



The Environmental Impact of Covid-19:

Will pandemic restrictions help Ireland meet EU emissions targets?

The PBO has found that early indicators show Covid-19 restrictions have had a large impact on the transport sector. This is likely to decrease emissions in this sector in 2020.

However, for other large emission producing sectors such as agriculture and energy industries, it is unclear from initial data whether Covid-19 restrictions will have an effect on emissions in 2020.

Key Messages

- Climate change will lead to both economic and budgetary costs for Ireland unless effective action is taken.
- The Covid-19 pandemic and subsequent restrictions have caused significant changes in society which will have an impact on our environment and on our greenhouse gas emissions in 2020.
- Emissions from the transport sector are likely to be the most affected by Covid-19 restrictions. Road usage, which makes up 95% of emissions in this sector, has seen a dramatic fall during Covid-19 restrictions. It's been estimated that this could cause a fall in total emissions by 2.5% in 2020 below 2018 figures.
- Data shows that as restrictions are lifting, road usage is rising. This suggests that any reduction in emissions achieved in the transport sector is likely to be temporary.
- There is no evidence, to date, that the other largest emission producing sectors, agriculture and energy industries, will experience significant decreases in emissions due to the Covid-19 restrictions. However, this is based on initial data and the longer-term behavioural impact of the Covid-19 pandemic is yet to materialise.
- To meet EU requirements and avoid budgetary costs, sustained decreases in Irish emissions are needed across emission producing sectors. Policy change will be needed to meet the 7% annual reduction in emissions committed to in the Programme for Government.

Introduction

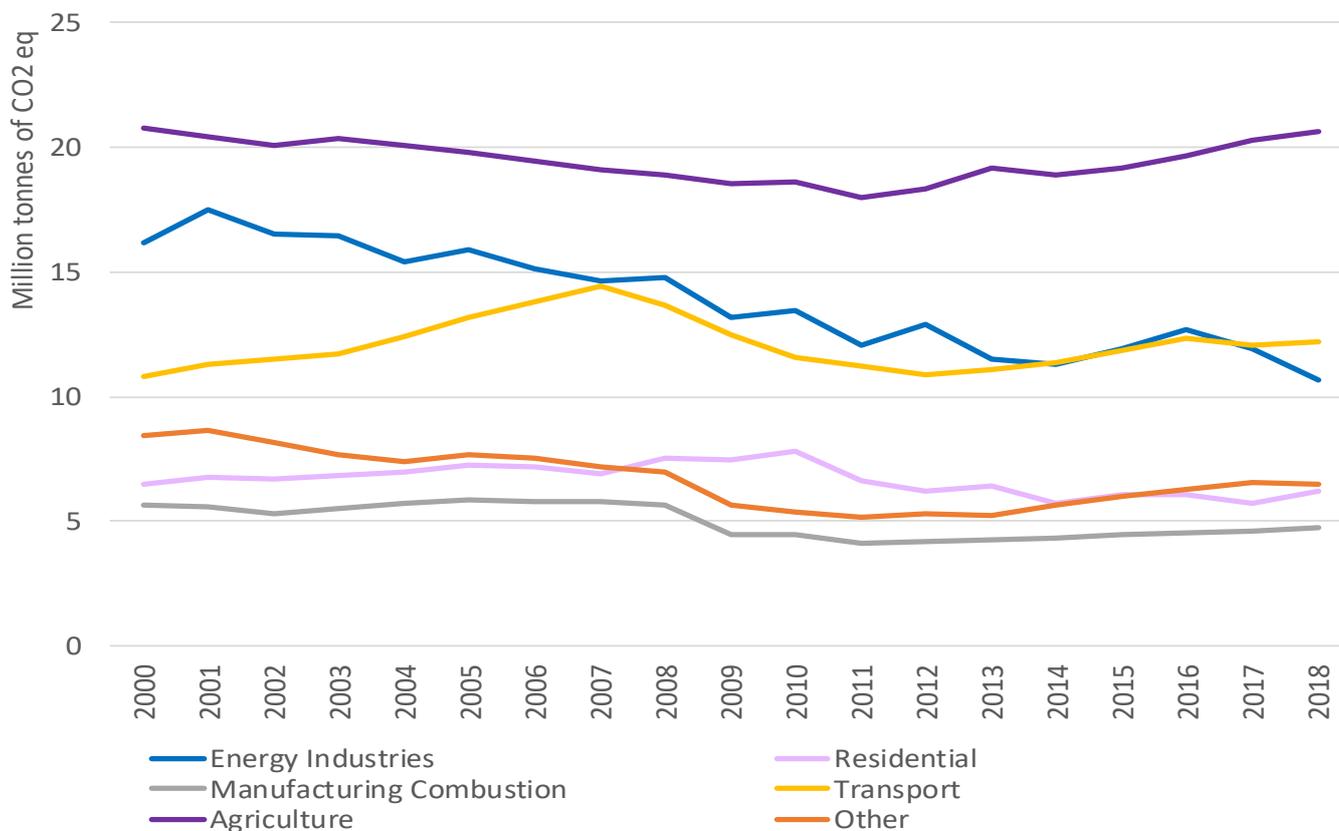
Climate change is widely acknowledged as a major risk which, without decisive action, will lead to significant long-term costs. Economic costs due to climate change arise through the effect on human health, agriculture and extreme weather events. Direct budgetary costs also arise if EU emissions targets are not met. The EU are targeting a 20% reduction in greenhouse gas emissions in 2020 from 1990 levels and 40% reduction in 2030 from 1990 levels.¹ Targets are also set for the use of renewables and improvements in energy efficiency. The most up to date projections published in 2019², estimate that Ireland is not on track to meet either our 2020 or our 2030 targets.

