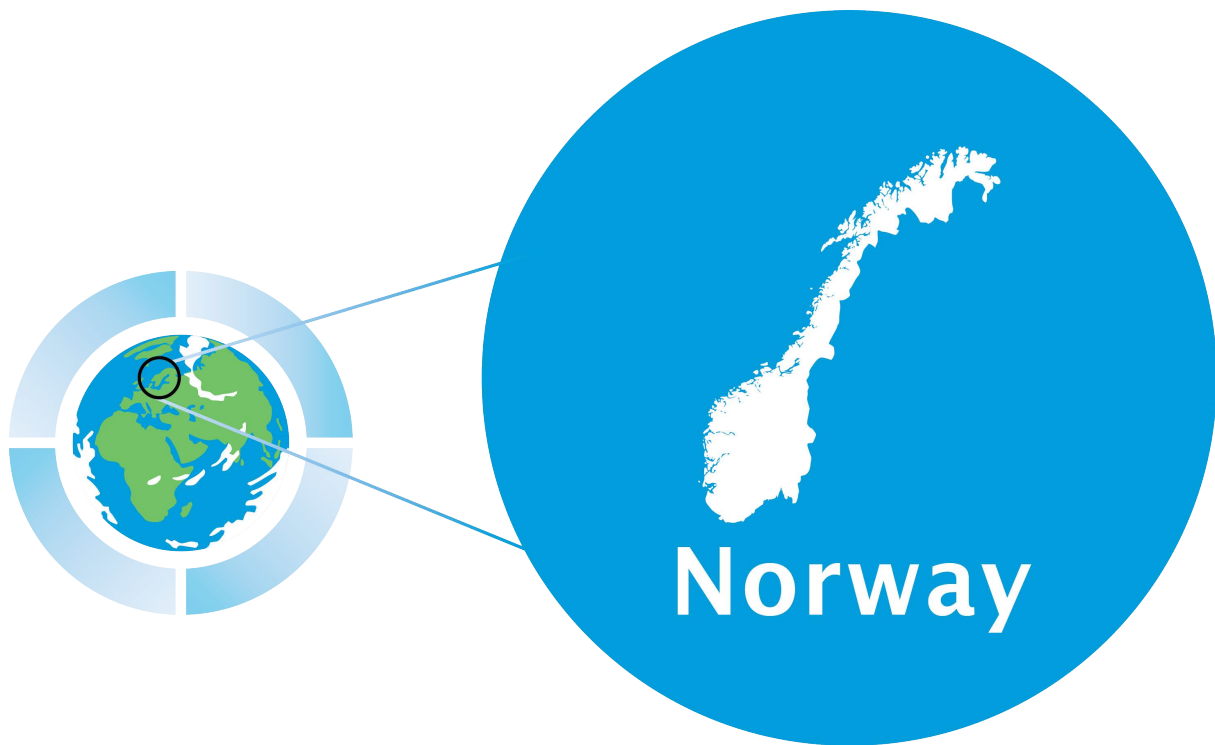




# NORWAY: AN EMISSIONS TRADING CASE STUDY



# Norway

## The World's Carbon Markets: A Case Study Guide to Emissions Trading

Last Updated: May 2015

Norway Emissions Trading: EU ETS Phase III	
Target 2020	30%-40% reduction below 1990 levels
Overall EU ETS Cap 2015	1,9 million tCO <sub>2</sub> e
EU ETS Carbon Price (av)	€5.88 (2014)
Greenhouse Gases covered	Carbon Dioxide (CO <sub>2</sub> ), Nitrous Oxide (N <sub>2</sub> O), Perfluorocarbons (PFCs)
Number of Entities Covered	273 (approx)
Sectors Covered	Power and heat generation, industrial processes: oil refineries, coke ovens, iron and steel plants. Production of cement, glass, lime. Bricks, ceramics, pulp, paper and board. Commercial aviation. CCS instalations, production of petrochemicals, ammonia, non-ferrous metals, gypsum and, aluminium, nitric, adipic and glycolic acid.
Threshold	Thresholds are sector specific
% Total emissions covered	50%
Compliance tools & Flexibility Mechanisms	Offsets, free allowances, banking, Market Stability Reserve (proposed)

