

Northern Ireland Carbon Intensity Indicators 2023

Notes for Guidance



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Department of
**Agriculture, Environment
and Rural Affairs**

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User Guidance Notes

Pre-release legislation dictates that only the latest published Official/National Statistics should be used where available. This means that some indicators may be more up-to-date than others although it is the trend that should be of primary interest rather than the most recent data point.

The user guidance for each of the indicators outlines the relevance of each indicator to greenhouse gas emissions and highlights any known issues.

User Guidance Notes for Cross-Cutting Indicators

Indicator

1.1 Ratio of greenhouse gas emissions to Gross Value Added (GVA)

Relevance of indicator to greenhouse gas emissions

Greenhouse gas emissions are affected by a range of factors including but not limited to economic activity. In the past greenhouse gas emissions and economic growth have been linked due to the structure of the global economy and reliance on fossil fuels. As Northern Ireland transitions towards a low-carbon economy we would expect to see greenhouse gas emissions falling, GVA rising and hence this ratio decreasing further.

Any known issues or limitations

This indicator has been derived by combining data from two different publications: greenhouse gas emissions for Northern Ireland from the greenhouse gas inventory and gross value-added data from ONS' national accounts. Neither dataset was designed for this purpose, and each will have an inherent uncertainty.

Estimates of greenhouse gas emissions have an inherent uncertainty due to uncertainty in the underlying activity data and emissions factors. For more information see:

[Northern Ireland Greenhouse Gas Inventory 1990 to 2021](#)

Other factors affect greenhouse gas emissions such as energy prices and weather. For example, a particularly cold winter can result in increased heating demand and relatively low prices for a particular fuel can increase its use.

Indicator

1.2 Greenhouse gas emissions per capita

Relevance of indicator to greenhouse gas emissions

Northern Ireland's population is projected to grow from the current 1.90 million¹ people to 1.93² million people by 2030. You would expect an increase in population to result in an increase in greenhouse gas emissions, due to, for example, a greater energy demand, more buildings, traffic, and waste. Hence it is useful to consider greenhouse gas emissions per capita.

Any known issues or limitations

Estimates of greenhouse gas emissions have an inherent uncertainty due to uncertainty in the underlying activity data and emissions factors. For more information see:

[Northern Ireland Greenhouse Gas Inventory 1990 to 2021](#)

There is a National Statistics publication which reports on emissions per capita, called [UK Local Authority and Regional Greenhouse Gas Emissions](#). The June 2022 publication was the first to include estimates of methane (CH₄) and nitrous oxide (N₂O) in addition to carbon dioxide (CO₂); publications prior to this covered emissions of CO₂ only.

However, the figures in the UK Local Authority and Regional Greenhouse Gas Emissions publication will differ to those in indicator 1.2 as they are on an end-user basis³ whereas emissions for indicator 1.2 are considered on a by source basis⁴. In addition, The Local Authority and Regional figures considers three greenhouse gases (CO₂ CH₄ and N₂O) whereas Indicator 1.2 considers seven (CO₂, CH₄, N₂O, HFCs, PFCs, SF₆ and NF₃).

¹ [NISRA, 2021 mid-year population estimates](#)

² [NISRA, 2020-based interim population projections for Northern Ireland](#)

³ End user basis - emissions from the production and processing of fuels, and the production of electricity, are reallocated to final consumers of the energy to reflect the total emissions relating to that energy use.

⁴ By source basis - all of the CO₂ produced by a power station is allocated to the energy supply sector and not the users of the electricity.

User Guidance Notes for Power Sector

Indicator

2.1 Greenhouse gas emissions per unit of electricity consumed/generated

Relevance of indicator to greenhouse gas emissions

The emissions per unit of electricity consumed/generated indicator is a key carbon intensity indicator for the energy supply / power sector. As the mix of fuel used in Northern Ireland's power stations changes, the resultant greenhouse gas emissions also change. Coal and oil result in greater emissions per unit electricity generated than natural gas and much more than renewable sources.

