



Chapter 5: Differences in national circumstances

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The devolved administrations have an important role to play in achieving the UK's carbon budgets. Scotland, Wales and Northern Ireland accounted for 22% of UK emissions in 2013, whilst accounting for 16% of the UK's population and 13% of GDP.

They have (fully or partially) devolved powers (Box 5.1) in a number of areas relevant to emissions reduction. These vary by nation, and are increasingly important as powers are further devolved. Key areas of devolved responsibilities include transport demand-side measures, energy efficiency, agriculture, land use and waste. The devolved administrations also have an important role in implementing UK policy (such as renewable energy deployment) through the provision of additional incentives and their approach in areas such as planning policy¹.

As part of their contribution to the UK's long-term emission reduction goal, the governments of the devolved administrations have adopted different emission reduction policies, as well as different strategies for monitoring their progress towards emissions targets. Scotland has passed its own Climate Change Act and has legislated annual targets, while in Wales and Northern Ireland targets have been set by the devolved governments. In Wales, the Environment Bill (2015) provides for the setting of reduction targets and carbon budgets.

This chapter explains how differences in national circumstances and devolved policies affect the recommended level for the fifth carbon budget. Our approach to assessing differences in national circumstances through the 2020s involves three steps:

1. Derive a baseline emissions projection to 2030 for each of the devolved administrations that takes into account, as far as possible, differences in current and projected trends across Scotland, Wales and Northern Ireland.
2. Present the results of analysis carried out for the 2020s on abatement opportunities across a range of sectors, highlighting where particular opportunities and challenges exist for the devolved administrations.
3. Put these together to provide an indicative Central scenario for 2030.

¹ Energy policy is fully devolved to the Northern Ireland Executive.

Box 5.1: Overview of current devolved matters for key sectors

The balance of powers that are reserved (i.e. issues upon which only the UK Parliament can make laws) versus devolved varies to some extent by devolved administration:

- **Economic and fiscal:** Mostly reserved, although increased powers are being devolved to the Scottish Government (e.g. air passenger duty).
- **Energy:** In Scotland and Wales energy is mostly reserved with the exception of the Renewables Obligation in Scotland. Energy (apart from nuclear) is devolved to Northern Ireland.
- **Planning:** Mostly devolved, with the exception of nationally significant infrastructure in Wales being reserved.
- **Local government and housing:** Including domestic and public energy efficiency and fuel poverty is mostly devolved.
- **Industry:** Mostly reserved.
- **Transport:** Demand side measures are mostly devolved.
- **Agriculture and land use:** Mostly devolved.
- **Waste:** Fully devolved.

It is likely that legislation will be altered and affect what is devolved in the future. If any subsequent changes between now and 2028 affect how to achieve the fifth carbon budget we will discuss them in our annual progress reports.

1. Current and projected emissions

Current emissions

The latest greenhouse gas inventory for the devolved administrations is for 2013² and shows higher shares of emissions relative to population and GDP, due to high emissions from sectors such as industry and agriculture (Figure 5.1):

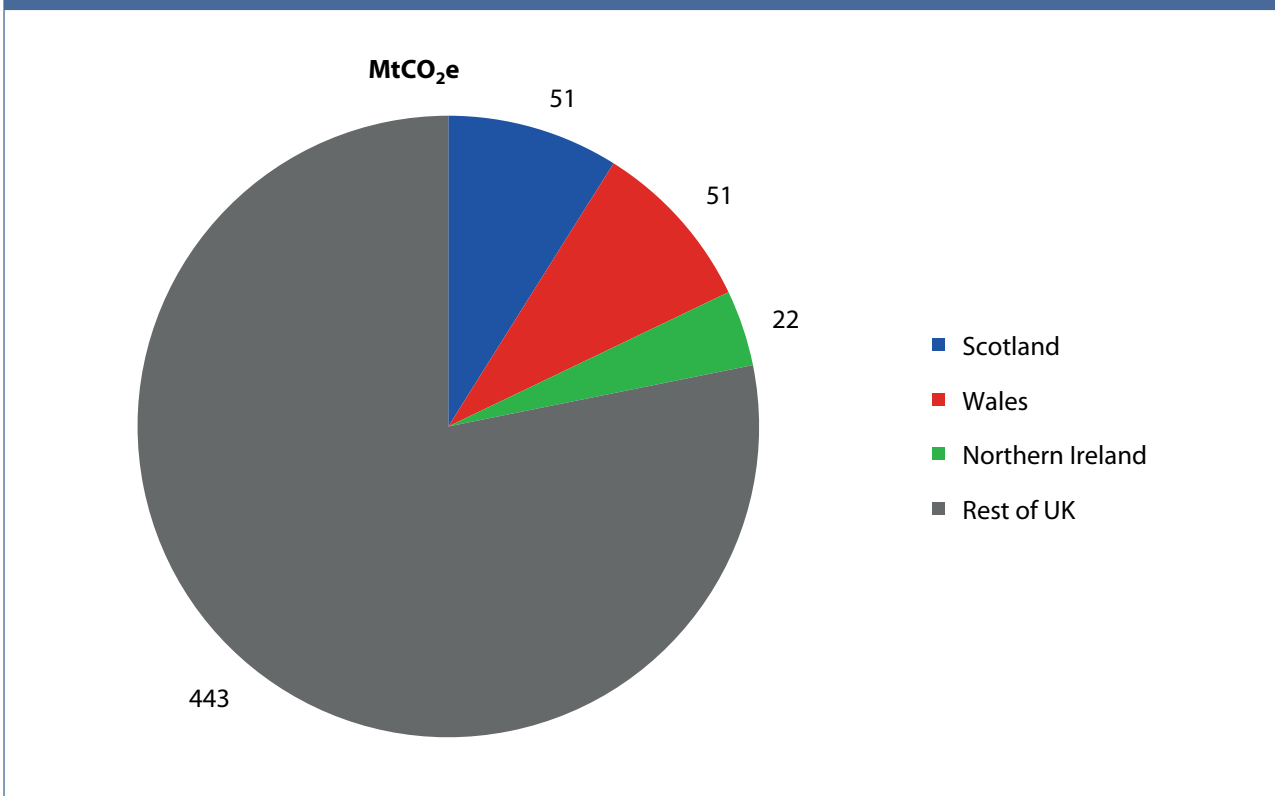
- Emissions in Scotland of 50.6 MtCO₂e account for around 9% of total UK emissions, compared with an 8% share of UK population and 8% share of UK GDP.
- Emissions in Wales of 50.8 MtCO₂e account for around 9% of total UK emissions, compared with a 5% share of UK population and 4% share of UK GDP. Higher emissions per person in Wales reflect the larger share of heavy industry in Wales.
- Emissions in Northern Ireland of 22.4 MtCO₂e account for around 4% of total UK emissions, compared with a 3% share of UK population and 2% share of UK GDP.

