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A compilation of questions to - and answers by - Norway
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[Question by Brazil](#) at Tuesday, 31 March 2015

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

Type: Before 31 of March

Title: Mitigation actions

Regarding Table 3, does Norway plan to estimate the impact of mitigation actions that have not being estimated (NE)? If not, what are the main reasons? If possible, give the explanation by mitigation action or by cluster/sector.

[Answer by Norway](#) at Thursday, 28 May 2015

Response to question 1 (mitigation actions):

In CTF table 3, Norway has only included new or changed policies and measures (PaMs) since Norway reported its fifth National Communication (2010). This is our understanding of the UNFCCC biennial reporting guidelines. The PaMs reported in CTF table 3 is a subset of the complete portfolio of PaMs reported in the sixth National Communication (NC6). In the NC6, we estimate that the total effect of adopted and planned PaMs is to be in the range of 12.6-15.2 million tonnes CO₂-eq. in 2010, 17.1-20.1 million tonnes CO₂-eq in 2020 and 17.8-20.4 million tonnes CO₂-eq in 2030.

For many of the PaMs in CTF table 3 the impact in terms of GHG reductions has not been estimated. There are good reasons for this. Firstly, the CTF table 3 reports on changes for many PaMs since 2010 and for many of the PaMs there are methodological difficulties in isolating the mitigation effect of a change/adjustment in a PaM. Secondly, as for the PaMs reported in the NC6, there are methodological difficulties in isolating the mitigation effect of a PaM from the effect of other PaMs or other factors that may influence on emissions.

Even though the mitigation effect has not been estimated for many of the PaMs, we believe it is useful for other Parties to see the range of PaMs that we have adopted. For the second Biennial Report (BR2), our understanding of the reporting guidelines is that we are to report on new or changed PaMs since we reported the NC6 and BR1.

[Question by](#) Canada at Tuesday, 31 March 2015

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

[Type:](#) Before 31 of March

[Title:](#) Mitigation impacts of policies and measures

Table 3 of Norway's Biennial Report lists several policies and measures, could you please expand on the estimated mitigation impacts (in Kt CO₂ eq) of these specific policies and measures?

[Answer by](#) Norway at Thursday, 28 May 2015

Response to question 2 (mitigation impacts of policies and measures):

In CTF table 3, Norway has only included new or changed policies and measures (PaMs) since Norway reported its fifth National Communication (2010). This is our understanding of the UNFCCC biennial reporting guidelines. The PaMs reported in CTF table 3 is a subset of the complete portfolio of PaMs reported in the sixth National Communication (NC6).

We understand that the question asks for more information concerning mitigation effect for those policies and measures (PaMs) for which Norway in CTF table 3 has reported quantified effect. Please find below some comments on these measures. More information is found in our sixth National Communication (NC6), also regarding other measures listed in CTF table 3 where the isolated effect of changes is not quantified.

Expansion of the CO₂ tax to include natural gas and LPG and fishing and catching. In 2010 the Norwegian CO₂ tax was expanded to include natural gas and LPG. The manufacturing industry is subject to reduced rates corresponding to the minimum rates of the Energy Tax Directive (2003/96/EC). (Some sectors are exempted from the CO₂ tax on gas.) In 2013 an exemption from the CO₂ tax on mineral for oil used for fishing and catching in inshore waters, was abolished and replaced by a low rate.

The mitigation effect of introducing a CO₂ tax on natural gas and LPG and abolishing the exemption for mineral oil used for fishing and catching is estimated to 0-50 kt CO₂-eq in 2020 and 2030, see page 65 in NC6. The estimate is inter alia based on assumptions of the price elasticity of demand. In CTF table 3 the same quantified effect is reported for the introduction of the CO₂ tax on natural, gas and LPG separately. However, taken account of the small figures and the uncertainty of the figures should read as the combined estimate of the said expansions.

The Norwegian Energy Fund, Enova. The Energy Fund is a government fund owned by the Ministry of Petroleum and Energy. The state enterprise Enova manages the Energy Fund and has been in full operation since 1 January 2002. It is a policy instrument to ensure a long-term, predictable and stable source of finance to

promote an environmentally friendly change in the consumption and production of energy, and the development of energy and climate technologies. The overall objective is enhanced security of supply and to reduce emissions of greenhouse gases. The initiative to promote energy and climate technologies is a new policy measure which was introduced in 2012, and represents a strengthening of national climate policies.

Enova reports results from the allocation of aid to projects in the form of contracted energy results, reported energy results or realised energy results. Many of the projects are of a size which entails that they are carried out over several years. The mitigation effect has been estimated to 900 kt CO₂-eq in 2020 and it is not estimated (NE) for 2030. The reported effect on national emissions from Enova's activities is the calculated reduction of annual CO₂ emissions because of the reduced consumption of fossil fuels estimated from Enova's energy results.

Increase in the requirement of bio fuels in road transport. In order to increase the use of biofuels, there is a mandatory biofuels turnover in Norway. A blending obligation was introduced in 2009, committing the economic operators to sell at least 2.5 % biofuels. Since April 2010, 3.5 % of the total yearly amount of fuel sold for road transport has to be biofuels. Table 4.7 of our sixth National Communication shows that the content of biofuels in petrol increased from 0.6% in 2010 to 1.2% in 2011. The content of biofuels in diesel decreased from 5.6% in 2010 to 5.2% in 2011. In CTF table 3, the mitigation effect since 2010 is estimated to 100 kt CO₂-eq in 2020 and 2030. The estimated effect is based on the change in the content of bio fuels in petrol and auto diesel from 2010 to 2011.

N₂O reduction, production of nitric acid. The N₂O emissions from the production of nitric acid have decreased mainly because increasingly more of the production from 2006 and onwards have been equipped with a new technology – N₂O decomposition by extension of the reactor chamber. Due to the new technology, the emission factor (IEF) for nitric acid production was reduced from 0.7 kg N₂O per tonne nitric acid in 2010 to 0.56 kg N₂O tonne nitric acid in 2011. If we assume a business as usual scenario from 2010 without the actual reduction in emissions per unit produced, then the emissions in 2020 and 2030 would have been 70 kt CO₂ equivalents higher.