The Covid-19 pandemic and the subsequent social and economic restrictions that were put in place to stop the spread of the virus have led to significant changes in our society. Many of these changes are likely to have an impact on our environment and on Irish emissions in 2020. This paper will look at the recent trend in Ireland's greenhouse gas emissions and analyse a selection of drivers of emissions, using recent data, to give an indication of the effect the Covid-19 pandemic has had on Ireland's emissions. Analysis will focus on the largest contributors to emissions in sectors with the largest annual emissions: transport, energy industries and agriculture.

Ireland's Greenhouse Gas Emissions

In April 2020, Ireland's Greenhouse gas emissions (GHG) for 2018³ were finalised by the Environmental Protection Agency (EPA).⁴ These figures found that Ireland's emissions decreased by 0.1% from 2017 levels but exceeded its 2018 annual emissions limit set by the European Commission. Figure 1 shows the breakdown of emissions over time in different sectors.

Figure 1. Ireland's Greenhouse Gas Emissions 2000-2018



Source: Environmental Protection Agency

Note: Figures show emissions in CO2 equivalent - greenhouse gases other than CO2 (i.e. methane, nitrous oxide and F-gases) are converted to CO2 equivalent using their global warming potentials (GWPs).

¹ European Commission. [2020 Climate and Energy Package](#)

² Environmental Protection Agency (2019) [Ireland's Greenhouse Gas Emissions Projections 2018-2040](#)

³ There is a significant lag on emissions data with 2018 being the most recent data available.

⁴ Environmental Protection Agency (2020) [Ireland's Final Greenhouse Gas Emissions 1990-2018](#)

The agricultural sector makes up the largest portion of Ireland's total greenhouse gas emissions, accounting for one third of all emissions. The agriculture sector includes a range of emission sources such as livestock, soils and fishing. Increases in emissions from this sector have occurred from 2014 onward, with a 2% increase seen from 2017 to 2018. The EPA has identified increased numbers of dairy cows as a main driver of this trend.⁵ The increase in dairy cows has come after the removal of the milk quota in 2015 and national plans to develop the dairy industry.⁶ A rise in use of nitrogen fertiliser has also been identified as a main driver of emissions in the agriculture sector.⁷

