sandbag

Europe is on track for 30% emissions cuts by 2020

The EU is doing much better than it thinks

27th **November 2015**

On 20th October 2015, the European Environment Agency (EEA) stated that Europe had already cut emissions in 2014 to 23% below 1990 levels, and that Europe is on track for emissions to be 25% below by 2020[1].

This is great news that Europe is substantially beating its target to be 20% below by 2020. But we believe Europe is on track to do even better than this.

The EEA forecast aggregates projections from EU-28 Member States (submitted to the EEA in August)[2]. Our analysis proves that these Member States forecasts are flawed because even emissions forecast for 2014 and 2015 are significantly above actual levels. If emissions in the near term are so wrong, it is highly probable the EEA aggregate forecast for emissions over the longer term is even more inaccurate.

About Sandbag

Sandbag is a UK-based not-for-profit think tank conducting research and campaigning for environmentally effective climate policies.

Our research focus includes the phase-out of old coal in Europe; deep decarbonisation of industry through technologies including Carbon Capture Utilisation & Storage; reform of the EU Emissions Trading Scheme; and increasing ambition in the EU 2020 and 2030 climate & energy packages.

For more information visit sandbag.org.uk

[1] Member State forecast "With Additional Measures". See "*EU shows leadership ahead of Paris with 23% emissions cut"* http://www.eea.europa.eu/media/newsreleases/climate-change-eu-shows-leadership

[2] "Trends and Projections in the EU ETS 2015" http://www.eea.europa.eu/publications/trends-and-projections-eu-ets-2015

Additionally, our modelling shows that by 2020, Europe is on track for a 30% cut in economy-wide emissions relative to 1990 – see figure 1. Looking at the ETS alone, by 2020 emissions will be down 38% against the ETS's 2005 baseline. Our modelling only adjusts emissions under the EUETS, keeping emissions under the Effort Sharing Directive (ESD) unchanged. If the same over-estimation bias also applies to the ESD, then Europe is on track for emissions cuts even greater than 30%.

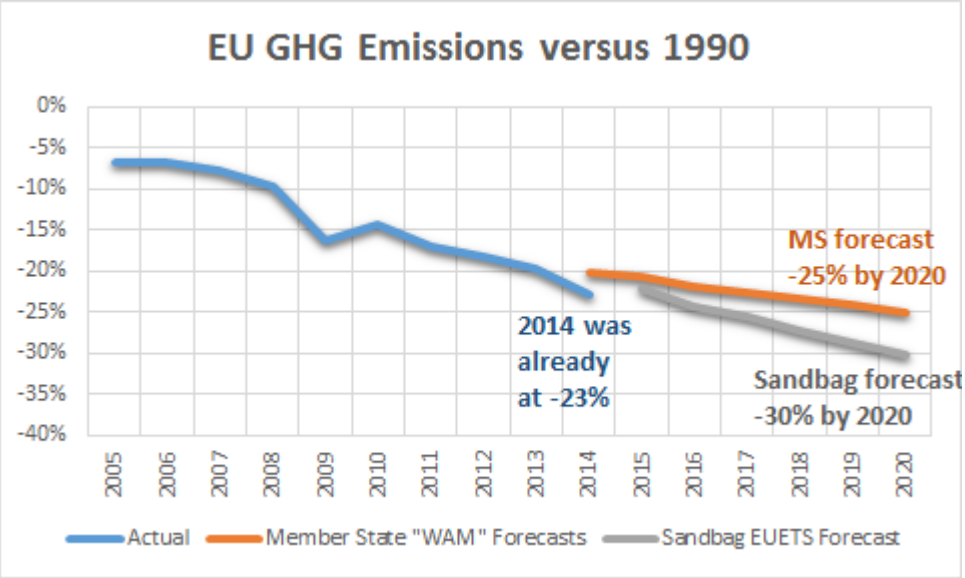


Figure 1 Progress on cutting emissions: Member State and Sandbag forecasts compared

In this briefing, we show:

1. **The Member State ETS forecasts are structurally flawed**. Even 2014 is over-estimated by 5.1%, and it is likely that 2015 will be over-estimated by a similar magnitude.
2. **Forecasts to 2020 do not mirror reality**. Member States in aggregate forecast for 2020 that ETS emissions will fall only 0.8% per year, from 2014 actual emissions. This seems implausible, given the increase in renewable electricity and fall in electricity consumption.
3. **Sandbag forecast 2020 ETS emissions will fall far more aggressively**. We forecast a fall of 3.8%/year average from 2014 to 2020, which compares favourably with actual falls of 3.0% from 2010 to 2014 since coal generation fell only marginally through this period.