The level of emissions reflects the distribution of production around the UK. Carbon budgets are set on the basis of where production – and emissions – take place. It may be that the devolved administrations have similar emissions to the UK as a whole when considered on a consumption basis (i.e. emissions embedded in the goods and services consumed in devolved administration)³.

² Emissions data for the devolved administrations are available almost a year after that of the UK. 2014 data for Scotland, Wales and Northern Ireland will be published in June 2016.

³ <https://www.theccc.org.uk/publication/carbon-footprint-and-competitiveness/>

Figure 5.1: Greenhouse gas emissions in the devolved administrations as proportion of UK total (2013)



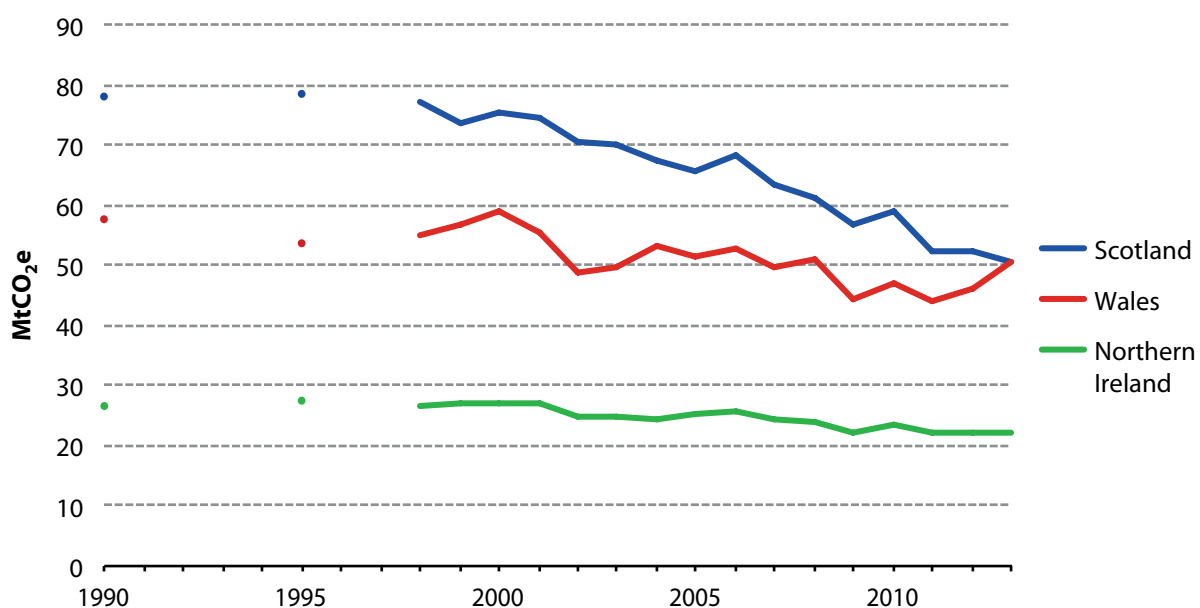
Source: National Atmospheric Emissions Inventory (2015).

Notes: Does not include international aviation and shipping emissions. Emissions presented are for 2013, as these are the most recent that have been disaggregated by devolved administration. Since their publication, the UK-wide emissions inventory has been revised, so data here are not consistent with UK-wide emissions data elsewhere in this report. It is expected that emissions estimates for 2013 will change for each devolved administration when 1990-2014 disaggregated data are published in June 2016.

Emissions trends since 1990 vary between the devolved administrations (Figure 5.2):

- Gross emissions have fallen since 1990 by 35% in Scotland, 12% in Wales and 16% in Northern Ireland.
- Emissions in 2013 in Scotland fell nearly 4% on 2012 levels, but rose 10% in Wales due to an increase in emissions from industry (primarily from Port Talbot steelworks). Emissions in Northern Ireland remained largely unchanged.
- Over the four years to 2013, emissions have fallen by an average 2% per annum in Scotland, have risen by an average 3% per annum in Wales and remained largely unchanged in Northern Ireland. This followed falls of 7%, 13% and 7% respectively between 2008 and 2009 due to the impact of the recession.