Question by Brazil at Tuesday, 31 March 2015

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

Type: Before 31 of March

Title: Discrepancy in information

In Table 1, total emissions in 1990 excluding LULUCF is informed as 50,452.50 kt CO₂eq. However, in Table 6 (a), the same year is informed as 50,362.37 kt CO₂eq. In view of the note at the end of this Table "Emissions and removals reported in these

columns should be as reported in the latest GHG inventory and consistent with the emissions and removals reported in the table on GHG emissions and trends provided in this biennial report”, how Norway explain this difference? The former value is compatible with CRF submitted in 2013, version 2.1. What about the latter?

[Answer by Norway](#) at Thursday, 28 May 2015

Response to question 3 (discrepancy in information):

The value of 50,362.37 kt CO₂eq for 1990 in CTF table 6 is from the CRF submitted in April 2013, version 1.1. This value was unfortunately not updated to reflect the resubmission of the CRF in November 2013.

[Question by Brazil](#) at Tuesday, 31 March 2015

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

Type: Before 31 of March

Title: Emission reduction target

Regarding Table 6(a) "Information on updated greenhouse gas projections under a 'with measures' scenario", in which emissions are of 50,362.37 kt CO₂eq in 1990 and of 54,400 kt CO₂eq in 2020, which means an increase of 8%, which is the preferred option for Norway to reach its target of 30% reduction by 2020 compared to 1990 levels? Additional policies and measures, KP mechanisms or account for other LULUCF activities not included up to now? Please explain possible actions being taken in order to close this gap between the target and projections.

[Answer by Norway](#) at Thursday, 28 May 2015

Response to question 4 (emission reduction target):

By 2020, Norway is committed to reducing global emissions of greenhouse gases equivalent by 30 % relative to Norway's emission level in 1990. This target is operationalised through Norway's commitment under the second commitment period of the Kyoto Protocol (2013-2020), where average emissions in 2013-2020 shall not exceed 84 % of the 1990 level. Thus, compliance with the commitment under KP will also imply that the 30% target for 2020 is achieved. Norway explained the relations between the target and a quantified emissions reduction commitment for an 8 years period in its submission under the KP 8 May 2012 (see FCCC/KP/AWG/2012/MISC.1) and in the subsequent presentation to the AWG KP on 16 May (http://unfccc.int/files/meetings/ad_hoc_working_groups/kp/application/pdf/awgkp_norway_ppt.pdf).

Projections in the National Communication and Biennial Report indicated a need for net import of more than 100 million units for 2013-2020. However, emissions in the first two years of the commitment period have been lower than projected, and the need for net acquisition of Kyoto units in 2013 and 2014 respectively is about 10 Mtonnes each. New projections were presented in October 2014 (Nation Budget 2015). Projected emissions for 2020 were adjusted downwards and these new estimates suggest that the need for net acquisition could be around 90 million Kyoto units in total.

Norway intends to meet its commitments through implementation of domestic policies and measures as well as cooperating with other countries on emissions reductions through the Kyoto mechanisms, particularly Emissions Trading and the Clean Development Mechanism (CDM).

Norway is considering including more LULUCF activities under Article 3.4 besides Forest Management. The decision on such inclusion will be taken in conjunction with submission of the Initial Report for 2013-2020 under the Kyoto Protocol. However, the net fluxes of carbon/CO₂ from other activities are expected to be quite small. Owing to the cap on issuance of Removal Units from Forest Management, the net effect of article 3.3 and 3.4 activities together may be close to zero for 2013-2020 if the activities under 3.3 contribute at the same level as in the first commitment period (see FCCC/ARR/2014/NOR).

As for 2008-2012, Norway intends to use International Emissions Trading to reflect cooperation through the common emissions trading system within the European Economic Area (EU, Iceland, Liechtenstein and Norway), the European ETS.

Further, the Norwegian purchase program for Kyoto units is in the process of acquiring the necessary number of CERs to make up the balance. Currently the programme is targeting acquisitions of about 60 Mt for the period 2013-2020. The program has already contracted about 33 million CERs from vulnerable projects and 4-5 Mtonnes from new projects in expected delivery and is in the process of contracting another 22-23 Mtonnes. This volume will be adjusted pending effects of domestic policies and measures, the contribution from LULUCF, the European trading system and other factors that may influence emissions.

[Question by](#) United States of America at Tuesday, 31 March 2015

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

[Type:](#) Before 31 of March

[Title:](#) ETS Participation

Are there any significant differences between Norway's participation in the EU ETS and the participation of EU countries?

[Answer by](#) Norway at Thursday, 28 May 2015

Response to question 5 (ETS participation):

Currently, during the 2013-2020 trading period, there are no significant differences between how the European emissions trading scheme applies to Norway and the EU Member States. All relevant EU legislation has been made applicable to Norway. There have been some differences in earlier trading periods. The scheme itself is described in the sixth National Communication.

A brief overview of the EEA Agreement will be useful to understand the differences between the ETS as it applies in the EU and in the EFTA States.

The EU and the three EFTA States Iceland, Liechtenstein and Norway are parties to the Agreement on the European Economic Area (EEA Agreement) which entered into force on 1 January 1994. Through the EEA Agreement, EU legislation covering the four freedoms — the free movement of goods, services, persons and capital — is made applicable to the three EEA EFTA States. Legislation relating to the EU ETS is covered by the EEA Agreement as is deemed relevant to these four freedoms.

Legislation that has been adopted in the EU does not have effect in the EFTA States before it has been incorporated in the EEA Agreement and transposed in the EFTA States domestic legislation. Through the legal process in which relevant EU legislation is incorporated into the EEA Agreement, there is a possibility to make adaptations to the EU legislation, altering both procedure and substance, provided there is agreement between the EU and the EFTA States.

A few general adaptations have been made applicable to all EU legislation. One such adaptation is that the EU Commission and other EU institutions have not been granted jurisdiction in the EEA EFTA States. Instead, separate institutions have been set up for the EEA EFTA States. For instance the EFTA Surveillance Authority is responsible for many of the Commission's surveillance tasks, and the EFTA Court (not the EU Court) is responsible for legal proceedings involving the EEA EFTA States. Through the EEA Agreement, the Surveillance Authority and the Court are responsible for arriving at and maintaining a uniform interpretation and application of the relevant EU legislation in order to ensure equal treatment of individuals and economic operators as regards the four freedoms and the conditions of competition.