We also include a restatement of our recommendations for how the EU needs to tighten its carbon budget in the traded sectors.

Europe is cutting emissions much faster than its targets show. It is time to tighten climate Europe's ambition to lock-in the emissions cuts that Europe is actually delivering.

1. The Member State forecasts are structurally over-estimated

The EEA forecast is not actually produced by the EEA, it is simply aggregating forecasts from EU-28 Member States. But the individual forecasts from the Member States are structurally flawed.

They were submitted to the EEA by 31st August this year and published by the EEA on 20th October[3]. For 2014, where actual emissions were available for the EUETS, emissions were over-forecast by 5.1% (see Figure 2a)[4].

For 2015, our latest emissions estimate at Sandbag is 1791mt for the EU-28 countries. It is based on actual generation data for most of the year, so this is unlikely to change too much[5]. Our estimate is detailed in Box 1 on page 4. Incredibly, Member States' forecast emissions for 2015 are 4.4% above this level (see figure 2b).

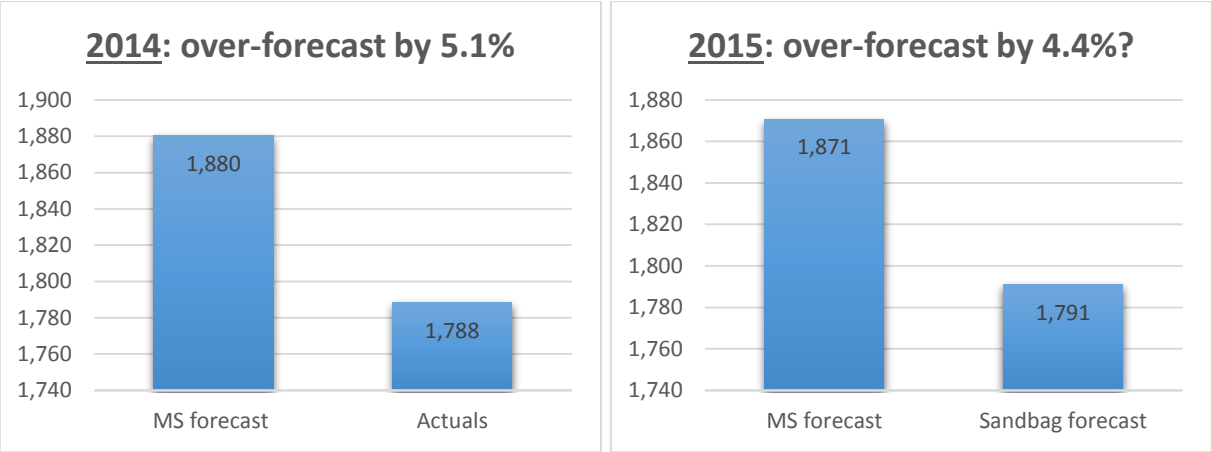


Figure 2 EU-28 Member States ETS emissions projections for (a) 2014 and (b) 2015

Over-estimation is endemic. 17 out of 28 countries are over-estimating both 2014 and 2015 emissions, compared to 5 countries under-estimating both years (see Figure 3). The country that is overestimating the most was the UK - for both 2014 and 2015 – as demand has fallen, coal burn collapsed and new renewables replaced coal generation. The UK's over-estimation contributes half the difference between the actual data for the last two years and the aggregate projections.

It's important to note that when Sandbag produced our emissions forecast for 2014, where we estimated emissions in the ETS had already fallen to the 2020 target level, six years early, we eventually proved to be accurate to within 0.4%, the most accurate of all analysts surveyed by Carbon Pulse.[6]

[3] "Trends and Projections in the EU ETS 2015"
http://www.eea.europa.eu/publications/trends-and-projections-eu-ets-2015

[4] It is not 100% clear whether the 2014 MS forecast was updated by MS this year (as we suspect) or is only reiterating last year's forecast; in either case, the 5.1% over-forecast is still valid.

[5] This is based on a range of production data up to 23-November (power generation data, steel and cement data) and forecasts through to year-end.