Figure 5.2: Greenhouse gas emissions in Scotland, Wales and Northern Ireland (1990-2013)



Source: NAEI (2015).

Notes: Includes CO₂ and non-CO₂ emissions from all sectors (power, buildings, industry, transport agriculture, LULUCF and waste). GHG emissions data are not available for the devolved administrations for 1991-1994, or 1996-1997. Does not include emissions from international aviation and shipping.

Baseline emission projections to 2030

Disaggregated projections to 2030 suggest that, without policy to reduce them, emissions could rise between 2013 and 2030 by 3% in Scotland and 12% in Northern Ireland, and fall 1% in Wales, compared to a 3% rise projected for England (Box 5.2). The slight fall in emissions in Wales is due to projected reductions in industrial emissions, in particular the iron and steel sector where DECC project a 20% drop in UK production by 2030. As industry emissions account for a higher proportion of Wales' total compared to elsewhere in the UK the impact of the drop in production is more pronounced.

The actual emissions to 2030 will in part depend on the actions and policies developed towards meeting devolved administration targets covering this period (Box 5.3), which include both traded and non-traded emissions:

- Scotland has missed its first four annual targets in large part due to inventory revisions. However, since 1990 gross emissions have reduced 35%, the most in the UK (UK wide emissions fell 30% in 2013), while net emissions in Scotland (including international aviation and shipping and adjusting for trading in the EU ETS) have fallen 38.4%. Scotland is therefore on track to meet its 42% reduction target by 2020. Scotland's strong performance is down to significant new entry of low-carbon electricity generation and some success improving the energy efficiency of homes.
- The Welsh Government has made good progress in some policy areas, for example implementing ambitious residential energy efficiency programmes. However, progress toward the 2020 target to reduce emissions to 34.6 MtCO₂e (a 40% reduction from 1990, 32% from 2013) is currently falling short of the reductions required. Wales has a higher proportion of emissions covered by the EU ETS than the rest of the UK, meaning the 40% target is particularly sensitive to increases in traded sector emissions for which policy is not devolved. Wales' emissions are dominated by traded sector industrial emissions (34% of total emissions in 2013 from industry), mostly from Port Talbot steelworks. In 2013, gross emissions in Wales had fallen only 12% from 1990 levels due to high industrial emissions.

- Northern Ireland has greater devolved responsibilities than Scotland and Wales (e.g. its energy market is linked to that in the Republic of Ireland), but delivery of its target still partially depends on UK-level policy and future targets on the fifth carbon budget. The Northern Ireland Executive is behind their required progress to reduce emissions 35% from 1990 levels by 2025.

The delivery of future devolved administration targets will be reliant at least in part on UK-wide policies and targets and requires continued commitment to meeting UK carbon budgets.

Box 5.2: Deriving baseline emissions projections for the devolved administrations

Our methodology includes:

CO₂ emissions

Residential emissions are derived from a UK baseline from the National Household Model (NHM). Average nation-specific shares derived from emissions between 2009 and 2013 are applied to the UK projections.

Non-residential buildings and industry emissions are derived from DECC interim projections (October 2015). Average nation-specific shares derived from emissions between 2009 and 2013 are applied to the UK projections. This does not account for the potential of future variation in demand for energy or in the fuel mix (for example if the gas grid was extended in Northern Ireland) specific to the devolved administrations.

Road transport (cars, vans, HGVs, and buses) emission projections are produced from the Department for Transport (DfT) National Transport Model for Scotland and Wales, while Northern Ireland's emissions are estimated on the basis of road transport fuel consumption⁴.

Emissions from land use, land use change and forestry are produced separately for each UK nation by the Centre for Ecology & Hydrology, currently projected to 2050.

Non-CO₂ emissions

Agriculture and Waste non-CO₂ emissions are derived from DECC's UK non-CO₂ forecasts. Average nation-specific shares derived from emissions between 2009 and 2013 are applied to the UK projections.

⁴ Rail transport and aviation and shipping are not included in the analysis as the emissions and abatement potential from the devolved administrations is relatively small.

Box 5.3: Devolved administration's emission reduction targets to 2020

Each of the devolved administrations has set their own targets for emissions reductions over the next decade:

- **Scotland:** The Climate Change (Scotland) Act 2009 sets the target of reducing emissions by 80% by 2050 compared to 1990 levels, with a target for 2020 of a 42% reduction in emissions, covering all greenhouse gas emissions (including international aviation and shipping). Additional targets include generating the equivalent of 100% of Scotland's gross annual electricity consumption through renewable sources by 2020 and for renewable sources to provide the equivalent of 11% of Scotland's heat demand. Secondary legislation in the Act sets annual targets for Scottish emissions. These have been set on an absolute basis up to 2027.
- The Scottish Parliament is due to pass legislation to set annual emission reduction targets for 2028-2032 in 2016. The fourth set of annual targets (2023-2027) are based on the Committee's advice to the Scottish Government in 2011 and originally embodied comparable ambition to the fourth carbon budget at UK level. However, since then there have been significant revisions to both historical emissions data and projections. As a result, these targets are now considerably more challenging and go beyond the ambition of the fourth carbon budget. The Scottish Government published its second report on policies and proposals in 2013 which sets out how it intends to meet these targets.
- **Wales:** has set a target to reduce all greenhouse gases by 40% by 2020 against a 1990 baseline. This goes beyond the UK-wide commitment and is compatible with a path to the level of ambition in the fourth carbon budget. Additionally, Wales has an annual target to reduce emission within devolved areas of competence by 3% per year. Wales' new Environment Bill due to be legislated in 2016 will include the provision for carbon budgets and interim targets to 2050.
- **Northern Ireland:** is aiming to reduce greenhouse gas emissions by 35% below 1990 levels by 2025 for all greenhouse gases and sectors. The Northern Ireland Executive have set out a Greenhouse Gas Action Plan in 2011 to outline how each department in the Executive will contribute towards meeting their 2025 reduction target.

