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Argus White Paper:

EU ETS emissions set for further sharp decline

Greenhouse gas emissions from sectors covered by the EU emissions trading system are set to fall dramatically this year as measures designed to slow and contain the spread of the Covid-19 viral pandemic have triggered a significant reduction in domestic electricity demand, industrial activity and air travel. And with this having come after output tumbled by the most for any year in a decade during 2019, EU leaders are likely to find themselves under growing pressure to make key decisions over the carbon market's supply structure if they are left with an even larger build-up of surplus allowances heading into the ETS scheme's fourth trading phase next year.

This white paper examines in detail the decline in ETS emissions seen last year, following the EU's April data release and compliance deadline, and provides outlook for how steep the decrease is likely to be this year.

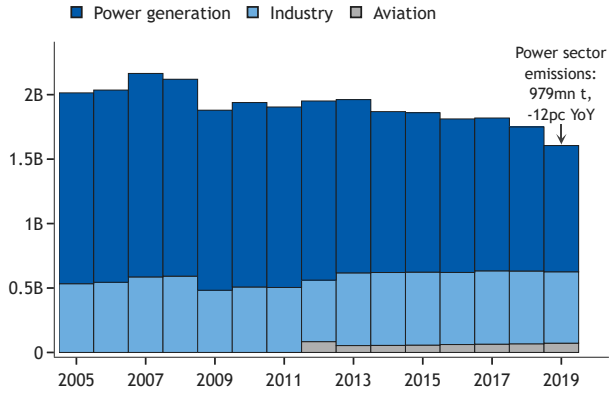
EU ETS emissions fall by more than 8pc in 2019

Emissions from sectors covered by the EU emissions trading system (ETS) fell by more than 8pc on the year in 2019, mainly driven by a further steep drop in power sector lignite and coal burn.

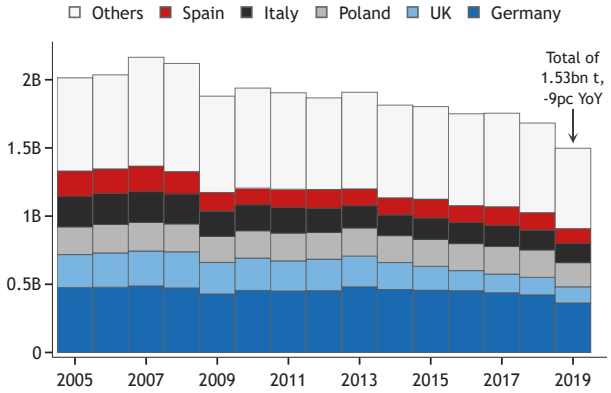
The fall is the sharpest annual drop since the 11pc recorded in 2009, when industrial activity was held down by the effects of the previous year's financial crash.

Total emissions from sectors covered by the EU ETS last year turned out at only around 1.61bn t of CO2 equivalent (CO2e), according to data from the European Commission, down by 8.1pc from the 1.75bn t CO2e produced in 2018. Where installations are still participating in the EU ETS but are yet to file, their 2018 verified emissions are carried over to 2019 to enable the total estimates reported here.

Total emissions by activity — *t CO_2e*



EU ETS stationary emissions — *t CO_2e*



Emissions
illuminating the markets

Emissions from stationary installations — excluding aviation — fell by nearly 9pc, or 146mn t CO2e, to 1.54bn t CO2e. The power sector was responsible for almost all of that reduction, seeing emissions fall by 12pc or 139mn t CO2e.

Those falls in power sector emissions were in turn concentrated in countries where lignite and coal-fired power has previously dominated. The sharp rises in ETS allowance prices, to nearly €30/t CO2e at one point last year, helped encourage large-scale switching from coal to gas for generation, while mild and windy weather conditions limited the call on lignite units. The resulting year-on-year falls of as much as 30pc in emissions from Germany's lignite-fired plants contributed to an overall reduction in the country's power sector emissions of around 18pc — or some 54mn t CO2e.

Those falls will have continued, and even accelerated, into 2020, with the Covid-19 pandemic suppressing power demand — generation from coal and lignite in Germany have in recent weeks fallen below even last summer's levels.

Further small falls in emissions elsewhere in German industry took the country's overall reduction in stationary ETS emissions to some 14pc — a significantly bigger drop even than in 2009.

Spain recorded a fall in power sector emissions of more than 20pc, and Poland 9pc — each representing a drop of 15mn t CO2e. And the UK's emissions from the sector were down by 10pc, or nearly 10mn t CO2e.

