work for our homes and buildings. We will undertake also further research and continue to engage with stakeholders and consumers as we develop policy proposals to decarbonise heat. These steps will inform a Decarbonising Heat Consultation, which we will publish in the next Assembly mandate.
Transport	Building on the sustainable transport hierarchy, where private vehicle use is necessary we must support the switch to zero or low emission vehicles. Clear direction has been set by the UK government ban on the sale of all new petrol and diesel cars by 2030 and all plug in hybrids by 2035. ³⁰ This ban applies to Northern Ireland. There are also plans to set targets for ending the sale of new non-zero emission buses and heavy goods vehicles. We will need a tailored approach here in Northern Ireland to support vehicle users to navigate these changes.

30 Government takes historic step towards net-zero with end of sale of new petrol and diesel cars by 2030 - GOV.UK (www.gov.uk)



Key Policies

Implement a support scheme to bring forward investment in renewable electricity generation

A new renewable electricity target³¹ of at least 70% provides clear direction for investment and the policies required to support new renewable generation. Although it is now cheaper to invest in large-scale renewable generation than fossil fuel plants³², developers need better revenue certainty to take forward projects. We are currently working with BEIS to explore whether we can extend the Contracts for Difference scheme currently operating in GB to Northern Ireland, with a view to inclusion for the next Allocation Round in 2023. If not, we will seek to put in place an alternative support mechanism for investors.

We are confident that with the correct support in place, and future developments of the electricity network and planning policy, we will continue to build on our success in this area to date. A review of strategic planning policy for renewable and low carbon energy is currently being taken forward to ensure it remains fit for purpose to enable appropriate development in appropriate locations.³³ We will consult on this in 2022.

Given our need to diversify the renewable technology mix, we will renew our focus on marine technologies. We are committed to offshore wind forming a part of our future renewable electricity generation mix and we are seeking to ensure the correct environment is in place to attract investment opportunities in offshore and marine developments in Northern Ireland waters. Our focus will be facilitating pre-commercial test and demonstration sites in the 2020s which will put us on a clear pathway to commercialisation by the early 2030s or sooner if possible.

Phase out fossil fuel home heating oil

We cannot achieve our vision of net zero carbon energy without phasing out fossil fuel heating oil for around 68% of homes and businesses that still use it.³⁴ We recognise that this will have a significant impact on many people and particularly on those in rural areas which tend to be off the gas grid and where there are currently limited alternatives. The timelines and processes for the transition will require detailed planning to support consumers. Liquid fuel boilers may be able to convert to sustainable lower carbon fuels in the future; however, more research is required to understand the effective and affordable use of these fuels in Northern Ireland.

There are a number of potential transition pathways available to consumers currently using heating oil. These include a switch to zero carbon heating technologies such as a heat pump or connection to the gas network (where possible) to take advantage of the plan to fully decarbonise the gas used in the network. A range of hybrid options may be available, for example connection to the gas network and installation of a hybrid heat pump which, while still requiring decarbonised gas, would see primary demand met by the electric heat pumps. Another alternative could include transitioning to a heat pump with the option to use sustainable low carbon liquid fuels to meet high heat demand. The transition pathway will be explored in more detail in our Decarbonising Heat consultation.

31 The level of target will be considered as part of the five-year strategic review in 2025 based on the criteria outlined in the Options Consultation. We will also undertake a review of calculation methodologies for our renewable electricity target.

32 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/911817/electricity-generation-cost-report-2020.pdf

33 <https://www.infrastructure-ni.gov.uk/news/mallon-gives-green-light-renewable-energy-planning-review>

34 [House Condition Survey Main Report 2016 \(nihe.gov.uk\)](https://www.nihe.gov.uk/publications/house-condition-survey-main-report-2016)



Heat pumps will take advantage of our substantial and growing renewable electricity resources. However, we also intend to utilise our modern gas infrastructure and the potential to generate and import zero carbon gases. We will continue to engage with gas network operators on replacing natural gas with renewable gas.

The limited extent of the gas network means that not all customers are able to connect to it and it is not economic or viable to extend the network to all homes. However, as natural gas has lower emissions than oil we will continue to encourage people with access to the gas network to connect to it. This policy will also be considered further in the planned Decarbonising Heat consultation. We recognise that continued use of natural gas is an interim solution in meeting our longer-term objective of ensuring that energy for heating does not contain fossil fuels.

