Small-scale Research Study on

Environmental impacts (Positive and Negative) flowing from COVID-19 and related measures

for the EPA State of the Environment Report 2020

epa Environmental Protection Agency

CTC CLEAN TECHNOLOGY CENTRE

CIT CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

Small-scale research study

for the Environmental Protection Agency

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July 2020

Clean Technology Centre at Cork Institute of Technology

Eileen O'Leary, Safaa Al Tameemi, Sarah Broderick and Colman McCarthy

‘Even if it results in significant temporary reductions in emissions, COVID-19 is and will remain a serious public health crisis. COVID-19 and its multiple impacts on our society cannot in any way be perceived as an event with positive outcomes.

Even those of us who, based on our expertise and knowledge, have been vocal and calling for serious changes in our systems of production and consumption, should not see the massive shut down of our society as an acceptable solution to urgent and systemic sustainability challenges.’

European Environment Agency

Hans Bruyninckx
Executive Director

March 2020

‘*How governments act today will shape the post-COVID world for years to come*.

This is true not only domestically, where the right policies can foster a resilient, inclusive and sustainable recovery, but also in terms of how countries co-operate to tackle global challenges together.’

OECD

Angel Gurría
Secretary-General

June 2020

A first look at the environmental effects of the pandemic in Ireland

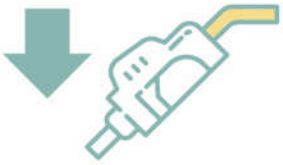
March to May 2020, compared to the same period in 2019

GREENHOUSE GAS EMISSIONS, AIR POLLUTION, AND NOISE

PETROL CONSUMPTION

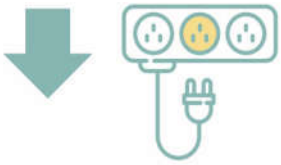
DOWN ALMOST **50%**

DIESEL CONSUMPTION



DOWN ALMOST **35%**

ELECTRICITY USAGE

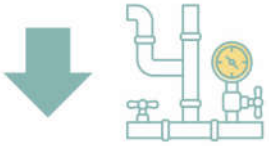


DOWN BY **6%**

ELECTRICITY GHG EMISSIONS

DOWN BY **7%**

NATURAL GAS GHG EMISSIONS



DOWN BY **6%**

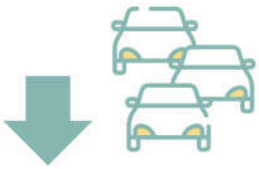
IRELAND'S OVERALL GHG EMISSIONS

DOWN BY **2.5%**

DOMESTIC HEATING OIL PURCHASES

DOUBLED
(LIKELY PRICE RELATED)

TRAFFIC



VOLUMES DOWN **68%**
NOISE LEVELS **DOWN**

AIR POLLUTION FROM TRAFFIC

NO_2
DUBLIN - **39%** DROP
CORK - **30%** DROP

$PM_{2.5}$
DUBLIN - **30%** DROP
CORK - **9%** DROP

ENVIRONMENTAL NOISE & ODOUR COMPLAINTS

UP

INTERNATIONAL ARRIVALS & DEPARTURES

APRIL DOWN **99%**
MAY**%** DOWN **98**%

WASTE AND RESOURCE USE

DOMESTIC BROWN BINS

UP **32%**

GLASS BOTTLE INTAKE

UP **46%**

HOUSEHOLD WASTE

UP **21%** OVERALL

DOMESTIC SKIP USE

UP

COMMERCIAL WASTE

DOWN **54%**

CONSTRUCTION WASTE

DOWN **65%**

ILLEGAL DUMPING

ANECDOTALLY **UP**
RELATED COMPLAINTS **UP**

HEALTHCARE RISK WASTE FROM HSE HOSPITALS

UP **24%**

DOMESTIC WATER USE

UP **20%**

NON-DOMESTIC WATER USE

DOWN

OVERALL RETAIL SALES

DOWN **32%**

FOOD RETAIL SALES

UP **16-17%**

IMPORTS

DOWN **21%**

ON-LINE RETAIL SALES

BREAK RECORDS, 15.5% OF TOTAL RETAIL!

NATURE AND PEOPLE

TIME OUTSIDE

MORE PEOPLE SPENDING TIME OUTSIDE - **93%** OF PEOPLE WALKING

ENGAGEMENT WITH LOCAL WILDLIFE

MORE PEOPLE ENGAGING WITH LOCAL WILDLIFE RECORDS UP **70%**

POLLINATORS

REDUCED MANAGEMENT OF GREEN SPACES ALLOWING WILD FLOWERS TO BLOOM, **GREAT FOR POLLINATORS**

Contents

1. Introduction

This report presents the findings from a small-scale research study on the main environment-related impacts arising from the COVID-19 experience in Ireland, both positive and negative.

While focused primarily on the environmental effects, we have also included related effects such as changes in consumption, which have knock-on environmental impacts.

The study period is for all of March and April 2020, which includes both the initial restrictions imposed on March 12th (closures of schools, workplaces, etc.), and the eventual lock-down on March 27th 2020. Where data are available, May 2020 has been included as well.

While we have endeavoured to be as accurate as possible, the report should be regarded as a 'first look' at the effects of the pandemic. In some cases, the information gathered was qualitative, rather than quantitative – where hard data are not yet available. In time, each of the different environmental areas will be duly systematically quantified as part of the normal environmental assessment processes.

The following are the key thematic areas covered:

- Climate and greenhouse gas emissions
- Air quality
- Water
- Waste
- Resource use
- Nature & wild places
- Environment, health & wellbeing and community engagement
- Noise
- Policy
- Media coverage of environmental aspects of COVID-19 measures

Compilation and analysis of data and information are detailed under each of these sections, as appropriate.

We would like to thank all those who have provided us with the data and insights used in the compilation of this report.

2. Climate and greenhouse gas emissions

Summary of energy-related greenhouse gas emission changes

Figure 1 summarises the energy-related greenhouse gas emission changes during the lockdown, which represent an overall 2.5% reduction in emissions compared to Ireland's total annual GHG emissions (2018).

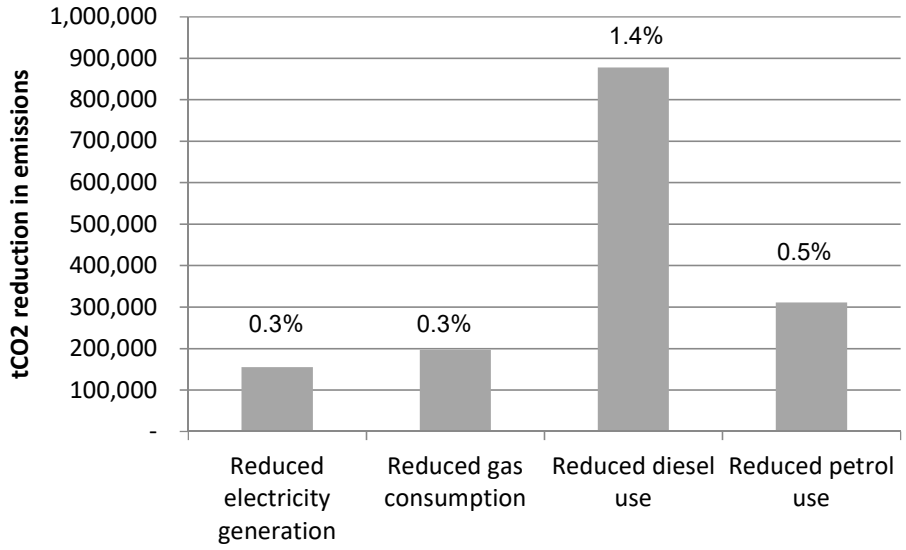


Fig. 1: Summary tonnes of CO_2 emissions reduction over the 2020 lockdown period compared to GHG emissions (of the 2018 total)

These are outlined in further detail in the following sections.

Electricity

The effects of the COVID-19 lockdown on the electricity system demand is readily apparent, as shown in Figure 2 comparing average daily demand (over 7 days) for 2020 to 2019.

Fig 2: Average daily electricity demand over 7 days, GWh, Jan - Jun 2019 and 2020[1]

[1] Source: Eirgrid.

Figure 2 shows that the average daily electricity demand (seven-day moving average) started dropping as the first restrictions came in just before March 14th, and by the first week of the lockdown it had fallen by 15% compared to the same week a month previous (76 GWh daily average versus 90 GWh pre-COVID-19).

By the second week of lockdown, the demand dropped further to a daily average of 71 GWh and remained more or less at this level for the duration of the lockdown, some 21% lower than pre-COVID-19 levels[2]. In summary, over March, April and May 2020 combined, the drop in electricity supplied to the Irish market was down 6% (470 GWh) compared to the same period in 2019[3].

The reduction in electricity generation corresponded to an estimated reduction in CO_2 emissions from electricity generation of 1% in March, 14% in April and 4% in May, compared to 2019[4]. See Figure 3. This represented an estimated drop of 155 kt CO_2 emissions across the 3 month period, a 7% reduction compared to 2019. This corresponds to roughly 0.3% of total annual GHG emissions for Ireland (based on 2018 total of 60.93 Mt CO_2 eq).

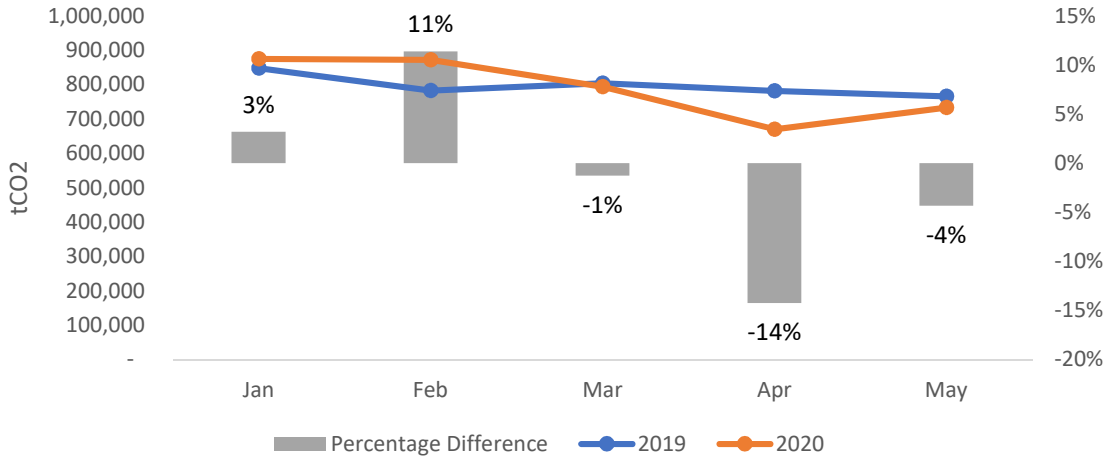


Fig. 3: CO_2 emissions from electricity generation for January-May 2019 and 2020, and percentage change[5]

There was settled weather during the lockdown which corresponded to a lower wind generation rate for April 2020, compared to 2019; down by 31% (514 GWh for April 2020, 741 GWh for April 2019). However, May 2020 did generate more electricity by wind compared to 2019, up by 36% (681 GWh for May 2020, 501 GWh for May 2019).

Natural gas

Natural gas demand showed a reduction of approximately 15% during the first two weeks of the lockdown, with daily demand dropping from an average of 230 GWh per day pre-lockdown to 196 GWh per day (not weather corrected). Settled weather meant that towards the end of April there was increased gas generated electricity to compensate for a reduction in available wind energy. Good weather during April and May showed a continuing flat demand for gas[6].

The reduction in gas usage corresponded to an estimated reduction in CO_2 emissions of 10% in April and 8% in May, compared to 2019 (based on SEAI data). This represented an

[2] Based on SEAI data.
[3] Based on SEAI and Eurostat data.
[4] Based on SEAI data.
[5] Based on SEAI data.
[6] Based on SEAI data and analysis.

estimated drop of 197 kt CO_2 emissions across the lockdown period, a drop of 6% on the previous year for March to May. This corresponds to about 0.3% of the total annual GHG emissions for Ireland, as Figure 4 shows.

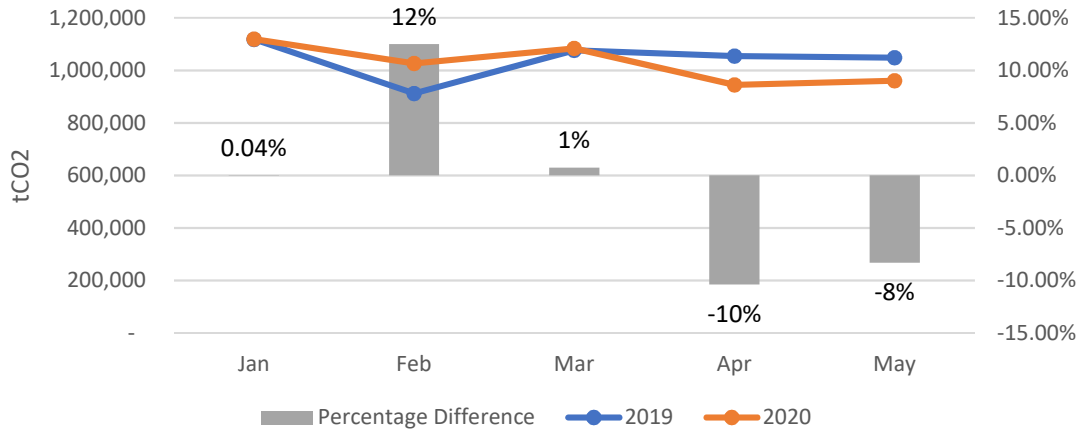


Fig. 4: CO_2 emissions from natural gas consumption for January-May 2019 and 2020, and percentage change[7]

Kerosene

Kerosene is used for heating in households, services and industry. Kerosene deliveries almost doubled across the lockdown period of March to May compared to the same time period the previous year (up 95%). There was an increase in kerosene deliveries of 86% in March, 79% in April and 145% in May, compared to the same months in 2019. The figure of 108 million litres was the highest excise clearance figure for May in the 2000-2020 series[8].

SEAI attributes the dramatic increase in March and April 2020 compared to 2019 as likely due to a combination of low oil prices and stocking up at the start of the lockdown. This continued on into May 2020 as Figure 5 shows. CSO data corroborates this with large decreases for March to May 2020 in the Wholesale Price Index for heating fuels which may have resulted in some advance purchases.

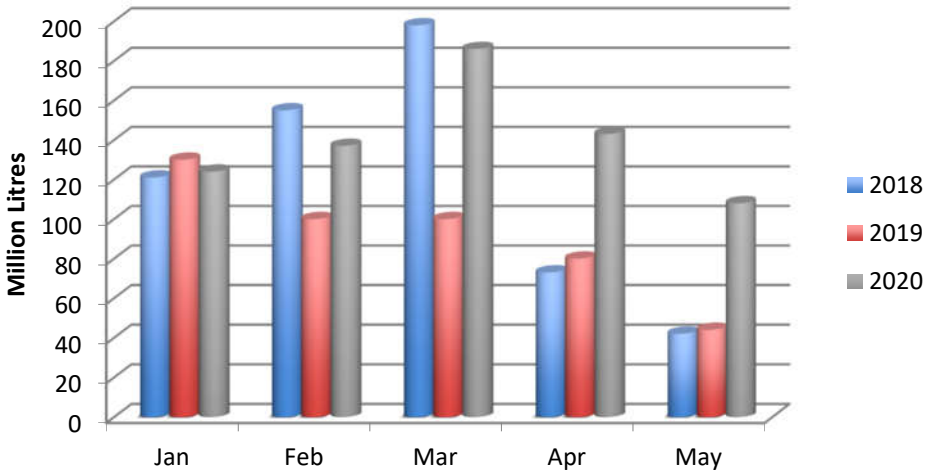


Fig. 5: Million litres of kerosene deliveries (excise clearances) for January-May 2018, 2019 and 2020

[7] Based on SEAI data.
[8] Based on CSO data.

Since these are deliveries, rather than consumption, it is anticipated that deliveries will reduce later in the year. This increase is equivalent to 20% of total 2019 deliveries. It is inappropriate to look at associated carbon emissions since much of this is yet in storage in household tanks; this instead should be done over a longer timeframe.

Gas oil

Marked gas oil is used for off-road purposes, such as agriculture and heating of larger buildings. There was an increase in gas oil deliveries across the lockdown period of March to May 2020 compared to the same time period the previous year (up 12%), but not to the same dramatic extent as kerosene. See Figure 6. There was an increase in gas oil deliveries of 32% in March, 10% in April and a drop of 1% in May, compared to the same months in 2019[9].