Any known issues or limitations

This indicator has been derived by combining data from two different publications: greenhouse gas emissions for Northern Ireland from the greenhouse gas inventory and electricity consumption/generated from BEIS' energy trends. Neither dataset was designed for this purpose, and each will have an inherent uncertainty. It gives a reasonable indication of the carbon intensity of the power sector, and how it has changed over the past decade.

Estimates of greenhouse gas emissions have an inherent uncertainty due to uncertainty in the underlying activity data and emissions factors. For more information see:

[Northern Ireland Greenhouse Gas Inventory 1990 to 2021](#)

Indicator

2.2 Electricity generation by fuel type

Relevance of indicator to greenhouse gas emissions

This is a supplementary indicator which is intended to show the fuels used to generate electricity in Northern Ireland. The emissions of carbon dioxide per unit energy produced is lower for natural gas than for coal or oil.

Any known issues or limitations

Imports and exports of electricity to or from Scotland and the Republic of Ireland are not considered in this indicator. Greenhouse gas inventory reporting attributes energy supply emissions to the country that the energy was generated in, so for example, electricity generated in Northern Ireland but used in Scotland, will contribute greenhouse gas emissions against Northern Ireland's total and not Scotland's. In 2021, Northern Ireland exported 1,092 GWh of electricity to the Republic of Ireland whilst 865 GWh of electricity were transferred from Scotland to Northern Ireland.

[Electricity generation and supply in Scotland, Wales, Northern Ireland, and England, 2017 to 2021](#)

[Energy Trends: UK electricity \(see Table 5.6 for exports, and transfers of electricity\)](#)

User Guidance Notes for Buildings Sector

Indicator

3.1 Residential greenhouse gas emissions per household

Relevance of indicator to greenhouse gas emissions

The emissions per household indicator is a useful carbon intensity indicator for the buildings sector. As new homes are built with additional consideration given to thermal efficiency and carbon emissions e.g., using low-carbon heat, and existing properties are retrofitted to improve their thermal efficiencies, e.g., additional insulation installed, it would be expected that residential emissions per household should decrease, even though more properties could mean more emissions.

Any known issues or limitations

This indicator has been derived by combining data from two different publications – greenhouse gas emissions for Northern Ireland from the greenhouse gas inventory and housing stock from Land & Property Services. Neither dataset was designed to be used in this way and the estimates of greenhouse gas emissions have an inherent uncertainty due to uncertainty in the underlying activity data and emissions factors. For more information see:

[Northern Ireland Greenhouse Gas Inventory 1990 to 2021](#)

Land & Property Services maintains Valuation Lists for all domestic and non-domestic properties in Northern Ireland for the purposes of rating. The housing stock figures show the number of domestic dwellings which have a rates liability. In line with the Rates Order (NI) 1977, housing stock is defined as a count of properties which are valued as domestic or mixed for the purposes of rating. This refers to properties in the Valuation List which are used (or when next in use, will be used) for the purposes of a private dwelling. This includes properties which are temporarily incapable of beneficial occupation, but excludes caravans, domestic garages, domestic stores, and car parking spaces.

[NI Annual housing stock statistics](#)

For more information see also Department for Communities' Northern Ireland Housing Statistics 2021-22 Section 1 Tables – Supply.

[NI Housing Statistics 2021-22 Section 1 Tables - Supply](#)

Indicator

3.2 Housing stock with energy efficiency measures

Relevance of indicator to greenhouse gas emissions

This indicator is related to the thermal efficiency of Northern Ireland's housing stock by considering measures such as full double glazing, full cavity wall insulation and loft insulation. More thermally efficient properties would expect to use less energy to maintain the desired level of heating. Lower fuel use would equate to lower levels of greenhouse gas emissions.