Source: Scottish Government, Welsh Government, Northern Ireland Executive.

2. Abatement opportunities and challenges through the 2020s

The devolved administrations have different emission reduction opportunities and ambitions to the UK average, and from each other. While advice on UK carbon budgets needs to be consistent with these circumstances, the devolved governments also need to take into account UK commitments in deciding on their individual paths. As further powers are devolved the Governments and Executive should ensure that any new plans are also consistent with UK climate change targets.

In developing a central emission reduction scenario for the devolved administrations, we identify abatement opportunities across key emitting sectors and take these off the baseline projection.

This is a high-level assessment and we will analyse abatement opportunities in greater detail in Scotland and Wales in follow-up advice in 2016.⁵

⁵ Advice on the levels of the 2028-2032 Scottish annual targets will be published March 2016. Advice on carbon budgets for Wales is expected to be published in the summer of 2016.

We do not include emissions from the power sector in our baseline emissions projections. Our UK power scenarios involve reduced use of fossil-fired power stations (especially coal), but we are not able to predict the exact spatial distribution of these. Nevertheless, we briefly discuss the potential contribution to decarbonising the UK's power sector from the devolved administrations, given the significant resource potential in each area.

Buildings: Energy efficiency and low-carbon heat

There is potential in the devolved administrations for emission reductions from both energy efficiency and low-carbon heat in buildings through the 2020s:

- At the UK level, we have highlighted scope in the residential sector for ongoing insulation of solid walls through the 2020s. The opportunity exists also at the devolved level, particularly in Scotland where the proportion of households with solid walls is around 26% (compared to 23% across the UK).
- Existing building regulations are likely to make a useful contribution to emission reductions, although these will impact on only a small proportion of the total building stock in 2030.
- Energy efficiency measures in all buildings (residential and non-residential) could provide potential abatement of 1.3 MtCO₂, 0.6 MtCO₂ and 0.4 MtCO₂ in Scotland, Wales and Northern Ireland respectively in 2030⁶.
- The devolved administrations also have high numbers of households in fuel poverty⁷ (39% in Scotland, 30% in Wales and 42% in Northern Ireland compared to 12% in England), in part due to higher numbers of households not on the gas grid (50% in Scotland, 21% in Wales and 80% in Northern Ireland compared to 10% across the UK), lower incomes and inefficient housing.
- Our detailed analysis of the housing stock and of potential for low-carbon heat at the UK level (see Chapter 3 of our technical report – *Sectoral scenarios for the fifth carbon budget*)⁸ also identifies opportunities at the level of the devolved administrations in residential buildings to 2030 (e.g. 0.3 MtCO₂, 0.4 MtCO₂, and 0.1 MtCO₂ of potential abatement in Scotland, Wales and Northern Ireland respectively). Low-carbon heat in non-residential buildings suggests further savings (e.g. 0.6 MtCO₂, 0.2 MtCO₂ and 0.1 MtCO₂ in Scotland, Wales and Northern Ireland respectively) in 2030.
- In particular Northern Ireland has a relatively high share of cost-effective low-carbon heat potential in the residential sector, reflecting the lack of a widespread gas grid and the high proportion of the population using oil for heating (68% compared to 4% in UK). There are plans to extend the gas grid in Northern Ireland to connect towns in the west to natural gas (approximately 4.5% of homes); however there will remain a large number of households (63%) who could potentially benefit from low-carbon heating.

There is therefore substantial scope for cost-effective emissions reductions from low-carbon heat across the devolved administrations.

Scotland and Northern Ireland both have targets and their own policies for low-carbon heat deployment. However, in our progress report in June 2015⁹ we highlighted that current projects are not enough to meet the targets. Scotland relies in part on funding from the GB-wide Renewable Heat Incentive for investment in low-carbon heat; however, with uncertainty about the future of the scheme, longer-term commitment from the UK and Scottish Governments is needed to encourage further uptake.

⁶ These numbers have been derived from CCC's UK energy efficiency abatement potential calculations.

⁷ A fuel-poor household is defined here, in line with definitions in the devolved administrations, as one which needs to spend more than 10% of its income on fuel to maintain an adequate standard of warmth. In England, this is defined as 21°C in the living room and 18°C in other occupied rooms.

⁸ Available at <https://www.theccc.org.uk/publications>

⁹ <https://www.theccc.org.uk/publication/reducing-emissions-and-preparing-for-climate-change-2015-progress-report-to-parliament/>

Industry

Industry emissions in the devolved administrations are in part covered by the EU ETS, in different proportions to the UK average. The 2013 share of industry CO₂ emissions covered by the EU ETS in Scotland is around 38%, with a share of 58% in Wales and 21% in Northern Ireland, compared with 40% UK-wide.

In the 2020s, there are significant opportunities for additional abatement (traded and non-traded) (see Chapter 4 of our technical report) including:

- For low-carbon heat, there is emission reduction potential up to 0.9 MtCO₂, 0.4 MtCO₂ and 0.2 MtCO₂ in Scotland, Wales and Northern Ireland respectively from increased penetration of biomass and biogas in industry.
- For carbon capture and storage (CCS), there are opportunities for deployment in Scotland¹⁰, first in power and then, utilising the CO₂ infrastructure developed for the power projects, for carbon-intensive industry. Deployment of industrial CCS in Scotland is not included in our Central scenario to 2030 (where deployment of industrial CCS is limited to England), but could be deployed by 2050. In practice, opportunities for deployment of industrial CCS will be determined by what happens with CCS power projects and the development of infrastructure clusters.