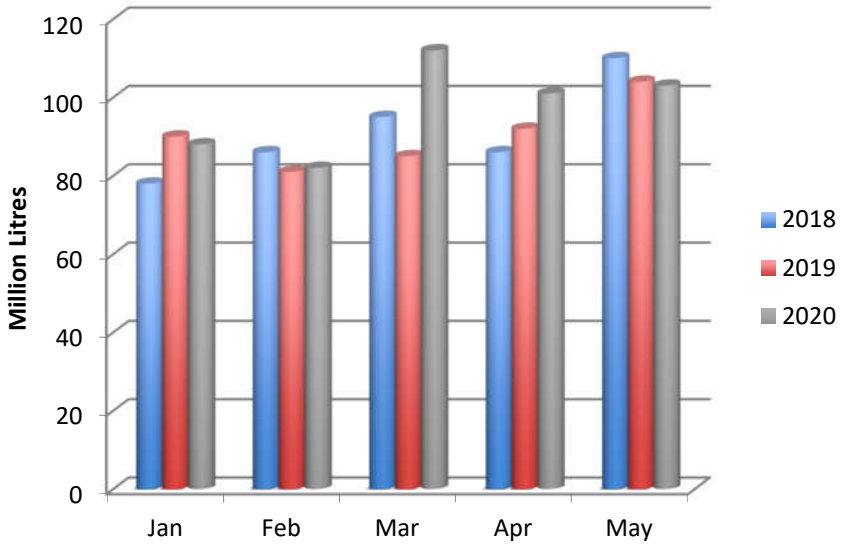


Fig. 6: Million litres of marked gas oil deliveries (excise clearances) for January-May 2018, 2019 and 2020

Again, as per kerosene, a look at associated carbon emissions has not yet been completed, as much is likely still in storage.

Road transport

Traffic volumes, which had been up earlier in the year, immediately dropped when restrictions were first introduced, and then fell even further when the lockdown came in at the end of March.

Figure 7 illustrates the considerable drop over the period[10]. The seven-day rolling average was down 30% by the end of the week of St Patrick's day compared to 2019, and by the end of the first week of the lockdown was 71% down on the same time last year and stayed at this for a period of time. Traffic volumes did steadily increase as the restrictions were gradually being lifted but at the end of May were still well below normal levels. At the end of the week of May 18th, with Phase 1 lifting, the 7-day rolling average was 53% below 2019. Overall, traffic volumes were down by an average of 68% during the lockdown compared to the same period in 2019.

[9] Based on CSO data.
[10] Data from Transport Infrastructure Ireland (TII).

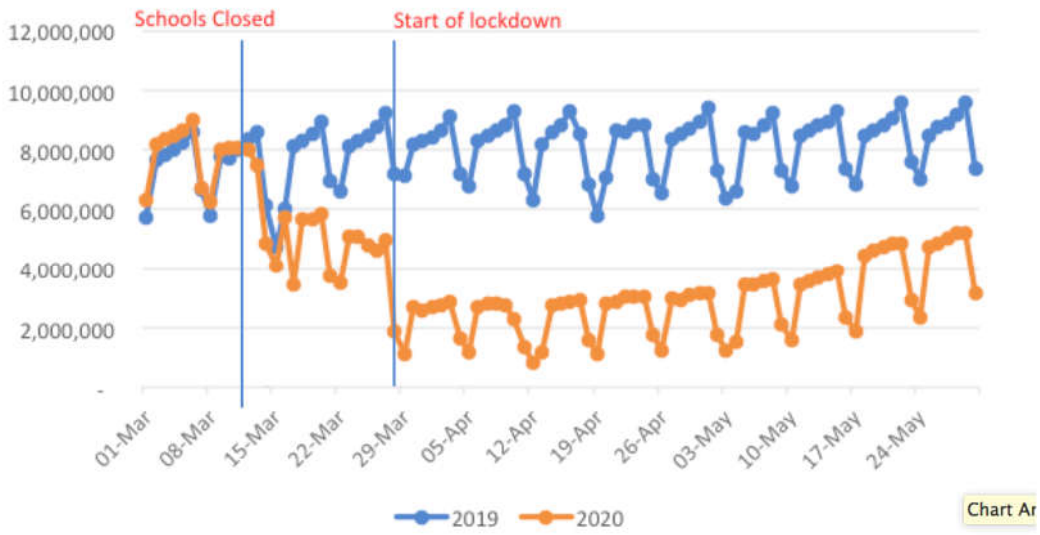


Fig. 7: National traffic volumes for January-May 2019 and 2020, daily comparison

Auto diesel and petrol use

The drop in traffic corresponded with a large reduction in auto diesel use. Diesel deliveries (excise clearance) were down by 35% over the three month period, corresponding to an estimated reduction in CO_2 emissions of 9% in March, 55% in April and 39% in May, compared to the same months in 2019[11] – see Figure 8. The April figure for auto diesel of 139 million litres was the lowest monthly excise clearance figure in the CSO's 2000-2020 series. This represented an estimated drop of 878 kt CO_2 emissions across the three month period. This corresponds to approximately 1.4% of the total annual GHG emissions for Ireland.

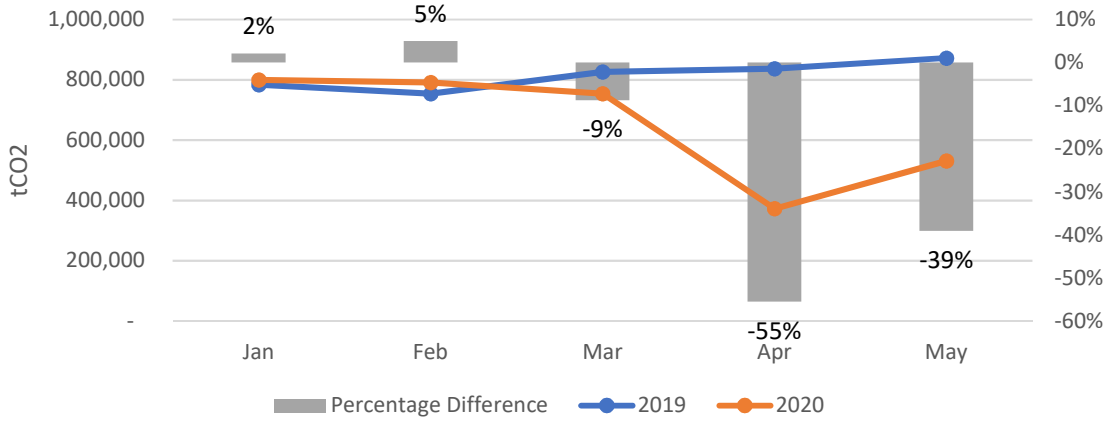


Fig. 8: CO_2 emissions from auto diesel for January-May 2019 and 2020 and percentage change

The reduction in petrol deliveries was even more substantial, almost halving for the three months, with an estimated drop in associated CO_2 emissions of 23% in March, 73% in April and 49% in May, compared to the same months in 2019[12] – see Figure 9. This represented an

[11] Based on CSO data.
[12] Based on CSO data.

estimated drop of 311 kt CO_2 emissions across the three month period. This corresponds to about 0.5% of total annual GHG emissions for Ireland.

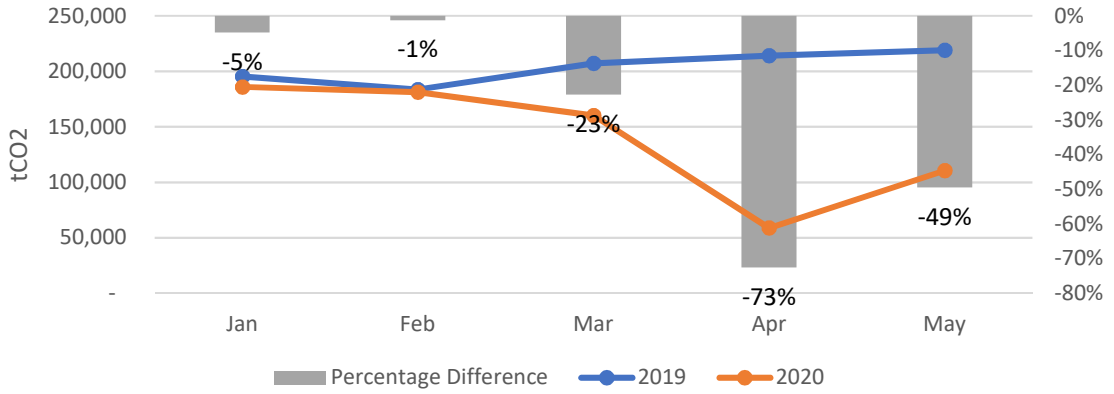


Fig. 9: CO_2 emissions from petrol for January-May 2019 and 2020, and percentage change

International travel

While international travel emissions are outside the scope of national emission reduction targets, it is still be useful to examine the effects the lockdown measures have had on air and sea travel.

Jet kerosene

Jet kerosene is used for air travel. Deliveries of jet kerosene in March 2020 were 27% lower than March 2019, and April 2020 was 84% lower than April 2020[13].

International travel

The CSO's air and sea travel statistics, based on information provided by airport and ferry operators, shows 'an extraordinary collapse' in international travel, with departures and arrivals for April 2020 both down by 99% compared to 2019, and for May 2020 both down by 98%. There were just 16,100 arrivals in April 2020 and 17,800 departures, while only 28,300 arrivals in May 2020 and 36,300 departures. This compares with monthly travel of more than 1.7 million in each direction in April 2019, and 1.8 million in May 2019 – see Figure 10.

[13] Based on SEAI data.

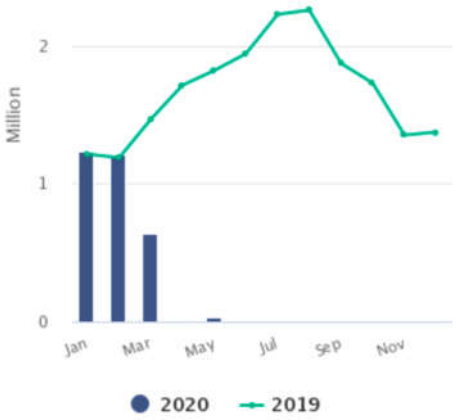


Fig. 10: Overseas arrivals, air and sea, 2019 and 2020

The number of flights arriving and departing Ireland were down on average by 89% across the period of the lockdown[14] – see Figure 11.

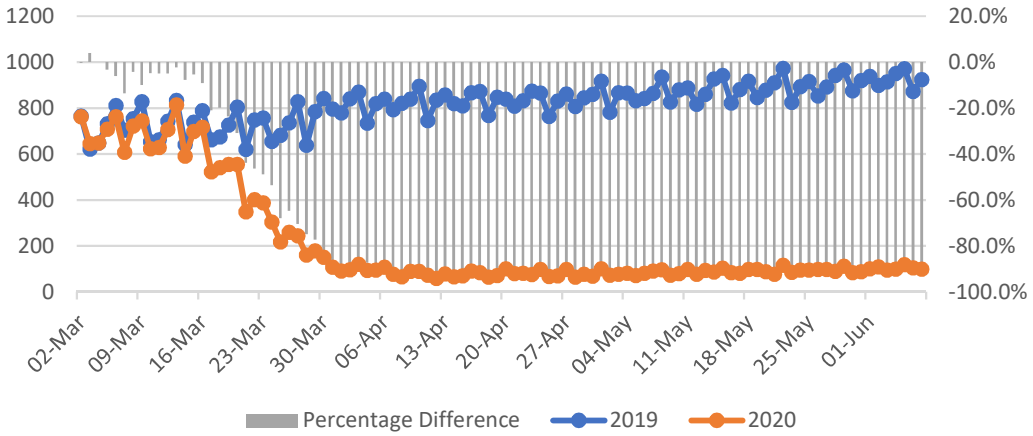


Fig. 11: Number of arrivals and departures of flights in Ireland, March to May, 2019 and 2020

Agriculture

Agriculture GHG emissions have not been calculated for the lockdown period – they are outside the scope of this study – and it is anticipated that much agricultural emission sources would continue unaffected in any case. CSO figures for slaughtering show that COVID-19 led to a decline in cattle, sheep and pig slaughtering. Both fell in April and May, even though numbers had been up in March 2020 compared to 2019. Only cattle levels are down overall across the three months (Mar – May) of 2020 compared to 2019, while sheep and pig levels are essentially the same across the period. It is not known if COVID-19 clusters in meat processing plants impacted on these figures. Data for March to May 2019 and 2020 are shown in Figure 12.

[14] Source: Eurocontrol.

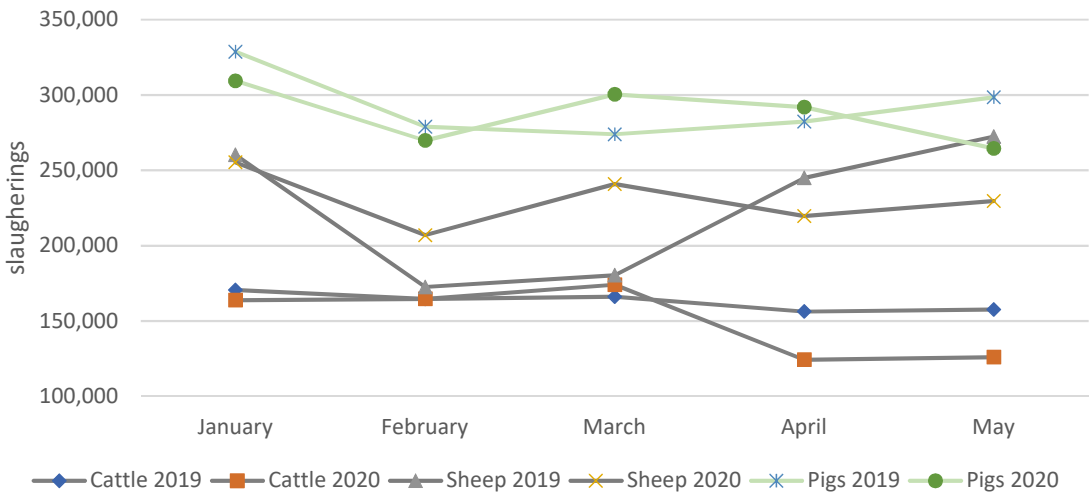


Fig. 12: Cattle, sheep and pig slaughtering, March to May, 2019 and 2020

3. Air quality

Long-term exposure to air pollution is known to contribute to chronic lung and heart conditions. High levels of air pollutants like nitrogen dioxide and particulate matter are attributed to causing premature deaths across the globe. The EEA states air pollution to be the single largest environmental health risk in Europe.

Nitrogen dioxide emissions

The EPA stated that there had been a decrease in air pollution, particularly towards the end of March and beginning of April coinciding with the introduction of the COVID-19 restrictions. The most significant changes were in the concentrations of nitrogen dioxide (NO_2) with decreases of up to 50%, as compared to the January average value[15].

In Ireland, NO_2 is primarily associated with vehicle exhausts. Hence the largest decreases were observed at urban traffic stations in the national air quality monitoring network. This corresponds to the large drop in traffic volumes, down 68% (see earlier) and as borne out by the almost 50% drop in petrol and 35% drop in diesel consumption over the three month period (again, see earlier).

The reductions in average monthly NO_2 concentrations at air quality monitoring stations in Cork and Dublin for 2020 compared to 2019 are shown in Figure 13. In Dublin, there was a drop of 39% in the average NO_2 concentrations over the lockdown period of March to May 2020 compared to March to May 2019. In Cork, there was a 30% drop[16].

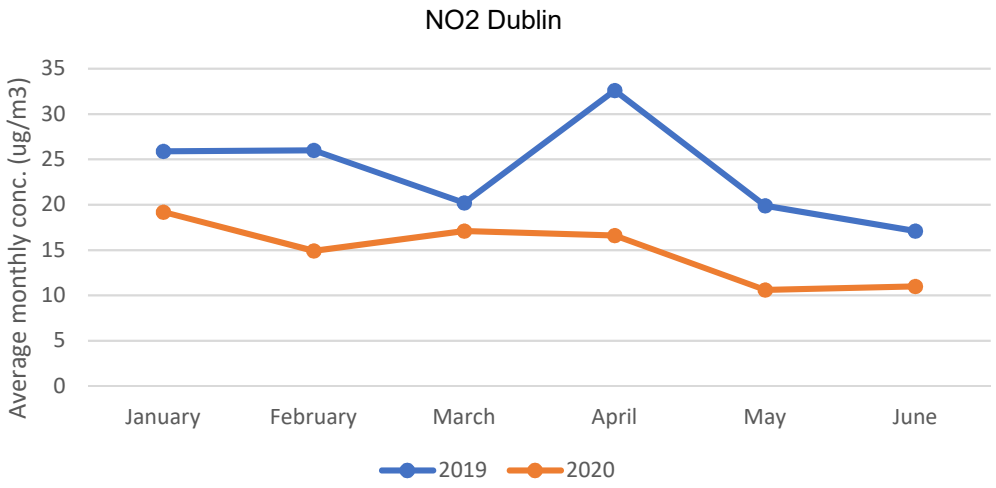


Fig. 13: Average Monthly NO_2 concentrations in Dublin, January-June, 2019 and 2020, EEA summary data

[15] Based on EPA data.
[16] Based on European Environment Agency summary data.

