Northern Ireland Carbon Intensity Indicators 2019

Notes for Guidance

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Department of
Agriculture, Environment and Rural Affairs
www.daera-ni.gov.uk

INVESTORS IN PEOPLE

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 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:

https://www.daera-ni.gov.uk/sites/default/files/publications/daera/ghg-inventory-statistical-bulletin-2017.pdf#page=10

Other factors affect greenhouse gas emissions, including for example, energy prices and weather. For example a particularly cold winter can result in increased heating demand, e.g. in 2010, and relatively low prices for a particular fuel can increase its use, e.g. coal in 2012 and 2013.

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 1.87 million people to 1.96 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:

https://www.daera-ni.gov.uk/sites/default/files/publications/daera/ghg-inventory-statistical-bulletin-2017.pdf#page=10

There is a National Statistics publication which includes greenhouse gas emissions per capita, called UK local authority carbon dioxide emissions estimates.

https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2017

However those figures will be considerably lower because the local authority inventory considers only the industrial & commercial, domestic, transport and land use, land use change & forestry sectors on an end-user basis. This indicator uses emissions on a by source basis for those four sectors, plus energy supply, agriculture and waste management.

User Guidance Notes for Power Sector

Indicator

2.1 Emissions per unit of electricity generated

Relevance of indicator to greenhouse gas emissions

The emissions per unit of electricity 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 from DECC's 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:

https://www.daera-ni.gov.uk/sites/default/files/publications/daera/ghg-inventory-statistical-bulletin-2017.pdf#page=10

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 2017 Northern Ireland exported electricity to Scotland (145 GWh) and the Republic of Ireland (110 GWh).

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770766/Regional_Electricity_Generation_and_Supply.pdf

User Guidance Notes for Buildings Sector

Indicator

3.1 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: https://www.daera-ni.gov.uk/sites/default/files/publications/daera/ghg-inventory-statistical-bulletin-2017.pdf#page=10

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.

https://www.finance-ni.gov.uk/publications/annual-housing-stock-statistics

For more information see also DfC's Northern Ireland Housing Statistics 2017/18, Appendix 1 – Supply.

https://www.communities-ni.gov.uk/publications/northern-ireland-housing-statistics-2017-18

Indicator

3.2 Housing stock with energy efficiency measure

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 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 has been completed and results are available, Preliminary results have been revised: the total stock figure for 2016 (which had been reported as 740,000). was investigated, and as a result, the total stock figure for 2016 was corrected to 780,000.

For more information see the House Condition Survey section of the NIHE website, and DfC's Northern Ireland Housing Statistics 2017/18, Appendix 2 – Energy.

https://www.nihe.gov.uk/Working-With-Us/Research/House-Condition-Survey

https://www.communities-ni.gov.uk/publications/northern-ireland-housing-statistics-2017-18

Indicator

3.3 Standard Assessment Procedure (SAP) ratings for residential buildings

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.

https://www.bregroup.com/sap/standard-assessment-procedure-sap-2016/

https://www.nihe.gov.uk/Documents/Research/You-can-download-the-reports-below/nihcs-sap-time-series-2001-2016.aspx

https://www.nihe.gov.uk/house_condition_survey_main_report_2016.pdf

For more information see the House Condition Survey section of the NIHE website, and DfC's Northern Ireland Housing Statistics 2017/18, Appendix 2 – Energy.

https://www.nihe.gov.uk/Working-With-Us/Research/House-Condition-Survey

https://www.communities-ni.gov.uk/publications/northern-ireland-housing-statistics-2017-18

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. This includes cavity wall insulation, loft insulation, hot water tank jacket installation, draught-proofing of windows and doors and repairment/ replacement of windows in disrepair. 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 DfC's Northern Ireland Housing Statistics 2017-18, Appendix 2 – Energy.

https://www.communities-ni.gov.uk/publications/northern-ireland-housing-statistics-2017-18

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 has been completed and preliminary results are available, however, a potential issue has been identified which is under investigation and may result in revised figures being issues. Therefore, we haven't updated these indicators in this report. For more information, visit the NIHE website at the link below.