Phase out coal and certain solid fuels for home heating

Burning coal and certain other solid fuels, such as peat and wet wood, to heat homes not only results in carbon emissions, but also contributes to poor air quality and impacts on people's health.³⁵ For those who rely on these fuels as their primary source of heat it is important that we support them in the transition to low-carbon heating. As a first step, we will gather further data on those who will be most affected by this phase out, before consulting on our plans for financial support for these groups, including energy efficiency support where relevant, along with our proposals on how we intend to bring to an end coal, wet wood and certain other solid fuels as sources of home heating.

Introduce support for low carbon heat technologies including heat pumps

Heat pump technology will play an important role in replacing the fossil fuel heating sources that we have committed to phasing out, although we recognise that the diversity of our building types, age and condition mean that other low carbon technologies will also play a role. We will introduce a new support scheme to help consumers switch to lower carbon forms of heat. Our first step will be to launch a pilot domestic and small business support scheme for low carbon heat in 2022/23 which will then lead to a wider rollout of support.

Improving energy efficiency will be important in supporting our transition away from fossil fuels. Ensuring that buildings are as energy efficient as possible is key to the successful future expansion of the heat pump sector and cost effective operation of heat pumps. Our approach will therefore align with proposed support for energy efficiency upgrades and provide clarity about what is needed for a home to be "heat pump ready". In the future, new builds will also be required to install low carbon heating technologies such as heat pumps, with timeframes determined through the phased approach to uplifting building regulations.

Whilst heat pumps are becoming increasingly established in other jurisdictions, the sector in Northern Ireland is in its infancy. We intend to undertake bespoke heat pump research to build on lessons learned in other jurisdictions and to better understand how we can develop a self-sustaining sector here. Lower upfront costs as a result of economies of scale and increased competition in the market will make heat pumps more accessible.

35 [A Clean Air Strategy for Northern Ireland – Public Discussion Document | Department of Agriculture, Environment and Rural Affairs \(daera-ni.gov.uk\)](#)



Run trials and demonstrations on emerging heat solutions

To support the longer-term phase out of gas we are already taking the necessary steps to facilitate injection of biomethane into the gas network by mid-2022. To ensure we can maximise the potential use of hydrogen in the gas network, we will review existing legislative provision by 2025. The route to fully decarbonised gas is uncertain and we are working with the gas sector to understand viable pathways.

To develop opportunities for heat networks we will assess potential solutions to decarbonise existing heat networks. We will take forward heat network trials and demonstrators, using a range of energy sources including geothermal energy and, where feasible, waste heat.

We have established a Geothermal Advisory Committee to provide advice and guidance on the availability of geothermal energy to heat our buildings. The Geological Survey of Northern Ireland have published a geothermal heat map³⁶ alongside the strategy which will allow developers and planners to determine if a location is suitable for geothermal heating and/or cooling.

We will continue to gather data on the potential for sustainable bioenergy, including biomass, Hydro-treated Vegetable Oil (HVO) and BioLPG for heating. We will also consider the need for trials of these fuels to assess their future role.

Create a roadmap to a cleaner, greener transport system

We need to support the transition to electric vehicles in the next decade in advance of the ban on the sale of new petrol and diesel cars by 2030. Estimates of the anticipated need for public charge point requirements by 2030 vary; however, we acknowledge that a significant increase will be required to support the transition to electric vehicles in Northern Ireland in addition to home, on-street, workplace and destination charge points. This scale of electrification of transport will present challenges and opportunities for our electricity network and demand management and will require investment for grid reinforcement.

The Executive will deliver an EV Charging Infrastructure Plan in 2022, supported by a group of essential partners from the public and private sector. This group will develop, implement, review and monitor the measures available to encourage private participation in EV infrastructure development and respond to local needs of users. In the short term, the focus will be to establish a network of rapid charging points across our strategic road network. This should include roads that link into Northern Ireland from Ireland. Another key element will be supporting the provision of on-street and destination charging in urban areas where access to driveways and home charging is more limited.



For the harder-to electrify sectors including HGVs, we will work on an all-island basis to develop the infrastructure for alternative fuels such as hydrogen and biomethane. Building on our existing capabilities in this area, we will work with partners to support vehicle and refuelling technology trials. We will identify and prioritise measures that:

- Inform technology choice and incentivise transport operators to move towards a zero emissions fleet; and
- Support demand management and behavioural change to incentivise optimisation of resources used to move people and goods.