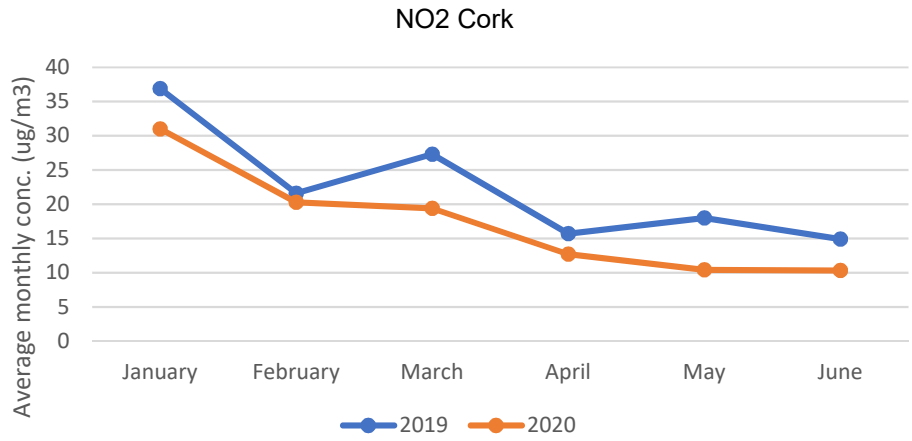


Fig. 14: Average Monthly NO_2 concentrations in Cork, January-June, 2019 and 2020, EEA summary data

The EPA undertook an analysis of nitrogen dioxide concentrations for 2020 against the previous four years (not just versus 2019). The Agency noted clear evidence that there was a decrease in air pollution, particularly towards the end of March and beginning of April coinciding with the restrictions, and with "dramatic decreases" noted during the period of full lockdown. Figure 15 shows this drop for one of the monitoring stations for one of the weeks during lockdown which had similar weather conditions in 2019 and 2020[17].

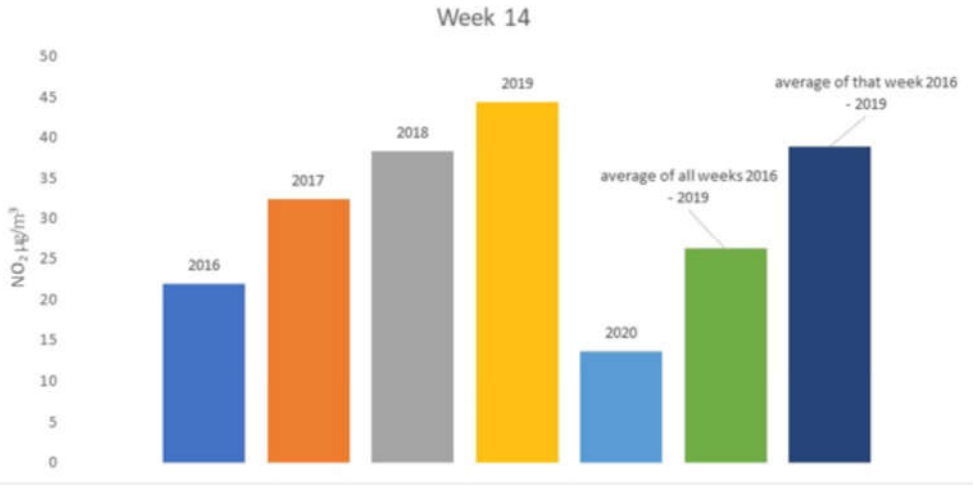


Fig. 15: Average NO_2 concentrations for Blanchardstown, week 14 (2nd week of lockdown) 2020 and previous years 2016 - 2019, EPA

Fine particulate matter

For Ireland, the main source of particulate matter air pollution ($PM_{2.5}$ and PM_{10}) is domestic use of solid fuel. Traffic exhaust is another source.

EPA national monitoring stations for air pollution include roadside/ traffic stations as well as background stations in urban, suburban and rural areas. The EPA carried out an analysis in early April of ambient particulate matter at its national monitoring stations comparing the lockdown to the same period in 2019, finding that levels of air pollution from solid-fuel burning had not changed due to the restrictions and were as expected for that time of year.

[17] www.epa.ie/newsandevents/news/name,69166,en.html

In terms of traffic, $PM_{2.5}$ dropped by an average of 30% in Dublin and 9% at Cork traffic monitoring stations for March to May 2020 compared to March to May 2019. For PM_{10} there was actually an increase of 22% for Dublin and a 20% drop for Cork[18].

PM_{10} exceedances at urban/suburban monitoring stations were down for the months of March and April 2020 by 83% compared to 2019 (72 versus 12), but these incidences are often related to prevailing calm weather conditions, and the lockdown period in addition had favourable weather making domestic solid fuel use less likely. See Figures 16-19 below.

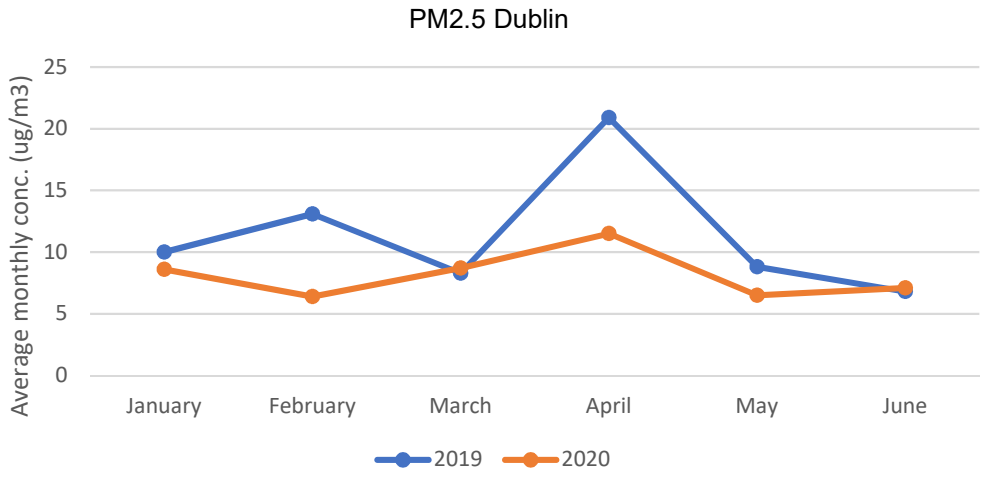


Fig. 16: Average Monthly $PM_{2.5}$ concentrations in Dublin, January-June, 2019 and 2020, EEA summary data

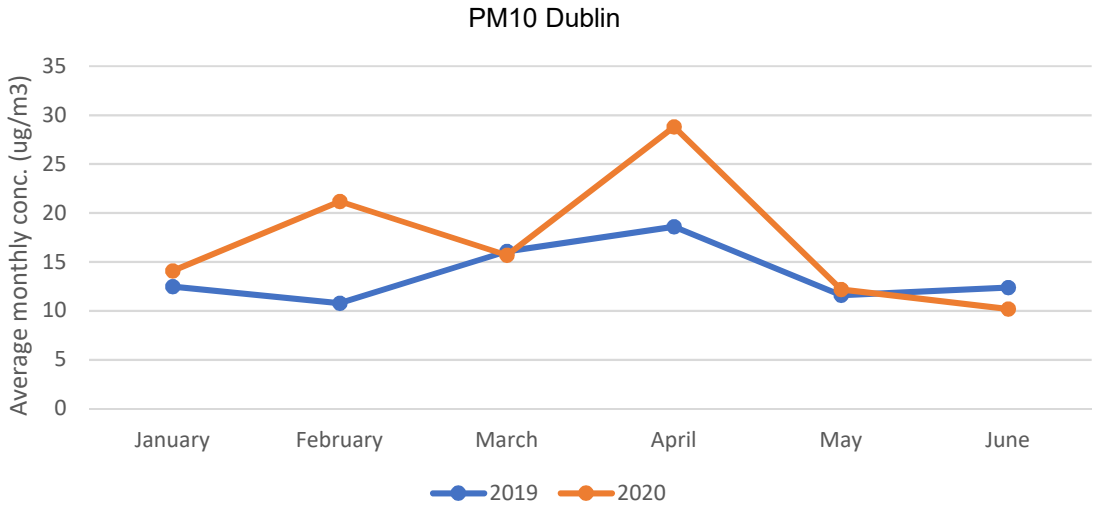


Fig. 17: Average Monthly PM_{10} concentrations in Dublin, January-June, 2019 and 2020, EEA summary data

[18] Based on European Environment Agency summary data.

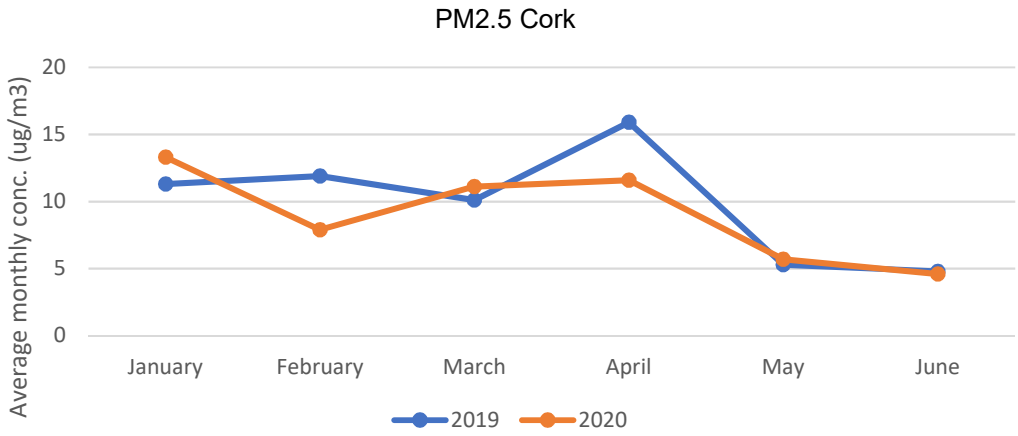


Fig. 18: Average Monthly $PM_{2.5}$ concentrations in Cork, January-June, 2019 and 2020, EEA summary data

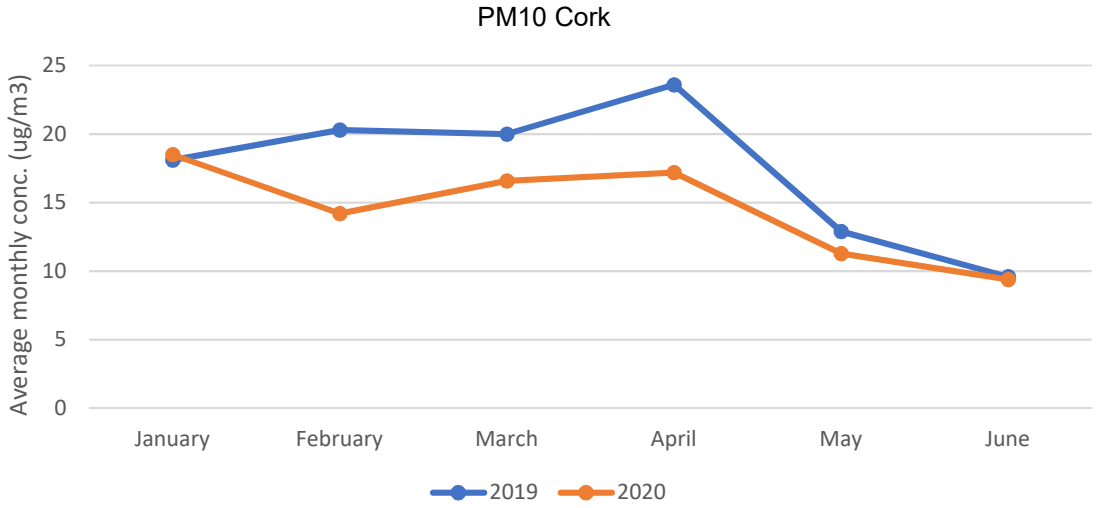


Fig. 19: Average Monthly PM_{10} concentrations in Cork, January-June, 2019 and 2020, EEA summary data

4. Water

From March to May, 2020 water consumption went up 20% for domestic use, with a drop in non-domestic use. Supply shortages were exacerbated by drought conditions leading to a hosepipe ban.[19]

Irish Water domestic metering data showed that during the COVID-19 lockdown households were using an additional 24 litres of water per person per day, an average 20% increase compared to February. A significant change in water usage patterns in commuter belt towns and rural areas was also noted, where normally, significant numbers of people would be out of the house for long periods during the day.

In May 2020, Niall Gleeson, Managing Director of Irish Water, said that while there was a large increase in domestic use, Irish Water did not see the corresponding reduction from businesses to compensate for that. So, overall, demand across the country was about the same as it was before the crisis started.

At that time, water treatment plants were mostly running at capacity, and the preceding dry spell was forecast to remain dry for several weeks. With the forthcoming prospect of businesses reopening and needing extra water for cleaning and flushing, Irish Water issued a call for water conservation. This campaign asked people to stop non-essential uses of water – 'to choose handwashing over powerwashing' – stressing the importance of maintaining the supply for handwashing, hygiene and cleaning for COVID-19 purposes.

Following the continued dry spell during almost all of May, Irish Water formalised this into a Water Conservation Order on June 9th, colloquially a hosepipe ban, for the whole country. The increased domestic demand and increase in commercial demand as businesses were reopening at the end of May and start of June was exacerbated by warm weather and deteriorating drought conditions. Met Éireann stated that May 2020 was the driest May since 1850 and continued dry weather was forecast. Businesses beginning to return were encouraged to flush their systems leading to an expected increase in non-domestic demand. The Order was issued in a bid to safeguard water supplies for essential purposes, in particular water needed for sanitation purposes during the COVID-19 crisis.

'The decrease in the commercial use of water could not off-set the increase in domestic demand. Some of our highest water users include hospitals, food and pharmaceutical manufacturing, and data centres, all of which used the same amount of water as normal during the COVID-19 crisis', according to Yvonne Harris Head of Customer Operations in Irish Water.

Irish Water reported that data consistently show spikes in water usage on very sunny day – see Figure 20.

Irish Water stated[20] that on the Saturday of the June Bank Holiday weekend, water demand exceed all previous consumption levels, with an increased extra supply for the equivalent of 200,000 people. They were especially concerned with extra consumption for watering gardens and the use of paddling pools etc.

When the Water Conservation Order was issued, 27 of Irish Water's 900 drinking water schemes were in a drought, with another 50 at risk of going into drought. Thereafter the situation deteriorated with the number of schemes in drought or at risk of drought peaking at 98.

[19] Summary based on Irish Water press releases, radio interviews, and the Irish Water Technical Report explaining the need for a hosepipe ban (www.water.ie/news/nationwide-water-conserva/Final-Final-June-2020-Technical-Report-re-water-conservation.pdf)

[20] Statements by Yvonne Harris, Head of Customer Operations, and Niall Gleeson, Managing Director.