It is also possible to grant specific adaptations relating to the legislation at hand. When it comes to the EU legislation relating to the EU ETS, a number of adaptations were granted through two EEA Joint Committee Decisions, Decision No. 146/2007 incorporating the original Emission Trading Directive (2003/87/EC) and EEA Joint Committee Decision No. 152/2012 incorporating the revised Emission Trading Directive (directive 2009/29/EC) into the EEA Agreement. The first JCD relates to the 2008-2012 trading period, while the second JCD relates to the 2013-2020 trading period.

During the 2005-2007 trading period, before the ETS Directive had been incorporated in the EEA Agreement, Norway had a parallel trading scheme, for all intents and purposes a blueprint of the EU scheme, but with a narrower scope, covering some 10-15 percent of Norwegian emissions. Sectors that were covered by a domestic tax on greenhouse gas emissions were exempt from the scope of the ETS. A unilateral link was established to the EU ETS, allowing Norwegian installations could cover their emissions using EU allowances, but EU installations could not cover their emissions using Norwegian allowances.

During the 2008-2012 trading period, the only substantial adaptation related to auctioning of allowances. The EU legislation stated that at least 90 % of the total quantity of allowances had to be allocated free of charge. An adaptation was granted to the EFTA States, stating that the EFTA States "may allocate a greater percentage of its allowances against payment than any limitation established under Article 10" of the Directive. This adaptation was used by Norway to allocate approximately half the total quantity of allowances against payment. In addition, Norway decided to use the possibility in the Article 24 of the ETS Directive to unilaterally include emissions of N₂O from nitric acid production. This opt-in was effective from 1 July 2008 to 31 December 2012. As from 1 January 2013, emissions of N₂O from nitric acid production became a part of the mandatory scope of the scheme.

During the 2013-2020 trading period, only one of the adaptations in the JCD is of material interest. Joint Committee Decision No 152/2012 states that Article 10 (3) of the Emission Trading Directive – which states that half of the revenues from auctioning allowances to stationary installations should be used for specific purposes relating to climate change – does not apply to the EEA EFTA States. The reason for this adaptation is that budgetary issues fall outside the scope of the EEA Agreement.

To sum up, there are no significant differences between Norway's participation in the EU ETS and the participation of EU countries during the 2013-2020 trading period, but there were some differences during the preceding periods.

[Question by](#) United States of America at Tuesday, 31 March 2015

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

[Type:](#) Before 31 of March

[Title:](#) Planned Pathway

Norway stated in its Biennial Report that emissions in 2020 are projected to be 7.9 percent above its 1990 level. Could Norway explain, and to the extent possible, quantify, the planned pathway for meeting its target under the Convention?

[Answer by](#) Norway at Thursday, 28 May 2015

Response to question 6 (planned pathway):

By 2020, Norway is committed to reducing global emissions of greenhouse gases equivalent by 30 % relative to Norway's emission level in 1990. This target is made operational through our commitment under the second commitment period of the Kyoto Protocol for 2013-2020. The Kyoto Protocol commitment is a multi-year emissions budget and does not constitute an emissions pathway. Both domestic policies and measures and use of the Kyoto mechanisms will contribute to compliance with Norway's commitments. For further details on the relations between the target for 2020 and the Kyoto Protocol commitment, and how Norway intends to comply with the commitment, we refer to our response to question 4.

[Question by](#) Brazil at Tuesday, 31 March 2015

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

[Type:](#) Before 31 of March

[Title:](#) Correction

According to the Guidelines and to footnote (a) in Table 1 in "nor_2014_v2.0_resubmission.pdf", the column "Base year" should be filled in only by those Parties with economies in transition that use a base year different from 1990 in accordance with the relevant decisions of the Conference of the Parties. Why did Norway use this column?

[Answer by](#) Norway at Thursday, 28 May 2015

Response to question 7 (correction):

The Common Tabular Format (CTF) table 1 has, as required, been imported from the Common Reporting Format (CRF) Reporter. By importing this table from the CRF, the CTF table 1 was automatically populated for the BR CTF submission. The concerned

footnote a is equal to note 1 in the CRF table 10s5. Our understanding is that the CRF Reporter software automatically fills in the concerned column based on Norway's choice of base years.

Question by United States of America at Tuesday, 31 March 2015

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

Type: Before 31 of March

Title: ETS and Carbon Tax

Could Norway explain the interaction between the emissions trading scheme and the CO2 tax? How does Norway decide whether the CO2 tax is appropriate for covering sectors or activities already regulated under the ETS?

Answer by Norway at Thursday, 28 May 2015

Response to question 8 (ETS and carbon tax):

The polluter pays principle is a cornerstone in the policy framework on climate change. The policy should be designed to yield the greatest possible emission reductions relative to effort, and should result in emission reductions both in Norway and abroad. General policy instruments are a key part of the domestic climate policy. Cross-sectoral economic policy instruments form the basis for decentralised, cost-effective and informed actions, where the polluter pays. In sectors that are subject to general policy instruments, additional regulation should be avoided. At the same time, the possibility of employing other policy instruments in addition to emissions trading and taxes must be continued, also in these sectors. Focus is on measures that are cost-effective in light of expectations of rising carbon prices over the lifetime of the investments, and which are not necessarily triggered by current policy instruments. This applies particularly to measures that contribute to technology development and to measures that mobilise the population to earlier adoption by the population of consumer patterns that yield lower emissions

Based on this, as a general rule, the same emissions are not subject to both a CO2 tax and part of the European Emissions Trading Scheme (ETS). One important exception to this general rule is the petroleum sector, which is subject to both the European ETS and a CO2 tax with an overall carbon price which is considered reasonable. If the price of allowances in the European ETS changes over time, it provides a basis for adjusting the CO2 tax so that the overall carbon price remains at about the same level. The majority of CO2-emissions from domestic aviation are also subject to both the European ETS and a CO2-tax. As of 2014, there was a higher CO2-tax for CO2-emissions from domestic aviation that are not covered by the European ETS.