Other industries saw emissions levels change much less dramatically and had relatively little impact on the overall figures.

Steel plants registered a small drop — of a little more than 1pc — in emissions, to around 104mn t CO2e. Of the largest emitters, Germany and Italy recorded falls of around 6pc and 3pc respectively, and Austria an increase of more than 8pc.

Individual steel installations tended to move up the rankings of the EU's largest emitters, as power plants dropped below them. Steel facilities made up 10 of the top 30 emitters in 2019, according to the available transaction log data, up from just five in 2018. Short-haul airline Ryanair held on to its position at number nine in the rankings.

Emissions from most polluting plants down sharply

Greenhouse gas (GHG) emissions from Europe's five most polluting power stations fell by nearly a quarter last year.

The five lignite-fired plants — Poland's Belchatow and Germany's Neurath, Niederaussem, Janschwalde and Weisweiler — produced a combined 104.7mn t of CO2e, down from 136.04mn t CO2e in 2018.

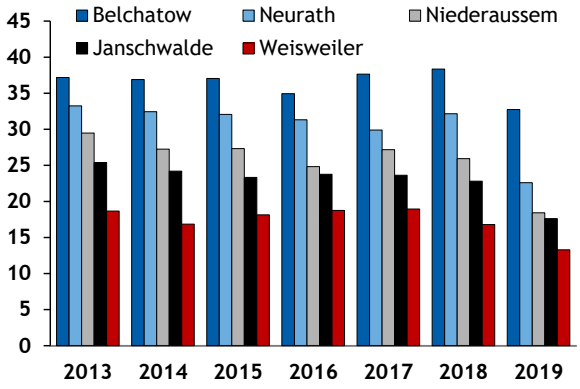
Emissions from each of the German plants were the lowest since the EU ETS started in 2005, while Belchatow's were the lowest since 2010.

The biggest drop was at RWE's Neurath plant, where emissions fell by just under 30pc to 22.6mn t CO2e, while Czech-owned Leag's Janschwalde recorded a 29pc fall.

German lignite-fired generation dropped sharply last year, losing its position as the country's largest source of electricity to wind farms for the first time, reflecting mild weather and as a steep fall in gas prices saw gas-fired units becoming more competitive.

There has been much less decarbonisation progress in Poland's fossil fuel-dependent power sector than in Germany, despite sharp rises in EU ETS allowance prices, which approached record highs of nearly €30/t CO2e in summer 2019. But last year's fall in emissions at Polish firm PGE's Belchatow plant — by 5.6mn t CO2e to 32.74mn t CO2e — was comfortably its largest since the start of the EU ETS and follows 2018's record emissions of 38.35mn t CO2e, suggesting that higher carbon prices are beginning to have an impact.

Most emitting power stations in EU ETS *mn t CO_2e*



Cement sector EU ETS emissions edge lower

GHG emissions from the production of cement clinker broke a four-year consecutive run of gains to record a decline in 2019, but remained at their highest for any year other than 2018 for the market's current trading phase.

Production of cement clinker is projected to have created 121.9mn t of CO2e in 2019, down slightly from 122.4mn t CO2e in 2018 but still the sector's second-highest level since 2011.

Cement clinker production accounted for around 7.6pc of total emissions under the EU ETS last year, which was up slightly from around 7pc in the previous year despite their overall

decline, owing to a steep fall in the share of emissions created by fuel combustion.

Germany, the country with the highest GHG emissions from cement clinker production, saw its emissions from the sector edge down marginally to 19.9mn t CO2e from 20mn t CO2e in 2018. This was the lowest level since 2016 and the second year in a row that the country's emissions from the sector have declined.

But the largest contributor to the overall drop in cement clinker production emissions was the sector's second-highest emitter, Spain, which saw emissions fall to 14.1mn t CO2e — their lowest since 2014 — from 15.2mn t CO2e in 2018 (*see chart*).

Poland reduced its cement sector emissions slightly to 11.29mn t CO2e from 11.34mn t CO2e in 2018, when an 11pc increase in such emissions had contributed significantly to an overall rise in EU ETS-covered cement emissions that year.

Of the remaining top 10 emitters, only Greece's emissions also fell on the year, declining to 53.5mn t CO2e from 54.7mn t CO2e.