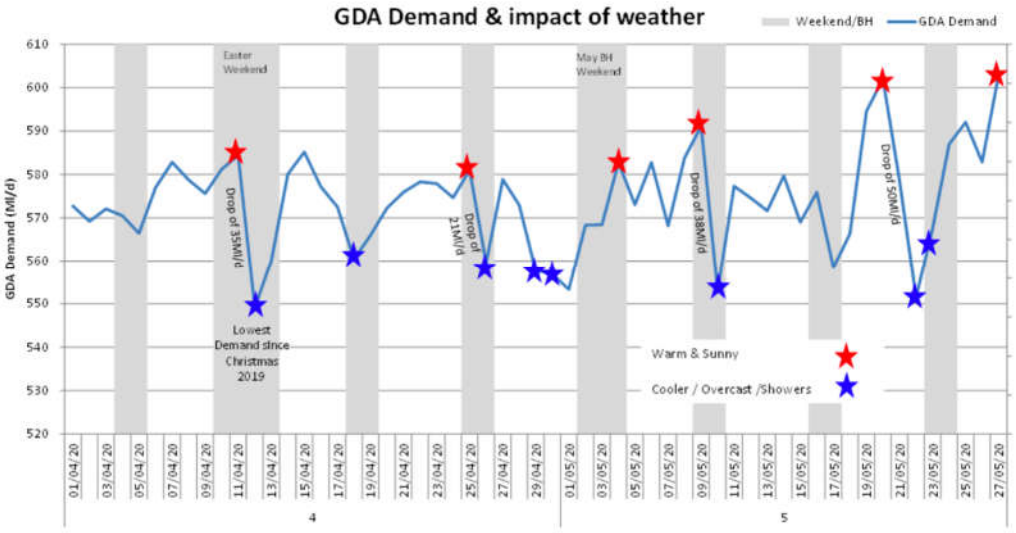


Fig. 20: *Greater Dublin Area water demand & impact of weather, from April-May 2020, Source: Irish Water*[21]

The hosepipe ban was expected to remain in place until the 21st of July, but was lifted on the 8th of July, following above average rainfall in many areas of the country during June, which has resulted in the recovery of some of the water supplies.

Environmental water quality

There is little indication that the COVID-19 restrictions had the potential to cause major changes to water quality. Across Ireland, the main pressures impacting water quality are from land use (particularly agriculture but also forestry), impacts to physical habitats (such as excess sediment) and wastewater[22]. Changes to land use and physical habitats were very unlikely during the period under study.

There may have been some impact due to the effects of wastewater on water quality. With most of the population remaining at home during the period, load on domestic wastewater systems increased. Typically, a significant portion of the population travel from rural to urban areas daily, increasing the load on urban wastewater systems. The reduction in travel would have caused an increase in pressure on home and or rural wastewater systems.

However, any potential effects of this increase in pressure would be very difficult to capture, particularly in the context of the weather experienced during the same period. Rainfall was lower than the long-term average across the country for March-May 2020. In fact, the season was the driest on record for counties Dublin and Meath. Total rainfall ranged from 31% of the long-term-average (LTA) recorded in Phoenix Park and 85% of LTA in Athenry. The effects of this unusually dry season likely far exceeded the effects of COVID-19 related effects in magnitude[23].

[21] Irish Water - Technical Report on Introduction of Specific Usage Prohibitions in All Areas Served via the National Public Water Supply, June 2020.
[22] EPA, 2019. *Water Quality in Ireland 2013-2018*. Wexford.
[23] Source: Met Éireann, 2020.

5. Waste

Implications for reuse and the circular economy

Anecdotally, the prevention of single use is proving difficult to reinstate as Ireland re-opens[24]. The Conscious Cup Campaign is promoting "contactless coffee" but uptake has slowed with most of the chains now refusing to refill reusable cups.

Similarly, for the Refill.ie Tap Map, many participating businesses have either folded or not reopened, reducing the impact of the scheme. Several canteens have removed crockery in favour of disposables even though many have industrial dishwashing facilities in place.

There are concerns also for the impacts on the market for second-hand clothes and the charity sector. While volumes of materials being presented remain high, the closure of charity shops in the lockdown and some public concerns regarding the use of second-hand clothes may impact on sales. Many charity shops are run by volunteers and tend to be small, where social distancing is difficult – this may deter volunteers and shoppers.[25]

The increase in single use plastic for deli, bakery & perishable goods, as well as single use PPE in hairdressers, beauticians, etc. will inevitably lead to much more waste. On a positive note, interest in upcycling & repurposing has increased during the lockdown.

Household waste

The Irish Waste Management Association (IWMA) carried out surveys across its members during the lockdown period[26]. IWMA members collect 75% of household waste in Ireland and most commercial, industrial and hazardous wastes, too. The surveys took place on April 6th, April 14th , April 27th, and May 14th, 2020.

In response to the question 'An estimate of the increase in your household waste volumes over the shutdown', overall household waste volumes collected were estimated to have increased at an average rate per company of 21%, ranging from 7% to 41% over the period – see Figure 21. This is to be expected with the majority of the country primarily remaining at home, aside from essential service workers.

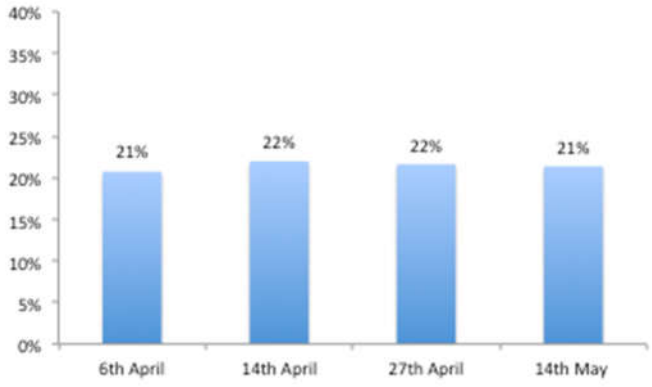


Fig. 21: Overall household waste volume increases - average per IWMA company

While all three domestic waste streams (residual, recycling and brown bin (compostable)) experienced an increase, the largest increase was seen in the brown bin. Across the lockdown

[24] Source: Pauline McDonogh of the Southern Waste Region Management Office.
[25] Source: Claire Downey of the Community Resources Network Ireland.
[26] These were kindly made available to CTC for this project.

this increased at an average rate of 32% per company. The breakdown across the weeks is shown in Figure 22.

Residual waste volumes increased at an average of 16% per company, and recyclables by 12%. The Southern Waste Region noted that the waste industry performed well during the pandemic, with a great deal of co-operation and all services broadly running very smoothly[27].

The Southern Waste Region noted that domestic food waste peaked in the first two weeks but has since levelled out. One waste company noted that their brown bin increase included a lot of seasonal garden waste.

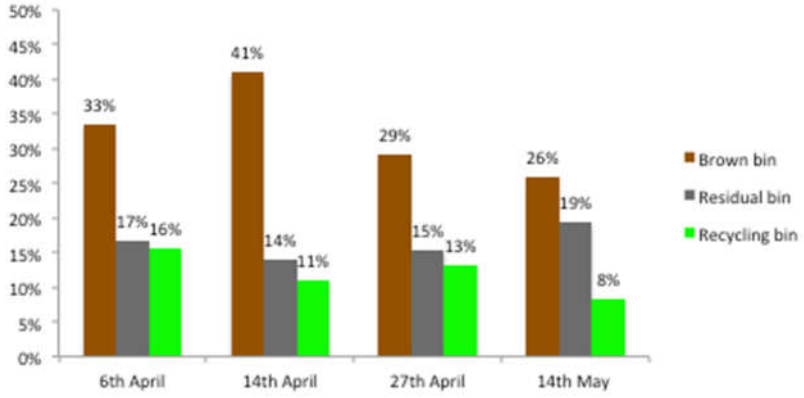


Fig. 22: Individual household waste stream volumes - average per IWMA company

Bottle bank volumes

The Southern Waste Region said that Repak reported a 46% national increase in domestic glass tonnage intake for April 2020, compared to April 2019, along with a 43% increase for May, and 25% for March. The collection of domestic glass was reported as being challenging over the pandemic, due to the volumes being presented.

South Dublin County Council reported 42% more collected from bottle banks during March and April compared to the same period in 2019. Westmeath County Council information indicated a 53% increase in bottle bank tonnage for the three months from March to May compared to the same period in 2019. Longford County Council and Offaly County Council also reported bring banks being filled more frequently.

Commercial and construction & demolition waste

The IWMA reported a sharp drop in commercial and construction and demolition (C&D) waste volumes during the lockdown – which is unsurprising. Commercial waste was down by an average of 54% per waste company, and C&D waste was down by 65% – see Figures 23 and 24. Several companies noted that while there was a big drop in skips on account, in some cases by over 50%, casual/domestic skips were up on average over the period, in some cases by more than 50%. One company noted that household skips had never been so busy.

The Southern Waste Region also reported that the collection and handling of textiles has proven problematic, with markets having shut down for export, along with no charity shops being open in Phases 1 and 2 of the reopening, making donation impossible. Textiles that were collected are reportedly in storage and future markets and collection systems remain unclear at the time of writing.

[27] Source: Pauline McDonagh, Southern Waste Region

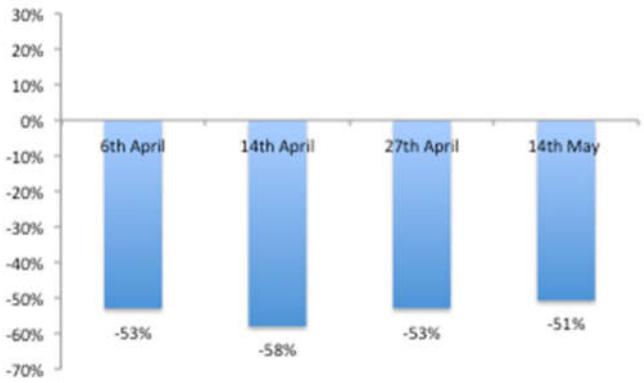


Fig. 23: Overall commercial waste volume decreases - average per IWMA company

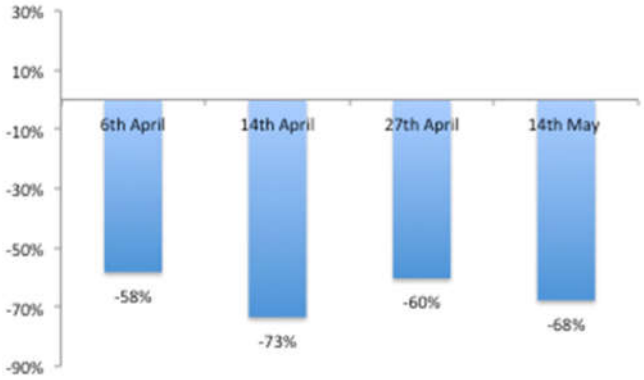


Fig. 24: Overall C&D waste volume decreases - average per IWMA company

Intake at civic amenity sites

Anecdotally, waste intake at civic amenity sites (CAS) and bring centres was extremely high[28] during the pandemic and continues to remain very high. A few CAS were temporarily closed but were reopened due to demand[29]. Meath decided to waive the gate fee but reinstated it due to huge demand.

Healthcare risk waste

The HSE continues to manage infectious medical waste (hospital masks, gloves, syringes, gowns, etc.) generated during the COVID-19 emergency in line with established procedures for infectious healthcare risk waste. Tonnages of healthcare risk waste produced by the HSE increased by 24% compared to earlier this year, pre-COVID. In January and February 2020 the HSE produced on average 213 tonnes per week, while in March and April 2020, 265 tonnes per week was produced[30]. Infectious healthcare risk waste generated during the COVID-19 emergency is treated, as usual, via high temperature steam sterilisation in Dublin and is used for energy recovery, with no new packaging or handling requirements. HSE hospital tonnage represents about 68% of all such waste in Ireland (pre-pandemic).

Stericycle Ltd., the company that processes and treats healthcare risk waste, reported that the volumes from public hospitals greatly increased. Collections went up, from once-a-day to twice-a-day for many hospitals. The Stericycle treatment plant extended its working week from

[28] Source: The Southern Waste Region

[29] Source: The County and City Management Association (CCMA)

[30] Data kindly provided by Helen Maher of the National Health Sustainability Office (NHSO) of the HSE.

five to seven days, in mid-March, in order to increase their capacity to deal with the extra tonnage.

Material was treated as healthcare risk waste as normal, being shredded and sterilised. The increase in amounts is due to increased usage of protective personal equipment (PPE). Rigid containers for anatomical parts, medicines, etc. were smaller than normal as the use of theatres and routine medicine were reduced due to the pandemic. GPs, dentists, and private hospital volumes all dropped off. Private hospitals volumes came back up again but not to the same level[31].

Illegal dumping and environmental complaints

Dublin City Council[32] reported increases in littering and illegal dumping amounts early on in the lockdown. DCC[33] estimated that they encountered approximately a 25% increase in instances of illegal dumping during the period. This was mostly made up of household junk and domestic waste. In addition, complaints also increased in comparison with year on year values. However, there was a lower use of litter bins in the Dublin city centre due to the reduction in people.

For March 2020, DCC reported there was a 30% increase in reports of illegal dumping compared to March 2019. DCC had received a 73% increase in reports of illegal dumping for April 2020, compared to April 2019, with 631 additional reports of illegal dumping handled over the month. Despite the noted increases in instances of illegally dumped material, the overall tonnage of waste collected dropped by an average of 15% across March and May 2020 compared to 2019, mainly due to the general reduction in the use of public litter bins and removal of DCC's on-demand bulky household waste service.

DCC reported significant increases in litter in amenity areas such as beaches and beauty spots, as well as in and around public parks, when lockdown restrictions coincided with fine weather. This was exacerbated by the continued reduction in overall service delivery capacity within the local authority.

Westmeath County Council[34] reported that in the municipal districts of Athlone and Mullingar the decrease in volume of litter bin waste collection during the lockdown period was offset against the increase in illegal dumping, but it is difficult/impossible to extract any meaningful data to reflect this from the overall tonnage values. A littering increase with increased usage of bring banks was also noted with more items being left around bring banks, comprising of a combination of recyclables and rubbish.

Carlow County Council[35] provided data on complaints related to waste, litter, and dumping. These showed a 42% increase in complaints in 2020 compared to the same period in 2019. There was also a 28% tonnage increase for litter/dumped material in 2020 compared to 2019, especially after the reopening of takeaways; this is notwithstanding that the 2019 figures included tonnage for a very busy National Spring Clean event. A large increase in complaints about back yard burning and hoarding of household waste in 2020 was reported in Carlow. The complaints log, which includes all environmentally based complaints, saw a significant spike during the COVID-19 period of March to May, with a 46% increase compared to the same period in 2019.

[31] Source: Fiona Dowling, Stericycle Ltd.

[32] Information in this section was kindly supplied by a selection of urban and rural local authorities. This is supplemented by council press releases and media reporting for other areas.

[33] DCC information supplied by Simon Brock.

[34] WCC information supplied by Ruth Maxwell.

[35] CCC information supplied by Jannette O'Brien.

Galway City Council[36] reported a 13% increase in litter complaints for March and April 2020 compared to 2019, but a 14% reduction in reports of illegal dumping.

Wicklow County Council[37] experienced a surge in dumping which was more localised, tending to happen nearer towns, and less evident in more isolated parts of the county. This suggested individuals were active rather than illegal waste operators. Wicklow also experienced a surge in dumping at bottle banks, and increased use of many on-street bins despite retail and leisure activities being shut down, which suggests they were used for household waste rather than on-street activity. Without the National Spring Clean campaign, litter accumulated and stayed in-situ more frequently. The amount of litter collected by Wicklow County Council from groups doing clean ups was down significantly with the cancellation of many such activities due to the lockdown.

Fingal County Council[38] confirmed an increase in litter complaints received over the period, and the deployment of litter wardens at the weekends in an effort to address the issue.

South Dublin County Council reported in the media a 33% increase in illegal dumping quantities across March and April compared to the same period in 2019 but noted a 13% reduction in the amount of litter collected from litter bins. Litter and illegal dumping complaints were consistent with 2019, but there was a considerable increase in complaints relating to household waste. South Dublin County Council also reported increases in incidences of the burning of waste, particularly domestic household waste.

In early April, Waterford City and County Council reported a 20% increase in the number of reports about illegal dumping compared to last year, and Louth County Council reported that illegal dumping had increased by an estimated 25% in the weeks during April.

At the end of April, Limerick City and County Council reported an increase in incidents of and complaints about illegal dumping. While noted as happening around the county, a particular increase was observed in the city. Meath County Council, Tipperary County Council, Offaly County Council, Cork County Council, and Cork City Council all also reported increases in illegal dumping and littering during the lockdown.

The Southern Waste Region[39] observed that while illegal dumping appeared on the one hand to be more prevalent, that tonnages were about the same, and it is just that people were more aware of it. Also noted was a trend in disposable gloves and masks discarded as litter.

During the lockdown, it was anecdotally observed that a lot of businesses in Dublin city centre were affected by graffiti, as noted by Dublin Town, a business representative group.

Anecdotally, there was an increase in dog fouling during the pandemic due to more people walking their dogs more often, with some local authorities initiating awareness campaigns to tackle the issue.