[Question by Brazil](#) at Tuesday, 31 March 2015

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

Type: Before 31 of March

Title: Negative reduction of emissions

Regarding Table 2(a) "Description of quantified economy-wide emission reduction target: base year", the emission reduction target is said to be -30%. A negative reduction might mean an increase of emissions. Therefore, the figure should be positive in order to mean a reduction.

[Answer by Norway](#) at Thursday, 28 May 2015

Response to question 9 (negative reduction of emissions):

It is correct that the number in table 2 should be 30 to reflect that Norway by 2020 is committed to reducing global emissions of greenhouse gases equivalent to 30 per cent of Norway's emissions in 1990.

[Question by Brazil](#) at Tuesday, 31 March 2015

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

Type: Before 31 of March

Title: Climate finance

Under Table 7(b), for 2011 and 2012, on provision of public financial support – contribution through bilateral, regional and other channels, numerous countries and regions are listed. However, there is a line marked "Global". What does this support refer to? Should this be referred to at Table 7(a), on provision of public financial support – through multilateral channels?

[Answer by Norway](#) at Thursday, 28 May 2015

Response to question 10 (climate finance):

It is unclear to us how this question is covered by the scope of the multilateral assessment. Anyhow, the reporting for "Global unspecified" under Table 7b) refers to global measures (where no individual countries are recipients) with other contracting parties than multilateral organizations. It includes in particular NGOs, the government sector or public-private partnerships. The amount reported is thus placed in Table 7b).

[Question by](#) United States of America at Tuesday, 31 March 2015

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

[Type:](#) Before 31 of March

[Title:](#) Expected Reductions from Policies and Measures

In its Biennial Report, Norway did not provide estimates of the mitigation impacts of most of its policies and measures. Could Norway provide rough estimates of the expected reductions from the listed policies and measures?

[Answer by](#) Norway at Thursday, 28 May 2015

Response to question 11 (Expected reductions from policies and measures):

In CTF table 3, Norway has only included new or changed policies and measures (PaMs) since Norway reported its fifth National Communication (2010). This is our understanding of the UNFCCC biennial reporting guidelines. The PaMs reported in CTF table 3 is a subset of the complete portfolio of PaMs reported in the sixth National Communication (NC6). In the NC6, we estimate that the total effect of adopted and planned PaMs is to be in the range of 12.6-15.2 million tonnes CO₂-eq. in 2010, 17.1-20.1 million tonnes CO₂-eq in 2020 and 17.8-20.4 million tonnes CO₂-eq in 2030.

Even though the mitigation effect has not been estimated for many of the PaMs CTF table 3, we believe it is useful for other Parties to see the range of PaMs that Norway has adopted.

[Question by](#) New Zealand at Monday, 30 March 2015

[Category:](#) All emissions and removals related to its quantified economy-wide emission reduction target

[Type:](#) Before 31 of March

[Title:](#) Cost of electric vehicle policies

What has been the estimated cost per tonne of emissions reductions of incentives to increase the uptake of electric vehicles in Norway?

[Answer by](#) Norway at Thursday, 28 May 2015

Response to question 12 (Cost of electric vehicle policies):

Norway provides strong user incentives for zero emission vehicles. Electric and hydrogen cars are exempt from the motor vehicle registration tax, VAT and the road usage tax. The motor vehicle registration tax is designed to stimulate purchases of

more environmentally friendly vehicles, including electric cars. In addition, electric car owners pay a reduced annual motor vehicle tax, and have benefits such as access to bus lanes, free toll passage, free ferries and free access to public parking spots. The cost per tonne CO₂ from these policies is difficult to calculate and is particularly dependent on whether you examine short-term or long-term emission reductions. In a short-term perspective the incentives are likely more costly, but their purpose is also to facilitate for cheaper emission reductions in the future by promoting technological innovation. When the external costs are taxed, the consumers have incentives to choose cars with climate- and environmental friendly technology with low emissions. As technology progresses, the incentives for zero-emission vehicles will be reduced, but the benefits from a more environmentally friendly vehicle fleet will remain.

The losses of government revenue due to the incentives targeting zero emission vehicles are significant. The Norwegian Centre for Transport research (TØI, 1385/2014) estimates that these losses were approximately 300 million Euros in 2014. The largest costs were due to VAT exemption, estimated at 140 million Euros, and exemption from registration tax, estimated at 120 million Euros. Free toll roads and reduced annual tax were estimated at 16 million Euros and 10 million Euros respectively.

With regard to access to bus lane, free parking, and free ferries, the values of these incentives have been estimated at 940 Euros, 398 Euros and 145 Euros per car per year respectively (User survey, Compett/TOI, 2014). This gives a total of 1494 Euros per car per year. Given that there were 36 000 EVs in 2014 (number of EVs exceeded 50 000 cars in april 2015) this amounts to approximately 54 million Euros.

In total, the value of the EV incentives adds up to approximately 350 million Euros for the year 2014.

Question by China at Monday, 30 March 2015

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

Type: Before 31 of March

Title: energy sector

In WM scenario, the GHG emission from energy sector will increase by 40% in 2020 compared with 1990 level, what is the strategies to control the energy-relate GHG emission in general in Norway?

Answer by Norway at Thursday, 28 May 2015

Response to question 13 (energy sector):

Energy emissions increased by 35 % from 1990 to 2011. Looking forward, energy emissions are projected to increase slightly up to 2020 and then decrease. The historic increase in energy emissions are mainly due to increased activity in oil and gas extraction, as well as increased emissions from transport, cf. table 5.1 on page 111 in our National Communication.

Policies and measures for the petroleum sector (inclusion in the European Emissions trading scheme, CO₂-taxes and other policies and measures) are described in chapter 4.3.3 in the National Communication and also elaborated on in our response to question 22 and 8. Policies and measures for the transport sector is described in chapter 4.3.5 (tax scheme, reward scheme for public transport and other policies and measures) in the National Communication.

