

Determining a Scottish cap for 2013

The following paper documents the calculations which determine the 'specified amounts' for emissions from (i) fixed installations located in Scotland and covered by the EU emissions trading system (EU-ETS) and (ii) aviation covered by the EU-ETS.

Part 1 of the paper addresses fixed installations and begins by defining the extent of overall EU ambition for the ETS. Thereafter, a notional cap for the UK is defined for the 2013 calendar year. Finally, a notional Scottish cap for 2013 is then defined.

Part 2 of the paper addresses aviation.

Part 3 of the paper shows the final Scottish cap for all sectors covered by the EU-ETS.

Part 1: Fixed Installations Cap

An EU-wide ETS cap.

In 2013 the ETS (onshore) Cap was set at **2,084,301,856** tonnes of CO₂e¹.

A UK notional cap for 2013.

The Department of Energy and Climate Change (DECC) published their annual statement of emissions on 25 March 2015. The UK notional EU-ETS is shown in the table below.

Table 1 – UK Notional EU-ETS cap for 2013, tCO₂e²

| | |
|--|--------------------|
| Amount of free allowances allocated to the UK in 2013 (E) | 66,180,000 |
| Amount of auctioned allowances allocated to the UK in 2013 (F) | 107,356,000 |
| Estimated amount of New Entrants Reserve for the UK in 2013 (D)* | 8,137,232 |
| UK Notional Cap for 2013 [(D)+(E)+(F)] | 181,673,232 |

The number of allowances auctioned by the UK amounts to **107,356,000** tCO₂e. This comprises 95,098,000 allowances auctioned during 2013³; and 12,258,000 allowances auctioned in advance of EU-ETS phase III⁴

¹ http://ec.europa.eu/clima/policies/ets/cap/faq_en.htm

² See table 13 in:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/417680/48439_Un-Act_DECC_Web_Accessible_v0.2.pdf

The EU National Implementation Measures (NIMs) for the UK indicate that it will attract **66,180,000 tCO₂e** allowances in 2013 to be freely allocated to existing emitters. This figure does not include new entrants already identified for 2013 as these are considered to be covered by the New Entrant's Reserve. This equates to a 7.81% share of the EU total for freely-allocated allowances.

EU guidance indicates that a New Entrant's Reserve (NER) will be held equal to 5% of the total EU cap in any year. Clearly, assigning an amount to member states is complicated greatly by the fact that the actual shares for member states will only be actually known at the end of the phase.

There are two possible approaches to dealing with this uncertainty.

1. Assume that ultimately the UK will ultimately attract a share of the NER equal to its share of free allocations.
2. Report on the New Entrants reserve as it is drawn down by new entrants.

The UK has chosen the first approach and, on this basis, the NER for the UK in 2013 is therefore assumed to be equal to: $2,084,301,856 \times 0.05 \times 0.0781 =$
8,137,232 tCO₂e.

The final UK cap for the UK is calculated as the sum of the 3 components defined above:

A Scottish cap for 2013

The Committee for Climate Change recommend that the amount of auctioned allowances assigned to Scotland should equal the UK amount for 2013 multiplied by the share of verified emissions from Scottish fixed installations during the Period 2005-2007 inclusive. The National Atmospheric Emissions Inventory contains the following estimates for verified emissions resulting from onshore installations only as offshore installations are assumed to be covered by the free-allocation.

³ https://www.theice.com/publicdocs/Auction_Calendar_2013.pdf

⁴ <https://www.theice.com/publicdocs/circulars/12164%20attach.pdf>

Table 2: Verified onshore emissions

| Year | Scotland | UK |
|------|----------|---------|
| 2005 | 20.463 | 233.651 |
| 2006 | 24.196 | 242.108 |
| 2007 | 22.253 | 243.624 |
| 2008 | 23.765 | 264.861 |
| 2009 | 21.962 | 231.753 |
| 2010 | 24.041 | 237.234 |
| 2011 | 20.056 | 220.690 |
| 2012 | 20.349 | 231.084 |