A large portion of Ireland's emissions come from the transport sector (20%), where emissions have also been found to be rising in recent years. Road traffic make up the bulk of emissions in this sector with railways and domestic aviation contributing to a lesser extent. Trends in this sector tend to follow the economic cycle with road traffic, and subsequently emissions, decreasing in recessions and increasing when the economy is growing. Evidence of this can be seen in the years during the financial crisis with emissions from the transport sector decreasing by 25% from 2007 levels to 2012 levels. Emissions are shown to increase again once the economy started to recover from 2013 onwards. The transport sector is the main channel through which we expect the COVID-19 pandemic will impact on emissions in 2020.

In 2018, the energy industries sector was the third largest sector in terms of annual emissions, making up 17% of total emissions. This trend has, however, been decreasing since 2000 with a 10% fall in emissions seen between 2017 and 2018. This can be attributed to an improvement in efficiency of gas fired power plants replacing less efficient peat and oil-fired plants, and an increase in the use of wind electricity. This downward trend has also been motivated by the introduction of the EU Emissions Trading System (EU ETS) in 2005, which is a carbon market aimed at reducing greenhouse gas emissions in the EU.⁸ The EU ETS applies to 30% of current GHG emissions in Ireland and limits emissions from power stations and industrial plants across the EU. The market allows companies to trade emissions allowances granted by the EU, which reduces emissions across the EU in a cost-effective way. National targets relate to the non-ETS sector and cover emissions from sectors such as transport, buildings and agriculture. Both ETS and non-ETS emissions are included in EU targets.⁹

Transport Sector

In 2018, emissions from the transport sector made up 20% of Ireland's total greenhouse gas emissions. The transport sector includes emissions from road transportation, domestic aviation¹⁰ and railways, with road transportation making up the majority of emissions in this sector. Emissions from road transportation come from cars, vans, lorries, buses and coaches.

Restrictions imposed due to the COVID-19 pandemic have led to dramatic changes in Ireland's transport needs, as large numbers of people are no longer commuting to work and restrictions are placed on the distance that people can travel. This has drastically decreased the numbers on public transport and numbers of vehicles on roads. As emissions from road transportation make up 95% of all emissions in the transport sector, this decrease could have a significant impact on emissions in this sector. Figure 2 shows the number of cars recorded in a 24-hour period on a particular road¹¹ on every Tuesday from March 3rd to June 23rd 2020, and compares to the equivalent days in 2018 and 2019.