We will also review how we measure carbon emissions from transport to assist with decarbonisation plans and monitor progress.



CASE STUDY:

Translink

Translink has developed plans to increase modal shift from the private car onto sustainable public transport alongside other forms of active travel, to deliver a net zero public transport system by 2040 and to be climate positive by 2050.

As part of the programme for introducing zero emission vehicles, the Department for Infrastructure has funded 3 Hydrogen fuel cell electric buses which have entered service with Belfast Metro in December 2020. These innovative vehicles are powered by hydrogen. Produced through renewable wind energy, the compressed hydrogen is taken to a bus depot in Belfast and used to refuel the buses. When in service the only emission from the bus is water from the fuel cell.

In November 2020 the Minister for Infrastructure announced funding for 100 zero emission buses made up of a further 20 fuel cell electric buses and 80 battery electric buses for addition to Translink's fleet. The roll-out of these vehicles will take place in the first quarter of 2022 and will operate approximately one third of all Belfast Metro services. This sets the direction for future zero emission fleet procurement with further plans in place for the next phase of Translink's decarbonisation journey to include Derry/Londonderry.





9. Create a Flexible, Resilient and Integrated Energy System

VISION

We will create a flexible, smart and digitised energy system that integrates renewables across heat, power and transport, creates value for consumers and enhances security of supply.

OBJECTIVES

Develop markets and infrastructure that integrate low carbon sources and meet our energy needs in a secure and cost effective way.

An accessible and digitised energy system where data provides value for consumers and system operation.

Decentralised solutions that enable people and communities to be active participants in the energy transition.

Introduction

The future of energy will be smarter and will integrate demand and supply more effectively. Innovative and flexible technologies will enable greater amounts of low-carbon electricity to provide much more of our energy needs in the next decade and beyond. We therefore require a new emphasis on flexibility and demand side services to manage our system efficiently, minimise costs and ensure security of supply. This will be enabled by well-planned, integrated infrastructure alongside efficient markets that provide value for the new capabilities. We support the North South Interconnector as a key measure to ensure security of supply in Northern Ireland.

The coming years will be crucial for developing and implementing these transformational changes and laying the foundation for a fully net zero energy system. We will improve the quality and availability of energy data to support better system planning and operation, which will also allow greater engagement by consumers. This necessitates a much more digitised electricity system and greater use of technology. Our shift towards decentralised energy also means new opportunities for consumers and communities, an increased emphasis on local energy solutions and new forms of engagement.

We have an ongoing obligation to transpose and implement legislation that maintains the integrity and operation of the Single Electricity Market (SEM).



Key Policies

Closely review and monitor the security and resilience of our changing energy system

As traditional sources of energy supply are replaced by new renewable sources and demand becomes more dynamic, the energy system - particularly electricity - will be more complex to manage. Supply from wind and solar resources is variable, and our ageing fossil fuel plants need to become much better able to operate alongside and facilitate this growth in renewable generation. Not only this, but many existing fossil fuel plants will likely be coming to the end of their useful life in the next 5 to 10 years.

There will be challenges in balancing supply and demand over the next decade. We need new mechanisms to continue to deliver a secure electricity supply and ensure it is better-matched with the higher and changing demands from the electrification of heat and transport. This will require a range of complementary approaches to be taken forward as part of an integrated, flexible and resilient system.

Figure 14: Key Aspects of a Resilient and Secure Electricity System





Defining and ensuring security of supply for all our energy needs in a renewables-based, integrated and digitised system will need to change. We will review security of supply definitions and good practice in an integrated energy system. We will then set out a roadmap for identifying opportunities and risks, including those represented by increased decentralisation and the potential use of decarbonised gas across the whole energy system.

Implement measures around system flexibility services, energy storage, data and electromobility

The growth of renewables across Northern Ireland is already having a profound effect on our electricity sector. We have been very successful in integrating high levels of renewables but we need to ensure that the system can accommodate and effectively utilise the expected doubling of renewable generation by 2030. This means the development of flexible demand and supply from households and businesses, supported by conventional generation and flexibility markets.

Our electricity system operators will play a crucial role in enabling increased flexibility by planning and delivering appropriate infrastructure and markets as well as operational tools to manage the network. Close cooperation between our transmission and distribution system operators is essential to meet these challenges. We will also require sustained cooperation and collaboration within the Single Electricity Market.

