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Multilateral assessment
Questions and answers Iceland

Question by European Union at Tuesday, 28 February 2017

Category: Progress towards the achievement of its quantified economy-wide emission reduction target

Type: Before 28 February

Title: Impact of mitigation actions

According to the information reported in its BR2, Iceland's total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 4,337.94 and 4,313.90 kt CO₂ eq, respectively, under the WEM scenario, which represents an increase of 23.6 and 22.9 per cent, respectively, above the 1990 level.

- Can Iceland provide additional information on how its mitigation actions to-date have had an impact on emissions reductions?
- Please could Iceland provide additional information on how believes its future implementation of actions will ensure it achieves its target for 2020?

Answer by Iceland, Friday, 28 April 2017

No economic analysis has been made to evaluate the impact of mitigation actions on Iceland's emissions in a quantitative manner, compared to business-as-usual. It should be noted that the overall emissions figures are small, and a detailed economic analysis costly when seen in that context. Iceland can point out that it has undertaken a number of comparative actions as many neighbouring countries, including setting up a carbon tax, introducing the EU-ETS in relevant sectors, and reducing taxes and fees on low-carbon fuels and vehicles. These measures should have a positive effect on net emissions, and there are signals in some sectors that this is the case, even if the evidence is not easily quantifiable. Some information on this is provided below.

Regarding transport, there are signals that mitigation actions have had an impact on emissions. In 2016 there was a significant increase in the sale of plug-in hybrid cars, a quadrupling from the previous year. The take-off of sales of electric and plug-in hybrid cars has been slow since taxes and fees were lowered significantly in 2011-2012. In part, this has been because sales of new cars were slow then, but they have increased greatly now. In part, this may have been because of limited infrastructure for quick charging of cars, especially outside urban areas. There is now a rapid build-up of charging stations, partly driven by government support. It is hoped that the upward trend of sales of plug-in hybrid cars in 2016 will continue, and that sales in pure electric cars will also go up. There is also a clear sign of increase in bicycling and use of public transport. Again, it is difficult to say if this is primarily due to government actions or other factors, such as increased awareness of a healthy lifestyle. But there has been effort in constructing bicycle paths in recent years, and in schemes by workplaces to support climate-friendly transport.

There has also been a marked decrease in emissions from fisheries and fish-meal production, a significant sector in Iceland. This is perhaps primarily due to actions promoted by industry, but clearly supported in some instances by government action, such as by the

carbon tax and a fisheries system that encourages minimum fishing effort for maximum gain.

It should be noted that the bulk of the increase in emissions – both in recent years and in projections – is from heavy industry that is regulated within the EU-ETS and needs to buy emissions permits within that system. These emissions are thus firmly regulated and accounted for under the regional climate regulation in the European Economic Area and the joint fulfilment arrangement Iceland has with the European Union and its Member States under the Kyoto Protocol in 2013-2020.

It should also be noted that the government launched a special climate action plan in 2015 to supplement a climate mitigation action plan from 2010. The special plan was intended *inter alia* to strengthen mitigation actions, such as the development of charging stations for electric cars, road maps for reduced emissions in agriculture and fisheries, and increased afforestation, revegetation and wetland restoration. The government has recently announced the development of yet another mitigation action plan, due to be completed by the end of this year and intended to ensure that Iceland can meet its commitment under the Paris Agreement up to 2030.

A new government study on Iceland's mitigation potential and options was published in February 2017. The study sees considerable mitigation potential in Iceland, most notably in the LULUCF and transport sectors. The use of afforestation, revegetation and other actions under LULUCF to meet climate obligations may, however, be limited for Iceland, under EU rules on LULUCF. Transport is also the sector seen in many neighbouring countries as being one of the most difficult to achieve mitigation.

Compared to many other developed countries, Iceland can be said to have a limited amount of low-hanging fruit when it comes to cost-efficient climate change mitigation. Energy production – the main sector targeted for mitigation action in many developed countries – is almost entirely based on renewable energy in Iceland. Industrial emissions – the biggest sector – is regulated under the EU-ETS and has very limited mitigation potential, according to the above-mentioned study. Emissions per ton of produced aluminium are probably nowhere lower in any country. Emissions from livestock, a significant source, are difficult to control.