5 Ibid.

6 Department of Agriculture, Food and the Marine (2014) [Food Wise 2025](#)

7 Environmental Protection Agency (2020) [Ireland's Final Greenhouse Gas Emissions 1990-2018](#)

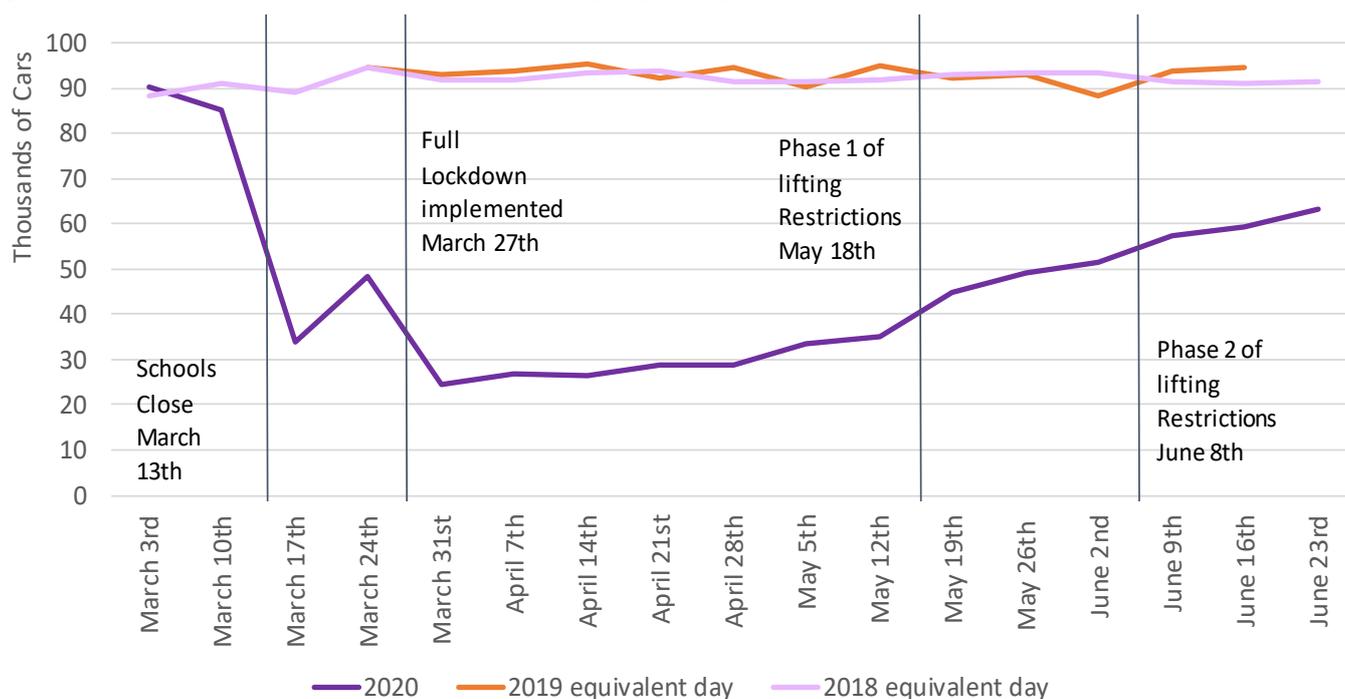
8 European Commission. [EU Emissions Trading System](#)

9 For a more detailed discussion of the EU climate strategy see: Oireachtas Library and Research Services (2020) [The European Green Deal and its Implications for Ireland](#)

10 Domestic aviation refers to flights which take off and land in Ireland. Emissions from other forms of aviation are counted for at EU level and do not affect national emissions.

11 Analysis looks at the N7 road between junction 2 and 3. This road was chosen as it is generally a high volume road and sufficient data points were available to compare figures during Covid-19 restrictions with previous years figures.

Figure 2. Traffic Flow of Cars on N7, J2 to J3 (Citywest). March 3rd to June 23rd, 2018 to 2020.



Source: Transport Infrastructure Ireland. Data shows car levels over a 24 hour period every Tuesday from March 3rd to June 23rd 2020. Car levels on equivalent Tuesdays are shown for 2018 and 2019.

Note: In early March 2019 a fault affected the volume count. Figures affected by the fault are omitted from analysis.

After the commencement of restrictions with the closure of schools on March 13th, the number of cars falls 43% below the number seen on the equivalent day in 2018. The lowest car traffic is seen on March 31st with a fall of 73% of cars compared to the previous two years. The number of cars has steadily increased since the first lifting of restrictions but remain below what is expected this time of year.

This trend is reflected in car numbers on roads across the country with a 72% decrease in car traffic seen in Cork and 67% decrease in Galway on March 31st compared to the previous year¹². Decreased numbers of goods vehicles, buses and motorbikes are also observed during this period.

Research conducted by the MaREI Centre have estimated that the fall in road traffic could lead to a reduction of CO2 emissions by 1.5 million tonnes in 2020.¹³ This equates to 12% of total emissions from the transport sector in 2018, or 2.5% of total emissions in 2018.

This, however, is not a sustainable reduction in emissions, as it is expected that road usage and therefore emissions will return to previous levels. The economic downturn caused by Covid-19 may prevent road usage returning to previous levels in the short-term, however once the economy begins to recover and in absence of policy changes, it is expected that road usage and emissions would increase.

Energy Industries Sector

The third largest emission producing sector in 2018 was 'Energy Industries' within which electricity and heat production is the largest component. Emissions from this sector have been steadily decreasing over time but still accounted for 17% of total greenhouse gas emissions in Ireland in 2018.