The second-largest drop in cement sector emissions was in the Netherlands, which more than halved its emissions on the year to around 251,000t CO2e in 2019 from 650,000t CO2e in 2018, making it the lowest emitting country out of the 29 EU ETS member states that produce cement clinker, down from 27th place the previous year.

Top 10 emitters Italy, France, the UK, Romania and Belgium all recorded a rise in cement sector emissions on the year for 2019. Of these, the largest increase was in Romania, where emissions rose to 5.9mn t CO2e in 2019 from 5.4mn t CO2e in 2018.

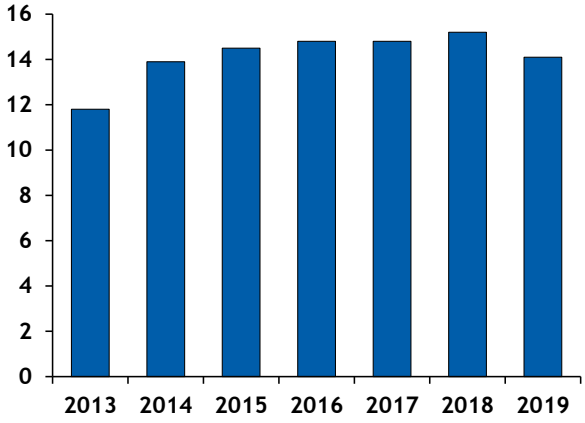
Belgium's 4.1mn t CO2e of GHG emissions from cement clinker production was the highest for the country since the current EU ETS trading phase began, up from 3.7mn t CO2e in 2018 and marking a second consecutive year-on-year rise.

Italy's cement sector emissions increased for a second year in a row, rising to 12.6mn t CO2e in 2019 from 12.3mn t CO2e the previous year, their highest since 2015.

Consistently higher EU ETS allowance prices following the introduction of the market stability reserve mechanism last year might have encouraged some reduction in production, although the effectiveness of this measure will have been limited by the free allowances granted to such firms in a bid to avoid "carbon leakage", where companies relocate their operations outside the EU to avoid carbon costs.

The front-year product's closing assessment averaged €24.91/t CO2e in 2019, compared with €15.91/t CO2e in 2018.

Spanish cement sector emissions *mn t CO_2e*



ETS emissions from oil refining at seven-year low

GHG emissions produced from the refining of oil inside the EU fell to their lowest level since 2012 last year, having recorded their steepest year-on-year decline in five years.

EU oil refining activities were responsible for the production of an estimated 122.7mn t of CO2e over the course of 2019. Output fell by roughly 1.9mn t CO2e, or 1.5pc, from the total recorded in 2018, while last year's figure was the lowest level of emissions produced by the sector in seven years.

The sector's year-on-year decrease in emissions was the largest for any sector outside of the fuel combustion segment of firms under the EU ETS, which predominantly comprises power generators.

Oil refining emissions have now fallen by some 9.9mn t CO2e from a record 132.6mn t CO2e produced during the EU ETS scheme's first year of trading in 2008. But they are still above a low of around 119.7mn t CO2e seen in 2012, with production having slumped in the years following the financial crisis before rising back to an average of 126.6mn t CO2e/yr over 2013-18.

The EU's largest emitting member state, Germany, recorded the steepest year-on-year decline in output from mineral oil refining activities in 2019, with German firms in this sector producing only around 21.8mn t CO2e, down from 22.59mn t CO2e in 2018. Sweden, the UK and Spain each recorded year-on-year falls of at least 500,000t CO2e.

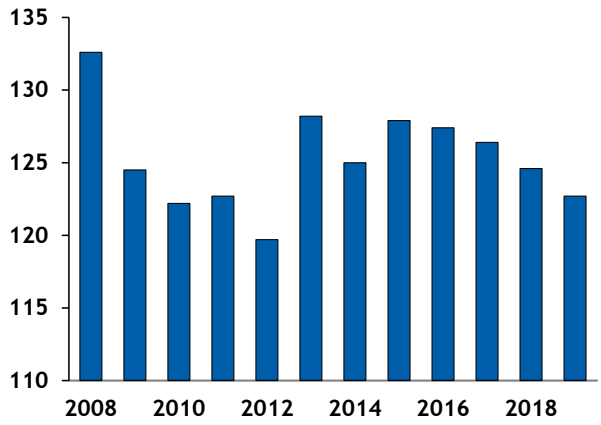
But eight member states recorded year-on-year increases in their GHG emissions from the sector, with the Netherlands producing roughly 800,000t CO2e more in 2019 than in 2018. The country's total output reached around 11.1mn t CO2e, which was the most for any year since 2015.