Onshore stationary energy related GHG emissions are in general very low, due to the high hydro power share in the power mix. Energy related GHG emissions are in general covered by the European Emissions Trading System (ETS). As the total amount of allowances are reduced in the European ETS, global emissions are reduced accordingly. Emissions are however not necessarily reduced in Norway. Norway and Sweden also has a common green certificate scheme. This will increase renewable power generation in 2012-2020 by 26.4 TWh in the two countries. Furthermore, Norway has strong energy requirements in the building codes. The government is currently considering even stricter requirements (passive house) for new buildings and major renovations. In addition, the Government has stated that it will ensure the phasing out of fossil oil from all public buildings from 2018 and ban the use of fossil oil for heating in all buildings from 2020. The reduction of energy related emissions is also targeted through Enova, a public enterprise that works to drive forward the changeover to more environmentally friendly consumption and generation of energy in Norway. It can also be mentioned that all types of industry that require a permit according to the Norwegian Pollution Control Act are obliged to take measures in order to operate as energy efficient as they can.

Question by China at Monday, 30 March 2015

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

Type: Before 31 of March

Title: market mechanism

According to the TRR, Norway will use the units from market mechanism to achieve the targets. Could Norway provide more information about how those units will be used under KP system (CP2) and UNFCCC system?

Answer by Norway at Thursday, 28 May 2015

Response to question 14 (market mechanism):

The target for 2020 is made operational through Norway's commitment for 2013-2020 under the Kyoto Protocol. Both domestic policies and measures and use of the Kyoto mechanisms will contribute to compliance with Norway's commitments. Hence, Norway will make use of the flexible mechanisms under the Kyoto Protocol to achieve the target. For further details on the relations between the target for 2020 and the Kyoto Protocol commitment, and how Norway intends to comply with the commitment, we refer to our answer to question 4.

Projections in the National Communication indicated a need for net import of more than 100 million units for 2013-2020. However, emissions in the first two years of the commitment period have been lower than projected. New projections were presented in October 2014 (Nation Budget 2015). Projected emissions for 2020 were adjusted downwards and these new estimates suggest that the need for net acquisition could be around 90 million Kyoto units in total.

Question by China at Monday, 30 March 2015

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

Type: Before 31 of March

Title: comparability of the 2 targets

Could Norway clarify the differences/relationship between the 2 targets they reported, which are 30% emission reduction in 2020 compared with 1990 level and 16% emission reduction in 2013-2020 respectively?

Answer by Norway at Thursday, 28 May 2015

Response to question 15 (comparability of the 2 targets):

The target of 30% emission reduction in 2020 compared to 1990 level was set by the Government in 2007, agreed by the Parliament (Storting) and sets the overall ambition level. It was reported pursuant to the Copenhagen Accords. In 2012 this target was made operational through the legally binding commitment for 2013-2020 under the Kyoto Protocol. Further details on the relations between the target for 2020 and the Kyoto Protocol commitment, and how Norway intends to comply with the commitment, is given in the response to question 4.

Question by China at Monday, 30 March 2015

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

Type: Before 31 of March

Title: completeness of GHG emission information

Mandatory reporting information of LULUCF sector is missing as indicated by the ERT, could Norway provide more information in this regard?

Answer by Norway at Thursday, 28 May 2015

Response to question 16 (completeness of GHG emission information):

The ERT noted in the IDR 6 review report (para 107), that the projections in the NC6 did not include CO2 sequestration from LULUCF but that projected emission data for forestry and LULUCF was available in the first biennial report common tabular format (CTF) table 6(a).

(http://unfccc.int/documentation/documents/advanced_search/items/6911.php?pref=600008391#beg)

Information on the LULUCF projections was supposed to be included in the NC6, but omitted by a mistake. The ERT confirms in the review report (para 131), that during the review, Norway provided a revised table 5.1 for the NC6, which was completed with projections for LULUCF, see attached table below. This additional information was consistent with the information already available in the first biennial report. Please note that the projections has since been revised (see response to question 4).

Revised table 5.1, as provided to the ERT:

Table 5.1 GHG emissions by sector. Million tonnes CO2 equivalents and per cent change

	Million tonnes				Per cent change		
	1990	2011	2020	2030	1990-2011	1990-2020	1990-2030
Total Energy	29.5	39.8	41.2	39.5	35 %	40 %	34 %
- Electricity and Heat production	0.3	2.1	1.7 ¹	1.7	549 %	415 %	435 %
- Petroleum Refining	1.0	0.9	0.8	0.8	-10 %	-16 %	-16 %
- Oil and gas extraction	5.7	11.5	13.0	10.9	102 %	129 %	93 %
- Manufacturing industry and Construction	3.6	3.3	3.5	3.7	-6 %	-1 %	5 %
- Transport	11.1	15.2	15.9	16.6	37 %	43 %	49 %
- Other sectors	4.8	3.5	3.1	2.9	-27 %	-35 %	-40 %
- Fugitives	3.0	3.3	3.2	2.8	7 %	4 %	-7 %
Industrial Processes	14.0	7.8	8.1	7.7	-44 %	-42 %	-45 %
Agriculture	5.0	4.5	4.2	4.2	-11 %	-16 %	-15 %
Waste	1.9	1.2	0.8	0.7	-34 %	-55 %	-64 %
Total emission (excluding LULUCF)	50.4	53.4	54.4	52.2	6 %	8 %	4 %
Mainland economy (excluding LULUCF)	42.6	39.7	39.1	39.2	-7%	-8%	-8%
LULUCF	-15.3	-27.6	-22.2	-19.8	80 %	45 %	29 %
Total emission (including LULUCF)	35.0	25.8	32.2	32.3	-26 %	-8 %	-8 %
Mainland economy (including LULUCF)	27.3	12.2	16.9	19.4	-55%	-38%	-29%

¹ Due to costs and uncertainties, the development of large scale CO2 capture at Mongstad was discontinued in 2013. Projected emissions in 2020 might therefore be somewhat underestimated.

Sources: Statistics Norway, Norwegian Environment Agency, Norwegian Forest and Landscape Institute and Ministry of Finance.

[Question by China at Monday, 30 March 2015](#)

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

Type: Before 31 of March

Title: recalculatoin

The ERT pointed out that the reasons and justifications for the recalculation of the Inventory are not transparent enough, and more information about the new methodology for agriculture and the QC process are also needed. Could Norway provide more clarification on this issue?