[6] Emissions in the EU carbon market reach 2020 target six years early
https://sandbag.org.uk/blog/2015/apr/1/emissions-europes-carbon-market-reach-2020-target-/

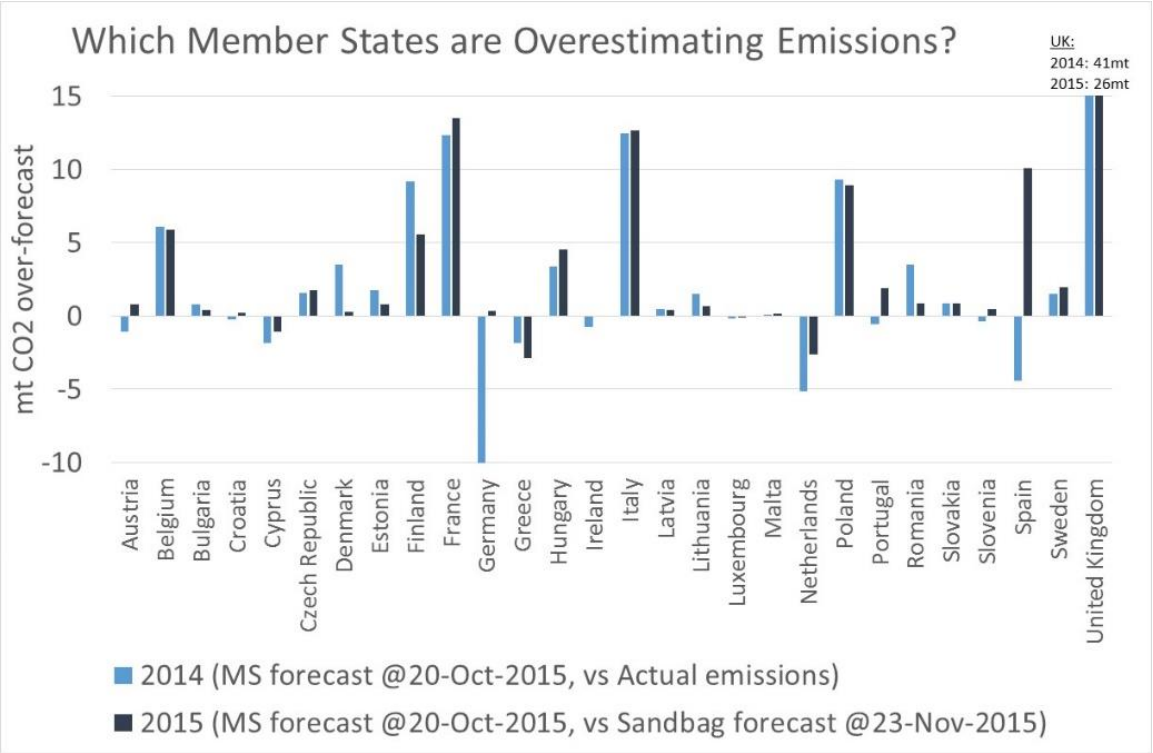


Figure 3 EEA breakdown of Member States forecasts

Box 1: Sandbag 2015 Forecast

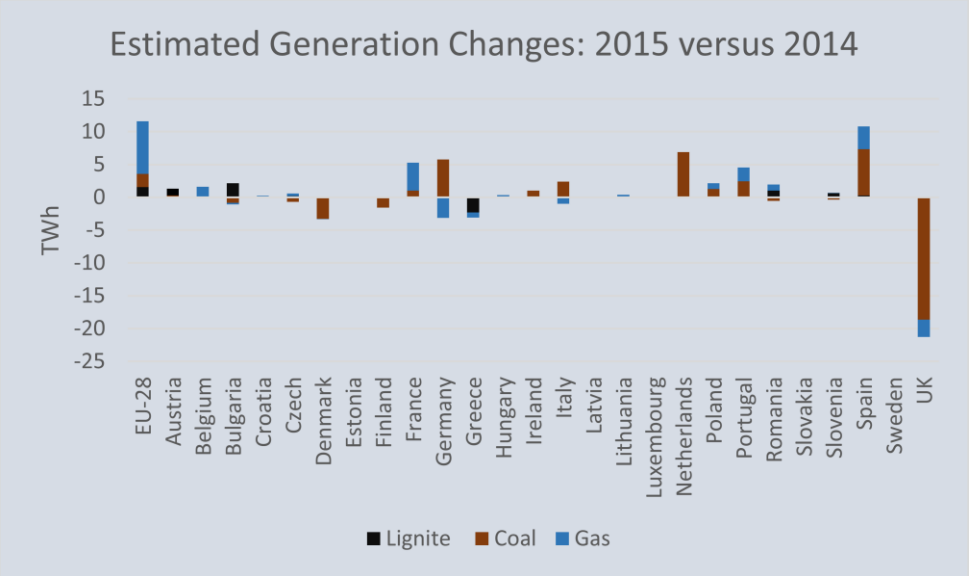
Our 2015 forecast takes 2014 actual emissions, then adjusts by country and by sector for known and projected variances. It includes actual generation data for UK and Germany up to as recently as 23rd November.