Only 11 EU member states have seen their GHG emissions from oil refining activities fall to levels below where they were during the first year of EU ETS trading, with output from Estonia, Germany, Poland, Greece and Hungary last year turning out more than 1mn t CO2e higher than in 2008.

France and Italy have comfortably recorded the largest reductions in output over this period, of more than 5mn t CO2e each, while the UK's production has fallen by around 2.35mn t CO2e.

Emitters under the scheme had until the end of April to secure and surrender the required number of carbon allowances to cover their 2019 output or face fines of up to €110/t CO2e. But the manufacture of refined petroleum products remains one of the sectors that receives the majority of its requirement under the carbon market for free to prevent against carbon leakage, so is less at risk of this than other sectors.

Oil refining emissions under EU ETS *mn t CO_2e*



UK emissions under EU ETS see accelerated decline

The rate at which the UK's GHG emissions under the EU ETS fell accelerated again in 2019, having slowed in 2018, as the country's low-carbon electricity generation rose further to leave coal-fired power plants virtually redundant for the majority of the year.

UK GHG emissions from stationary installations under the EU ETS are estimated to have amounted to around 119.6mn t of CO2e in 2019, having fallen by roughly 9.2mn t CO2e or 7pc from 2018's total, verified emissions data released by the EU show.

This compared with a year-on-year fall in output of around 8mn t CO2e in 2018 but remained slower than the 10.3mn t CO2e fall recorded in 2017 and significantly below the falls of more than 20mn t/yr CO2e seen over the 2014-16 period when the majority of the country's power sector coal-to-gas fuel switching was seen.

The rate at which UK emissions under the EU ETS fell had slowed in 2018 as any remaining coal-fired plants left in operation were still required by the grid to supply power during hours of highest demand.

But the commissioning of new offshore wind capacity and further energy efficiency improvements saw the requirement for coal-fired power generation fall to an average of only around 700MW or just 2pc of overall supply in 2019, compared with an average of around 1.7GW in 2018 and 2.3GW in 2017.

Low-carbon forms of power generation, including that produced by the UK's nuclear plants, supplied more than half of the country's electricity last year for the first time, while wind farms rose above nuclear facilities in the generation stack to become the second-largest source of power behind only gas-fired facilities.

Fuel combustion accounted for roughly 46pc of the UK's GHG emissions from stationary installations last year, with this having fallen from a near-50pc share in 2018.

Beyond power and heat generation activities, the UK recorded slight increases in its GHG emissions from some industrial activities, most notably by firms involved in the production of metals, cement or ammonia.

The pig iron or steel manufacturing sector reported a year-on-year rise of around 605,000t CO2e, to take its GHG emissions back above the 6mn t CO2e mark they had fallen below for the first time since 2009 during 2018.

While cement clinker production — which remained the UK's largest emitting sector after energy — produced around

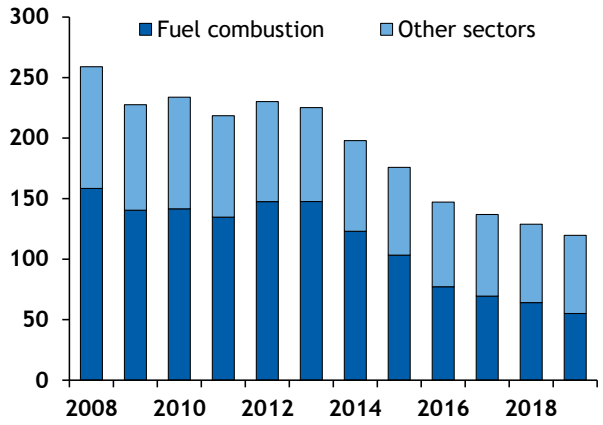
90,000t CO2e more in 2019 than in 2018, with total emissions reaching roughly 7.2mn t CO2e last year.

The cement sector's annual emissions in the UK have fallen only narrowly since the EU ETS scheme's full launch in 2008. Output amounted to around 8.5mn t CO2e in that year and fell to a low of around 6.1mn t CO2e in 2012 but have turned out in a range of 6.5mn-7.3mn t CO2e every year since.

The UK remained the fourth-largest emitting country, behind only Germany, Poland and Italy, under the EU ETS last year in what is due to be the country's penultimate year of participation in the scheme.