[Answer by Norway at Thursday, 28 May 2015](#)

Response to question 17 (recalculation):

This question seems to have basis in the ARR report for the review of the inventory submitted in 2013.[1] In the ARR, the expert review team (ERT) finds that in response

to recommendations made in the previous review report, Norway undertook a large number of recalculations. In the same ARR, the ERT recommends that Norway improve the descriptions of the reasons and justifications for the recalculations in the sectoral chapters (e.g. in the LULUCF sector). In table 10.6 of our National Inventory Report (NIR) submitted in 2014, Norway summarize its implemented improvements in response to the review process. Concerning recalculations, Norway state that all recalculations implemented since last submission are described in the sectoral chapters for agriculture and Land Use, Land-Use Change and Forestry (LULUCF).

Concerning the question about more information on the methodologies used for agriculture and the QC process, this also seems to have basis in the ARR report for the review of the inventory submitted in 2013. More information is now given in the NIR about the activity data and the methodologies used in the estimations. In §62 of the ARR, the ERT recommends that Norway report in the NIR information on: (i) the proportion of feed concentrate in the rations of mature dairy cows; (ii) the carcass weight and months at slaughter of young cattle; and (iii) all parameters required to estimate the gross energy intake of sheep and lambs in the NIR. In §64 of the same ARR, the ERT recommends that Norway improve its QA/QC activities to ensure that the reported values are consistent within and between different CRF tables as well as consistent with the values reported in the NIR. In table 10.6 of our National Inventory Report (NIR) submitted in 2014, Norway summarize its implemented improvements in response to the review process. For the issues referred to in §62 and 64 in the ARR for the inventory submitted in 2013, Norway explain that the requested information is reported in NIR chapter 6.3 (tables 6.5 and 6.6) and in Annex X. In the inventory submitted in 2014 an updated methodology was used for the estimation of methane from manure management. The methodology used is described in NIR 2014. The estimations and descriptions of the nitrogen flux from manure in the Norwegian inventory have also been updated to be more in line with the IPCC Guidelines and following recommendations from the ERTs.

[1] <http://unfccc.int/resource/docs/2014/arr/nor.pdf>

Question by Switzerland at Monday, 30 March 2015

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

Type: Before 31 of March

Title: Carbon neutrality target

How will the Party's longer term target of carbon neutrality be reached in light of observed domestic emission trends? Are there limitations perceived by the Party as to the extent to which carbon neutrality can be achieved through the use of market-

based mechanisms, i.e., by compensating domestic emissions through projects abroad?

[Answer by Norway](#) at Thursday, 28 May 2015

Response to question 18 (carbon neutrality target):

Norway has reported on the 2020 target and Kyoto Protocol commitment for 2013-2020 in table 2 in the Biennial Report, and understands that this defines the scope for this part of the Multilateral Assessment. However, Norway's carbon or emission neutrality target for 2050 will be implemented through delivering global emission reductions that correspond to Norway's emissions of greenhouse gases in 2050. Details of the accounting relative to this target have not been decided yet. Although Norway's domestic emissions are expected to decline, it is foreseen that it will be necessary to make use of mechanisms to offset remaining domestic emissions in 2050.

[Question by Switzerland](#) at Monday, 30 March 2015

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

Type: Before 31 of March

Title: Use of market-based mechanisms

How will double counting be avoided by the Party when using units from market-based mechanisms for the achievement of the 2020 target?

[Answer by Norway](#) at Thursday, 28 May 2015

Response to question 19 (Use of market based mechanisms):

Explanation of the relation between the 30% target by 2020 and the commitment under the Kyoto Protocol for 2013-2020 is given in the response to question 4.

The European emissions trading system will achieve its common target for emissions for the commitment period. Any net import or export of AAUs between the Parties involved in the trading system will be consistent with this overall achievement and thus not lead to double counting of efforts.

The CDM projects are deemed additional by the CDM Executive Board. This means that the emission reductions would not have happened in the absence of the CDM and its way of channeling finance. Norway operates under the Kyoto rules in this market. If Norway uses CERs issued pertaining to emissions reductions in host countries that do have targets for relevant years, it would be up to these host countries to clarify if they are counting or not counting contributions from CDM projects to their targets.

Question by European Union at Monday, 30 March 2015

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

Type: Before 31 of March

Title: Policies and measures in LULUCF

Given the large size of Norway's forest sink in comparison with its total GHG emissions, could Norway provide estimates of historic and projected emissions and removals in LULUCF sector as well as explanations on the reasons of the growth in net removals? Has Norway evaluated the effectiveness of policies and measures in the LULUCF sector? Could the Party also provide this information?

Answer by Norway at Thursday, 28 May 2015

Response to question 20 (policies and measures in LULUCF):

The table below gives estimates of historic and projected net contribution from emissions and removals in the LULUCF sector. Forest land covers around one third of the mainland area of Norway and is the most important land-use category considered managed. The carbon stock has increased for living biomass throughout the time-series. The steady increase in living carbon stock is the result of an active forest management policy over the last 60–70 years. The combination of the policy to re-build the country after World War II and the demand for timber led to a great effort to invest in forest tree planting in new areas, mainly on the west coast of the country, and replanting after harvest on existing forest land. In the period 1955–1992 more than 60 million trees were planted annually with apex of more than 100 million annually in the 1960s. These trees are now in their most productive age and contribute to the increase in living biomass, and hence the carbon stock. Currently about 20 million trees are planted every year. At the same time, annual drain levels are much lower than the annual increments, causing an accumulation of tree biomass.

The net CO₂ sequestration is expected to decline in the future. This is due to a combination of an assumed increase in logging and aging of the Norwegian forests. Nevertheless, sequestration in forest and other land areas are projected to equal about two-fifths of the aggregate greenhouse gas emissions from Norwegian territory in 2030.

Year	LULUCF
1990	-15.3
1991	-16.5
1992	-16.4
1993	-18.2
1994	-17.1
1995	-19.8
1996	-19.4
1997	-19.0
1998	-19.9
1999	-14.9
2000	-15.0
2001	-18.6
2002	-21.2
2003	-23.2
2004	-26.7
2005	-26.8
2006	-21.7
2007	-21.7
2008	-24.5
2009	-22.2
2010	-23.6
2011	-27.6
2020	-23.8
2030	-19.8

The report "Climate Cure 2020" has evaluated the effectiveness of several measures in the Norwegian LULUCF sector. . E.g. may afforestation on 1 mill. decares increase CO2 uptake by 1.4 million tons CO2/year in 2100 with acceptable consequences for biodiversity and other environmental values. Forest fertilizing of 5000 – 10 000 hectares annually may increase CO2 uptake by 0.14-0.27 million tons CO2/year after 10 years. The cost of these measures are respectively 50 NOK and 36 NOK per ton CO2. Norway also has emissions from cultivated mires, approximately 2 million tons CO2-eqv. Norway is in 2015 starting a pilot project on restoring mires, to reduce emissions and restore environment values in these areas. Restoring abandoned cultivated mires has an estimated cost of 168 NOK/ton CO2. These examples show that Norway has evaluated the effectiveness of policies and measures in the LULUCF sector.