The Minister for Communications, Climate Action and Environment announced on April 22nd that €1 million from the Anti-Dumping Initiative would be ring-fenced to support efforts to tackle the reported increase in illegal dumping during the COVID-19 crisis, for waste removal costs and increased monitoring and surveillance equipment. Westmeath County Council noted that cameras have been deployed in problem spots in the county, using the fund.

[36] GCC information supplied by Fiona Coen.
[37] WCC information supplied by Jim Callery.
[38] FCC information supplied by Michael Campbell.
[39] SWRMO information supplied by Pauline McDonogh.

6. Resource use

Retail sales

CSO data in relation to the retail industry show retail sales were greatly reduced in April 2020, dropping by almost 36% in value compared to the previous month, and 45% compared to April 2019. This followed a contraction in retail sales for March: nearly 14% in value compared to February 2020, and 12% compared to March 2019.

Retail sales jumped by 28% in value in May 2020 when compared with April, as the partial lifting of restrictions were introduced. However, this is still 29% lower compared to April last year, and as Figure 25 shows, the retail sector is still well below normal levels. This is not surprising since many retail outlets remained closed in May with the exception of essential businesses, and phase 1 of the reopening on 18th May, only allowed some other sectors to reopen like hardware, garden centres, electrical, motor trade, etc.

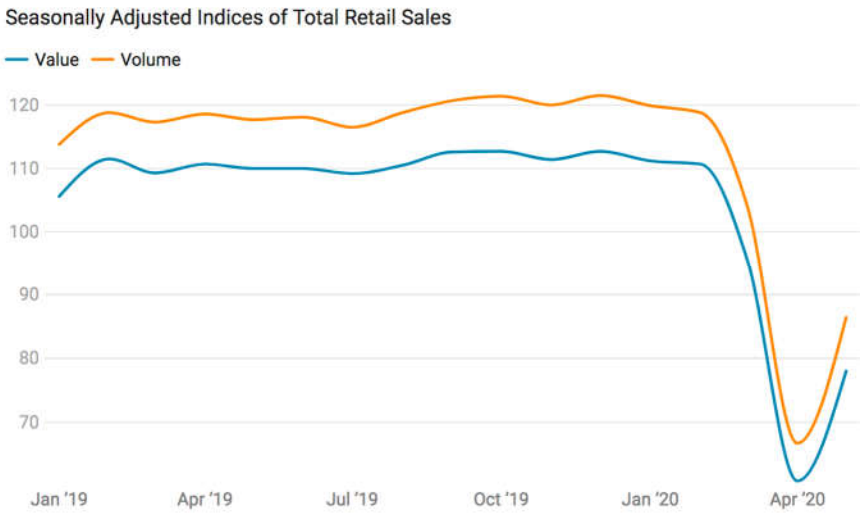


Fig. 25: Irish Retail sales January 2019-April 2020, seasonally adjusted retail sales index, base year 2015 = 100

The motor trade has a significant effect on the overall CSO retail figures. As Figure 26 shows, the drop in retail sales was even more pronounced for the motor trade, with April 2020 at 80% below April 2019 values. This did make some recovery due to car sales in May when the sector reopened towards the end of the month, but as the graph shows, this is still well below normal levels, standing at 51% below May 2019 values.

Transport fuel retail sales were also greatly reduced during the lockdown: March 2020 amounts were down on March last year by 13%, April by 50% compared to April 2019, and May volumes were lower than May 2019 by 38%.

One sector to experience a surge in sales was food retail. In March 2020, retail sales in food outlets (both supermarkets and specialised food retailers) were up 17% in value compared to March the previous year. This was sustained into April and May 2020, staying at 16% above April and May 2019 values.

Figure 26: Retail sales including and excluding motors, May 2018-May 2020, CSO

Aside from food retail businesses, all other retail sectors had reduced sales during the pandemic, with a significant drop for some sectors. Retail sales values for April 2020 show the following drops compared to April 2019:

- bars down 90%,
- clothing and footwear down 87%,
- furniture down 87%,
- department stores down 80%,
- books and newspapers down 69%,
- hardware down 51%,
- electricals down 38%, and
- medicines & cosmetics down 16%.

There had been a flurry in March 2020 for certain sectors including electricals (up in value by 16% compared to March 2019), medicines & cosmetics (up by 11%), and hardware (up by 11%), but all were hit in April, as outlined above. All other sectors in March had experienced a drop. In May 2020 all sectors continued to show reduced sales values compared to May 2019, with the exception of food businesses, as already noted.

A June 2020 CSO survey published on the social impact of COVID-19 shows that 80% of people reported reduced expenditure since COVID-19 restrictions came into place. Respondents with additional available money plan to save (51%), do home improvements (50%), do garden improvements (36%), and spend on future holidays (26%). At the same time, almost 38% of people report being negatively financially impacted by COVID-19.

Three surveys issued by the CSO on the business impacts of COVID-19 found that 54% of businesses have adopted new methods of communication, over one third (33.8%) have adopted new methods of providing products or services as a result of COVID-19, and that 89% of businesses are trading at the end of May 2020.

At the height of the shut-down, over two-thirds (69%) of enterprises indicated that they implemented remote working over the five-week period from 16 March to 19 April 2020. 92% of large enterprises implemented remote working compared to 46% of micro enterprises. At the end of May, enterprises had an average of 46% of their workforce working at their normal place of work compared to 30% working remotely, with 20% not currently working.

A perspective on the pandemic from Musgrave Group

Sales by the Musgrave Group, including in SuperValu and Centra stores, underwent huge increases[40]. It was akin to a series of Christmas weeks in succession. Online sales had a threefold increase.

While volume sales were up about 30 to 50% in some areas, there were a number of factors which meant that margins were up, but not at the same rate as sales. These included the fact that high margin areas, like deli, bakery, and serve-over, dipped due to the absence of office or construction workers. About 30 stores temporarily closed in such locations. In addition, the cost to serve increased significantly, with limited numbers in the store meaning it lengthened the retail day, with surge times now spread, along with the need for extra staff for marshalling and hygiene. Other costs included additional cleaning routines and the fitting of items like canopies and screens.

During the lockdown people were buying more in stores, due to not eating at work and not eating out, and were shopping more frequently. This has eased off somewhat as measures have been eased, but it is still above normal because of eating at home and a lack of socialising.

Store food waste levels stayed consistent, and were slightly down in May, even though sales were greatly increased. Thus, overall, the rate of food waste has declined relative to sales.

COVID-19 saw increased in-store packaging use and of packaged products, e.g. bread was put back in a plastic bag. There has also been an increase in packaged fruit being purchased. While Musgraves are trying to increase the level of sustainable packaging, the immediate demands due to COVID-19 means an increase in single-use plastics use, for reasons of hygiene, to ensure continuity of supply.

Online retail sales

Over the course of the shutdown, online sales showed the highest share of turnover of all businesses since first being recorded by the CSO in 2018. Online sales comprised 15.5% of total retail in April 2020, breaking the previous month's value of 4.3% for March 2020, which in itself was a record. There was a slight decrease to 13% in May 2020, as more outlets reopened for business, but still almost four times the normal pre-pandemic levels of about 3.3% for 2019. The on-line increases were across all sectors, markedly so for some sectors like clothing and electrical.

In May 2020, the CSO published a survey: 'The Impact of COVID-19 on ICT Usage by Households'. Online food and grocery shopping doubled in March 2020 compared to January 2020 (13% versus 6% of respondents). Other sectors also saw increases.

Goods imports and exports

The CSO reports imports for April 2020 as having decreased by €1.5 billion (-21%) compared to April 2019. The main categories reduced were vehicles and transport equipment, furniture, clothing, and certain manufactured goods like iron, steel and other metals. The main categories that increased include food, fuels, chemical and pharmaceutical products, certain electrical machinery, telecoms, professional/scientific equipment, and power generating equipment. There was also a decrease in imports between March 2019 and March 2020 (-9%).

Exports for April 2020 decreased by €1.2 billion (-10%) when compared with April 2019. The only categories with an increase were medical and pharmaceutical products, machinery, some

[40] Source: John Curran, sustainability lead for the Musgrave Group.

food categories like dairy products, and natural gas. There was an increase in exports in March 2020, of 39% compared to 2019, and the highest monthly exports on record. This was mainly due to medical and pharmaceutical products, organic chemicals, and electrical machinery.

Manufacturing

The CSO reports that manufacturing output was reduced by 11.6% for May 2020 compared to 2019. The 'Modern' Sector (pharma, IT, etc.) only showed an annual decrease of 4.7% when compared with May 2019. There was an annual decrease of 27%% in the 'Traditional' Sector (food, forestry) compared with May 2019.

Internet usage habits

CSO surveys on internet usage indicate the following most significant changes in what people are using the internet for, since before the pandemic (January 2020) and during the implementation of lockdown restrictions (March 2020)[41]. Figure 27 shows activities which have increased in use; the main growths in usage include seeking health information (+12%), streamed movies/series (+11%) and internet banking (+9%).

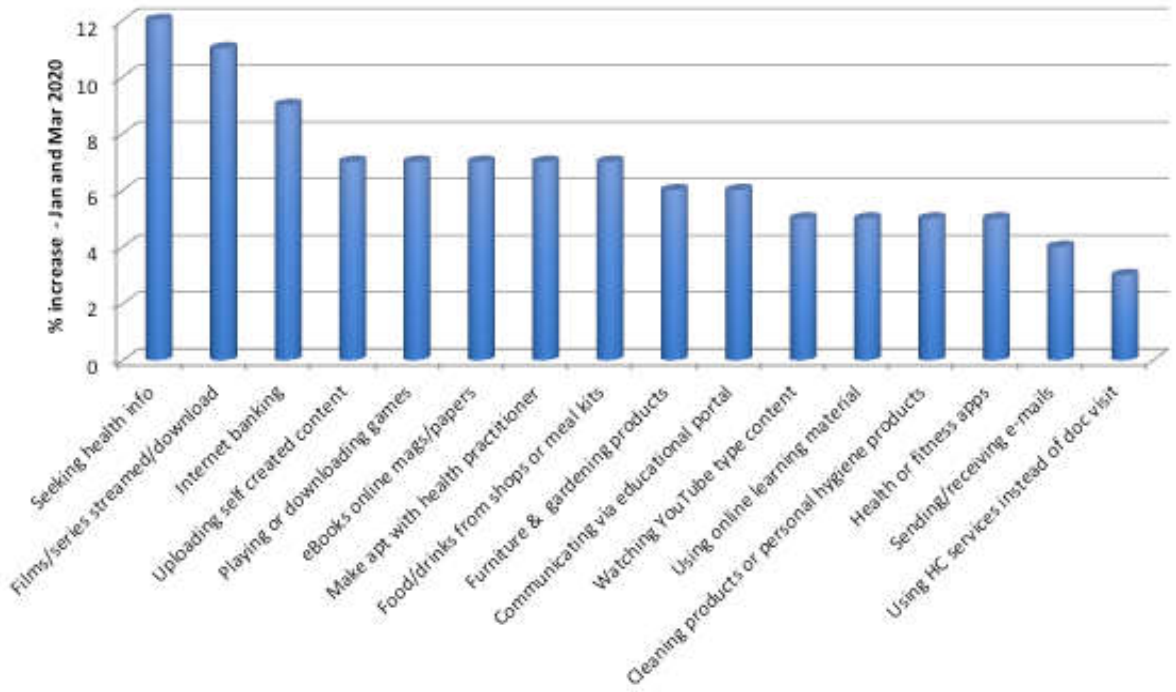


Fig. 27: Online activities with the largest increases in January-March 2020, for individuals who regularly use the internet, CSO

Figure 28 shows the main decreases of online activities, with booking tickets for cultural or other events down 16%, buying clothes down 15%, looking for information on goods and services down 13% and tickets for sports events down 10%.

[41] Interestingly, video conferencing (Zoom, Teams, etc.) was not included as one of the online activities to choose from in the surveys, thereby indirectly reflecting the unprecedented pace of change the lockdown has caused.

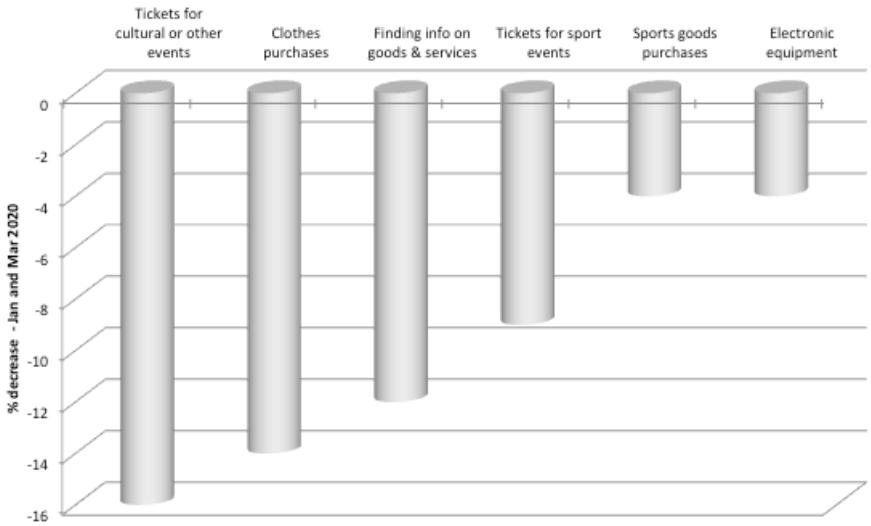


Fig. 28: Online activities with the largest decreases in January-March 2020, for individuals who regularly use the internet, CSO

Food Habits

Bord Bia has been tracking consumer trends over the COVID-19 period. Fall-off in demand in foodservice (restaurants, etc.) has been replaced by increased consumer demand through retail. Bord Bia noted that the beef sector is experiencing 'carcass imbalance' whereby consumer demand for lower value cuts like mince is increasing while demand for higher value steak cuts, often sold to restaurant customers, is falling sharply. Live cattle exports continue to run well below the equivalent period in 2019. The dairy sector is noted as continuing, but cold storage facilities for products are increasingly difficult and costly to obtain, which may pose problems as the sector enters peak milking season. As well as the fall off in European markets for seafood, the sector is also facing logistical difficulties in getting product abroad to markets in Asia.

Food Cloud's experience of COVID-19

Food Cloud brings surplus food from the retail and food industries to charities. The two areas involved are 'Retail' and 'Surplus'.

Retail - direct from retail to charities via an app

There was an immediate decrease in retail with the restrictions on March 12th, dropping by 50% in about three days. This was due to 30% of the charities having to close (volunteers could not leave home or were high risk), and due to panic buying causing difficulties for stores to operate. They did recover somewhat, but there was a second dip when the more strict measures came in at the end of March.

For the remaining active charities, demand was increasing to a level that Food Cloud could not service.

From early June, the retail aspect of the opeation was back at, or ahead of, pre-COVID-19 levels, due to charities reopening. From then on Food Cloud could fully support charities and retailers aain in relation to donations, and shopping patterns returning to normal.

For their retail division, volumes for Quarter 1 2020 were up 7% from 2019, and for Q2 they were down by 11%.

Food surplus from manufacturers and distributors via warehouses

Food Cloud saw a reduction in charities running on the warehouse surplus side, but there was a drastic increase in demand by the 100 plus charities still operating. Demand doubled compared to pre-COVID-19 levels.

Food Cloud worked with the local development authorities in each local authority region, who collected food en mass and took it to charities who made up food parcels.

To meet charity demand, they did make a short-term emergency effort to also get adequate donations in – not just surplus food – with a great response. They had demand for 50 tonnes per week and could meet that, of which five to eight tonnes were donated. Thus, the majority was still surplus food. They were over capacity in all three locations and required the use of a third-party storage capacity. Currently, Food Cloud find themselves short of some key food categories.

The charity has been supplying 40 tonnes of food per week since end May/early June. At present they can meet only about 70-80% of demand. Food Cloud thinks the demand could become even higher and do not expect it to drop. On the supply side, the charity anticipates that there is a surplus supply of food of at least 50 tonnes per week, possibly more.

For their surplus food division, volumes for Quarter 1 2020 were up 53% from 2019, and for Q2 up 159%.

Footfall in Dublin city centre

Metrics related to consumption include cameras recording footfall in Dublin city centre. Data from 13 on-street cameras operated by Dublin Town, the representative organisation for 2,500 city centre retailers, showed a persistent drop in footfall for each of the four weeks beginning March 9th 2020 as shown by Table 1.