This methodology was very successful last year – in October 2014 we forecast 2014 emissions at 1,822mt, which was only 0.4% variance to actual emissions of 1,814mt (published in May 2015).

We forecast 1,818mt for 2015 (1,791mt of EU-28 only). This is an increase of just 0.2% from the 2014 actuals, after last year's record fall of 4.9%. This is 2.2% above our projection in October 2014. The increase in our forecast is due to continued Belgian nuclear outages, record German exports keeping lignite generating, and high coal burn in Spain due to low hydro generation. The majority of the variances are in electricity emissions, as opposed to the industrial sectors.

Power sector:

The major change in 2015 is the collapse in coal generation in the UK, due to gas featuring higher in the merit order and record renewables. However, in total across the EU coal generation marginally increased: in Netherlands 3 new coal power stations were commissioned; in Germany exports rose to a record level, enabling lignite to continue running near-baseload; and low hydro generation in Spain and Portugal at the start of the year was replaced with coal generation.



The source of the data is mostly ENTSO-E data, but since this is not complete to year-end, it is supplemented by a variety of national actuals data, then projections are added for the remainder of the year. Rough emissions factors are then used to translate the TWh by fuel into CO2 emissions.

Industrial sector:

We forecast a very small drop in industrial emissions. This is caused by slight falls in projected steel output (especially in UK and Italy, although rising in Poland) and falls in cement output (in Germany and France). Overall, GDP for the Euro area will advance 1.5%[1], leaving likely efficiency improvements and output changes broadly offsetting each other.

2. 2020 forecasts do not mirror reality

The overestimation of 2014 and 2015 emissions is, in our view, the precursor to a larger overestimation of 2020 emissions under planned policies. The 2014 and 2015 overestimation is the thin end of a wedge, with the overestimation magnifying the further one moves from current emissions towards 2020.

Incredibly half – 14 out of the 28 EU member states – are forecasting that emissions in 2020 will be *higher* than actual emissions in 2014 (see figure 4). These include larger countries like France, Italy and Spain.

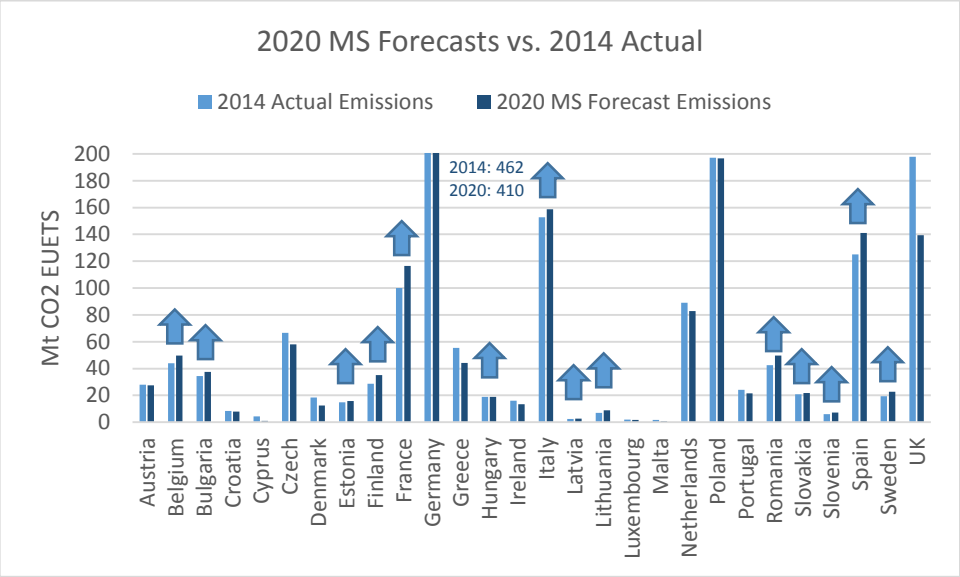


Figure 4 Member State ETS Emissions Forecasts

The Member States collectively forecast that ETS emissions will fall by only 0.8% per year from 2014 actuals to their 2020 forecast. It is hard to fathom any scenarios whereby ETS emissions will fall by only 0.8%/year from 2014 to 2020: gas and renewable electricity will displace huge amounts of coal generation reducing capacity as a result of tightening air quality standards and carbon pricing; electricity consumption will continue to fall as existing sources of demand are replaced with higher efficiency products and services; and heavy industry output is continuing to fall, as demand falls and imports rise.