[Question by](#) European Union at Monday, 30 March 2015

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

[Type:](#) Before 31 of March

[Title:](#) Projections of LULUCF

Projections reported in NC6 do not include CO₂ sequestration from LULUCF, but projected emission data for forestry and LULUCF is available in the biennial report in CTF table 6(a). Could Norway provide further information on projected emissions for LULUCF including the methods used for the estimation?

[Answer by](#) Norway at Thursday, 28 May 2015

Response to question 21 (projections of LULUCF):

We refer to our response to question 16. Total net removals from the LULUCF sector was estimated to -27.6 million tonnes CO₂-equivalents in 2011. The CO₂ sequestration is expected to decline to -23.8 million tonnes CO₂-equivalents in 2020 and -19.8 million tonnes CO₂-equivalents in 2030. This is due to a combination of an assumed increase in logging and aging of the Norwegian forests.

The projections are done by the Norwegian Forest and Landscape Institute (NFI). They use the method described in Antón-Fernández and Astrup (2012) for projections of growth in biomass and felling in the land use category forest land remaining forest land. While the soil model Yasso is used for projections of carbon in soil and dead organic materials, the projections for carbon stock changes in other land use categories than forest land are based on the historic trend.

The model used for the estimation projections for forest management was developed to be 1) in accordance with the stock change method employed in the Norwegian LULUCF reporting, 2) transparent and simple, and 3) to utilize the NFI data employed in the current reporting as foundation for the driving function.

Living biomass of each NFI plot is forecasted individually. Each year, 1/5 of the NFI plots (corresponding to the NFI plots that are scheduled for re-measurement) are forecasted.

Finally, the stock change between moving 5-year averages are computed and assigned to the appropriate year. As in the historic reporting, dead organic and soil carbon are modeled with the Yasso model (Liski et al 2005) utilizing the forecasted litter inputs from the NFI plots.

The forecasting of an individual sample plot consists of two sub-models: (1) the biomass increment sub-model and (2) the probability of final felling and harvest sub-model. See more details on the models and uncertainty estimates in attached pdf file.

(Attachment: [Norway to EU Projections of LULUCF.pdf](#))

Question by European Union at Monday, 30 March 2015

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

Type: Before 31 of March

Title: Effect of policies and measures

Offshore petroleum sector is regulated in Norway through a subset of policies and measures (CO2 tax, EU ETS, the Petroleum Act, the Pollution Control Act, energy efficiency measures, CCS, combined heat and power, and power from the onshore electrical grid). Could Norway explain which of these underlying measures have the most significant effect/impact?

Answer by Norway at Thursday, 28 May 2015

Response to question 22 (effect of policies and measures):

It is difficult to estimate the effect of a policy measure, and even more so the isolated effect of a measure that work in combination with others. The CO2 tax on petroleum activities has so far been the most important instrument for reducing emissions in the petroleum sector, and has had a significant impact. The CO2 tax and regulations under the Pollution Control Act have resulted in improvements in technology and emission reducing measures, since the introduction of the CO2 tax in 1991. Several energy conservation measures have been carried out. Other important mitigation actions are the CO2 storage projects at Sleipner and Snøhvit, and the replacement of gas turbines with electricity from the onshore power grid. Power supply from the mainland gives lower emissions compared with using offshore gas turbines.

As of 1 January 2008, the petroleum activities are subject to both a CO2 tax and the duty to surrender emissions allowances under the European ETS. With an allowance price in the European ETS of approximately NOK 50 per tonne of CO2, and a CO2 tax for the petroleum activities at a fixed price of about NOK 420, the total charge for greenhouse gas emissions in the petroleum activities will be about NOK 470 per tonne of CO2. If the allowance charges in the European ETS increases over time, it will provide a basis for reducing the CO2 tax so that the overall carbon price remains at about the same level.

[Question by](#) European Union at Monday, 30 March 2015

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

[Type:](#) Before 31 of March

[Title:](#) Projections

Could Norway provide more information on why the NC6 reports a stabilization of emissions between 2011 and 2020 and between 2020 and 2030, while projections are showing fluctuating trends for oil and gas extraction, transport, industrial processes and LULUCF?

[Answer by](#) Norway at Thursday, 28 May 2015

Response to question 23 (projections):

In the NC6 total emissions are projected to increase slightly from 53.4 million tonnes CO₂-eq. in 2011 to 54.5 million tonnes in 2020. From 2020 to 2030 total emissions are projected to fall by 4 % to 52.2 million tonnes CO₂-eq. The decrease in emissions from 2020 is mainly due to falling production of oil and gas. On the other hand, emissions from transport are projected to increase some. High population growth and high economic growth are important drivers for transport. On the other hand, the strong economic incentives and technological improvements will ensure that the emission intensity will continue to decrease. Emissions from industrial processes are projected at the same and level in 2030 as in 2011. Since 1990, emissions in these sectors have been reduced by more than 40 %, due to lower emissions of other gases than CO₂. Looking ahead, industrial activity is projected to increase while emissions do not. The emission intensity is projected to continue to decline. Including LULUCF, emissions are projected to increase from 25.8 million tonnes CO₂-eq. in 2011 to just above 32 million tonnes CO₂-eq. in 2020 and 2030. Annual harvest rate is projected to increase due to age class effects maturity of forest types on accessible forest land with high economic value, and sequestration is projected to decrease.

[Question by](#) European Union at Wednesday, 25 March 2015

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

[Type:](#) Before 31 of March

[Title:](#) Use of market mechanisms

Does Norway intend to use market mechanisms to achieve the targets? If yes, to which extent and what is the associated effect on the emission level projections for the period up to 2020? Is use of international credits foreseen and if so, to what extent?