Percentage change week on week:	March 2-8	March 9-15	March 16-22	March 23-29	March 30-April 5	April 6-12
	2%	-21%	-53%	-38%	-35%	2%

Table 1: Patterns of footfall in Dublin city centre, March-April 2020

After four weeks of decline, the footfall started to rise again towards the end of April, starting the week beginning April 6th, but this was only relative to the previous week. Even as footfall started to pick up, values were well below normal, for example 58,000 people were recorded on April 20th, compared to pre-COVID-19 daily averages of 300,000 people. Even by the reopening of June 8th there was still only an average of 162,000 people per day in the city centre, just over half of typical numbers. On Monday June 8th, 26% of retailers had reopened and that figure more than doubled to 56% by Friday June 12th.

7. Nature and wild places

Green space management

The management of many public and private green spaces changed during the COVID-19 period. Across the country, areas that would have typically been maintained as short grass lawns were allowed to grow.

Landscaping and green space management were not deemed as essential services during the early stages of restrictions and so, in most instances, were discontinued. For the period of March 27th to May 18th a very large proportion of public green space management did not take place. (Note there were some reported instances of members of the public carrying out mowing of public spaces during this period[42]).

The Minister for Housing, Planning, and Local Government stated that the maintenance of public spaces that were open and used for exercise could be given a minimum level of maintenance. After some initial confusion, GAA pitches[43] and golf courses were allowed to be maintained from early April. As restrictions eased on the May 18th, landscapers and gardeners were allowed to return to work. Some work on publicly managed land resumed. However, in many instances, the frequency and coverage of mowing and other maintenance has remained reduced throughout the summer thus far.

Reducing mowing frequency is one of the key actions recommended by the All-Ireland Pollinator Plan[44]. It increases the availability of important food species and creates a more diverse habitat for pollinators. While research would need to be carried out to establish the effects of the reduced mowing, it is likely that it had a net positive impact on pollinators.

This forced reduction in green space management came at a time when many organisations were considering, or had begun, taking action to provide more food and habitat for pollinators. For example, many local authorities have now signed up as partners to the All-Ireland Pollinator Plan. In February Trinity College announced plans to convert the lawn outside the main gates to a wildflower meadow[45]. Dublin City Council announced their planned 'wilding' of green amenity spaces in the capital in April. This plan involves reduced mowing and the increased planting of bulbs, wildflowers and trees[46]. UCC has converted parts of its campus to a wildflower garden[47].

Disturbance to wild places

With travel restrictions preventing people from visiting wild places, potential for disturbance to wildlife was reduced. This may have been of significance for groups of species prone to disturbance, such as ground-nesting birds. However, the effects of disturbance are multifaceted and difficult to accurately measure.

In addition, due to the restrictions themselves, much of the monitoring of these habitats did not take place so it is difficult to determine what changes were in fact due to COVID-19 related

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[42] https://www.galwaydaily.com/news/city-council-public-grass-cutting/

[43] https://www.irishexaminer.com/breakingnews/sport/gaa/gaa-members-permitted-to-undertake-essential-pitch-maintenance-992032.html

[44] National Biodiversity Data Centre, 2018. *Councils: actions to help pollinators. All-Ireland Pollinator Plan 2015-2020.*

[45] https://www.irishtimes.com/news/education/trinity-college-plans-wildflower-meadow-on-college-green-1.4183714

[46] Dublin City Council. *Nature Goes Wild in the City.* http://www.dublincity.ie/nature-goes-wild-city

[47] https://www.yaycork.ie/a-magical-wildflower-meadow-has-totally-transformed-the-grounds-of-ucc/

changes. For example, Bird Watch Ireland's Countryside Bird Survey, one of the largest volunteer based ecological monitoring programmes, was cancelled for the 2020 season[48].

Terrestrial habitats

While more people got outside in their localities when restrictions were in place, many of the commonly visited wild places experienced a sharp reduction in footfall. Coillte reported significant reductions in visitor levels across their managed sites, following an initial surge in early March. This surge coincided with the short period following the closure of schools and advice to work at home but before the 2 km travel restriction was imposed[49].

Some of the sites that have important ecological status and high visitation rates will likely benefit from a reduction in visitor numbers. Skellig Michael is closed to visitors landing on the island for the 2020 season. The Cliffs of Moher is expecting an 80% reduction in visitor numbers this year, down from a high of 1.6 million in 2019[50]. Both of these locations are important seabird nesting sites and have been exposed to erosion due to footfall in recent years. On Skellig Michael, visitor numbers have been well in excess of sustainable carrying capacity since 2016 and there has been resulting erosion of vegetation and monastic structures. However, the ecological implications of visitor disturbance are not fully known due to a lack of research[51]. Anecdotally, the reduction in visitor numbers has allowed some plant species, typically suppressed due to disturbance, to grow in these popular coastal tourist destinations[52].

On a not-so-positive note, with the absence of humans on the streets, Dublin city experienced a visible rodent infestation, as noted by the retailer representative body Dublin Town. Waste left uncollected due to collection contracts having been suspended by closing businesses was also noted by the body.

Freshwater and Marine habitats

Freshwater

COVID-19 related restrictions likely influenced angling patterns but whether or not this had an impact on the aquatic environment is unclear. Inland Fisheries Ireland closed all fisheries on March 28th. With the exception of Galway and Moy, fisheries reopened on May 6th for anglers within relevant travel limits[53]. Galway and Moy were reopened on June 29th[54].

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[48] https://birdwatchireland.ie/our-work/surveys-research/research-surveys/countryside-bird-survey/

[49] Data provided by Coillte.

[50] https://www.newstalk.com/news/cliffs-moher-see-80-drop-visitor-numbers-year-1044564

[51] An Tasice, 2019. *Re. Public consultation on Skellig Michael World Heritage Site Management Plan 2019-2029 to replace the previous 10 year Management Plan dating from 2008. Letter to the Department of Culture, Heritage and the Gaeltacht.*

[52] https://www.irishtimes.com/news/environment/lockdown-gives-nature-a-chance-to-flourish-at-the-giant-s-causeway-1.4266984

[53] https://fishinginireland.info/2020/fishing-updates/new-5km-limit-ifi-and-esb-fisheries-reopen-permits-and-licences-available/

[54] https://www.fisheriesireland.ie/Notices/inland-fisheries-ireland-update-phase-3-galway-and-moy-fisheries.html

Marine

Human activity by the coast and at sea was significantly altered due to restrictions. The number of passenger ferries was reduced, while freight transport by ferry remained active[55,56]. Recreational boating was also reduced while travel restrictions were in place.

The closure of restaurants across Europe caused a collapse in the market for Irish caught fish. This in turn caused the majority of Irish vessels to remain tied up during restrictions[57]. In May, the Minister for Agriculture Food and the Marine launched the COVID-19 Voluntary Fleet Tie-up Scheme[58]. The voluntary scheme for June-August 2020 is to provide financial support to fishing vessels opting to remain tied up during these months to maintain quotas for later in the year. There is a potential for this to impact on commercially fished species in Ireland.

There is some anecdotal evidence that higher numbers of large marine animals occupied near-shore coastal waters during the restricted period. It is possible that reduced human activity results in a reduction in disturbance and marine noise pollution. Basking sharks were seen in unusually large numbers along the west coast. The Irish Basking Shark Project received higher level of reports[59] and there was significant national and regional media coverage. It is unclear whether the sharks' behaviour was altered by a reduction in disturbance or whether natural factors such as calm seas and fine weather were the sole reasons for their presence and their detection. A number were seen in Derrynane Bay[60]. These reports of increases were not confirmed by the Irish Whale and Dolphin Group who experienced a 24% decrease in sightings between March 1st and May 18th 2020. The Group attributes this to the reduction in people visiting the coastline and going to sea in boats.

[55] Irish Ferries, Sailing Updates. https://www.irishferries.com/

[56] Stenaline, Latest Sailing Updates. https://www.stenaline.ie/

[57] https://www.irishexaminer.com/breakingnews/ireland/coronavirus-fish-processor-closes-as-markets-collapse-989270.html

[58] Department of Agriculture Food and the Marine, 2020. *Press Release: Creed announces Temporary COVID-19 Voluntary Tie-Up Scheme for parts of the Fishing Fleet.*

[59] https://www.baskingshark.ie/post/social-distancing-basking-sharks

[60] Source: personal communication with Vincent Hyland, environmentalist and owner of Wild Derrynane.

8. Environment, Health & Wellbeing and Community Engagement

There is evidence to suggest that people spent more time engaged in outdoor activities than they had prior to the introduction of COVID-19 related restrictions. Walking has been the most popular activity. The NUIG Corona Citizens Science Project (Wave 3) found 93% of respondents were walking during restrictions[61].

According to a report published on April 30th by Sport Ireland[62], there have been an additional 500,000 regular walkers, 450,000 runners and 220,000 cyclists when compared to March-April 2019. While a portion of the recorded growth in these activities is due to the closure of many sports facilities and restrictions on team sports, a second report from May 2020 confirms that overall, more Irish people were active during this period. The rate of sedentary adults has decreased from 22% in February-May of 2019 to just 11% for the same period of 2020. This is the lowest level ever recorded by Sport Ireland[63].

A CSO survey on the social impact of COVID-19, published in June 2020, shows that frequency of exercise is up for 37% of respondents, but down for 33%[64]. On the down-side, that report indicated consumption of alcohol up for 22% of respondents and down by 17%; tobacco consumption is up for 31% of respondents and down for only 9%; junk food and sweets consumption was up for 45.4% of people and down for 12%; time watching TV was up for 44% of people and down for only 9%; and time spent on the Internet was up for 59% of people and down for only 2%. Relating to concern about household stress due to confinement, 23% of respondents said 'not at all', 60% said 'somewhat' and 17% said 'very concerned'.

Interest in gardening rose during the period. Online searches for 'gardening' and other related terms were higher than previous five-year trends[65]. NUIG research found that 64% of respondents were taking part in gardening[61]. There was a marked increase in the demand for materials for vegetable growing. One of Ireland's key supports for vegetable growing, reported five-fold increase in online traffic to their resources[66]. Other sources of seeds reported unpreceded demand this spring. The Irish Seedsavers' Association experienced a 225% increase in online orders during March[67]. Grow It Yourself (GIY) Ireland launched a national campaign 'Grow it Forward' in response to the restrictions. They provided seeds starter packs and online support to 5,000 participants, asking them to use the supports to provide food or seeds to 10 people within their own community[68].

In addition to exercising outdoors and gardening, there was a notable increase in the public's engagement with wildlife during the period. Anecdotally, shortages of bird feed were experienced as more people attempted to encourage wildlife into their gardens.

The National Biodiversity Data Centre recorded large changes in the submissions of records to their citizen science portal. When compared to 2019, March saw a decrease of 14% in records while April and May saw increases of 54% and 70% respectively, as Figure 29 shows.

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[61] NUIG, 2020. *Corona Citizens Science Project* https://www.nuigalway.ie/corona-study/

[62] Sport Ireland, 2020. *Impact of COVID-19 on Sport and Recreational Walking. Report 1.* https://www.sportireland.ie/sites/default/files/media/document/2020-04/impact-of-covid-19-restrictions-on-sport-and-recreational-walking.pdf

[63] Sport Ireland, 2020. *Impact of COVID-19 on Sport and Recreational Walking. Report 2.* https://www.sportireland.ie/sites/default/files/media/document/2020-05/covid-and-sport-apr-2020-v2-22-may-2020.pdf

[64] https://www.cso.ie/en/releasesandpublications/ep/p-sic19/socialimpactofcovid-19surveyapril2020/

[65] Google Trends [Accessed 13 July 2020].

[66] Source: personal communication with GIY Ireland.

[67] Green News, 2020. *Focus on: The Irish Seedsavers Association* https://greennews.ie/how-the-irish-seedsavers-association-is-dealing-with-the-coronavirus-and-preparing-for-the-future/

[68] https://giy.ie/get-growing/grow-it-forward/what-is-grow-it-forward.html

This represents a total of 18,000 additional citizen science records when compared to March-May of 2019.

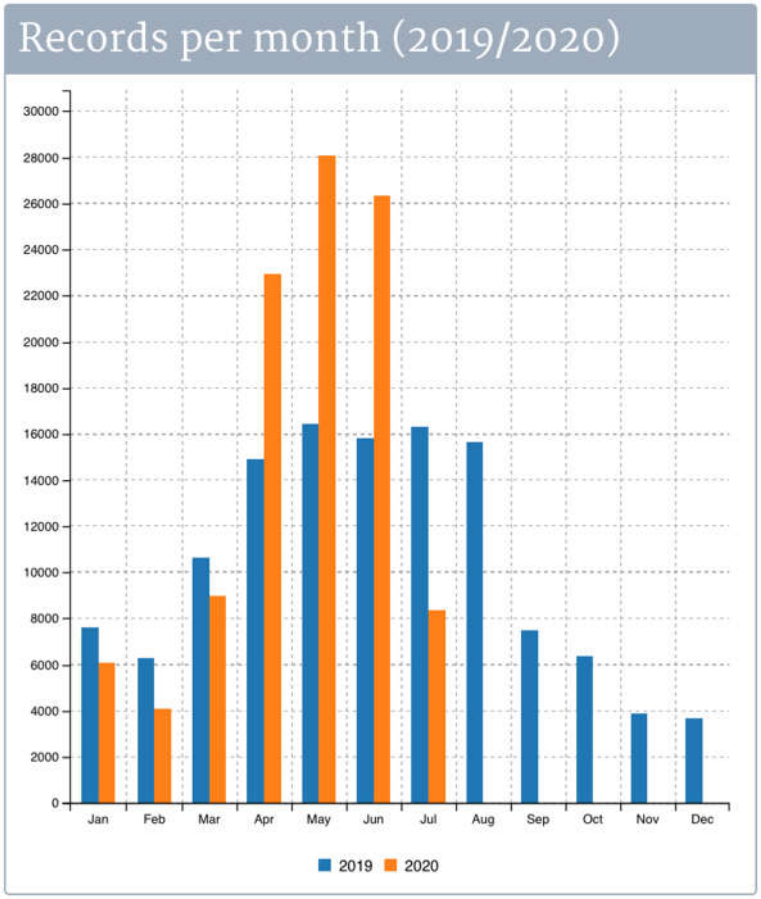

Fig. 29: Citizen science records on the NBDC portal, 2019-2020

The Centre implemented a campaign over the period called *Species a Day* (#speciesaday). This involved asking people to share photographs of a specific Irish species each day on Twitter and it gathered a high level of engagement from the public.

Community Engagement

Many of Ireland's community based environmental engagement initiatives were impacted by restrictions. Several moved to online engagement models while others could not take place. For example, the EPA's Stop Food Waste programme and An Taisce's Climate Ambassador and Green Schools programmes all moved to online engagement activities.

On April 21st the Minister for Rural and Community Development announced the cancellation of the national SuperValu Tidy Towns competition. On May 20th, the department announced that any funding granted for the 2020 competition could still be used by Tidy Towns groups. Many Tidy Towns groups have continued some level of activity throughout the period of restrictions.

The National Spring Clean, hosted by An Taisce, was initially cancelled when restrictions came into effect. It was then rescheduled for a later date (early June 2020) and took place with social distancing measures and travel restrictions in place[69].

Changes in transport

Pre-COVID-19, 300,000 people visited Dublin's city centre each day, with 67% of such people using public transport to access the city[70]. Due to social distancing restrictions, public transport capacity was severely curtailed, with onboard capacity restricted and an appeal to keep it for essential workers' travel. Since June 29th customer capacity on board Dublin Bus increased from 25% to 50% of normal levels, and a return to a Monday to Friday schedule.

A reopening action plan by Dublin Town, the retail representative body, identified a need to invest in pedestrian and cycle infrastructure, stagger business opening times, and maintain car access to the city. In addition, it identified pedestrianisation of certain streets being required to allow businesses to re-open. It is also calling for increased footpath widths and increased space for cycling provision, along with the use of e-bikes and e-scooters to allow access from further distances.

Given the limitations on access to the city, Dublin Town states there may well be an argument for investment in home deliveries, with a number of smaller independent retailers sharing the cost of delivering goods to customers, allowing those customer to access the city by walking or cycling.

The new Irish Government's 2020 agenda has set a priority on transport. This includes a planned phasing out of new petrol and diesel cars from 2030. A €360 million/per annum programme is planned focusing on cycling and pedestrian projects. The National Transport Authority (NTA) will be asked to produce a park-and-ride implementation plan. Improvements to service capacity and frequency of rail services are also proposed.

Use of urban spaces and remote working

Dublin City Council is facilitating the use of the public realm for expanded street furniture provision for businesses as part of Phase 3 easing of restrictions since June 29th, with fees waived for this year.