For more information see the House Condition Survey section of the NIHE website, and DfC's Northern Ireland Housing Statistics 2017/18, Appendix 2 – Energy.

https://www.nihe.gov.uk/Working-With-Us/Research/House-Condition-Survey

https://www.communities-ni.gov.uk/publications/northern-ireland-housing-statistics-2017-18

Indicator

3.6 Penetration of renewable heat

Relevance of indicator to greenhouse gas emissions

Greenhouse gas emissions from domestic, commercial and public buildings are primarily a result of space heating via combustion of fossil fuels. These emissions can be reduced by improving the energy efficiency of buildings, for example though insulation, to reduce how much fuel is needed, or from deployment of renewable / low-carbon heating, such as heat pumps. Heat networks with low-carbon sources are a longer-term option.

The Renewable Heat Premium Payment (RHPP) scheme was a DETI scheme that provided upfront payments towards the installation costs of alternative renewable technologies to heat buildings and provide hot water. The RHPP scheme has been absorbed into the Renewable Heat Incentive scheme.

Any known issues or limitations

The level of activity for the domestic RHI/ RHPP scheme was quantified by reporting the number of applications there were for the scheme each year which were in receipt of an upfront payment. Conversely, the level of activity for the non-domestic RHI scheme was quantified by reporting the cumulative number of installations there were under the scheme. The schemes are run independently with differing riles and procedures, so comparing data for the schemes should be done with caution.

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 aims 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 runs from 1 April 2014 to 31 March 2019. The CRC scheme recorded approximately 8% of total UK GHG emissions.

Any known issues or limitations

In Northern Ireland there were 41 participants in the scheme in 2017/18. They recorded total emissions of 0.5 Mt CO2. In 2017 Northern Ireland produced 20.0 Mt CO2 equivalent. So the CRC scheme recorded approximately 3% of total NI 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 NI 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 NI CRC emissions in 2011/12). This and other changes means it is not possible to compare the figures for 2010/11 - 2011/12 with 2012/13 - 2013/14 or 2014/15 - 2017/18. 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 and 2017/18.

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

https://www.gov.uk/government/publications/crc-annual-report-publications-phases-1-and-2/crc-annual-report-publication-2017-to-2018

User Guidance Notes for Transport Sector

Indicator

5.1 Licensed cars by CO2 emissions

Relevance of indicator to greenhouse gas emissions

In 2017 the transport sector accounted for 23% of Northern Ireland's greenhouse gas emissions, with cars accounting for 15%. 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:

https://www.daera-ni.gov.uk/sites/default/files/publications/daera/ghg-inventory-statistical-bulletin-2017.pdf#page=10

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/794663/vehicle-licensing-statistics-notes-definitions.pdf

The 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 important 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). DfT estimates that under 2% of the vehicles records have an inaccuracy in one of the variables used for the statistics published.

Indicator

5.2 Emissions per vehicle kilometre travelled (VKT)

Relevance of indicator to greenhouse gas emissions

In 2017 the transport sector accounted for 23% of Northern Ireland's greenhouse gas emissions. Demand for travel is expected to increase, so in order to reduce emissions the demand will need to be met more efficiently. 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 kilometers travelled, from the Northern Ireland Road Safety Strategy to 2020 Annual Statistical Report 2018. 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:

https://www.daera-ni.gov.uk/sites/default/files/publications/daera/ghg-inventory-statistical-bulletin-2017.pdf#page=10

https://www.infrastructure-ni.gov.uk/publications/northern-ireland-road-safety-strategy-2020-annual-statistical-report-2018

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 TSNI provides vehicle kilometres for car users, which includes 4-wheeled + 3-wheeled vehicles + Land Rovers + Jeeps + minibuses + motor caravans + dormobiles + light vans. The trend for cars usage in the TSNI closely mirrors the all vehicles previously carried out in the VKT survey.

Indicators

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

5.4 Mode of transport

5.5 Bus passenger journeys

5.6 NI Rail service passengers, number of journeys and distance travelled

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

There has been a change in the source data used to calculate the rates used in indicator 5.2. 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 TSNI provides vehicle kilometres for car users, which includes 4-wheeled + 3-wheeled vehicles + Land Rovers + Jeeps + minibuses + motor caravans + dormobiles + light vans. The trend for cars usage in the TSNI closely mirrors the all vehicles previously carried out in the VKT survey.