All values MtCO_{2e}

The Scottish share of UK onshore verified emissions over the period is therefore 9.30% and the amount of auctioned emissions that can be attributed to Scotland for 2013 equals: $107,356,000 \times 0.093 = \mathbf{9,985,394}$ tCO_{2e}

Similarly to the UK, the amount of freely allocated emissions allowances can be obtained from the NIMs. This source indicates that the amount of freely allocated emissions allowances for Scotland in 2013 is therefore **6,339,902** tCO_{2e} which equates to a 9.58% share of the UK free allocations once new entrants in 2013 have been excluded. Similarly to the UK position, there is no way of knowing the actual share of NER that will be assigned to Scotland until the end of Phase 3.

Figures for 2013 indicate that no new allowances Scottish institutions were allocated from the New Entrants reserve in 2013. Following discussions with the Committee for Climate Change, we have agreed that imputing a notional figure would lack credibility given the actual – zero - position. For this reason, the second option for dealing with the uncertainty around the NER has been chosen – to include actual allocations from the New Entrants reserve as it is drawn down by new entrants.

Table 3: Scottish Cap with NER calculated using option 2

| Component | 2013 Allocation tCO _{2e} |
|-----------------------|-----------------------------------|
| Auctioned allowances | 9,985,394 |
| Free allocation | 6,339,902 |
| New Entrant's Reserve | 0 |
| Total | 16,325,296 |

Part 2: Aviation Cap.

At an EU level, the annual aviation sector cap for 2013 has been calculated as 95% of the average annual level of aviation emissions in a 2004-06 base period. Note that only CO₂ are considered for the EU ETS aviation cap.

Following advice from the CCC^{5 6}, the notional 2013 EU-ETS aviation cap for Scotland has been calculated as **1,365,013 tCO₂**. The steps to calculate this cap are outlined below.

Firstly, a baseline of the total EU ETS domestic aviation emissions is calculated. The Baseline is the annual average of 2004-06 domestic aviation emissions for the EU ETS countries. The EU ETS countries are defined as the EU-28 countries as well as Iceland, Norway and Liechtenstein. Data are obtained from the European Environment Agency Data Viewer⁷.

Table 4: Domestic EEA aviation emissions 2004-06

| Year | Domestic Aviation tCO ₂ |
|------|------------------------------------|
| 2004 | 19,434,208 |
| 2005 | 19,906,678 |
| 2006 | 20,079,615 |

The annual average of the 2004-2006 Baseline period for Domestic Aviation for the EU ETS countries is therefore **19,806,833 tCO₂**.

Scotland's share of 2010 EU domestic aviation emissions was then calculated. The Scottish figure has been obtained from the Scottish Greenhouse Gas Inventory 1990-2012⁸ and the European data have been obtained from the European Environment Agency Data Viewer.

Table 5: Domestic EEA aviation emissions, 2010

| Component | Domestic Aviation tCO ₂ |
|--------------------|------------------------------------|
| Scottish Emissions | 430,628 |
| EU ETS Emissions | 18,280,467 |

Scotland's share of 2010 EU domestic aviation emissions is therefore **2.36%**

The figure for Scotland's average 2004-2006 domestic aviation emissions for the EU ETS cap is obtained by the following calculation: 2.36% x 19,806,833 tCO₂ = **466,584 tCO₂**

⁵ http://www.theccc.org.uk/wp-content/uploads/2013/07/27.06.13_amending_carbon_accounting_regs.pdf

⁶ http://archive.theccc.org.uk/aws/IA&S/CCC_IAS_Core_ScopeOfBudgets_April2012.pdf

⁷ <http://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>

⁸ <http://www.gov.scot/Publications/2014/06/5527>

Calculate a baseline of total EU ETS international aviation emissions. The Baseline is the average of 2004-06 domestic aviation emissions for the EU ETS countries. This is defined as the EU-28 countries as well as Iceland, Norway and Liechtenstein. Data are obtained from the European Environment Agency Data Viewer.