Pedestrianisation of certain streets has been called for by Dublin Town, with the use of outdoor spaces for both queueing and hospitality seating requiring planning and weather proofing for the autumn/winter. Pedestrianisation is supported by a majority of represented businesses, and according to a survey, 61% of the public are in favour. Businesses on Suffolk Street in Dublin, reported increases of 15% when their street was pedestrianised in 2018.

Due to workplace social distancing requirements, and reduced public transport capacity, along with future promotion of home working, Dublin Town expects a reduction in the number of office workers coming into the city, which, pre-COVID-19, was 250,000 workers on a daily basis. This would result in less commercial activity within the city centre.

After an initial period of adjustment, Dublin Town anticipates that the growth of leisure and entertainment will continue, an increase in residential uses within town centres, and that space devoted to retail will be reduced. The representative body alludes to the scope of linking the arts with retail and other businesses under their Reopening Action Plan.

[69] https://nationalspringclean.org/

[70] Data from a January 2020 Dublin Town survey

Pedestrianisation of streets in Cork has also been welcomed and deemed a success[71]. Already, The Marina, Prince's Street and Harley's Street have been closed to traffic, boosting numbers of visitors, and Cork City Council plans to also pedestrianise Emmet Place, Father Matthew Street, Fitton Street East, Liberty Street, Cross Street, Castle Street and Daunts Square. Plans are underway to install bike stands at 43 new locations in the city.

A survey[72] on people's opinions on working from home during the pandemic and also their feelings towards continuing to do so after lockdown found that 61% of workers expect to work from home more frequently when the COVID-19 restrictions are lifted. It found 63% of people had only worked remotely one day a week or less before the pandemic. 82% of respondents agreed that working from home can improve work-life balance.

Tourism

The Irish Tourism Industry Confederation (ITIC) predicts revenues in the tourism sector will fall to €2.4 billion including air fares this year, a three-quarters drop from the €9.3 billion in 2019[73]. While the move to 'staycations' will provide a boost, the loss of incoming visitors from abroad and the continued closure of pubs and other outlets will have a major effect on the industry.

The section on climate and greenhouse gas emissions covers the drop in arrivals to Ireland.

[71] https://www.irishtimes.com/news/ireland/irish-news/cork-city-set-to-pedestrianise-streets-and-increase-cycle-paths-1.4258038

[72] https://www.irishexaminer.com/breakingnews/business/61-of-people-expect-to-work-from-home-post-coronavirus-998212.html The survey was carried out for eir Business and TechCentral.

[73] https://www.itic.ie/covid-19-itic-bulletin-5-emerging-irish-tourisms-greatest-ever-challenge/

9. Noise

A June 2020 article by the Institution of Engineering and Technology (IET)[74] reports that globally there is a marked decrease in noise as a result of the COVID-19 lockdown, primarily attributed to reduced traffic noise. The WHO states[75] that road traffic is the worst cause of noise pollution, followed by trains, aeroplanes and heavy industry. In Europe there has been a reduction in air traffic of 90%, car usage has dropped by more than half, and train services have been significantly reduced. According to European Environment Agency noise expert Eulalia Peris, quoted in the IET article, 'Noise pollution from transport sources is linked to economic activity. Therefore, in the current situation we expect to see a significant reduction in transportation noise levels in the short-term due to decreased mobility demand. The strong implication is that as society emerges from lockdown and transport usage gradually returns to its previous levels, so too will noise pollution levels. Despite the fact that noise is the second largest environmental cause of health problems (coming in a close second to air pollution), it is something we have learned to live with.'

Noise levels above 40 dB L_{Aeq}[76] can influence well-being, with most people being moderately annoyed at 50 dB LAeq and seriously annoyed at 55 dB L_{Aeq}. Levels above 65 dB L_{Aeq} are detrimental to health.[77] The impacts of noise can have a serious impact on health. According to the World Health Organisation: 'Environmental risks constitute 25% of the burden of disease. Widespread exposure to environmental noise from road, rail, airports and industrial sites contributes to this burden … Epidemiological evidence indicates that those chronically exposed to high levels of environmental noise have an increased risk of cardiovascular diseases such as myocardial infarction. Thus, noise pollution is considered not only an environmental nuisance but also a threat to public health.'[78]

Figure 30 shows a marked decrease of noise in the Dublin Mountains due to the lockdown, as recorded by the Irish National Seismic Network[79], from March 9th to April 20th.

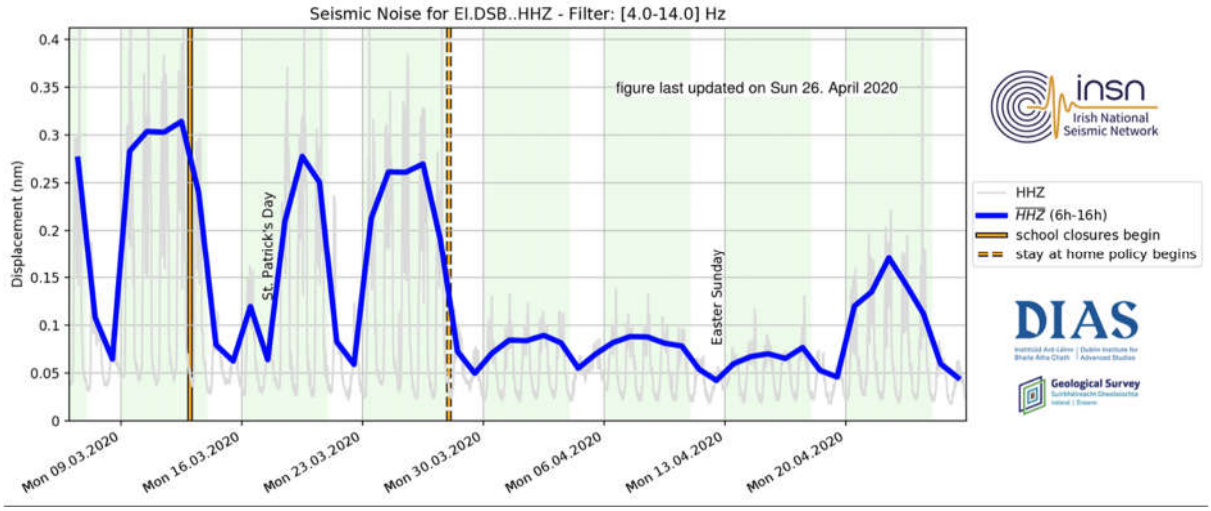

Fig. 30: Seismic noise data in the Dublin Mountains from March-April 2020

[74] https://eandt.theiet.org/content/articles/2020/06/has-lockdown-made-the-world-a-quieter-place/
[75] https://www.euro.who.int/__data/assets/pdf_file/0009/383922/noise-guidelines-exec-sum-eng.pdf
[76] LAeq: Continuous equivalent sound pressure level, A-weighted. This is essentially the average level.
[77] World Health Organization (WHO), 2011. *Burden of disease from environmental noise: Quantification of healthy life years lost in Europe.* Copenhagen, WHO.
[78] *Ibid.*
[79] https://www.insn.ie/2020-covid19-low-seismic-noise/

Human induced seismic noise is identified by its clear variation between day and night and also lower amplitudes on weekends. Seismic noise data from urban centres indicates that COVID-19 is "quieting"[80] the world.

Industrial noise

There has been a notable increase in complaints to the EPA relating to EPA licensed industrial and waste sites[81]. The main points of complaint were:

- Significant spike in odour complaints in the period March to June 2020, peaking in April 2020. See Figure 31.
- Number of individual sites being complained about for odour, air quality and noise increased from March-June 2020 when compared with the same period in 2019. See Figure 32.
- Figure 33 shows that the number of combined odour, air quality and noise complaints for the period January to June 2020 was significantly higher in March-April 2020 than for the same period in the previous five years, spiking in April, 2020 with 180 complaints.
- *Odour:*
    - Number of odour complaints for period 1/1/20 to 30/6/20 – 420. Two facilities were responsible for 54% of odour complaints.
    - Number of odour complaints for period 1/1/19 to 30/6/19 – 125. Two facilities were responsible for 28% of odour complaints.
- *Noise:*
    - Number of noise complaints for period 1/1/20 to 30/6/20 – 161**.** One facility was responsible for 43% of noise complaints.
    - Number of noise complaints for period 1/1/19 to 30/6/19 – 70**.** One facility was responsible for 53% of noise complaints.

Local authorities also saw an increase in environmental complaints (see above). The increase in environmental complaints across the board may possibly be due to people spending more time at home.

[80] https://www.nationalgeographic.com/science/2020/04/coronavirus-is-quieting-the-world-seismic-data-shows/

[81] Data source: EPA Enforcement Section

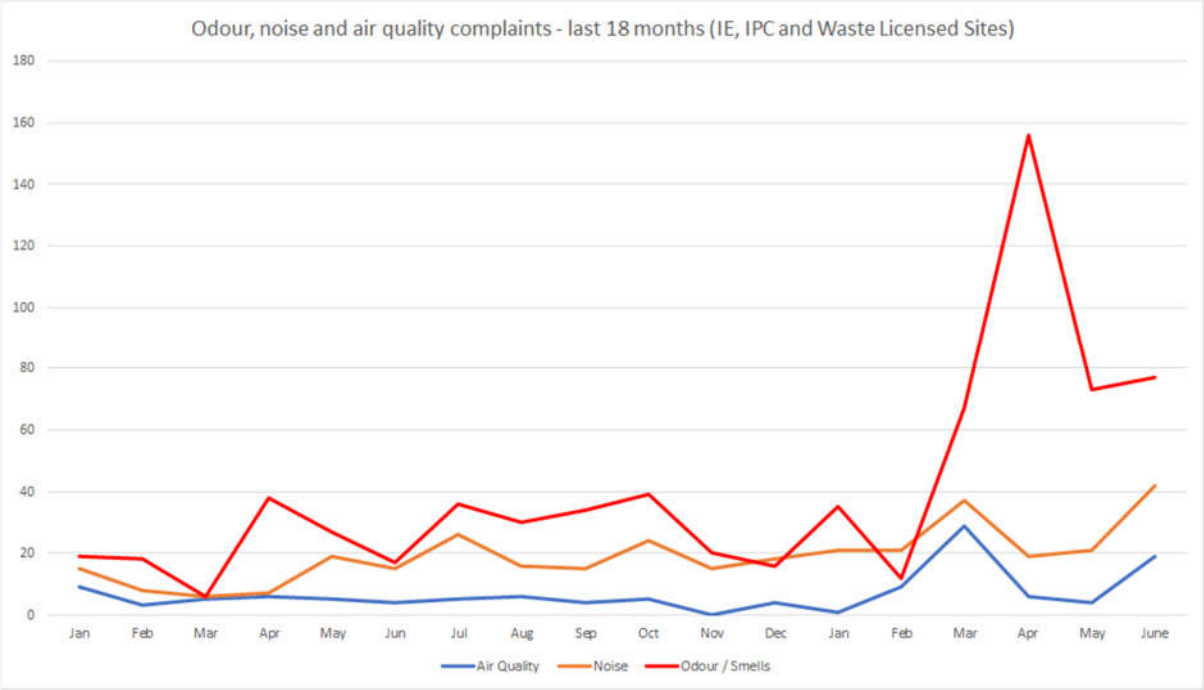

Fig. 31: Odour, noise and air quality complaints to EPA, January 2019-June 2020

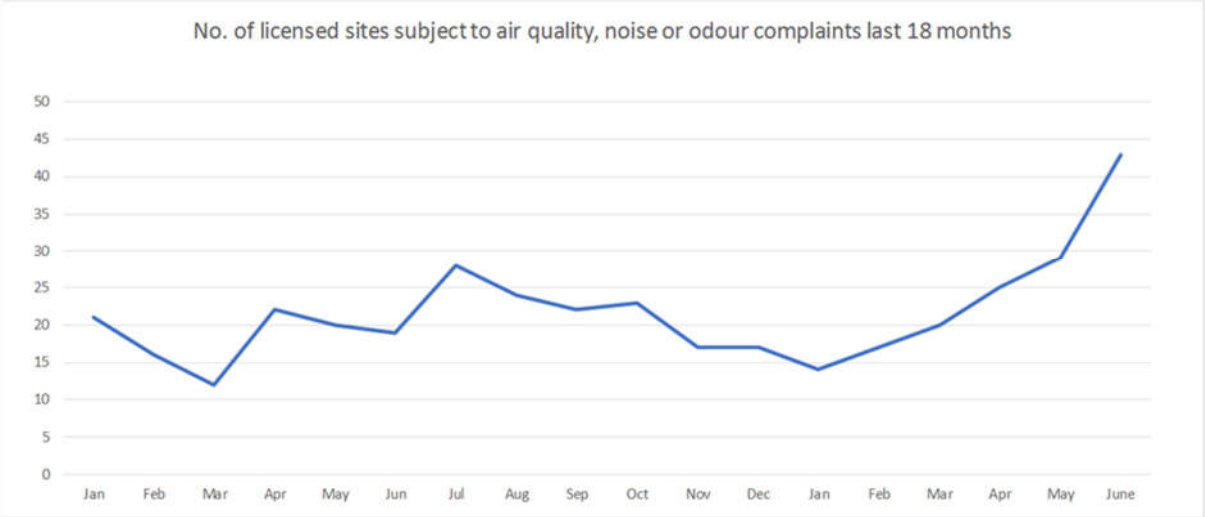

Fig. 32: Licensed sites subject to odour, noise and air quality complaints, January 2019-June 2020

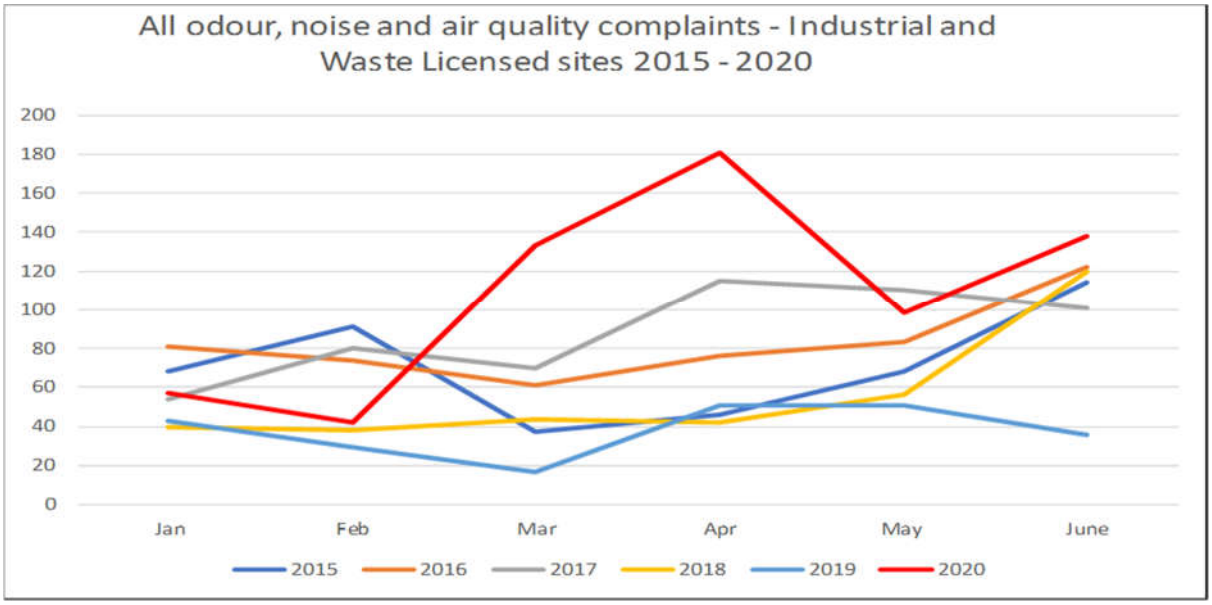

Fig. 33: Number of licensed sites subject to odour, noise and air quality complaints, January to June, 2015 to 2020

Urban noise

In both Dublin and Cork there have been well-publicised incidents of noise nuisance in the community during the COVID-19 lockdown, including house parties[82] (while all pubs and nightclubs were closed) and security alarms from locked-up commercial premises[83] ringing continuously for several days. Noise complaints were reported to have more than doubled in Derry during lockdown[84].

Traffic noise

There was significant reduction in commuter traffic noise around the M50 in Dublin over the course of the lockdown, where there are a series of 43 air and noise monitoring stations. Nine noise monitoring stations are located at noise sensitive locations[85,86].