Our analysis of additional abatement options in the carbon-intensive industry sectors suggests there is potential by 2030 for:

- In Scotland an additional 0.3 MtCO₂ from the refining sector from waste heat and energy recovery, as well as increased energy efficiency.
- In Wales, a further 0.4 MtCO₂ from the refining sector and 0.3 MtCO₂ from the iron and steel sector. Industry in Wales accounted for 34% of total emissions in 2013, with nearly half of these from Port Talbot steelworks. The plant is not located near any planned CCS infrastructure. The abatement potential identified is from steam and power production system upgraders, reducing yield losses and from heat recovery and reuse.

There remain challenges in realising this potential for reducing emissions in the devolved administrations, particularly in Wales where industry emissions make up a large share of the total and have increased in recent years. Industry remains a reserved matter and to reduce emissions further as targets tighten through the 2020s devolved and UK governments need to work together on innovative solutions which can be implemented at a devolved level.

Transport

The main opportunities for reducing transport emissions through the 2020s are more efficient conventional vehicles, increased penetration of electric and plug-in hybrid vehicles and biofuels.

However, there are also important demand-side measures, such as the promotion of 'Smarter Choices' including use of public transport, eco-driving and developing cycling infrastructure, for which devolved administrations control the relevant policy levers.

The disaggregation of abatement potential for the devolved administrations from road transport in both reserved and devolved matters is split by distance travelled and suggests significant scope in 2030 of 5.4 MtCO₂, 3.4 MtCO₂ and 3.1 MtCO₂ in Scotland, Wales and Northern Ireland respectively.

¹⁰ A final investment decision will be made in early 2016 on the Peterhead gas CCS power plant, while there is also potential for a 570 MW CCS coal-gasification power station at Grangemouth, following £4.2 million industrial research and feasibility work.

We are not able to account for how geographic factors will affect uptake of abatement measures in transport for the purposes of the advice in this report given a lack of evidence. When we later provide specific advice to the devolved governments we will consider local options further.

Changing travel behaviour is the main lever to influence emission reductions from transport available to the devolved administrations, and they are often at the forefront of programmes and action. However, the devolved governments need to work with UK and EU policy to ensure that infrastructure facilitating sustainable behaviours, such as EV charging and cycling provisions, are in place and that any future targets are tailored to their specific nation's needs.

Agriculture and land use

Agriculture is particularly important in the economies of the devolved administrations compared to the UK as a whole, reflected in this sector's share of emissions of 29% in Northern Ireland, 16% in Scotland and 12% in Wales, compared to 9% for the UK as a whole.

Agriculture is a devolved policy matter and the devolved administrations, like England, have voluntary programmes to reduce emissions through a range of soils and livestock measures:

- The Scottish Government has outlined 1.5 MtCO₂e abatement potential by the end of the 2020s from Farming for a Better Climate, a programme aimed at improving efficiency, optimising livestock management and developing renewable energy, and 0.2 MtCO₂e from uptake of fertilizer efficiency measures¹¹.
- The Welsh Glastir programme supports farmers to develop sustainable land management approaches and encourages on-farm renewable energy generation.
- The Northern Ireland Executive has established the Greenhouse Gas Implementation Partnership (GHGIP), which encourages implementation of on-farm efficiency measures which will reduce the carbon intensity of local food intensity.

Beyond 2020, our Central scenario contains abatement in agriculture of around 8.5 MtCO₂e for the UK as a whole in 2030 (see Chapter 6 of our technical report). Analysis of the potential at the devolved administration level suggests a Central scenario of around 1.2, 0.9, and 0.9 MtCO₂e reductions in 2030 in Scotland, Wales and Northern Ireland respectively. This abatement potential forms a higher share of overall abatement in devolved nations compared to UK as a whole (e.g. 18% of total abatement potential from the sectors analysed in Northern Ireland being from agriculture, compared to 8% in UK, reflecting its high share of agriculture emissions).

In addition, there are opportunities for reducing emissions through devolved administration approaches to land use and forestry:

- Scotland has a significant proportion of the UK's carbon sinks in its peat soils (60%). The importance of protecting and managing this is highlighted in the Scottish Government's land-use strategy. Although peatland restoration is not included in our abatement scenarios, the Scottish Government have previously estimated 0.5 MtCO₂e of potential abatement in 2027^{12,13}. Targets in Scotland to increase forests require 100,000 hectares of woodland to be created by 2020 (approx. 10,000 per annum). Farmers in Scotland are also able, depending on the land's ongoing use, to receive funding for agro forestry under Pillar II of the EU CAP while still being able to receive Pillar I payments. These payments are greater than those available in England. Afforestation and agro-forestry could contribute 0.8 MtCO₂e of potential abatement in 2030.

¹¹ As reported in Scottish Government's second report on policies and proposals <http://www.gov.scot/Publications/2013/06/6387/0>

¹² As reported in Scottish Government's second report on policies and proposals <http://www.gov.scot/Publications/2013/06/6387/0>

¹³ Emissions from upland peat and the savings potential from the restoration of degraded peat are not currently included in the LULUCF inventory.