Any known issues or limitations

This indicator is an estimate and is subject to uncertainty because it is collected using a sample survey with associated sampling error margins. This indicator is taken from the Northern Ireland House Condition Survey. The 2016 survey had a sample size of 1,917. The gross response rate for the 2016 House Condition Survey was very high. A total of 1,942 full inspections were successfully carried out giving an overall response rate of 99 per cent.

The 2016 House Condition Survey is the latest available survey with results published in 2018. Preliminary results were revised: the total stock figure for 2016 (which had been reported as 740,000) was investigated, and as a result the 2016 figure was corrected to 780,000.

For more information see the House Condition Survey section of the NIHE website, and Department for Communities' Northern Ireland Housing Statistics 2021-22, Section 2 Tables – Energy.

[House Condition Survey](#)

[NI Housing Statistics 2021-22 Section 2 Tables - Energy](#)

Indicator

3.3 Mean Standard Assessment Procedure (SAP) rating for dwelling stock

Relevance of indicator to greenhouse gas emissions

Dwellings with better SAP ratings will be more energy efficient and will require less energy to maintain a particular standard of living. Using less energy is strongly linked to lower greenhouse gas emissions unless the energy is provided by renewable sources.

Any known issues or limitations

This indicator is an estimate and is subject to uncertainty because it was collected using a sample survey with associated sampling error margins. This indicator was taken from the Northern Ireland House Condition Survey. The 2016 survey had a sample size of 1,917. The gross response rate for the 2016 House Condition Survey was very high. A total of 1,942 full inspections were successfully carried out giving an overall response rate of 99 per cent.

The SAP rating itself is on a logarithmic scale and provides a comparative measure of the energy efficiency of dwellings. The lower the score the lower the energy efficiency and the higher the score the higher the efficiency; a SAP rating of 100 represents zero energy cost. The rating can be over 100 for dwellings that are net exporters of energy.

Over time the SAP model has been modified in order to improve the accuracy of energy efficiency ratings. The Energy Efficiency Rating for the 2016 NIHCS data has been derived from SAP 2012, which was published in 2013 and revised in 2017. The main HCS report (published in May 2018) outlined findings from the latest model for 2016.

In order to provide a complete consistent SAP time series BRE has calculated revised SAP values for the NIHCS survey years 2001, 2006, 2009, 2011 using the SAP 2012 methodology and the latest 2016 energy model. The model incorporates updates and improvements that have been made annually as part of BRE's standard modelling programme.

The mean SAP 2012 values for all dwellings for previous HCS years are shown in Indicator 3.3.

[Standard Assessment Procedure \(SAP 2012\)](#)

For more information see House Condition Survey section of the NIHE website, and Department for Communities' NI Housing Statistics 2019-20, Section 2 Tables – Energy.

[House Condition Survey](#) specifically see HCS 2016 Main Data Tables, Chapter 7

[NI Housing Statistics 2021-22 Section 2 Tables - Energy](#)

Indicator

3.4 Grants processed for energy efficiency measures

Relevance of indicator to greenhouse gas emissions

The Affordable Warmth Scheme offers a range of insulation measures to eligible households, those included in this indicator are loft, cavity wall and solid wall insulation. As well as these improvements, householders may also be eligible for installation of a fully controlled energy-efficient oil or gas central heating system where no system currently exists or conversion of an existing bottled gas, solid fuel or Economy 7 heating system to oil or natural gas. Unlike the previous Warm Homes Scheme, the Affordable Warmth Scheme also offers replacement of boilers which are more than 15 years old to eligible households. These heating and insulation measures would improve the energy efficiency of the property and could result in lower greenhouse gas emissions.

Any known issues or limitations

The Warm Homes Scheme ended on 31 March 2015 and has been replaced by the Affordable Warmth Scheme. The heating options for these schemes are quite different, so they cannot be directly compared.

There are a number of ways in which actual observed performance may differ from theoretical expected performance and these may apply here. Particularly the comfort factor, where householders may decide to increase the temperature in their home after installation of such measures.