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 856 and 1,037 households per year, so three years of data have been combined to ensure the analysis carried out is robust.

https://www.infrastructure-ni.gov.uk/publications/travel-survey-northern-ireland-tsni-headline-report-2016-2018

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.

This data is supplied by Translink and should be viewed as management information rather than Official Statistics.

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, number of 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 Plug-in cars and vans licensed in Northern Ireland

Relevance of indicator to greenhouse gas emissions

Plug-in cars and vans grants are available for electric vehicles, plug-in hybrid electric vehicles and some other vehicles with technologies such as hydrogen fuel cells. Such vehicles are expected to play an important role in the decarbonisation of the transport sector. 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

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. Northern Ireland figures are provisional and may be revised for greater consistency with other tables.

https://www.gov.uk/government/collections/vehicles-statistics

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 BovIS 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). 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.

Indicator

6.2 Area of new forest and 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 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 not include restocking of harvested woodland/forest. More information is available from the Forestry Commission.

http://www.forestry.gov.uk/forestry/infd-7aqknx

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 carcase weight 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 carcase 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 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 (75%) and from waste water treatment (19%). 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 at UK level, rather than being specific to NI.

https://www.daera-ni.gov.uk/sites/default/files/publications/daera/ghg-inventory-statistical-bulletin-2017.pdf#page=10

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.

https://www.daera-ni.gov.uk/sites/default/files/publications/daera/lac-municipal-waste-management-statistics-2017-18-report.pdf#page=25

(limitations of local authority collected municipal waste data)

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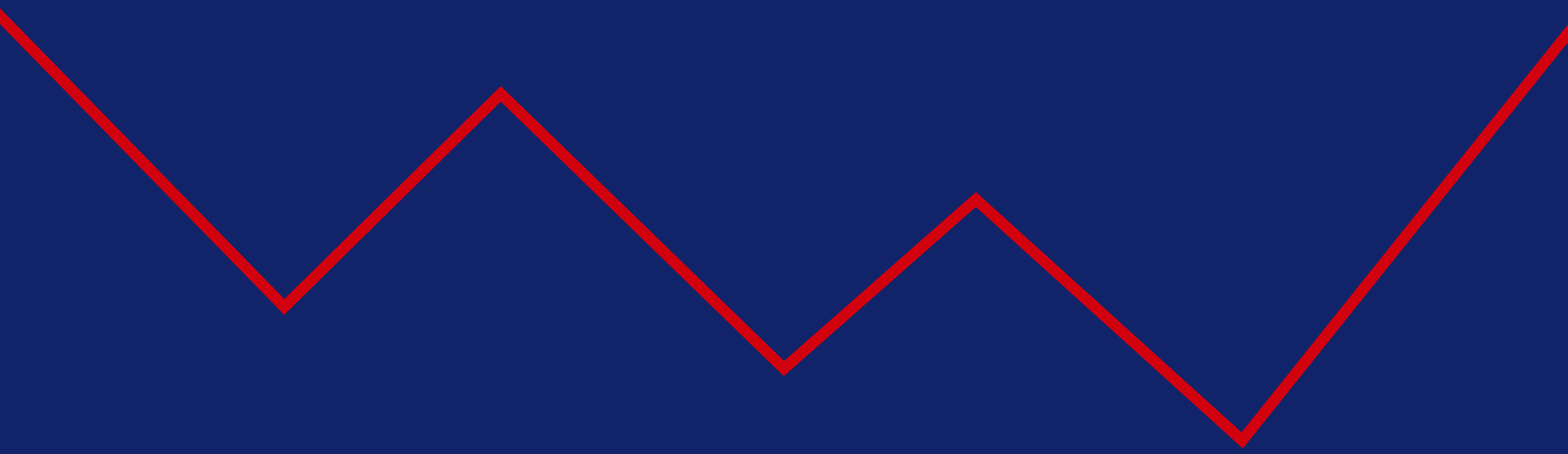

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