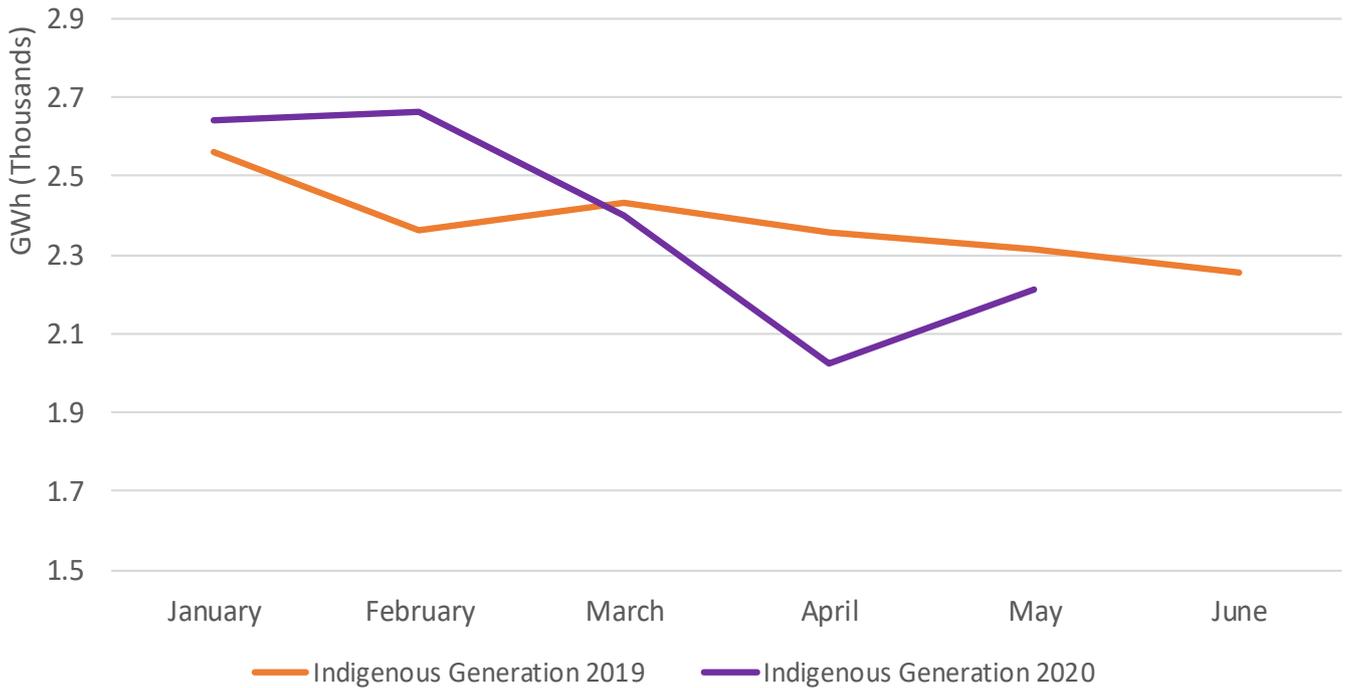
Covid-19 restrictions have changed the demand for electricity and heat, as more people working from home leads to more demand for electricity in the home and less in offices and places of work. It is not clear if this will change the amount of electricity and heat needed, or whether energy usage will just be transferred from workplaces to homes.

¹² Analysis looked at N40 in Cork and the N6 in Galway.

¹³ Glynn et al. (2020) *The Pandemic and Ireland's Energy System*

Figure 4 shows electricity generation in Ireland in 2020 compared to 2019.