For more information see Department for Communities' Northern Ireland Housing Statistics 2021-22, Section 2 Tables – Energy.

[NI Housing Statistics 2021-22 Section 2 Tables - Energy](#)

The 2020/21 figures for grants processed under the Affordable Warmth Scheme are likely to have been affected by Covid-19, during lockdown the NIHE Grants Offices were only able to address emergency cases i.e., those without heating.

Indicator

3.5 Primary energy source for heating of residential buildings

Relevance of indicator to greenhouse gas emissions

This indicator is concerned with how a dwelling maintains the desired level of heating. Different fuels have different emission factors and will result in different levels of greenhouse gas emissions when supplying a particular level of thermal comfort. Home heating oil, for example, has a higher emission factor than natural gas, meaning to generate a given quantity of energy, oil will result in higher greenhouse gas emissions than natural gas.

Any known issues or limitations

This indicator is an estimate and is subject to uncertainty because it was collected using a sample survey with associated sampling error margins. This indicator was taken from the Northern Ireland House Condition Survey. The 2016 survey had a sample size of 1,917. The gross response rate for the 2016 House Condition Survey was very high. A total of 1,942 full inspections were successfully carried out giving an overall response rate of 99 per cent.

The 2016 House Condition Survey is the latest available survey with results published in 2018. Preliminary results were revised: the total stock figure for 2016 (which had been reported as 740,000) was investigated, and as a result the 2016 figure was corrected to 780,000.

For more information see the House Condition Survey section of the NIHE website, and Department for Communities' Northern Ireland Housing Statistics 2020-21, Section 2 Tables – Energy.

[House Condition Survey](#) specifically see HCS 2016 Main Data Tables, Chapter 7

[NI Housing Statistics 2021-22 Section 2 Tables - Energy](#)

User Guidance Notes for Industry Sector

Indicators

4.1 Number of participants in the Carbon Reduction Commitment Energy Efficiency Scheme

4.2 CO₂ emissions from participants in the Carbon Reduction Commitment Energy Efficiency Scheme

Relevance of indicator to greenhouse gas emissions

The Carbon Reduction Commitment (CRC) Energy Efficiency Scheme aimed to cut greenhouse gas emissions in large, non-energy intensive public and private sector energy users, and in practice includes organisations such as water companies, supermarkets, local authorities, government departments and other public bodies. Phase 1 ran from April 2010 until the end of March 2014, and phase 2 ran from 1 April 2014 to 31 March 2019. In 2018/19 the CRC scheme recorded approximately 6% of total UK GHG emissions.

Any known issues or limitations

In Northern Ireland there were 41 participants in the scheme in 2018/19. They recorded total emissions of 0.4 Mt CO₂. In 2018 Northern Ireland produced 19.4 Mt CO₂ equivalent. So, the CRC scheme recorded approximately 2% of total Northern Ireland emissions, a lower share than in the UK. This will be partially due to many premises in Northern Ireland reporting their fuel usage through their registered office in England, to the Environment Agency in England, rather than to the Northern Ireland Environment Agency.

In addition, there were significant changes made to the scheme on two occasions, before the 2012/13 and 2014/15 reporting years, which included a reduction in the number of types of energy supplies that had to be reported from 29 to just 2 types (electricity and gas, although these accounted for the majority of all Northern Ireland CRC emissions in 2011/12). This and other changes mean it is not possible to compare the figures for 2010/11 - 2011/12 with 2012/13 - 2013/14 or 2014/15 - 2018/19. However, comparisons can still be made between 2010/11 and 2011/12, 2012/13 and 2013/14, and between 2014/15, 2015/16, 2016/17, 2017/18 and 2018/19.