3. Sandbag forecast EU emissions will be 30% below 1990 by 2020

Sandbag released an in-depth forecast last October on EUETS emissions to 2020, and is briefly outlined in Box 2[7]. We forecast a more rapid fall in emissions, compared to most analysts. We changed our forecast for 2015 emissions based on one-off factors, as described in Box 1, however we feel no need to change the rest of our forecast.

We forecast that EUETS emissions will fall by an average of 3.8%/year from 2014 to 2020, compared to Member States forecast of 0.8%/year.

This compares to the 3.0% fall per year on average from 2010 to 2014[8]. This aggressive fall happened even as 90% of renewables offset gas rather than coal over this period, with overall coal generation remaining broadly unchanged.

Figure 4 shows our Sandbag forecast compared to the Member States' forecasts. Sandbag's forecast puts ETS emissions in 2020 approximately 300 Mt below the aggregated Member State forecasts submitted to the EEA.[9] This is equivalent to more than 5% of Europe's 1990 emissions baseline, which is roughly 5.7 billion tonnes according to the UNFCCC data in the EEA's GHG Data Viewer.[10]

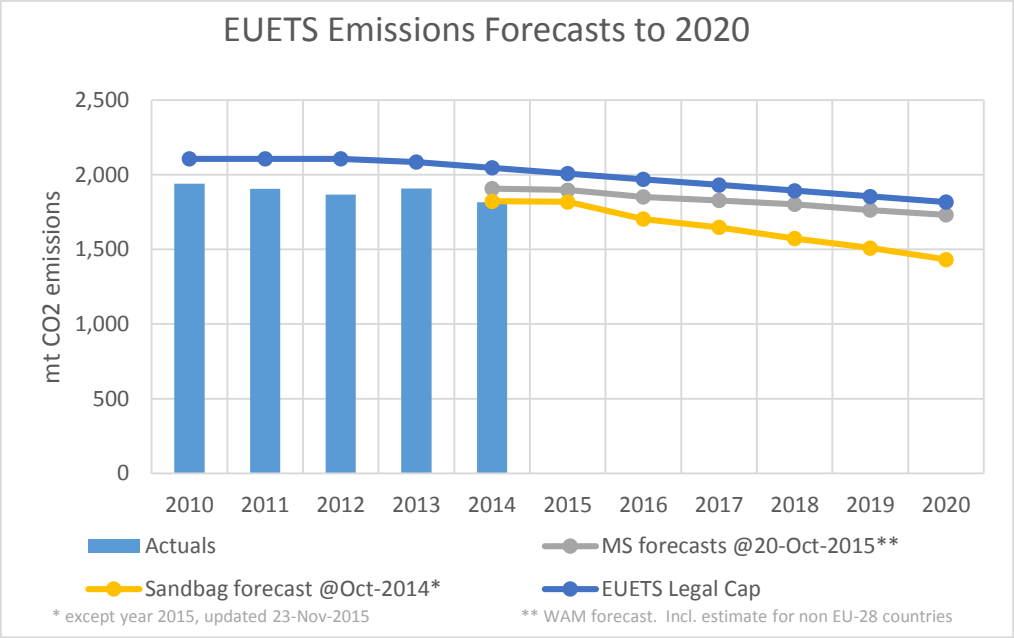


Figure 5 EUETS Emissions forecast to 2020[11]

Again the Member State forecasts predict economy-wide emissions to be 25% below 1990 levels by 2020. **We therefore estimate that Europe is on track to achieve domestic emissions reductions of 30% below 1990 level by 2020.** This means that by 2020 stationary ETS emissions would reach -38% relative to their 2005 baseline.

[7] "Forecasting the EUETS to 2020" https://sandbag.org.uk/site_media/pdfs/reports/Briefing-2020surplusprojection.pdf

[8] Includes 2013 scope change, so are on a emissions on a like-for-like basis

[9] Sandbag 2020 ETS emissions forecast is 1432 Mt compared with 1731 Mt for Member State forecasts (adjusted up slightly for non EU countries)

[10] EU 2020 target excludes LULUCF but includes international aviation: http://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer

[11] Note – makes no adjustment for scope change, therefore 2013 like-for-like emissions fell, whereas here is looks like they increased.