Iceland puts an emphasis on reducing emissions from mobile sources – cars and ships – and in carbon sequestration in LULUCF. Mitigation action, however, are also undergoing in all other sectors, including industry and waste. A comparative analysis of Iceland's mitigation potential and cost in relation with other developed countries is being considered. Iceland's unusual mitigation profile calls for different priorities than in many other developed countries.

In the short run Iceland faces a challenge regarding emissions development, in the effect of strong economic growth, mostly fuelled by a growth in tourism. Tourist arrivals increased

about 350% between 2010 and 2016, and further increase is projected. This will clearly make it a big challenge for Iceland to meet targets for 2020, even if the increase in the EU-ETS sector is not counted in total emissions.

In the longer run Iceland hopes to carry out a similar energy transformation from fossil fuels to renewables regarding mobile sources as has already been carried out in stationary energy production. Iceland also plans to harness its great potential in LULUCF, and gradually reduce emissions in the agriculture, waste and industry sectors. There are clear signals that mitigation actions have had an impact, and it is hoped that new action plans and mitigation actions will help this development.

Question by Japan at Tuesday, 28 February 2017

Category: Progress towards the achievement of its quantified economy-wide emission reduction target

Type: Before 28 February

Title: Large Industry Energy Programme

Can you provide details on contents and outcomes of "Large Industry Energy Programme"?

Answer by Iceland, Thursday, 27 April 2017

In Iceland, the electricity production is based 100% on renewable energy, 73% from hydro and 27% from geothermal (2015). The Icelandic energy grid is isolated with no interconnectors.

No formal strategy or programme regarding "Large Industry Energy Programme" has been set forth by Icelandic authorities.

Although not set forth formally, for almost four decades, governments in power, made efforts to make use of the renewable energy resources by attracting large scale industry to Iceland by inviting concessionary investment agreements to the companies. This has resulted in the fact that around 80% of all electricity produced in Iceland is used by power intensive industry; 3 aluminium smelters and one ferrosilicon plant. In addition licences have been granted to two silicon metal plants, which will start operation 2017 and 2018. Since 2007 and 2016 respectively, the concessionary investment agreements for two of the three aluminium smelters have been revoked and the smelters now fall under the general taxation system in Iceland.

The GHG emission from the power intensive industry is mainly from industrial processes, as the energy is 100% renewable.

The present government that came to power in January 2017 has stated that there will be no new concessionary investment agreements for the building of polluting heavy industry.

[Question by](#) China at Tuesday, 28 February 2017

[Category:](#) Progress towards the achievement of its quantified economy-wide emission reduction target

[Type:](#) Before 28 February

[Title:](#) WEM scenario projection

According to the projection results for WEM scenario, it is quite challenging for Iceland to achieve its 2020 target. What is plan for Iceland to implement additional measures to narrow the gap?

[Answer by](#) Iceland, Thursday, 27 April 2017

In 2015, a three year program was set forth with 16 different projects, financed in the years 2016, 2017 and 2018. The main projects are as follows:

Energy transition in the transport sector: The transport sector is accountable for 19% of the total emissions. As all the electricity production in Iceland is based on renewable energy, it is logical to focus on electrification of the car fleet as well as alternative fuels. Emphasis is on infrastructure such as charging stations and incentives for electric cars.

Fishing industry: The fishing industry is responsible for 10% of total emission. Emphasis is on electrification of the harbours, electrification of the fish-meal industry and alternative fuel for the ships.

Afforestation and revegetation (LULUCF): Potentials are good for removals by increased afforestation and revegetation and effort has been made to make farmers and land owners more aware of these potentials.

Green incentives and taxes: A coordinated system of green taxes needs to be established to impose normal duties on polluting activities and also create incentives to reduce emissions

and to take other countermeasures. To this end, work will continue on the taxation of vehicles and fuel. A decision has been taken to double the carbon tax on fuel as of January 1, 2018.

Reduction of food waste: Campaign run by the Environment Agency.

It is important to note, that more than 40% of Iceland's emissions come from industry which falls under the European Emission Trading Scheme (EU-ETS). In Iceland, 8 companies fall under the scheme. The system works on a "cap and trade" principle. A cap is set on the total amount of certain greenhouse gases that can be emitted by installations covered by the system. The cap is reduced over time so that total emissions fall. Within the cap, companies receive or buy emission allowances which they can trade with one another as needed. They can also buy limited amounts of international credits from emission-saving projects around the world. The limit on the total number of allowances available ensures that they have a value. After each year a company must surrender enough allowances to cover all its emissions, otherwise heavy fines are imposed. If a company reduces its emissions, it can keep the spare allowances to cover its future needs or else sell them to another company that is short of allowances.