The CRC scheme underwent a review in 2016 and closed following the 2018/19 compliance year. For more information see:

[UK Environment Agency, Carbon reduction Commitment Annual report publication](#)

User Guidance Notes for Transport Sector

Indicator

5.1 CO₂ emissions of licensed cars

Relevance of indicator to greenhouse gas emissions

In 2021, the transport sector accounted for 17% of Northern Ireland's greenhouse gas emissions, with cars accounting for 11%. Demand for travel by car is expected to increase, so in order to reduce emissions the demand will need to be met more efficiently. This indicator considers how efficiently the demand for transport by car has been met, and how that has changed over time.

Any known issues or limitations

Estimates of greenhouse gas emissions have an inherent uncertainty due to uncertainty in the underlying activity data and emissions factors. For more information see:

[Northern Ireland Greenhouse Gas Inventory 1990 to 2021](#)

The Driver and Vehicle Licensing Agency (DVLA) database can be regarded as being virtually complete in terms of the number of licensed vehicles and vehicles with a SORN. However, there will be some errors in some of the specific details of individual vehicles.

The DVLA carry out regular Traceability Surveys which look at whether it is possible to trace the owner of any given vehicle and check what details on the database are inaccurate. They estimate that every variable is correct for roughly 89% of the registered vehicles. The remaining 11% of vehicles will have an error in at least one of the fields. Of the overall total, about 4% have wrong details that make it impossible to trace the registered keeper of the vehicle (often caused by keepers not providing DVLA with updated details when they move or dispose of the vehicle).

Most of the inaccuracies in the database are with the less critical variables, such as colour, though some will affect the statistics published here (e.g. by having the wrong CO₂ g/km emission value or the wrong wheelbase). Department for Transport estimates that under 2% of vehicle records have an inaccuracy in one of the variables used for the statistics published.

There have been a number of major changes to the Vehicle Excise Duty system which should be taken into account when considering trends over time. From March 2001, cars were taxed according to the emissions emitted by the vehicle. There were six bands (A to F). In March 2006, a new emissions band (Band G) was introduced. From April 2009 the seven emission bands were increased to 13 (A to M) and redefined. For cars registered for the first time from April 2017 onwards, a flat Standard Rate applies (except for zero emissions cars which remain zero rated) after the first year. Cars with a list price in excess of £40,000 incur a supplement on their standard rate for the first five years in which a standard rate is applied. These changes in rates may have influenced car choice. For further details see:

[Vehicle Excise Duty](#)

When a car is registered for the first time, a CO₂ emissions figure is reported for monitoring purposes. The method used to determine emissions has changed over time. Up until September 2018 cars registered for the first time reported a New European Driving Cycle (NEDC) figure. From September 2018, the Worldwide harmonised Light vehicles Test Procedure (WLTP) was introduced, with a transition period allowing cars to report either a NEDC or an equivalent NEDC figure (or e-NEDC figure) i.e. one calculated based on the results of a WLTP test. WLTP became the reported figure used when cars registered from April 2020 and from 2021 will be the only figure available for new cars. Whilst the e-NEDC figure was designed to be broadly 'equivalent' with an NEDC figure, the new WLTP figure is typically about 20% higher for petrol and diesel cars.

[Vehicle Licensing Statistics: Notes and Definitions](#)

Indicator

5.2 Road transport emissions per vehicle kilometre travelled (VKT)

Relevance of indicator to greenhouse gas emissions

In 2021, the transport sector accounted for 17% of Northern Ireland's greenhouse gas emissions. This indicator attempts to consider how efficiently the demand for transport has been met, and how that has changed over time.

Any known issues or limitations

This indicator has been derived by combining data from two different datasets: greenhouse gas emissions and vehicle kilometres travelled, from the Northern Ireland Road Safety Strategy to 2020 Annual Statistical Report. Neither dataset was designed for this purpose and each will have an inherent uncertainty.