Table 6: International EEA aviation emissions

| Year | International Aviation tCO ₂ |
|------|---|
| 2004 | 125,539,450 |
| 2005 | 132,518,364 |
| 2006 | 138,533,294 |

The average of the 2004-2006 Baseline period for International Aviation for the EU ETS countries is therefore **132,197,036 tCO₂**.

Calculate Scotland's share of 2010 EU international aviation emissions. The Scottish figure has been obtained from the Scottish Greenhouse Gas Inventory 1990-2012 and the European data have been obtained from the European Environment Agency Data Viewer.

Table 7: International EEA aviation emissions 2010

| Component | International Aviation tCO ₂ |
|--------------------|---|
| Scottish Emissions | 974,590 |
| EU ETS Emissions | 132,785,304 |

Scotland's share of 2010 EU international aviation emissions is therefore **0.73%**

The figure for Scotland's average 2004-2006 international aviation emissions for the EU ETS cap is obtained by the following calculation: $0.73\% \times 132,197,036 \text{ tCO}_2 = \mathbf{970,272 \text{ tCO}_2}$

Calculate an estimate of Scotland's average domestic and international aviation emissions in 2004-2006

Table 8: Scottish aviation baselines

| Component | Aviation tCO ₂ |
|------------------------|---------------------------|
| Domestic Aviation | 466,584 |
| International Aviation | 970,272 |

This gives a total value of **1,436,856 tCO₂**.

The 2013 Scottish EU ETS aviation cap is calculated by taking 95% of this value:

$95\% \times 1,436,856 = \mathbf{1,365,013 \text{ tCO}_2}$

A similar approach was adopted by DECC in accounting for domestic aviation in their Annual Statement of Emissions 2012⁹.

Data from the European Environment Agency Data Viewer have been selected to estimate emissions from domestic and international aviation at a European level. For 2004-2006, this equates to 152,003,869 tCO₂. This value is different to 221,420,279 tonnes CO₂, which is outlined on the European Commission website¹⁰. The European Environment Agency Data Viewer contains results of the greenhouse gas inventories from all European member states, as required by the UNFCCC.

The value from European Environment Agency Data Viewer considers emissions from departing flights (bunker fuel sales only). This is a directly comparable method with what is reported in the Scottish greenhouse gas inventory, as aviation emissions are attributed to a country on the basis of their departure point. The value of 221,420,279 tCO₂ was based on a bottom-up analysis for the Commission of the EU flights and reflects all arriving and departing flights under the original scope of the EU Emissions Trading System. It would not be appropriate to compare with the Scottish aviation estimates. The value of 221,420,279 tCO₂ on the European Commission website considers the original scope of the EU ETS aviation. This includes all international and domestic flights in the EU ETS airspace. It does not include any exemptions for flights to non-EU ETS countries. As such, the Scottish aviation cap considers all international and domestic flights.

Scotland's share of EU domestic and international aviation emissions is taken from 2010. Scotland's domestic and international aviation emissions are compared to total EU domestic and international aviation emissions in this year. 2010 is used because this was the benchmarking year for the allocation of free allowances to aircraft operators in the EU ETS. The Scottish share of EU domestic and international aviation is then applied to the 2004-06 EU average.

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https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/296152/38238_Un_Act_DECC_web_accessible_v2.pdf

¹⁰ http://ec.europa.eu/clima/policies/transport/aviation/allowances/index_en.htm

Part 3: Total EU-ETS cap for Scotland, 2013

The following table shows the final EU-ETS cap for Scotland in 2013.

Table 8. Total EU-ETS cap for Scotland, 2013

| Component | 2013 Allocation tCO₂e |
|-----------------------|---|
| Fixed Installations | 16,325,296 |
| Auctioned allowances | 9,985,394 |
| Free allocation | 6,339,902 |
| New Entrant's Reserve | 0 |
| Aviation | 1,365,013 |
| Domestic | 443,255 |
| International | 921,758 |
| Total 2013 Cap | 17,690,309 |

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