Question by Brazil at Tuesday, 28 February 2017

Category: All emissions and removals related to its quantified economy-wide emission reduction target

Type: Before 28 February

Title: table 6(a): BR1 and BR2

Regarding table 6(a), the GHG emissions projected for 2020 are the same in BR1 and BR2. Please, explain the reasons for not updating the projections.

Answer by Iceland, Thursday, 27 April 2017

The reason for not publishing an updated table 6(a) (published in NC) in BR2, is that we are facing challenges because lack of resources and expertise.

However, we plan to be able to publish updated projection in the BR3 report, which is to be published in December 2017.

[Question by](#) Brazil at Tuesday, 28 February 2017

[Category:](#) Assumptions, conditions and methodologies related to the attainment of its quantified economy-wide emission reduction target

[Type:](#) Before 28 February

[Title:](#) CTF Table 3 - Lessons learned and barriers

Regarding “CTF Table 3 Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects”, please, inform the reasons for not reporting quantified mitigation impacts for all mitigation actions reported. What are the difficulties to do so?

[Answer by](#) Iceland, Thursday, 27 April 2017

Iceland has not been able to set forth detailed projections nor detailed mitigation impact assessment for all sector.

The main reason for not reporting on quantified mitigation impacts for all mitigation actions reported is lack of resources and expertise.

However, the plan is to start the work on projection later this year, to be published in NC and BR3, in December 2017.

[Question by](#) Thailand at Wednesday, 22 February 2017

[Category:](#) Progress towards the achievement of its quantified economy-wide emission reduction target

[Type:](#) Before 28 February

[Title:](#) Technology Transfer

In Section 5: Technology Transfer, please provide timeframe of the projects in the table (to avoid double counting), and please provide table number to this table.

[Answer by](#) Iceland, Thursday, 27 April 2017

The table in section 5 (technology transfer) does not have a timeframe. It simply lists the number of students that graduated in 2013 and 2014 and from which countries. (See

attachment, Table 5.2.).

Regarding the tables on “Overview of Iceland’s Support to Climate related projects and programmes” for the years 2013 and 2014, both tables have timeframes listed. In the attachment the two tables, have been combined into one table for clarification and to avoid double counting. (See attachment, Table 5.1).

We take note of your comment regarding the fact that no table numbers were included in the tables in chapter 5 in BR2, and we will strive to make sure that table numbers will be included in our next report, to avoid any misunderstanding.

Attachment: Technology_Transfer_Tables_Question_by_Thailand.pdf

[Question by Thailand](#) at Wednesday, 22 February 2017

Category: Assumptions, conditions and methodologies related to the attainment of its quantified economy-wide emission reduction target

Type: Before 28 February

Title: IPCC guideline

In Section 4, please provide references to support Tier 3 approach as mentioned in the BR2 “The methods used to estimate biomass are defined as Tier 3 approaches”.

[Answer by Iceland](#), Thursday, 27 April 2017

The national forest inventory makes it possible to use Tier 3 approach when estimating carbon stock and carbon stock gain through biomass and biomass changes. The NFI is a systematic plot sampling system consisting of two strata, one for natural birch woodland (NBW) with 1.5 x 3.0 km grid and another for cultivated forest (CF) with 0.5 x 1.0 km grid. Carbon stock gain of the living biomass of trees in CF is estimated based on data from direct field measurement on the sample plots of the NFI. Estimates are based on the inventory data from the first and second national forest inventory cycles of CF conducted in 2005-2014 (Snorrason 2016 & 2010). In 2015 the third inventory cycle of cultivated forest started with re-measurement of plots measured in 2010 and of new plots since 2010 on new afforestation areas. Simultaneously the second inventory cycle in NBW started in 2015 and when measurements are finished in 2019 they will be used to estimate carbon stock changes in similar way as for CF. The area estimate of NBW is built on new mapping of NBW conducted in 2010-2014 (Snorrason et.al. 2016). In meantime we use estimated changes in area and biomass between two surveys of NBW. The former was conducted in 1987-1991 and the latter is the first systematic sampling plot inventory mentioned above conducted in 2005-

2011. The mean annual changes in area and biomass stock are used as preliminary estimate of carbon stock changes. (Snorrason et.al. 2016, Snorrason et.al. 2017).