Estimates of greenhouse gas emissions have an inherent uncertainty due to uncertainty in the underlying activity data and emissions factors. For more information see:

[Northern Ireland Greenhouse Gas Inventory 1990 to 2021](#)

[Northern Ireland Road Safety Strategy to 2020 Annual Statistical Report 2021](#)

There has been a change in the source data used to calculate the rates used in this indicator. One of the primary sources of data was the Vehicle Kilometres Travelled (VKT), however the last available year of data for the VKT is 2014; due to budget constraints the survey is no longer being carried out. Therefore, an alternative source of data was required to enable continued reporting – the Travel Survey for Northern Ireland (TSNI). The trends from TSNI and the VKT survey track each other consistently and was therefore considered suffice. More information is available online:

[NI Road Safety Strategy to 2020 - Indicator Guidance Booklet PDF \(1,395 KB\)](#)

The VKT is calculated using data from the [Travel Survey for Northern Ireland](#) (Department for Infrastructure). Normally 3 years of data are combined as sample size is relatively small, however, the 2020 and 2021 data are reported as a single year in the Travel Survey. This is due to significant changes to the survey methodology from 2020 due to the COVID-19 pandemic and because 2020 was an exceptional year with travel restrictions in place in response to the pandemic.

Indicators

5.3 Average distance travelled per person per year by mode of transport

5.4 Journeys per person by mode of transport

5.5 Number of bus passenger journeys and distance operated

5.6 Number of NI Rail service passenger journeys and distance travelled/operated

Relevance of indicator to greenhouse gas emissions

These indicators give an idea of how the demand for travel has been met. They look at number of journeys and/or distance travelled by vehicle type/mode of transport. From the perspective of lower greenhouse gas emissions a lower distance travelled by car and greater distances by train or bus, or better yet by cycling and walking, would result in lower emissions.

Any known issues or limitations

These indicators are estimates and are subject to uncertainty because they are collected using a sample survey with associated sampling error margins.

The Travel Survey for Northern Ireland typically has a sample size between 889 and 979 households per year, so three years of data have been combined to ensure the analysis carried out is robust. The exception here is the reporting of 2020 and 2021 data as single years due to methodological changes as a result of the COVID-19 pandemic. The survey, normally carried out by face-to-face interviewing, switched to a telephone interview from April 2020. For further details on the methodological changes see the [Travel Survey for Northern Ireland technical report 2021](#). Also note the sample size achieved in 2020 (415 households) and 2021 (785 households) were much less than that prior to 2020.

[Travel Survey for Northern Ireland headline report 2021](#)

Whether a decrease in passenger journeys by bus or train is good or bad for greenhouse gas emissions will depend on why the journeys have decreased. For example, if it is a result of more car journeys then this would mean higher greenhouse gas emissions, whereas cycling would result in lower emission.

The bus and rail passenger data are supplied by Translink and should be viewed as management information rather than Official Statistics. It should be noted that indicator 5.5 was previously presented as passenger kilometres, however, the information supplied is actually operating kilometres i.e., the number of kilometres operated by buses on public transport services. Indicator 5.6 remains as passenger kilometres which is calculated by

multiplying the number of passenger journeys on a particular flow by the number of corresponding track miles between stations. Operating kilometres for trains for the latest available years is presented for comparative purposes between these two indicators.

In terms of carbon dioxide emissions, walking and cycling result in the lowest emissions, and public transport is less carbon intensive than private car use when you consider emissions per passenger kilometre.

For indicator 5.6 (NI Rail service passengers journeys and distance travelled) there is a discontinuity in this series due to a methodological change. Figures for NI Rail passenger journeys have been revised and updated back to April 2013. The journey factors used to calculate the estimated number of journeys taken using weekly, monthly and annual rail tickets have been revised down. Therefore, figures for NI Rail passenger journeys from 2013-14 onwards are not directly comparable with figures in previous years which were calculated using higher journey factors.

Indicator

5.7 Number of plug-in cars and light goods vehicles licensed in Northern Ireland

Relevance of indicator to greenhouse gas emissions

Plug-in vehicles are expected to play an important role in the decarbonisation of the transport sector. Some plug-in vehicles are eligible for a government grant. ([Low-emission vehicles eligible for a plug-in grant](#)).