Figure 4. Electricity Generation (GWh) in Ireland 2019-2020



Source: Sustainable Energy Authority of Ireland

Electricity generation in March is largely similar to 2019 trends, however a 14% decrease is seen in electricity generation in April. When looking at the breakdown of electricity generated, the decrease seen in April reflects a decrease in the use of renewable sources such as hydro and wind¹⁴ which are highly dependent on weather trends. This fall in April is likely due to the mild weather conditions seen in April, rather than any impact of Covid-19. The fall in the use of renewable sources of energy also coincided with a small increase in the use of coal and natural gas, so it is unlikely that this will lead to any change in emissions. Electricity usage is also found to increase in May, to similar levels seen in 2019.

A recent ESRI report¹⁵ has analysed the effect of Covid-19 on energy demand in Ireland and have suggested that although there will be an upward effect on the demand for energy due to low prices for oil, coal and natural gas, there will also be a downward effect on energy demand due to lower consumption and production from Covid-19 and the subsequent economic downturn. They find that this downward pressure will be greater than any increases in demand due to low prices, and conclude that this could decrease total emissions (from all sectors) by 9.5% in 2020.

So far, however, data on energy usage doesn't show significantly different trends than what was seen in previous years. Data also does not show evidence that the use of non-renewable energy sources has changed during Covid-19 restrictions. Therefore, it is unclear if Covid-19 will have any impact on emissions in the energy industries sector in 2020.

Agriculture Sector

The Agriculture sector makes up the largest proportion of emissions in Ireland, accounting for one third of all greenhouse gas emissions in 2018. The largest contributor to emissions within this sector is 'enteric fermentation' which refers to the digestive process of some animals which leads to the production of methane. The EPA have pointed to increases in the dairy sector as the most significant driver of emissions in this sector, with increases in dairy cow numbers needed to increase milk production.

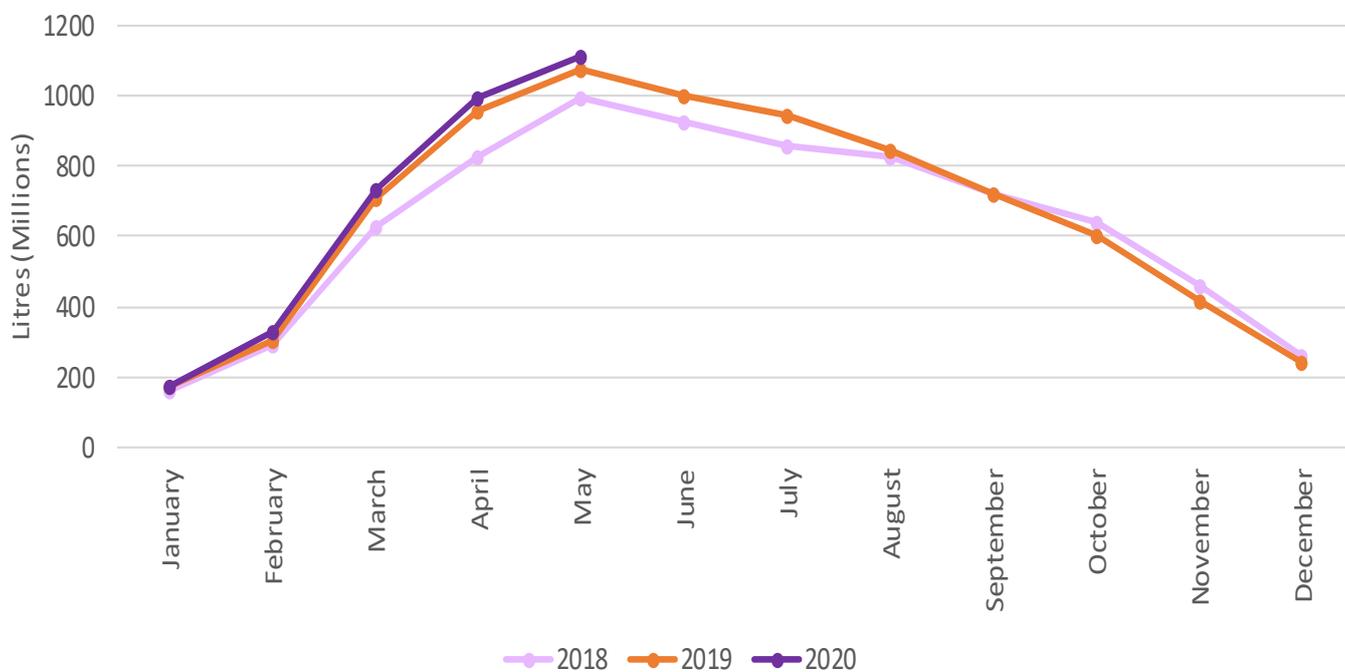
¹⁴ Data from Sustainability Energy Authority of Ireland monthly reports