UK emitters will be required to cover their 2020 output with carbon allowances under the programme, but the government intends to launch a new national ETS scheme from next year, which would then be linked back to the EU's, as part of its full exit from the bloc at the end of a continuing Brexit transition period.

UK stationary emissions under EU ETS *mn t CO_2e*



Estonia's GHG emissions drop sharply in 2019

Estonia recorded the second-largest proportional year-on-year drop in GHG emissions covered by the EU ETS of any participating country for last year, reaching its lowest level since the scheme's full launch, while the other Baltic states lagged behind.

Estonia's GHG emissions are projected to have dropped by 5.4mn t of CO2e, or 39pc, on the year in 2019 to a total of 8.5mn t of CO2e, verified emissions data published by the EU show. Of the 31 member states in the EU ETS scheme, only Liechtenstein recorded a larger proportional drop, of 42pc, but from a much smaller base quantity of 341t of CO2e to 198t of CO2e.

The fall reduced Estonia's EU ETS emissions to their lowest level since at least 2008 and marked the country's second consecutive year-on-year reduction. Estonia's GHG emissions accounted for about 0.53pc of overall EU ETS emissions last year.

The majority of Estonia's emissions savings came from fuel combustion, where output fell to 6.2mn t of CO2e from 11.6mn t of CO2e a year earlier. Conversely, the country's second-highest polluting industry, mineral oil refining, last year saw a rise in emissions to 1.7mn t of CO2e from 1.6mn t of CO2e a year earlier, while cement clinker production output remained steady, at about 547,000t of CO2e. Emissions from aircraft operator activities in the country were down to 28,000t of CO2e in 2019 from 36,000t of CO2e a year earlier.

Estonia's renewable power generation increased last year, displacing some more carbon-intensive forms of production in the country's energy mix. As many as 4,380 renewable energy producers submitted applications to join state-owned electricity distribution system operator Elektrilevi's grid last year, three times as many as in 2018. The proportion of renewable energy in the power system has risen to 21pc.

Industrial wood chip consumption in Estonia has also grown substantially. Emissions from biomass production are exempt from the EU ETS scheme, as they are classed as carbon neutral.

Wider Baltic region

The other Baltic states lagged well behind Estonia's progress last year, recording only marginal reductions in overall EU ETS emissions on the year.

Latvia's GHG output fell to 2.97mn t of CO2e from 3.01mn t of CO2e, while Lithuania's declined to 5.94mn t of CO2e from 6.02mn t of CO2e, both representing a 1pc decrease from 2018.

This marks the lowest level of EU ETS emissions for Lithuania since 2012. But Latvia's total is the second-highest of any year since the current ETS trading phase began in 2013. The countries account for a low proportion of overall ETS emissions — 0.4pc and 0.2pc, respectively.

Both countries also saw a drop in fuel consumption output. In Lithuania, such emissions dropped to 688,000t of CO2e from 898,000t of CO2e, while in Latvia they fell to 135,000t of CO2e from 142,000t of CO2e (or to 1.6mn t of CO2e from 1.7mn t of CO2e, taking into account emissions from combined-heat-and-power plants).

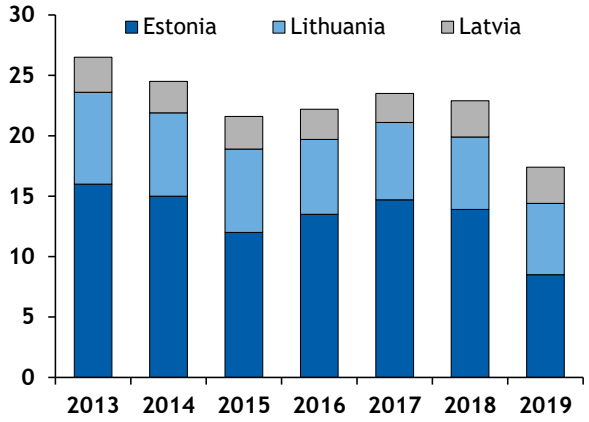
Outlook

Estonia's fuel consumption emissions could fall further this year, following approval by the country's government of amendments to the national Electricity Market Act, allowing for greater use of biomass in the production of electric energy.

Owner Utilitas expects a new biomass-fired combined-heat-and-power plant launched in November to reduce emissions by about 130,000t of CO2e.

Emissions are likely to be down significantly across Europe this year, as a result of restrictive measures put in place to stem the spread of the Covid-19 virus. The measures have curtailed air travel and suppressed industrial demand and, therefore, power production.