This indicator monitors the number of plug-in vehicles registered each quarter in Northern Ireland. Higher numbers of plug-in vehicles should result in lower petrol and diesel consumption and so lower greenhouse gas emissions, as the electricity used to run the vehicles can be generated with lower emissions.

Any known issues or limitations

Figures have been revised from previous years publication as table source discontinued (VEH0131). VEH0131 was considered an undercount as it only included low emission plug-ins.

This indicator includes all models of cars and light goods vehicles identified as being battery electric, plug-in hybrid electric, or range-extended electric.

The location of the registered keeper is based on the contact address held by DVLA, and does not necessarily reflect where the vehicle is kept.

The figures are subject to minor revision between quarterly publications when individual vehicles are reviewed against the criteria. For more details see: [Vehicle licensing statistics: notes and definitions.](#)

User Guidance Notes for Agriculture Sector

Indicator

6.1 Emissions intensity of milk production

Relevance of indicator to greenhouse gas emissions

Emissions per kilogram of energy corrected milk is a key carbon intensity indicator for the agriculture sector. With dairying being a major contributor to total emissions from the agriculture sector it is important for the industry to monitor progress and identify appropriate mitigation strategies. As farming systems change, the resultant greenhouse gas emissions also change.

Any known issues or limitations

This indicator has been derived by applying the AFBI Dairy Greenhouse Gas calculator to those dairy farms that participated in DAERA's Farm Business Survey (FBS). The calculator developed by AFBI uses a life cycle assessment approach to determine carbon footprints for each dairy farm. The calculator takes account of all major on-farm emissions and a number of significant off-farm emissions that can be attributed to the dairy enterprise. Total emissions determined by the calculator are presented in terms of carbon dioxide equivalent per kilogram of energy corrected milk (CO₂e/kg ECM), excluding carbon sequestration. The calculator has been assessed as meeting international standards (PAS 2050). The FBS is an annual survey that monitors the physical and financial performance of farms in Northern Ireland and is considered representative of the main types and sizes of farms in Northern Ireland. With the indicator being based on data from a sample of the population it is subject to sampling error. More information on this indicator can be found in the report online:

[Greenhouse Gas Emissions on Northern Ireland Dairy Farms](#)

Livestock numbers: [Farm animal populations](#)

Output of milk: [Milk price and production statistics](#)

In 2022, there were minor updates applied to the AFBI Dairy Greenhouse Gas calculator. In particular, emission factors for the production of concentrates were updated to better reflect current standard rations as well as country of origin of the main ingredients. This update resulted in a step change to the 2020 year in the series that is attributed to this specific year but is in fact a cumulative effect over recent past years. It is estimated that this update accounts for approximately 70% of the reduction in the indicator between the 2019

and 2020 years. Due to this update, caution should be applied when making comparisons between 2020 and the previous five years.

Indicator

6.2 Area of new woodland planting

Relevance of indicator to greenhouse gas emissions

One of the ways to combat climate change is to sequester carbon through more trees. Young trees, in particular, absorb carbon dioxide quickly while they are actively growing. A stable or increasing area of new plantings, especially of conifers, is consistent with increasing total sequestration potential.

Any known issues or limitations

This indicator tracks new planting of conifer and broadleaf woodland (private sector woodland) that is grant aided by Northern Ireland Forest Service. It does not include private planting that is unsupported by grant aid or land in natural conversion from scrub to woodland. Nor does it include restocking of harvested woodland/forest. More information is available from Forest Research.

[Forest Research - Woodland Statistics](#)

Indicator

6.3 Soil nitrogen balance

Relevance of indicator to greenhouse gas emissions

The nitrogen balance is the difference between nitrogen inputs (including manufactured and organic fertilisers), and off-takes (via crop/livestock production and fodder for livestock, including grass). The overall balance of nitrogen provides a high-level indicator of potential environmental pressure allowing comparisons over time and between countries. Other things being equal, more efficient use of manufactured (and organic) nitrogen fertilisers will be observed through a declining nitrogen balance which will in turn lead to a reduced risk of nitrous oxide emissions and other environmental pressures.