We will complete the implementation of legislation that maintains the integrity and operation of the SEM relating to flexibility services, energy storage, data and electromobility as soon as practicable. This framework aims to create an integrated competitive, consumer-centred, flexible, fair and transparent electricity network and market.

Introduce smart measures as part of a wider digitisation and data framework

Data is at the heart of our future energy system. Gathering better quality data, and enabling appropriate access to it, will provide important benefits for consumers, network operation and market participants. It will also enable greater participation in the electricity system. Safely accessing this data will require the introduction of a range of technologies, regulation and consumer protection. Our approach to a digitised system will focus on three key aspects.

**Table 9: Creating a Digitised Energy System**

Consumer	Approach
Consumer Data	Timely and detailed data access will enable new tariff types ³⁷ , which will help to match consumption to periods when energy is more abundant, provide system support and potentially lower costs. A priority is smart data access and management functionality for consumers. Smart meters are one potential tool for providing this and we will carry out a Cost Benefit Analysis on smart data in 2022. We will establish a framework for data regulation that allows market participants such as aggregators and demand response providers to optimise value.
System Data and Accessibility	Network operators have been investing to increase the available electricity system data in Northern Ireland, but more needs to be done. The Energy Data Taskforce ³⁸ focused on two key principles of first filling in data gaps through requiring new and better-quality data and then maximising its value by embedding the presumption that data is open. We will ensure consumers and market participants have fair and easy access to comprehensive, detailed electricity system data. We expect the system operators to establish an integrated framework for energy system data in line with a Northern Ireland Digitalisation Strategy. NIAUR will work with stakeholders to take forward the Taskforce recommendations to unlock opportunities for customers as soon as possible.
Smart Technologies	A framework for smart technologies that considers the role of smart meters as part of a smart grid is required to enable effective use of data and support flexibility. Alongside the roll-out of EV charging, including smart charge points, we expect similar integration of other technologies in the electricity network, such as heat pumps and batteries.

Adopt policies that facilitate active consumers and energy communities

If individuals and communities have an active stake in the energy transition they can also access more of the value generated within the energy system and be rewarded for the services that they may provide such as demand flexibility or data. We will develop enabling frameworks for both active consumers and Citizen Energy Communities. These frameworks will enable them to engage in a range of energy services including generation, supply, consumption and aggregation and consider what financial support or access to new revenue streams can be provided.

Enabling meaningful community involvement and engagement is essential and pre-application community consultation will assist in shaping new developments through the planning system. A Planning Engagement Partnership has been convened to consider ways to enhance the quality and depth of community engagement in the planning process at both regional and local planning level. Actions to enhance community involvement may also emerge from the review of the implementation of the Planning Act (NI) 2011.³⁹

³⁷ <https://www.uregni.gov.uk/consultations/call-evidence-launched-electricity-distribution-tariff-reform>

³⁸ <https://esc-non-prod.s3.eu-west-2.amazonaws.com/2019/06/Catapult-Energy-Data-Taskforce-Report-A4-v4AW-Digital.pdf>

³⁹ [Review of the implementation of the Planning Act \(NI\) 2011 - Call for Evidence | Department for Infrastructure \(infrastructure-ni.gov.uk\)](https://www.infrastructure-ni.gov.uk/review-of-the-implementation-of-the-planning-act-ni-2011-call-for-evidence)



CASE STUDY:

Rural-Led Energy Transition (RULET)

RULET is a joint Ulster University/Northern Ireland Housing Executive initiative within SPIRE 2 (an EU Interreg-funded project), which aims to reduce or eliminate the risk of low-income households being left behind in the transition to clean, smart, integrated energy systems.

Domestic electrical heating systems, when combined with energy storage and smart controls and operated at scale, have the potential to create significant system value by managing high levels of wind generation. Northern Ireland has world-leading levels of wind energy; however, when wind generation exceeds electricity demand, the output from wind turbines is ‘dispatched down’ – turned off. In 2020, 15% of NI’s available wind energy, with a retail value of over £80m, was dispatched down.

RULET builds on the work of the HANDIHEAT project (which assessed low carbon heating and improved thermal performance) and is focused on developing new tariffs and technologies designed to make the full benefits of cheap wind energy available to the most vulnerable households in the western counties of Northern Ireland, a wind energy hotspot. Partners include NIE Networks, PowerNI, You Generate CIC, the Utility Regulator and technology manufacturers Climote, Grant and Sunamp.

The project will install equipment in October 2021 to assess tariffs and technologies for deployment in social housing, with further plans to expand low carbon heating programmes in winter 2022-23.