- The Welsh Assembly Government has a target to plant 100,000 hectares of new woodland over 20 years. The Government has also set out a rural development plan to help prioritise areas for investment and emission reductions. Abatement potential from afforestation and agro-forestry in Wales is estimated at 0.4 MtCO₂e in 2030.
- The Northern Ireland Executive has a longer-term planting target to double the area of forest from 2012 levels (6%) by 2056. Abatement potential from afforestation and agro-forestry is estimated at 0.1 MtCO₂e in 2030. Northern Ireland has the lowest woodland cover in the UK.

Waste

Waste in the UK is fully devolved to the Scottish and Welsh Governments and Northern Ireland Executive. Their policies go further to reduce the amount of waste and waste emissions than those in England. These are discussed in greater detail in Chapter 7 of our technical report – *Sectoral scenarios for the fifth carbon budget*.

- Landfill taxation will become devolved to Scottish and Welsh Governments before 2020 and it is expected that the landfill tax will be set at a higher level than in England.
- Sending food waste to landfill will be banned in Wales under the planned Environment Bill and in Northern Ireland under the Food Waste Regulations (2015).

Our Central scenario for UK abatement includes the impact of devolved policies to divert biodegradable waste streams from landfill, and then across the UK by 2025. Abatement potential in 2030 has been identified as 0.5, 0.2 and 0.1 MtCO₂e respectively in Scotland, Wales and Northern Ireland.

Power sector

Much of the UK's renewable electricity resource potential lies in the devolved administrations, especially Scotland, due to favourable geography for onshore and offshore wind. Alongside strong progress to date, there are significant investments in the pipeline and ambitious targets in place:

- Scotland's renewable electricity generation accounted for 29% of the UK's total, including 36% of total UK wind in 2014. This was generated from 7.2 GW of capacity. Planning has been granted for a further 4.1 GW of offshore wind at sites in Scottish Territorial Waters and for 4.4 GW of onshore wind. In addition, up to 150 MW of wave and tidal energy could be deployed by 2020. These projects could deliver the capacity required for the Scottish Government to meet its target for at least 100% of gross electricity consumption to be delivered from renewables by 2020 (nearly 50% was met in 2014). However, latest projections from Scottish Renewables¹⁴ show that predicted capacity by 2020 will produce 87% of equivalent annual demand for power. This is because a number of the projects with planning permission may not have finance in place as they cannot meet the deadline for the closure of the Renewables Obligation and have not yet secured a Contract for Difference. There is also greater uncertainty in investment in Scottish renewables following the announcement of subsidy cuts for onshore wind energy from April 2016. With 66% of planned onshore wind farms in the UK located in Scotland, this could have a greater impact on future development than for other areas of the UK.

¹⁴ <https://www.scottishrenewables.com/publications/update-scotlands-2020-renewable-energy-targets/>

- In Wales, renewable electricity generation accounted for around 5% of the UK total. Planning decisions for large infrastructure projects are a reserved matter, with applications over 50 MW decided by the UK Planning Inspectorate. The Silk Commission in Wales recommended that powers over larger-scale energy consents (between 50 and 350 MW) become devolved by 2020. The world's second largest wind farm opened in 2015 off the coast of Wales delivering nearly 600 MW of capacity. In 2015, planning permission was granted for a tidal lagoon scheme in Swansea which would generate 500 GWh/year of electricity if built, although there is uncertainty over whether the project will be awarded a contract.
- Northern Ireland accounted for 3% of the UK's renewable electricity generation in 2014. The Northern Ireland Executive has set a target to generate 40% of electricity from renewable sources by 2020, although the current pipeline of projects is not enough to meet this target. Northern Ireland is not part of the GB small-scale feed-in-tariff at present although the Department for Enterprise, Trade and Investments (DETI) are in discussions with DECC on how they can be integrated into the scheme to help drive uptake in smaller-scale renewables.

Given their resource potential and ambitious targets, the devolved administrations, in particular Scotland, have an important role to play contributing to required UK power sector decarbonisation through the 2020s. For our Central power sector scenario in 2030¹⁵, which has a carbon intensity below 100 gCO₂/kWh across GB, Scottish emissions from the power sector are projected to fall to 1.6 MtCO₂, a reduction of 86% from 2013 levels compared to a 69% fall for GB as a whole. However, the Scottish Government has a target to achieve a carbon intensity of 50 gCO₂/kWh or lower in the power sector. If reached this would give a fall in emissions of 90% from 2013 levels¹⁶.

3. Central scenario for emissions in the devolved administrations

Table 5.1 and Figure 5.3 bring together our baseline emissions projections and our assessments of abatement potential to set out a central emissions scenario for the devolved administrations through the 2020s. Under our Central scenario for the fifth carbon budget (Chapter 3), direct emissions in the sectors analysed (i.e. excluding power)¹⁷ would fall by around 54%, 39%, and 28% by 2030 in Scotland, Wales and Northern Ireland compared to 1990 levels.¹⁸

The different rates of reduction largely reflect the respective shares of emissions from different sectors. For example, our scenarios have a lower amount of reduction in emissions from agriculture compared to transport, leading to lower overall reductions in emissions in Northern Ireland, where agriculture has a larger share. The scenarios at devolved level are necessarily approximations; precise levels are hard to predict as changes in single emissions sources (e.g. a single power plant or industrial facility) can have a large effect.

We will use parts of this analysis to help inform our advice on targets on emissions reduction in Scotland and Wales in 2016.

¹⁵ The power sector model (Chapter 2 of our technical report) for Great Britain is split into geographical regions matched to Distribution Network Operator regions. Scotland is included as a region on its own. Wales is split between two and therefore cannot be separated. Northern Ireland is not included as the model is GB only.