Any known issues or limitations

The methodology for calculating soil nutrient balances has been developed by OECD and adopted by Eurostat. Although based on an internationally recognised methodology, the nutrient balance estimates are subject to a level of uncertainty or error margins. The physical data on which the estimates are based is subject to uncertainty because it is generally collected using a sample survey with associated sampling error margins. Similarly, the coefficients are derived from research but are subject to uncertainty and are, out of necessity, based on average rates (e.g., average amount of nitrogen taken up by the growth of a tonne of wheat). There can be a considerable amount of variation within these averages with no cost-effective method of taking this variation into account.

Indicator

6.4 Average daily carcass gain of beef cattle

Relevance of indicator to greenhouse gas emissions

Higher rates of daily weight gain mean that cattle reach the desired slaughter weight at a younger age, reducing lifetime GHG emissions.

Any known issues or limitations

Data on age and carcass weight at slaughter are derived from a dataset collected to assist beef producers improve herd breeding programmes and management systems. The quality of the data is high, as the system (AFBI-BoVIS) covers a high proportion of cattle slaughtering in Northern Ireland. Average daily weight gains, above certain levels, are only likely to be possible by using high levels of concentrate feeds. If this is the case, the benefits of slaughter at a younger age may be offset by increased emissions from animal feeds. However, as average daily weight gains in Northern Ireland are currently below the optimal level, an increase in the mean value can be interpreted as an improvement that will contribute to reducing emissions intensity per kilogram of beef produced.

Indicator

6.5 Metabolic energy from grass silage

Relevance of indicator to greenhouse gas emissions

Higher levels of metabolic energy in grass silage, the main forage for housed cattle, reduces the quantity of high energy concentrate feeds that are needed to meet overall dietary requirements. Higher quality grass silage also reduces the volume of enteric methane from cattle, compared with lower quality silage. By reducing the volume of concentrate feed required and decreasing the amount of methane from enteric fermentation, higher quality grass silage reduces the emissions intensity of both beef and milk production.

Any known issues or limitations

Data on grass silage quality is derived from the AFBI Hillsborough Feeding Information System (HFIS), a dataset consisting of results from analyses of circa 10,000 samples per year of grass silage in Northern Ireland. As farmers pay for the service and the results are used in the development of on-farm nutritional planning, it is possible that farmers utilising the service may have above average farm management skills and that, as a result, energy levels reported by HFIS are higher than the average for all farms in Northern Ireland. Despite this, the trends observed in grass silage energy levels provide a good indicator of change in the efficiency of cattle feeding systems.

User Guidance Notes for Waste Sector

Indicator

7.1 Greenhouse gas emissions from waste management per capita

Relevance of indicator to greenhouse gas emissions

Most of the greenhouse gas emissions in the waste management sector are emissions from landfill (77%) and from waste water treatment (16%). Both are strongly related to the quantities of waste produced by the population of Northern Ireland.

Any known issues or limitations

There is uncertainty in the figures taken from the GHG inventory with methane being one of the gases with greater uncertainty. Figures are based on a model of methane production in landfill sites but works at UK level, rather than being specific to NI.

[Northern Ireland Greenhouse Gas Inventory 1990 to 2021](#)

Indicator

7.2 Local authority collected municipal waste

Relevance of indicator to greenhouse gas emissions

This indicator gives an indication of the quantities of waste sent to landfill in Northern Ireland, which will become a source of methane when the organic components of the waste material decompose.

Any known issues or limitations

These figures only include waste collected by councils in Northern Ireland which is not the only source of landfill. However, data for commercial & industrial and construction & demolition waste is limited. For further information see:

[Northern Ireland Local Authority Collected Municipal Waste Management Statistics 2021/22](#)

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