**Table 1: Program Overview**

## Brief History and Key Dates

Year	Event
2001	Norway releases <a href="#">White Paper</a> on ETS implementation
2005	Phase I of the Norwegian ETS begins
2007	Norway ETS amended to link with EU ETS
2008	EU ETS and Norwegian ETS <a href="#">officially link</a>

**Table 2: Key Dates**

Norway has put in place climate change policies since the 1980s. The country’s current climate policy framework is rooted in the United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol (KP) objectives. Norway’s initial KP pledge was to reduce its greenhouse gas (GHG) emissions to no more than 1% above its 1990 levels by 2008-12.<sup>1</sup> In 2012, Norway’s total GHG emissions were 52.7 million tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e),<sup>2</sup> which is 3.5% higher than its intended target under the KP. Norway still intends to meet its emission reduction target by purchasing emission allowances through the European Union (EU) emissions trading system (ETS). With net CO<sub>2</sub> removal from the LULUCF sector at 26.7 million tCO<sub>2</sub>, Norway’s net GHG emissions, including all sources and sinks, was 26 million tCO<sub>2</sub>e in 2012.<sup>3</sup> In June 2014, Norway was the first member of the Organisation for Economic Co-operation and Development (OECD) to ratify the second period of the Kyoto Protocol.

At present, Norwegian GHG mitigation policies include a CO<sub>2</sub> tax, the Pollution Control Act, the Petroleum Act, and the Greenhouse Gas Emissions Trading Act (GGETA). The GGETA outlines the country’s emissions trading system (ETS) which became active on January 1 2005. These measures combined cover more than 70% of Norwegian domestic GHGs.<sup>4</sup> Following the expansion of the system in 2013, about 80% of Norwegian domestic emissions are subject to mandatory allowances or a CO<sub>2</sub> tax.<sup>5</sup> Momentum for emissions trading in Norway dates back to 2000-01 when the Norwegian government’s white paper No.54 *Norwegian Climate Policy* stated that an ETS would be a central measure towards achieving Norway’s Kyoto Protocol commitment.<sup>6</sup> According to the GGETA, “the purpose of this Act is to limit emissions of greenhouse gases in a cost-effective manner.”<sup>7</sup> The most recent White Paper discusses Norway’s commitment for the period up to and after 2020, suggesting a minimum 40% reduction in GHG emissions by 2030 relative to 1990 levels.<sup>8</sup>

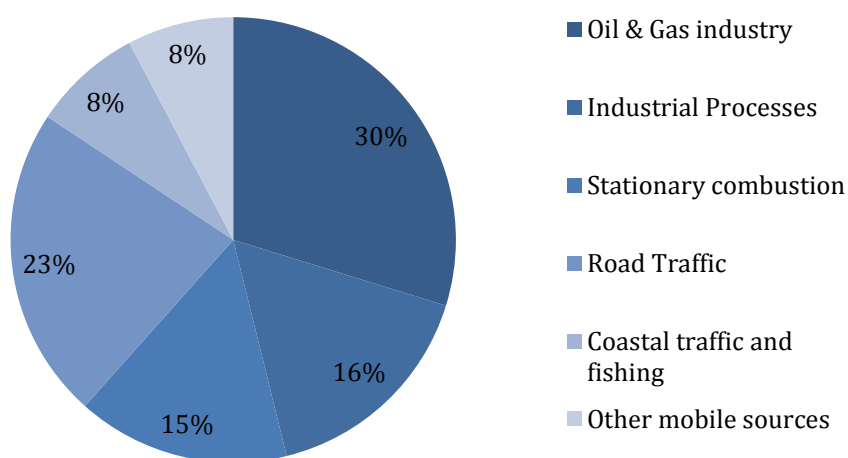
From the start, the Norwegian ETS was designed to be compatible with the EU ETS, and many of the features of the two programs are similar. Like the EU ETS, the Norwegian ETS is split into three phases: Phase I (2005-07), Phase II (2008-12), and Phase III (2013-20). The Norwegian ETS was amended in June 2007 and February 2009 to bring its program features in line with Directive 2003/87/EC and thereby facilitate compatibility with the EU ETS during the Kyoto commitment period (Phase II, 2008-12). The two programs officially linked at the beginning of Phase II, and were fully harmonized by the start of Phase III.<sup>9</sup> For perspective, the EU ETS cap for 2008-12 is 2,083 million tCO<sub>2</sub>e/year<sup>10</sup> and the Norwegian cap in the same period is 15 million tCO<sub>2</sub>e/year;<sup>11</sup> so, the EU ETS covers almost 140 times as many emissions as does the Norwegian ETS. The link with the EU’s cap and trade system for the period spanning 2013–20 means Norway and the EU would collectively reduce their emissions by roughly 11 million tCO<sub>2</sub> by 2020.<sup>12</sup>