This assumes that the Member State forecasts for the non-traded sector are correct, however, early signs indicate that these may be also inflated. The EEA estimates that 2014 emissions in the Effort Sharing Decision are lower than the trajectory implied by Member States forecast. If Member State forecasts for the Effort Sharing Decision are also overestimated for 2020, Europe could be on track to achieve emissions reductions of more than 30% by 2020 relative to 1990 levels.

This represents a massive overachievement of Europe's current 2020 target, which currently requires emissions cuts of only 20% by 2020 relative to 1990 and also allows for a significant share of emissions reductions to be achieved overseas through carbon offset projects.

The 2020 20% EU's target was always inadequate, falling short of the 25-40% emissions reductions indicated by the IPCC as an equitable contribution for wealthy countries in the 4th Assessment Report, and also falling shy of the 25% domestic target pathway indicated by the European Commission's Low Carbon Roadmap, as a cost-effective milestone to our long term goal. The EU's relatively unambitious targets contribute to the gap that currently exists between the aggregate effect of all the INDCs submitted to the Paris talks and what is needed to stand a good chance of staying below 2 degrees global average temperature increase. The EU should be required to increase its targets.

The failure to update Europe's targets and carbon budgets to a more appropriate level, will lead to billions of tonnes of excess allowances accumulating in the EU ETS. These will carry-over into the 2020's, weaken the carbon price, and needlessly delay investment. The newly agreed Market Stability Reserve was not designed to deal with a surplus of this scale and will struggle to bring these surpluses under control in a timely fashion.

4. Recommendations

Our overall recommendations for the EUETS are discussed in our recent report on increasing climate ambition *'Harder, Better, Faster, Stronger'*.

They are:

- **Strengthen the 2020 climate target by cancelling ETS allowances from the new Market Stability Reserve;**
- **Strengthen the 2030 climate target to 50%, and accordingly readjust the budgets of the ETS and ESD;**
- **Enable climate ambition to be reviewed more regularly by introducing five-year budget periods for the ETS and the ESD;**
- **Introduce automatic ratchets which cancel excess allowances from the Market Stability Reserve after a certain period or volume has been exceeded;**
- **Ensure no carryover of allowances is allowed from the current Effort Sharing Decision into the next.**

We hope this report gives more confidence to policy-makers to undertake reform to increase the ambition of the European Union.

Box 2: Sandbag 2020 Forecast

Sandbag released an in-depth forecast last October on EUETS emissions to 2020, "Forecasting the EUETS to 2020".

Many things have changed since our October forecast, but the evidence continues to support our expectation of fast-falling emissions. Falling coal generation due to the UK coal phase-out, the German lignite reserve, agreed Dutch coal closures, and a falling gas price. Wind and solar continue to show the levels of growth anticipated. And falling electricity demand is expected to continue to fall, although this remains the largest uncertainty. Heavy industry output is expected to continue to fall, especially with Chinese steel imports continuing to erode European production.

This table shows 2010 EUROSTAT data, with our projections of 2015 based on actual generation from ENTSO-E up to October, and our projection of 2020 emissions. Our model operates at a much more granular level, and the table provides a summary overview.

		2010	chg	2015	chg	2020
Demand	TWh	3,208	-134	3,074	-133	2,941
Nuclear	TWh	872	-53	819	2	821
Hydro	TWh	407	-17	391	16	407
Renewables	TWh	222	260	482	291	773
Imports	TWh	8	7	15	0	15
Lignite	TWh	306	1	308	-118	190
Hard coal	TWh	465	-28	437	-104	333
Gas	TWh	721	-280	442	-221	221
Oil, waste	TWh	205	-24	181	0	181
CO2 mt proxy	**mt**	**1,185**	**-132**	**1,053**	**-311**	**742**
Fossil	**TWh**	**1,698**	**-331**	**1,367**	**-442**	**925**

The main result is that fossil generation will continue to collapse, due to falling electricity consumption and increasing renewables. In the last 5 years most of the fall has been from gas, but there is simply not enough gas to displace to allow this to continue. Therefore, coal generation will begin to collapse.

Even with our assumption that gas generation will still halve further from 2015 to 2020, this still leads to a 313mt fall in emissions from 2015 to 2020.

This alone is a 17% reduction in emissions from 2015.

On top of that, we also forecast falling industrial emissions of 9% from 2015 to 2020, as production of heavy industries continues to reduce, as well as becoming more energy efficient.

In total, we predict a fall in emissions of 21% - from 1815mt in 2014, to 1440mt in 2020.