HANDIHEAT pilot, Housing Executive houses, Co Fermanagh

10. Outlook to 2050

Future Uncertainties

By 2030, energy in Northern Ireland will have changed considerably due to this Energy Strategy. We aim for carbon emissions to have reduced significantly through energy efficiency measures, greater consumer engagement, changed transport patterns and a system that delivers a much greater proportion of all our energy needs from renewable and lower carbon sources. This will make an important contribution to carbon reductions needed to 2030 and beyond.

We will develop expertise in the installation and use of a range of low carbon technologies in the next decade. However, greater uncertainty lies ahead about the future balance of existing and emerging energy sources and technologies in our energy system. We expect to see some new technologies mature and become more cost effective in Northern Ireland, such as electrolysers, floating platform offshore wind and Carbon Capture, Usage and Storage. This will depend on their development over the coming years.

Scenario Modelling

There are a range of approaches that could be taken to deliver a net zero carbon energy mix by 2050. To help illustrate potential pathways after 2030 we have developed two scenarios that visualise different net zero carbon energy systems based on different policies and technologies. These scenarios explore future energy pathways and have been developed using a new publicly-available and open-source Energy Transition Model built specifically for Northern Ireland.⁴⁰ Neither are forecasts of the future, nor do they represent any statement of policy intent.

Table 10: Illustrative 2050 Energy System Scenarios

Scenario	Approach
Power Play	In this scenario we rely largely on the success of the renewable electricity sector. High levels of electrification take advantage of a substantially larger renewable electricity base. Increased generation capacity is met through a combination of solar photovoltaic, offshore wind and marine technology. In addition, there is an expansion of onshore wind, aligned with improved demand-side management and flexibility measures.
Flexible Fit	This scenario takes greater account of regional differences in Northern Ireland and includes higher levels of both local involvement and local responses to the energy transition. Although electrification remains at the centre of the energy system, there is greater use of fuels such as hydrogen and bio-fuels. Energy for heat and transport have quite different solutions depending on location and geography and for power it may imply a more decentralised system.

40 [Northern Ireland – Power Play 2050 - Energy Transition Model](#)
[Northern Ireland – Flexible Fit 2050 - Energy Transition Model](#)

Both long-term scenarios illustrate a significant drop in final energy demand and a much greater proportion of our energy coming from electricity. There is growth in zero-carbon gases in both scenarios, although Flexible Fit sees higher levels of gasification in the form of green gas and hydrogen. Another significant change is in our use of oil for heating and transport: in 2018 this was 60% of final energy demand, by 2030 it falls to 47% and in 2050 represents only 3% of final energy demand in these scenarios.

