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Environmental Information Regulations (EIR) request

Received: 4 November 2024
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Ref: Sent by email from enquiries@theccc.org.uk
Published: www.theccc.org.uk/about/transparency

Your request:

Freedom of Information request

Dear CCC,

Enquiry on Upstream Emissions of Natural Gas

Please reply to the following queries.

What figures does the CCC use in its models of fuel supply emissions for the per unit (eg in CO2e/KWh) "upstream" emissions of natural gas supplying :-

1) gas power stations

2) hydrogen plants (ie gas reformers) ?

Have these figures been updated since the publication of the Sixth Carbon Budget Report and is there any intention to update them further before carrying out any further analysis?

Some explanation of how your figures are arrived at would also be helpful.

Background Information and comments related to the above questions

The Sixth Carbon Budget Report (Fuel Supply Report, page 24) states that the emissions saving for blue hydrogen compared to grey hydrogen plants:-

"…..depends on both achieving a 95% CO2 capture rate at the gas reformation stage, but also on upstream emissions from fossil gas production being at the bottom end of our estimated range of

15-70 gCO2e/kWh. …"

It is not entirely clear whether the figure used then was 15gCO2e/kWh or some slightly higher figure within that 15-70 range.

That range applied specifically to UK gas supplies. Recent independent studies report that these have been under-reported by the industry.

UK gas supplies will run down over time. Will UK gas emissions figures nevertheless continue to be used as a proxy for all the gas supplied?

Alternatively, if estimates will factor in an increasing proportion of imports in the UK gas supply and especially if your methodology is to use figures entirely based on LNG, which seems certain to fulfil additional UK gas demand, will only those emissions occurring within the UK be accounted for? If so, how will they be defined? For example, for LNG, will extraction and compression (into a tanker) emissions be excluded, due to the country of origin including them in their own carbon accounting ? Also, will shipping emissions be excluded until the end of 2032 and thereafter included from the start of the Sixth Carbon Budget period in 2033 (ie once international Aviation and Shipping emissions attributable to the UK start being included in Carbon Budgets)? If that last assumption is correct, will half of the import shipping emissions be included, with half allocated to the exporting country or will some other method be used to measure the "UK share"?

Please explain what UK wide energy system modelling is done to generate emissions levels, and if you use the Dynamic Despatch Model. In the case that the DDM is not used by CCC, please explain how your modelling differs from the DDM.

Your Sixth CB Methodology Report, (page 161) stated that in your modelling, gas-CCS is used as a proxy for BECCS, and unabated CCGT for hydrogen plants. Is this still the case? If not, how has it changed?

Direct replies to these questions and any further explanatory comments you believe would be helpful would be very welcome.

Best Regards,

[name redacted]

Our response:

Thank you for your request. We have handled your request under the Environmental Information Regulations 2004.

1. We do not use a single figure for upstream emissions of natural gas in our analysis. Under the Climate Change Act (2008), we are required to follow international carbon reporting practice for determining emissions, as per the UK's national emissions inventory. The guidelines for this are set through the international process by the UNFCCC/IPCC and are based on territorial emissions. We model emissions associated with domestic fuel production on a bottom-up basis in our 'fuel supply sector. Combustion emissions associated with use of natural gas are allocated to the sector where the use of fuel occurs. Emissions associated

with production of imported fuels are captured in the emission inventory of the exporting country.

2. Our analysis in the Sixth Carbon Budget advice report will be updated with the publication of our Seventh Carbon Budget advice report, on 26 February 2025.

3. The calculation in the Sixth Carbon Budget advice report for emissions savings from blue hydrogen is illustrative and provided as context. Gas emissions are based on the carbon content of the fuel, in line with territorial emissions accounting.

4. Our latest modelling of the energy system, using AFRY's BID3 model, was published in 2023 and can be found in our Delivering a reliable decarbonised power system report.

Information disclosed in response to this EIR request is releasable to the public. In keeping with the spirit and effect of the EIR and the government's Transparency Agenda, this letter and the information disclosed to you may be placed on the CCC website, together with any related information that will provide a key to its wider context. No information identifying you will be placed on the CCC website.

If you are dissatisfied with the handling of your request, you have the right to ask for an internal review. If you are not content with the outcome of the review, you may apply directly to the Information Commissioner for a decision. In keeping with our transparency policy, the information released to you will be published on www.theccc.org.uk. Please note that this publication will not include your personal data.

Kind regards,

Climate Change Committee