In each inventory year the internal annual growth rate of all measured currently living trees is estimated by calculating the differences between current biomass and the biomass five years ago for cultivated forest. Trees that die or are cut and removed in this 5 or 10 years period are not included so the C-stock gain estimated is not a gross gain.

References:

- Arnór Snorrason, Thorbergur Hjalti Jónsson, Björn Traustason and Ólafur Eggertsson 2017. Natural birch woodland in Iceland – changes in biomass from 1987 to 2007. [In manuscript – unpublished].
- Arnór Snorrason, Björn Traustason, Bjarki Þór Kjartansson, Lárus Heiðarsson, Rúnar Ísleifsson og Ólafur Eggertsson 2016. Náttúrulegt birki á Íslandi – Ný úttekt á útbreiðslu þess og ástandi . [The natural birch woodland in Iceland – a new assessment on distribution and state]. Náttúrufræðingurinn 86 (3–4), bls. 97–111. [In Icelandic with English summary].
- Arnór Snorrason 2016. In: Vidal, C., Alberti, I., Hernández, L. & Redmond, J. (eds.). National Forest Inventories - Assessment of Wood Availability and Use. Chapter 24: Iceland. Springer, p. 451-467. ISBN 978-3-319-44014-9.
- Arnór Snorrason 2010. National Forest Inventories reports: Iceland. In: Tomppo, E., Gschwantner, Th., Lawrence, M. & McRoberts, R.E. (eds.). National Forest Inventories - Pathways for common reporting. Springer, p. 277-289. ISBN 978-90-481-3232-4.

[Question by Thailand](#) at Wednesday, 22 February 2017

Category: Progress towards the achievement of its quantified economy-wide emission reduction target

Type: Before 28 February

Title: Accuracy of emissions estimation

In Section 4, please provide more details of sampling in “The main source of information used to estimate both area and removals/emissions of GHG regarding forest and forestry is the data sampled”. How about the accuracy of sampling.

[Answer by Iceland](#), Thursday, 27 April 2017

As mentioned in the answer to question, raised by Thailand on IPCC guidelines regarding Tier 3 approach in section 4, the systematic sampling plots of the NFI are used to estimate the biomass of trees both in the cultivated forest (CF) and in the natural birch woodland (NBW). They are also used to estimate the area of CF. The accuracy of the area estimate of CF is for the total area $\pm 4\%$ (95% confidence interval). The accuracy of the carbon stock change measurement of CF is $\pm 11\%$ (95% confidence interval). The estimate of area and

area changes in NBW are built on direct in field mapping and they are of better accuracy than the CF area. The accuracy of the carbon stock estimate of the NBW is lower than for CF as the number of plots visited and measured are just 25% of the number of CF plots. For the two surveys used preliminary to estimate the carbon stock changes in NBW the accuracy of the biomass stock estimate was in the 1989-1991 survey $\pm 24\%$ (95% confidence interval) and in the 2005-2011 survey $\pm 22\%$ (95% confidence interval).

Question by Thailand at Wednesday, 22 February 2017

Category: Progress towards the achievement of its quantified economy-wide emission reduction target

Type: Before 28 February

Title: Projection in Waste Sector

In Section 4, Iceland mentioned that “Decreased amount of landfilled waste has led to slightly decreased methane emissions since 2008”, however, Table 4.18 shows that emissions from waste sector will decrease drastically from 198 Gg-CO₂ in 2011 to 101 Gg-CO₂ in 2030. What are the main PAMs to support this projection?

Answer by Iceland, Thursday, 27 April 2017

The waste management policy is set forth in legislation, regulations and national plans for waste management. The regulation on waste management prescribes that ways to fulfill objectives of reduced organic waste destined for landfills shall be laid out in the National Plan for waste management. The share of organic household waste shall have been reduced to 75% of total waste in 2009, 50% in 2013 and 35% in 2020, with 2005 as a reference year.

Local municipalities shall develop regional waste management plans based on the objectives in the National Plan. The latest National Plan (2013 – 2024) was published in 2013.

Predicted emissions from the waste sector in 2030 are based on a projection that extends beyond existing policies and measures (when the projection was made). The assumptions made are that increased waste separation will lead to less organic material being landfilled, a new biogas plant will be commissioned in the metropolitan area, and that methane recovery will be extended to more landfills.