¹⁶ However, given that Scotland is part of an integrated GB power system, calculating its carbon intensity is less meaningful, as it will share back-up capacity with the rest of the system.

¹⁷ Includes: buildings, industry, road transport, agriculture, LULUCF and waste. Power sector projections are not included in Scotland. If they were, Scottish emissions would be projected to fall by 61% from 1990 levels in our Central scenario.

¹⁸ Emissions would fall by around 27%, 23%, and 18% by 2030 in Scotland, Wales and Northern Ireland compared to emissions in 2013.

In 2050 the aim for the devolved administrations is similar to the UK as a whole. This will include energy efficient homes, very low emissions from waste and transport and decarbonised power and heat sectors. Scotland has legislated within the Climate Change (Scotland) Act, a target to reduce emissions by at least 80% in 2050 on 1990 levels, with a cumulative budget of 1,250 MtCO₂e covering 2010 to 2050. Wales is also planning to introduce an 80% reduction target in its Environment Bill. Northern Ireland does not have any specific target for 2050, although all the devolved governments are covered by the UK-wide targets and carbon budget levels.

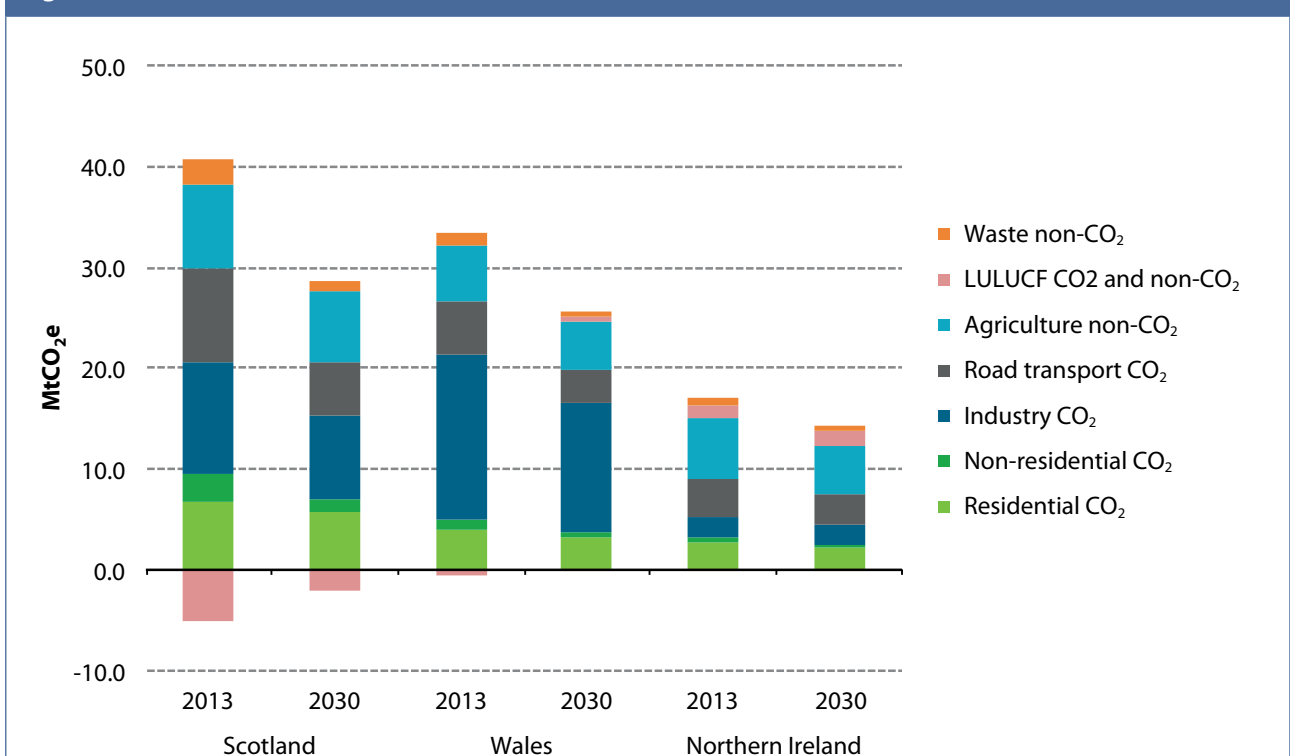
Table 5.1: Abatement potential in the devolved administrations in 2030 (MtCO₂e)

Sector	Scotland	Wales	Northern Ireland	Total abatement	2030 Central emissions	% reduction from 2013
Buildings	2.2	1.2	0.6	4.0	13.0	26%
Industry	1.2	1.1	0.2	2.5	23.4	20%
Transport	5.4	3.4	3.1	11.9	11.5	41%
Agriculture	1.2	0.9	0.9	3.0	16.5	17%
LULUCF	0.8	0.4	0.1	1.3	-0.2	n/a
Waste	0.5	0.2	0.1	0.8	2.0	56%
Total	11.7	7.4	5.3	24.4	66.2	22%

Source: CCC calculations, DECC, DEFRA, DfT, SRUC, CEH, ICL (2015).

Notes: Total abatement, 2030 Central emissions and % reduction from 2013 are combined across Scotland, Wales and Northern Ireland. For LULUCF, the emissions can be positive or negative, and so a percentage reduction is not an appropriate metric.

Figure 5.3: Scotland, Wales and Northern Ireland – 2013 emissions and 2030 Central scenario (selected sectors)



Source: DECC, DEFRA, DfT (2015), CCC calculations.