Baltic EU ETS emissions *mn t CO_2e*



ETS emissions to fall by 'at least' 14pc in 2020

GHG emissions from stationary installations covered by the EU ETS will end this year down by at least 14pc on the year, and more than a quarter below the system's supply cap, environmental think-tank Sandbag said.

In an analysis of the effects of the Covid-19 pandemic on EU ETS emissions, Sandbag examined two scenarios. Both assume that initial lockdown measures in Europe will be lifted from 15 May, but the second maps out how emissions will be affected if there is a second "wave" of the pandemic and another lockdown, imposed from 15 September until the end of this year.

Under its first scenario, the think-tank estimates that GHG emissions covered by the EU ETS, excluding the aviation sector, will end the year at 1.3bn t CO2e, while under the second scenario this falls to 1.2bn t CO2e. This represents an on-the-year drop in emissions of about 14pc and 19pc, respectively, based on the most recent EU data on 2019 ETS emissions.

The report's modelling assumes a 30pc monthly reduction in industrial emissions and a 12pc fall in power sector emissions owing to the pandemic, both of which the think-tank expects to recover gradually in the six months following lockdown. It also assumes a further 10pc drop in power sector emissions owing to lower coal burn driven by unrelated factors.

Social distancing measures introduced across Europe in a bid to slow the spread of the coronavirus have resulted in lower industrial activity, which in turn has caused a significant drop in heat and power demand and reduced GHG emissions in the region.

And market factors are increasingly pushing the more carbon-intensive coal-fired plants out of European power generation mixes independent of the pandemic, as installed renewable capacity increases and low gas prices encourage coal-to-gas switching.

EUA surplus

Sandbag's estimated emissions for this year would leave them about 27pc below the EU ETS supply cap under the first scenario, and 31pc below in the second, the think-tank said. The cap stands at about 1.8bn t of CO2e at present.

According to Sandbag's calculations, this leaves 1.34bn of excess ETS allowances (EUAs) not absorbed by the market stability reserve (MSR) this year — and therefore remaining in circulation — under the first scenario, and 1.43bn under the second scenario, up from about 1.25bn last year.

This supply-demand imbalance could pose a problem for the EUA market if prices are pushed down as a result. Sandbag is therefore calling for the MSR's rate of absorption to be examined in its upcoming review, as well as for the supply cap to be reduced, to avoid market oversupply in the EU ETS' fourth trading phase (2021-30).

"The MSR review in 2021 has to look at the appropriateness of the current thresholds to cope with the giant historical surplus the ETS will inherit for phase 4," the think-tank said.

"There was already a pressing need to adjust the EU ETS cap to real emission levels and to the Paris agreement before the pandemic began. Following the lockdown, this becomes an urgent necessity, without which phase 4 is doomed to be shadowed by an immense oversupply of two years' worth of 2019 emissions equivalent."

Sandbag had already warned that the supply cap would need to be lowered, having told *Argus* previously that the EU should use the UK's impending departure from the EU ETS at the end of this year as an opportunity to "reset" the cap at GHG emissions levels and align it with the bloc's likely goal of reaching net zero emissions by 2050.

Stationary emissions, by country			***mn t CO2e***
Country	2018	2019	± pc change
Germany	422	363	-14.0
Poland	200	184	-7.8
Italy	146	141	-3.7
United Kingdom	129	119	-7.9
Spain	127	110	-13.9
France	97	94	-3.2
Netherlands	87	84	-4.2
Czech Republic	67	63	-6.4
Belgium	44	45	1.4
Greece	47	40	-14.1
Romania	40	37	-7.8
Bulgaria	31	31	-0.2
Austria	28	30	4.1
Norway	25	25	-2.3
Finland	26	23	-11.5
Portugal	26	22	-17.7
Slovakia	22	20	-10.3
Hungary	20	20	-2.6
Sweden	20	19	-5.5
Ireland	16	14	-8.7
Denmark	15	12	-19.3
Estonia	14	8	-38.7
Croatia	7	8	1.2
Slovenia	6	6	-3.7
Lithuania	6	6	-1.6
Cyprus	5	4	-2.7
Latvia	3	3	-4.0
Iceland	2	2	-2.6
Luxembourg	1	1	1.9
Malta	1	1	5.9
Liechtenstein	0	0	-41.9
Total	1682	1533	-8.9

— 2019 figure includes 2018 data for open installations that had yet to report to the Transaction Log by 7 April

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