Figure 34[87] shows the pattern of the average day-time and evening noise levels for weekdays for one of these monitoring sites, in Palmerstown, which shows a drop during March when the restrictions came in.

[82] https://www.breakingnews.ie/ireland/call-for-stronger-garda-powers-to-tackle-lockdown-house-parties-1003088.html
[83] https://www.irishexaminer.com/breakingnews/ireland/no-one-knows-what-to-do-alarm-in-dublin-has-been-going-off-for-four-days-1005492.html
[84] https://www.irishnews.com/news/northernirelandnews/2020/06/27/news/derry-noise-levels-more-than-double-in-coronavirus-lockdown-1987288/
[85] https://tii.sonitussystems.com/
[86] Source: Transport Infrastructure Ireland (TII)
[87] Source: Transport Infrastructure Ireland (TII)

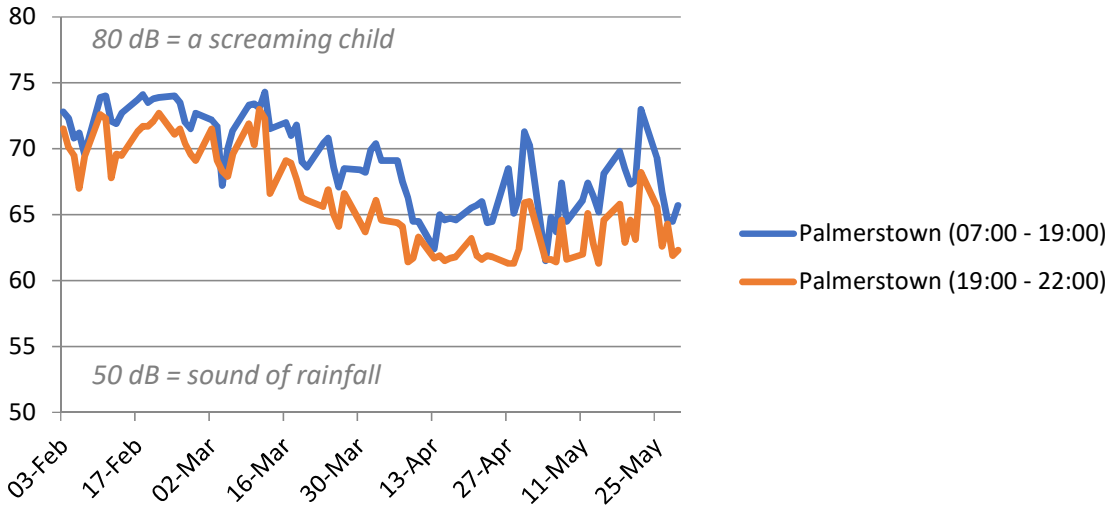

Fig. 34: Average day-time and evening noise levels for weekdays for M4/M50 Palmerstown site, February-May 2020

Examination of the average day-time and evening noise levels during weekdays at three of these sites from February-May 2020 graphically illustrate the reduction in noise associated with the drop in traffic over the same period. These monitoring points are near the M1/M50 interchange (Turnapin), the M4/M50 interchange (Palmerstown), and the M11/M50 interchange (Rathmichael)[88]. See Figure 35.

The drop in the average monthly values that took place across these three monitoring points was of the order of 7 decibels. Since the decibel scale is a logarithmic scale it is important to emphasise that an increase by 10 decibels is ten times the sound intensity, for example 70 decibels is ten times the sound intensity of 60 decibels. Thus, the average drop across the three sites of 7 decibels is very significant.

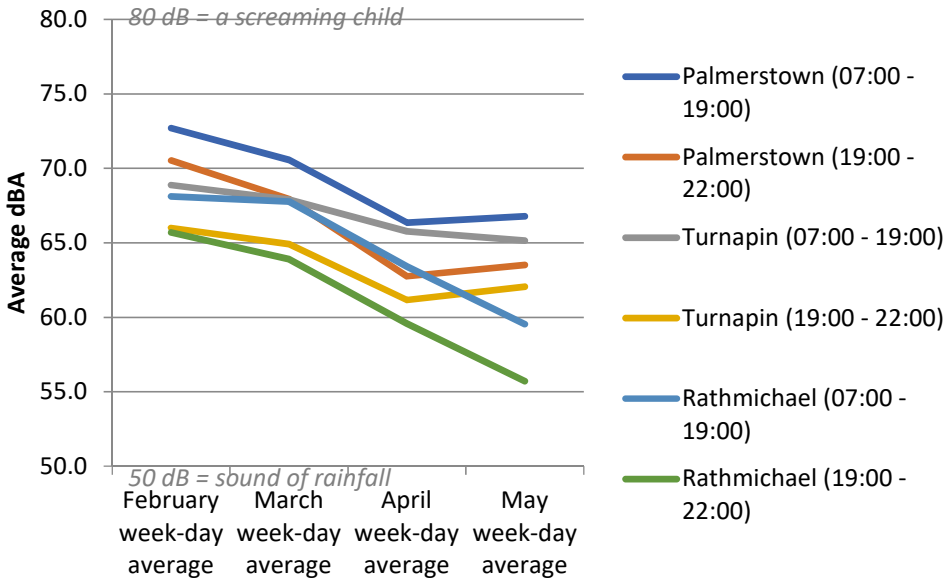

Fig. 35: Monthly average day-time and evening noise levels for weekdays for three sites, February-May 2020

[88] *Ibid.*

10. Policy

European Commission's proposed Recovery Plan

On May 27th 2020, the European Commission presented a proposed Recovery Plan for Europe and a new financial instrument 'Next Generation EU' (NGEU)[89] to support the economy, as well as a reinforced EU long-term budget for 2021-2027, for recovery from the coronavirus crisis.

A sustainable recovery is very much centre stage of the plan. The recovery plan is closely aligned with the policy initiatives covered by the European Green Deal. The European Commission maintains that 'the European Green Deal is our growth strategy'.

The proposed financial instrument, amounting to €750 billion, has three pillars - Supporting Member States (MSs) to recover, kick-starting the economy and helping private investment, and learning lessons from the crisis, all under the tagline 'Investing in a green, digital and resilient Europe'. All three pillars have sustainability included as a theme in one form or another, be it climate neutrality, biodiversity, food sustainability, etc. It includes the following, all of which have sustainability related elements:

- The Recovery and Resilience Facility: consists of large-scale financial support for both public investments and reforms, notably in green and digital. €310 billion for grants and €250 billion in loans for the implementation of Member States' national Recovery and Resilience Plans in line with the EU's priorities of green, digital and social resilience.
- React EU – additional cohesion policy funds of €55 billion for municipalities, hospitals, and companies. Again, aside from immediate crisis support, there is also an emphasis on green and digital longer-term recovery measures.
- A proposal to strengthen the Just Transition Fund up to €40 billion, to assist Member States in accelerating the transition towards climate neutrality.
- A €15 billion reinforcement for the European Agricultural Fund for Rural Development to support rural areas in making the structural changes necessary in line with the European Green Deal and achieving the targets of the new Biodiversity and Farm to Fork strategies.
- A Solvency Support Instrument to provide equity support to sound companies to weather the storm and support their green and digital transformation.
- Strengthen InvestEU, Europe's investment programme, to mobilise investment in areas such as sustainable infrastructure and digitisation, including a new Strategic Investment Facility.
- Urgent action to kick start private sector investment in key sectors and technologies, with sustainable sectors/technologies mentioned like clean hydrogen and offshore renewable energy.

In July 2020, at a Special European Council, the 27 EU MS leaders agreed the 2021-2027 budget, with a comprehensive package of €1,824.3 billion which combines the Multiannual Financial Framework (MFF) and an extraordinary recovery effort under the Next Generation EU (NGEU) instrument[90].

The size of the MFF – €1,074.3 billion – will allow the EU to fulfil its long-term objectives and preserve the full capacity of the recovery plan. This proposal is largely based on the proposal made by European Council President Michel in February, which reflected two years of discussions between MSs.

[89] https://ec.europa.eu/commission/presscorner/detail/en/ip_20_940
[90] https://www.consilium.europa.eu/en/meetings/european-council/2020/07/17-21/

The European Commission adjusted its Work Programme for 2020 to take account of the coronavirus, including prioritising measures under the existing two flagship policies of the green and digital transitions. Under the Green Deal, this includes prioritising:

- A large 'Renovation Wave' to modernise Europe's buildings and critical infrastructure, including building one million charging points for electric vehicles.
- One million new green jobs through promotion of the circular economy, while also touting the potential to bring production home and eliminate foreign dependencies.
- The Farm to Fork Strategy, which supports farmers in providing affordable, nutritious, safe and sustainable food. Proposing to reinforce the budget for the European Agricultural Fund for Rural Development, as outlined above.
- The recently adopted Biodiversity Strategy for 2030 and an upcoming Forest Strategy.
- The Just Transition Fund, as outlined above, to support re-skilling of workers and create economic opportunities for small and medium-sized enterprises.

European Environment Agency

The EEA calls for green fiscal recovery packages as being essential to help decouple economic growth from environmental and climate impacts and reduce existing welfare inequalities that will be exacerbated by the pandemic in the short-term and climate change in the long-term[91].

The Agency states short-term reductions in air pollution and GHG emissions resulting from lockdowns will themselves have minor long-term effects, unless they facilitate deeper and longer-term human, business, and institutional changes. Urgent rescue packages have been necessarily focused on preserving liquidity, solvency, and livelihoods, but their climate and environment impact also needs to be positive.

As we move from the rescue to the recovery phase of the COVID-19 response, the Agency notes that policymakers have an opportunity to invest in productive assets for the long-term. Such investments can enhance the shifts in human habits and behaviour already under way. In the lead up to COP26, recovery packages are likely to be examined on their climate impact and contributions to the Paris Agreement, it notes.

As an EEA article concludes 'Without a fundamental transformation of our production and consumption systems, any emission reduction triggered by such … crises is likely to be short-lived and come at an extremely high cost to society.'

OECD

The OECD policy brief 'COVID-19 and the low-carbon transition: Impacts and possible policy responses'[92] sets out the immediate steps that governments can take to ensure that emergency measures implemented to tackle the crisis do not derail their efforts to address pressing environmental challenges and improve the environmental health and resilience of societies. It notes that careful preparation of recovery policies presents opportunities to simultaneously address recovery and climate objectives, which critically depend on actions and investments over the next decade.

As both fossil fuel and low-carbon investments are under considerable stress, policies have a particular opportunity to tilt the balance towards more sustainable energy sources. The recovery from the crisis can be harnessed to speed up the low-carbon transition. Public policies

[91] https://www.eea.europa.eu/post-corona-planet/index
[92] https://www.oecd.org/coronavirus/en/

play a crucial role to ensure that people's well-being is at the centre of a post COVID-19 recovery as well as the low-carbon transition. Such an approach will also help boost political and social support for more ambitious mitigation action, and overcome the barriers to change. It advocates that:

- Lifeline support to firms and industries should not be combined with the dismantling or watering down of environmental policies. Signals from carbon pricing, emissions standards, and other environmental regulations need to be maintained to provide more certainty and long-term stability for low-carbon activities.
- Direct support to firms should be made contingent on environmental improvements, and investment steered toward low-carbon production modes and emissions reductions. For affected industries such as air or maritime travel – which are largely exempt from environmental taxation – bailouts should be accompanied by stronger regulation.
- Green stimulus packages be devised to support the longer-term recovery, including investing in low-carbon infrastructure; maintaining government support for innovation; incentives for low-carbon consumption, and investment and innovation during the recovery through the removal of fossil fuel subsidies and commitment to carbon pricing.

It notes that the majority of EU MSs already advocate that the European Green Deal becomes a central part of the recovery after the COVID-19 pandemic.

In terms of rural development, OECD notes in its June 2020 policy response for that sector, to include sustainability criteria in COVID-19 recovery actions for rural development, so that they also contribute to long-term resilience by addressing climate change and ecological transition. It notes rural economic sectors as being important GHG emitters and that rural areas comprise the vast majority of natural resources fundamental to absorbing carbon. Thus, supporting countries in developing pathways for climate conscious rural economic development will be key to the recovery from COVID-19.

In terms of developing countries and COVID-19, an OECD policy statement of May 2020[93] recognises the need for policies and partnerships to respond, reset and rebuild better and to contribute to the realisation of the 2030 Agenda for Sustainable Development as part of the recovery. It calls for promoting a global investment effort for a sustainable recovery, including the economic, environmental and social dimensions.

Environmentally positive recovery measures elsewhere

Examples of environmentally positive recovery measures internationally, in terms of overall economic and other recovery measures being planned, include the following:

- Germany's recovery package includes a €50bn climate fund for change[94]. It includes new hydrogen projects, EV charging infrastructure, support for auto industry transformation, a doubling of a state electric car incentive, public transport improvements, building energy efficiency improvements, energy digitalisation and 'sector-coupling' R&D, improved forest management, and green aviation and shipping. Also moving renewables subsidies into general taxation, and decarbonisation tax reforms.
- Denmark has proposed a €4bn fund[95] for green renovations to social housing from 2020 to 2026 with insulation, window replacements and replacing oil-fired heating; two wind-powered "energy islands" providing 4 GW)of electricity generating capacity; grants for electrification and energy efficiency in industry for 2020-24; a fund for biogas

[93] https://www.oecd.org/coronavirus/en/policy-responses
[94] https://www.nytimes.com/2019/09/20/world/europe/germany-climate-protection-merkel.html
[95] https://gronfond.dk/en/

and other green gases; and extra funding to help companies keep to "green transition and circular economy" principles despite the crisis.

- South Korea is planning €4bn on solar, wind and hydrogen energy, €4.2bn on public building upgrades by 2022 creating 89,000 jobs, and €1.2bn to finance SMEs with 'green, sustainable' business models creating 11,000 jobs[96].
- Sweden's green stimulus package has committed to financially support 'green job' creation to reduce unemployment[97].
- The UK has a £2bn 'green homes grant' voucher scheme to fund home efficiency improvements for 2020-21[98], a £1bn programme for 2020 for energy efficiency and low-carbon heat upgrades of public buildings, and a £40m "green recovery challenge fund" for tree planting, habitat restoration, and green space creation.

Ireland's EPA

In publishing its greenhouse gas emissions projections for the period 2019-2040 in July 2020, the EPA noted short term emission reductions due to COVID-19 do not negate the need for long term, targeted action across all sectors.

It also notes that focusing on climate action as part of a 'green' recovery stimulus offers the opportunity to rebuild our economy, generate new jobs and respond to climate change[99].

[96] https://www.eco-business.com/news/how-green-are-asias-post-covid-economic-recovery-plans/
[97] https://sweden.se/climate/
[98] https://www.bbc.com/news/business-53313640
[99] https://www.epa.ie/pubs/reports/air/airemissions/ghgprojections2019-2040/

11. Media coverage of environmental aspects of COVID-19 measures

A review of media articles on the environmental effects from the COVID-19 pandemic in Ireland was undertaken. Across the main media outlets[100], between the start of March and mid July 2020, overall there were 77 articles in relation to the various environmental effects from the COVID-19 measures in Ireland.

The main focus areas were carbon emissions and climate (30 articles) and the environmental benefits to a green recovery from COVID-19 (23 articles), while 15 touched on air pollution. Sustainable transport measures were included in 13 articles, remote working & learning was discussed in 8 articles, public transport in 12 articles, while another 12 articles featured traffic and commuting effects from COVID-19. Litter and illegal dumping featured in 8 articles, while waste was discussed in 13 articles. Other environmental areas included: consumption (6), nature and wildlife (5), air travel (4), food and security of supply (3), exercise and outdoor activities (3), noise (2), grow your own (2), and agriculture (1).

Some of the more interesting aspects reported in these articles have been included elsewhere in this report.

The estimated reduction in carbon emissions of 2.5% for the country, as set out in this report, is just for the period March to June only. This is somewhat in line with reported projections for the while year: a drop of 9.5% predicted by ESRI, and a drop of 5% predicted by MaREI for the whole of 2020[101]. The impact on global 2020 annual emissions is projected to be around 4 - 7 % compared to 2019[102].

[100] The Irish Times, the Independent, the Examiner, RTE.ie and the journal.ie

[101] The pandemic & Ireland's Energy System - what are the impacts on Irish greenhouse gas emissions? The SFI Research Centre for Energy, Climate and Marine.

[102] A study led by the University of East Anglia and published in Nature Climate Change www.irishtimes.com/news/environment/covid-19-crisis-causes-17-drop-in-daily-global-carbon-emissions-1.4257501