¹⁵ ESRI (2020) *The Environmental and Economic Impacts of the Covid-19 Crisis on the Irish Economy*

There is not a clear link between the impact of the Covid-19 pandemic and emissions from the agriculture sector. However, as the largest emission producing sector in Ireland and given the increases in emissions over recent years, it is important to investigate this relationship.

As the number of dairy cows has been highlighted as a driver of emissions in this sector, we have looked at domestic milk intake by creameries and pasteurisers in litres as a proxy measure for the number of cows. Figure 5 shows the volume of domestic milk intake in Ireland in 2018-2020.

Figure 5. Domestic Milk Intake by Creameries and Pasteurisers, 2018-2020



Source: Central Statistics Office

These figures show that domestic milk intake levels are following similar trends to the intake in the previous two years. Figures for March, April and May are slightly higher in 2020 compared to 2019 figures. This indicator may see a decrease in future months, driven by a weakened economy and a subsequent fall in demand, however data available thus far does not indicate that Covid-19 restrictions have had an impact on milk supply. Therefore, it is currently unclear whether emissions within the agriculture sector from enteric fermentation will be impacted by Covid-19 restrictions.

The ESRI have projected that the agricultural sector will see an increase in emissions in 2020 due to an increased level of output¹⁶. The trend in domestic milk intake provides evidence that an increase in milk output could be achieved in 2020, however further analysis is needed to determine whether this trend will persist throughout the year.

Increased usage of nitrogen fertiliser has also been identified as a driver of emissions in the agriculture sector, however up to date data on fertiliser use is not available and therefore cannot be analysed at this time.

The agriculture sector accounts for one third of total GHG emissions in Ireland and over half of these emissions are attributed to enteric fermentation. Using domestic milk intake by creameries and pasteurisers as a proxy for the number of cows in Ireland, we find no significant change in milk volume trends compared to previous years. Therefore, it is unclear whether emissions in the largest emission producing sector will be affected by Covid-19 restrictions.

¹⁶ Ibid.

Ireland's Emissions Going Forward

While restrictions put in place due to the Covid-19 pandemic may lead to significant reductions in emissions in some sectors, early indications suggest that other large emission producing sectors could be largely unaffected by restrictions.

Recent data suggests that Covid-19 restrictions have had large impacts on the transport sector which could lead to a decrease in total emissions in 2020 by 2.5% below 2018 levels from decreases in road traffic alone. However, in energy industries and agriculture sectors which collectively made up 50% of all greenhouse gas emissions in 2018, early indicators do not show clear deviations from figures seen in previous years. This might indicate that Covid-19 restrictions will not have any significant impact on emissions in these sectors.

Furthermore, trends in road traffic data show that as restrictions are lifting, road usage is increasing. This implies that although a static decrease in emissions may have been achieved in the transport sector, this reduction in emissions is likely to be temporary.

The Programme for Government approved on June 26th, outlines a commitment to an average decrease in total greenhouse gas emissions by 7% each year from 2021 to 2030.¹⁷ While Covid-19 restrictions may help to reach this reduction target in 2020, it is unlikely that it will deliver the entire 7% reduction, and the reduction is unlikely to be sustained in future emissions levels. Policy changes across different sectors will be needed to reduce Ireland's emissions in a sustained manner and achieve the annual 7% emission reduction commitment.

17 Programme for Government (2020) *Our Shared Future*