Figure 14: Final Energy Demand by Scenario to 2050

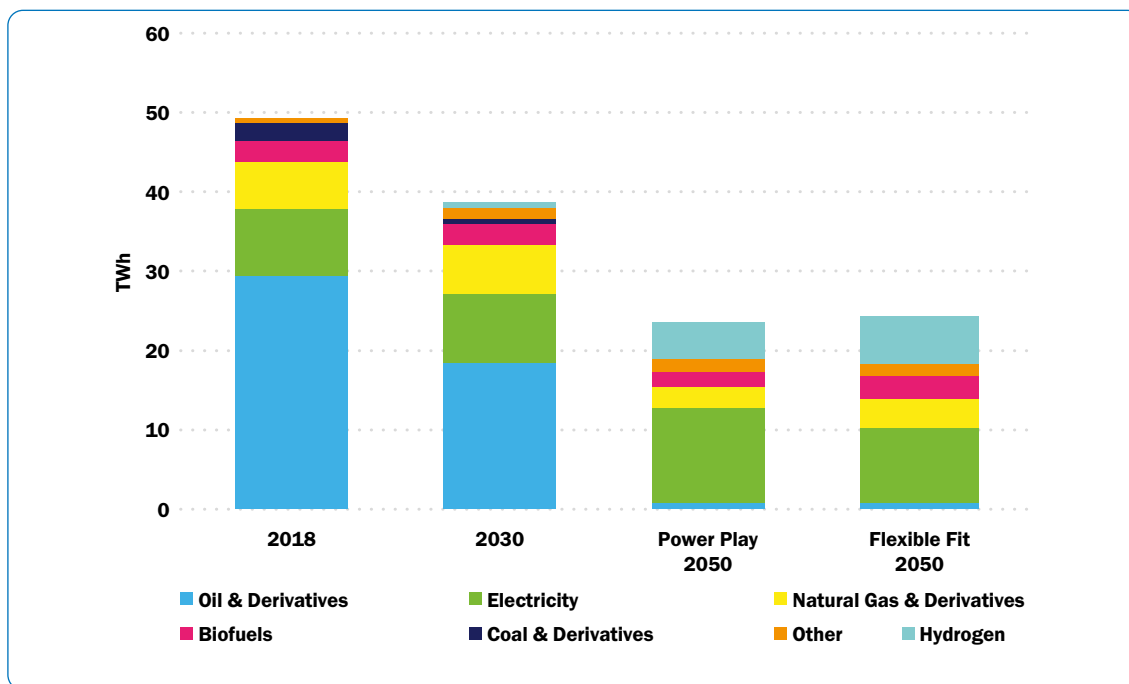


Table 11: Characteristics of Illustrative Future Energy Scenarios in 2050

POWER PLAY	FLEXIBLE FIT
<ul style="list-style-type: none"> • With high levels of electrification and energy efficiency, overall energy demand falls by 52%. • Electricity is the largest energy source across heat, power and transport: 50% of total demand. • Hydrogen (19%) plays a key role in transport and industry and biogas is an important energy source. • Oil and gas continue to play a very small role due to the 'hard to electrify' areas • Coal is no longer in use. 	<ul style="list-style-type: none"> • A diverse mix of technologies, greater decentralisation and energy efficiency means energy demand falls by 50%. • Electricity is the largest energy source: 38% of total demand. • Biofuels account for 29% of total energy demand, due to biomethane use in the gas network and biofuels replacing some heating oil. • Hydrogen contributes 24% across transport, heat and industry, whilst coal is no longer in use. • Oil accounts for 3% of final energy demand for transport.

11. Delivering the Strategy

We have integrated the following delivery priorities that were identified in the consultation within other areas of the strategy:

- **Security of supply:** We have incorporated this into Chapter 9.
- **Costs:** Our approach to costs and investment is set out in Chapter 4.

We will bring together the leadership and actions, evidence and monitoring to successfully deliver this strategy. This will be supported by a new Programme Board to oversee delivery, an action plan and the necessary legislation to underpin the net zero carbon energy pathway.

Delivery Roadmap

The Energy Strategy will be supported by an action plan, which will be brought forward by the end of 2021. This will set out the key supporting actions planned to March 2023 that will progress and deliver on the Energy Strategy, as well as an outline of expected actions in the following years. The action plan will be overseen and monitored by a new Programme Board.

Provide leadership across the central and local energy governance landscape

Implementing this strategy will require even greater coordination across government. As with the development of the Energy Strategy, DfE will provide leadership across the energy landscape to deliver this. We will implement a new NI Executive Programme Board to oversee and coordinate delivery of the strategy and associated policies.

Figure 15: Overview of Energy Strategy Programme Board



Given the very significant contribution that this strategy will make to Northern Ireland's climate commitments we will ensure close coordination with delivery and reporting in the Climate Action Plan. We will work with Local Authorities to map where current capabilities and responsibilities exist and identify gaps or constraints in delivering our vision. The one stop shop will also provide expertise and support once established.

Review and implement necessary legislative and regulatory changes

The current legislative and regulatory base is not sufficient to deliver on this Energy Strategy. New energy legislation is required to underpin the delivery of the net zero carbon pathway. We will identify where new powers are needed to enable strategy delivery and set out a framework for implementing these. As the Utility Regulator is a critical policy enabler we will develop an appropriate mandate to support a net zero carbon future, including reviews of licencing and regulatory regimes.

Produce a comprehensive energy evidence programme to inform policy decisions

We have published an outline of the research, modelling and analysis that has taken place in support of the strategy and our future Energy Evidence Work programme.⁴¹ This highlights modelling, data and research projects that have supported the development of the Energy Strategy. A range of future research projects and activities to further develop the evidence base have also been identified.

Monitoring

We will carry out a review of this strategy every five years, with the first in 2025. In addition, we will publish annual progress reports on delivery of actions against this strategy which will present new and updated actions each year. These will:

- Track our identified metrics and monitor progress;
- Refresh and update the action plan, including new actions identified; and
- Provide an overview of strategic developments.

The first progress report will cover the period up to March 2023.

41 [Energy Evidence Programme](#)