Question by Thailand at Wednesday, 22 February 2017

Category: All emissions and removals related to its quantified economy-wide emission reduction target

Type: Before 28 February

Title: Transparency of emission estimation

In Section 4: Projection, in Table 4.11 it is not clear that domestic and/or international emissions are included.

Answer by Iceland, Thursday, 27 April 2017

Table 4.11 shows emission from domestic road transport, aviation, and navigation.

In the next BR, it will be stated more clearly to avoid misunderstanding.

Question by Thailand at Wednesday, 22 February 2017

Category: Assumptions, conditions and methodologies related to the attainment of its quantified economy-wide emission reduction target

Type: Before 28 February

Title: Assumption

In Section 4: Projection, Table 4.1 shows oil prices of 127, 133, and 139 USD/ barrel in 2020, 2025 and 2030 respectively. Please provide the references.

Answer by Iceland, Thursday, 27 April 2017

The work on the projections was done in the autumn 2013. The reference regarding the oil prices comes from the U.S. EIA Annual Energy Outlook 2012 (see page 105) where oil prices are projected to be 126.68, 132.56 and 138.49 USD/barrel as a reference case for 2020, 2025 and 2030 respectively.

Question by Thailand at Wednesday, 22 February 2017

Category: All emissions and removals related to its quantified economy-wide emission reduction target

Type: Before 28 February

Title: Accuracy of reporting

In Section 4: Projection, please check the accuracy of reporting since Table jump from 4.3 to 4.6.

Answer by Iceland, Thursday, 27 April 2017

Thank you for pointing out this inaccuracy and apologise for any inconvenience this might have caused. We will strive to avoid such inaccuracy in our next submission.

Question by Thailand at Wednesday, 22 February 2017

Category: Progress towards the achievement of its quantified economy-wide emission reduction target

Type: Before 28 February

Title: Accuracy of reporting

In Section 3: Progress in achievement, in Table 3.1 it is not clear about the meaning of "Main Category" and "Exception Category".

Answer by Iceland, Thursday, 27 April 2017

Table 3.1.is based on Act Nr 29/1993 on excise duty for passenger cars and fuel.

As stated in the text, the tax is based on carbon dioxide emission, which has its base in the registered emissions of CO₂ of the vehicles.

It is right that it is not clear in the text, what is the distinction between "Main Category" and "Exception Category". Under the main category fall all normal vehicles, which are not listed under the exception category. Under the exception category fall many different types of "unusual" vehicles, such as cars for handicapped, ambulances, vehicles used by the rescue

forces, vehicles owned by foreign embassies, vehicles 40 years and older and machines used in the construction sector. The full exemption category is listed in the Act No 29/1993, on excise duties, Art. 3, 4 and 5, but unfortunately the text is only available in Icelandic, see: <http://www.althingi.is/lagas/nuna/1993029.html>.

Question by Thailand at Wednesday, 22 February 2017

Category: Assumptions, conditions and methodologies related to the attainment of its quantified economy-wide emission reduction target

Type: Before 28 February

Title: IPCC guideline

Did Iceland apply the 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands (Wetlands Guidelines)?

Answer by Iceland, Thursday, 27 April 2017

The 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands (Wetlands Guidelines), is applied in the Icelandic NIR since the submission 2015.

Question by Thailand at Wednesday, 22 February 2017

Category: Assumptions, conditions and methodologies related to the attainment of its quantified economy-wide emission reduction target

Type: Before 28 February

Title: IPCC guideline

In Section 1, Iceland mentioned that “The emission factors used are mainly obtained from the 2006 IPCC Guidelines, the revised 1996 IPCC Guidelines”. In general, only emission factors from 2006 IPCC GLs are necessary. Please provide emissions that need 1996 IPCC GLs.

Unfortunately, the Icelandic inventory is partly based on the 1996 IPCC GL. The main reason for this is that in some cases not only the emission factors are updated in the new guidelines, but the methodology as well. In some cases, new methodology requires different or additional data. For some sectors Iceland does not have sufficient data to update to the 2006 IPCC GL. This mainly refers to data for the waste, agriculture and transport sectors. The emission estimates have though been partly updated to the 2006 GL, and we plan to have this fully updated before the 2018 inventory submission.

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