[Answer by Norway](#) at Thursday, 28 May 2015

Response to question 24 (use of market mechanisms):

As was explained in our response to question 4, the target of 30% reduction by 2020 is operationalised through Norway's commitment for 2013-2020 under the Kyoto Protocol. Norway intends to cooperate with other Parties through use of the Kyoto mechanisms under KP to achieve the target. Projections in the National Communication indicated a need for net acquisition of more than 100 million units for 2013-2020. However, emissions in the first two years of the commitment period have been lower than projected. New projections were presented in October 2014 (Nation Budget 2015). Projected emissions for 2020 were adjusted downwards and these new estimates suggest that the need for net acquisitions could be around 90 million Kyoto units in total.

As in the commitment period for 2008-2012, use of International Emission Trading to reflect flows of units under the European ETS, is expected to give a net acquisition of AAUs and CERs/ERUs.

Currently the programme is targeting acquisitions of about 60 Mt for the period 2013-2020. The program has already contracted about 33 million CERs from vulnerable projects and 4-5 Mtonnes from new projects in expected delivery and is in the process of contracting another 22-23 Mtonnes. This volume will be adjusted pending effects of domestic policies and measures, LULUCF and the contribution from the trading system and other factors that may influence emissions.

[Question by European Union](#) at Wednesday, 25 March 2015

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

Type: Before 31 of March

Title: Decoupling of economic growth from GHG emissions

To what extent is economic growth decoupled from GHG emissions?
What have been the main effects of the existing policies and measures on the emission trends? What have been the main deviations from expected results and what in your view has caused this?

[Answer by Norway](#) at Thursday, 28 May 2015

Response to question 25 (decoupling of economic growth from GHG emissions):

On de-coupling economic growth from GHG emissions:

In chapter 2.4 of our sixth National Communication (NC6), we briefly describe on pages 30-31 the emission intensity for Norway. Despite strong economic growth and immigration, Norway's greenhouse gas emissions have decreased in recent years. The emission intensity fell by 2.3 % annually from 1990 to 2012 (see Figure 2.14 in the NatCom 6). An even more marked decline has occurred in the mainland economy (excluding offshore activities), where emissions per produced unit have dropped by 3.1 % annually. Greenhouse gas emissions relative to GDP normally decline as scarce resources are utilized more efficiently. Higher energy costs, for example as a result of taxes or quotas on emissions, reinforce this trend. Norway introduced a CO2 tax as early as 1991. This tax has subsequently been supplemented by the participation of Norwegian businesses in the EU's emissions trading system. As from 2013, more than 80 % of all greenhouse gas emissions in Norway are subject to economic instruments. The use of economic instruments has contributed to the significant decline in emission intensity.

For further information concerning emission intensities, please see Statistics Norway's web-pages:

<http://www.ssb.no/en/natur-og-miljo/statistikker/nrmiljo>

On the main effects of the existing policies and measures on the emission trends:

Table 5.5 in our NC6 summarizes the mitigation effects of the policies and measures that have been implemented in Norway. In the NC6, we estimate that the total effect to be in the range of 12.6-15.2 million tonnes CO₂-eq. in 2010, 17.1-20.1 million tonnes CO₂-eq in 2020 and 17.8-20.4 million tonnes CO₂-eq in 2030. Both cross-sectoral policies and PaMs directed at specific sectors have had a mitigation effect on the greenhouse gas (GHG) emissions. The estimated mitigation effects are high for the petroleum activities and industry. But also transport, other energy use and waste have seen strong effects of PaMs. Figure 5.3 in the NC6 shows that historical and projected emissions of GHG are substantially lower than for the estimated GHG emissions without PaMs.

On the main deviations from expected results and what in our view has caused this:

Almost all the policy measures are introduced to reduce emissions, but rarely in order to obtain a specific quantified mitigation result from that particular measure. In principle the carbon price should be equal across sectors independently of the measure's (expected) effect on emissions. A uniform carbon price would lead to cost efficient reductions in emissions (when carbon leakages are not taken into account). In reality, the measures introduced are a result of a range of policy considerations.

Question by European Union at Wednesday, 25 March 2015

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

Type: Before 31 of March

Title: Estimation of LULUCF emissions and removals

How does Norway estimate its LULUCF emissions and removals in its emission levels' projections over the period? What are the methodological approaches used and how do they impact on the assessment of the progress to the QEWERT?

Answer by Norway at Thursday, 28 May 2015

With respect to the very last part of the question, Norway currently expects very limited, if any, contribution from LULUCF to be accounted for towards the target for 2020 as operationalized through the commitment for 2013-2020 under the Kyoto Protocol (see question 4). This is despite the major net sequestration that takes place in Norwegian forests due to forest management (see ia. question 21). Both the 2020 target and the commitment for 2013-2020 assume accounting for LULUCF activities under Kyoto Protocol rules for Article 3.3 and 3.4. The estimates for such contribution was revised from about 3Mt at the time the 2020 target was set (2007) to 2 Mt when the Kyoto commitment was made (2012). Further revisions in methodology and current activity levels may imply that the net contribution under Kyoto rules may be close to zero for 2013-2020.

The projections of LULUCF emissions and removals are done by the Norwegian Forest and Landscape Institute. They use the method described in Antón-Fernández and Astrup (2012) for projections of growth in biomass and felling in the land use category forest land remaining forest land. While the soil model Yasso is used for projections of carbon in soil and dead organic materials. The projections for carbon stock changes in other land use categories than forest land are based on the historic trend.

The model used for the estimation projections for forest management was developed to be 1) in accordance with the stock change method employed in the Norwegian LULUCF reporting, 2) transparent and simple, and 3) to utilize the NFI data employed in the current reporting as foundation for the driving function.

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Finally, the stock change between moving 5-year averages are computed and assigned to the appropriate year. As in the historic reporting, dead organic and soil

carbon are modeled with the Yasso model (Liski et al 2005) utilizing the forecasted litter inputs from the NFI plots.

The forecasting of an individual sample plot consists of two sub-models: (1) the biomass increment sub-model and (2) the probability of final felling and harvest sub-model. See more details on the models and uncertainty estimates in the pdf file attached to our response to question 21.