Notes: 2013 emissions do not match figure 5.2. This chart does not include emissions from the power sector, other transport, non-CO₂ from buildings, industry, and road transport, and CO₂ from agriculture and waste.

4. Wider considerations

Chapter 4 covered a range of considerations required under the Climate Change Act, at the UK level. Here we cover relevant issues specific to the devolved administrations.

Fuel Poverty

Rising carbon prices and support for investment in renewable electricity could result in higher energy bills. These costs could be disproportionate to those heating with electricity, especially in off-gas grid properties, often in rural or island communities, of which there is a greater number in the devolved administrations. This could exacerbate fuel poverty, which is already a significant problem.

However, fuel poverty and energy efficiency is a partially devolved matter. Each nation has its own targets and programmes to improve energy efficiency of homes, which are more comprehensive than those available in England (i.e. GB-wide Green Deal and Energy Company Obligation). These include area-based schemes in Wales and a new £224m scheme in Scotland which targets funds at installing energy efficiency measures in fuel-poor homes over the next 15-20 years.

We will consider fuel poverty in more detail when we advise the devolved administrations individually.

Competitiveness

There is a potential risk to the competitiveness of energy-intensive sectors in the devolved administrations, in particular Wales where these are a large part of the economy. These can occur if low-carbon policies disadvantage specific sectors or firms, potentially harming profits and driving location of production to other countries. The steel industry has seen some large changes globally and in the UK including the price of steel decreasing, the strengthening of the pound and an increase in electricity prices due to the wholesale cost of electricity increasing.

Climate change policies however, constitute a small proportion (around 2%) of total costs in the UK steel sector. For steel and other heavy industry, exemptions and compensations for climate policy costs are in place or planned. We have therefore concluded that competitiveness risks are manageable across the UK given the policies in place, and cost effective abatement opportunities to reduce emissions (Chapter 4).

There may also be positive impacts from the shift to a low-carbon economy given opportunities for the devolved administration to sell in new markets for low-carbon goods and services and opportunities for investments in renewables.

Energy Security

The devolved administrations, especially Scotland, have ambitious targets for renewable power generation. These pose challenges related to the intermittency of supply (i.e. wind power is only available when the wind is blowing). Our conclusion at the UK level also applies at the devolved level – these challenges are likely to be manageable with sufficient deployment, within the overall GB system, of back-up gas capacity, interconnection, storage and demand-side response (see Chapter 2 of our technical report). It is likely that, due to the locations of unabated gas power stations required for the GB system as a whole, some devolved administrations will appear to have less or more than their ‘fair share’ of emissions from gas generation required to balance the system at times of high demand or low renewables output.

Further planned interconnections between England, Scotland and Wales will also help to improve security of electricity supply in Great Britain.

Wider energy security is reserved in Scotland and Wales, and in Northern Ireland it is devolved to the Executive. Increasing the proportion of renewable generation would increase the diversity of the energy mix, while reduced reliance on fossil fuels would lessen the exposure to fossil fuel price volatility. The Northern Ireland gas supply relies on imports, so deployment of non-fossil generation will reduce this dependence.

Overall, security of electricity supply will depend on incorporating flexibilities that exist across the GB grid alongside the decarbonisation programmes of the devolved administrations. A transition to a low-carbon economy is likely to be beneficial for broader energy security.

5. Summary

There is a similar pattern of abatement potential in the devolved administrations as in the UK, but with the following key differences:

- There is potential for Scotland to contribute a greater share of low-carbon power, given the size of its renewable resources.
- The high share of energy-intensive industry in Wales is reflected in a relatively lower amount of abatement and a lesser overall projected fall in emissions compared to UK as a whole.
- Agriculture abatement is more pronounced, given the higher share of agriculture emissions in devolved nations. This is especially the case in Northern Ireland where the sector is relatively more important for emissions and the economy. This also contributes to a lower overall fall in emissions in Northern Ireland compared to the UK as a whole.

Devolved levers and policies are important to delivering the scenarios for reducing emissions set out in Chapter 3. In areas where devolved administrations have led so far there is increased scope to reduce emissions further. There is also potential for greater learning across the UK from the experience of each devolved administration.

The total potential abatement in the sectors analysed (excluding power) from the devolved administrations in 2030 is 23.5 MtCO₂e¹⁹. While they will deliver against their own targets, which may be more stretching than the fifth carbon budget, the potential abatement is 21% of the total UK abatement and therefore the devolved administrations will be important in delivering the emissions reductions needed to meet the fifth carbon budget.

Delivering these feasible emissions reductions through the 2020s will require action now to develop options and new policies, both at the UK and devolved levels, given the balance of reserved and devolved powers:

- New policies and commitments will be required to support energy efficiency improvements in the period to 2020 and beyond.
- UK and devolved government support and incentives will be required for development of markets for low-carbon heat and promotion of public transport and active travel.
- Development of land use strategies and local action plans across the nations including new policies to encourage farmers to reduce emissions.

¹⁹ This includes both traded and non-traded abatement potential in industry. This is therefore in part dependent on EU ETS allocation to 2030. Non-traded only potential abatement is 21.5 MtCO₂e.

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- As further powers are devolved the governments and Executive should ensure that any new plans are consistent with climate change targets and reducing greenhouse gas emissions.
 - UK Government financial and other support will be required if renewable electricity resource potential is to continue to be exploited.
 - Devolved and UK governments need to work together on innovative solutions to reduce industrial emissions which can be implemented at a devolved level.