## Summary of Key Policy Features

**CAP/TARGET:** In **Phase I** of the Norwegian ETS, the **cap** for covered entities was 6.57 million tCO<sub>2</sub>e/year.<sup>13</sup> More sectors were included in **Phase II** and the cap for covered entities became 15 million tCO<sub>2</sub>e/year, 17% below 2005 levels (18 million tCO<sub>2</sub>e) and 30% below projected 2010 levels (21 million tCO<sub>2</sub>e).<sup>14</sup> This annual emissions limit implies that the Norwegian ETS was designed to contribute approximately two-thirds of the emissions reductions required for Norway to achieve its Kyoto pledge.<sup>15</sup> As stated above, Norway's **Kyoto Protocol commitment** was to reduce emissions to **1% above 1990 levels for 2008-2012**; an ambition that was later bolstered by a voluntary pledge to reduce emissions to 9% below 1990 levels for 2008-2012.<sup>16</sup> By **2020**, Norway aims, through its **Copenhagen Accord pledge**, to reduce its GHG emissions by **30% relative to 1990 levels**, and by 40% if there is an international agreement.<sup>17</sup> As a result, Norway plans to reduce its GHG emissions by 15-17 million tCO<sub>2</sub>e relative to business-as-usual (BAU) by 2020, two-thirds of these cuts are to take place domestically.

In its Intended Nationally Determined Contribution (iNDC) submission to the 2015 Agreement, Norway pledged to reduce GHG emissions by at least 40% by 2030 relative to 1990 levels.<sup>18</sup> This reduction target will be fulfilled through developing an emissions budget which will cover the years 2021-2030. With an emissions reduction target that is equally ambitious to the EU's, Norway intends on joining the EU 2030 framework for climate policies so the two systems can collectively fulfill their climate targets. About 45% of the EU's emissions are covered by the EU ETS which is expected to reduce total emissions from covered sectors 43% by 2030 relative to 2005 levels. Sectors that fall outside of the EU ETS scope have a target to reduce emissions by 30% relative to 2005 levels. Almost half of Norway's emissions are covered by the EU ETS, obligations for sectors not included will be determined by the EU and distributed among EU Member States (based on GDP).

**SCOPE & COVERAGE:** CO<sub>2</sub> emissions constitute the largest portion of Norway's GHG emissions (84%, or 44.1 million tCO<sub>2</sub>e, of total GHG emissions in 2012). The largest source of CO<sub>2</sub> emissions in Norway is in oil and gas extraction, which emits 30% (7.2 million tCO<sub>2</sub>) of the country's total CO<sub>2</sub> emissions.<sup>19</sup>



**Figure 1: Distribution of CO<sub>2</sub> emissions by sector, 2014**

Source: Norwegian Environment Agency, 2014. Available at: [unfccc.int](http://unfccc.int)

In **Phase I**, the Norwegian ETS did not cover any sectors that were subject to the country's CO<sub>2</sub> tax (see the "Complementary and Supplementary Measures" section for information about Norway's CO<sub>2</sub> tax). Therefore, the ETS

only covered **51 entities and 6.1 million tCO<sub>2</sub>e**, which equates to **11% of total 2005 GHG emissions**.<sup>20</sup> As part of June 2007 amendments, sectors that were subject to the CO<sub>2</sub> tax were added to the Norwegian ETS in order to improve its compatibility with the EU ETS. As a result, beginning in **Phase II** the Norwegian ETS covered **more than 100 entities and 40% of the country's projected GHG emissions**.<sup>21</sup>

The Norwegian ETS applies to the following energy and industrial **sectors**: energy production; refining of mineral oil; coke production; production and processing of iron and steel, including roasting and sintering of iron ore; production of cement, lime, glass, glass fibre, and ceramic products; and production of paper, board, and pulp from timber or other fibrous materials. The transport sector is not included under the ETS, nor is combustion from biomass, hazardous waste, or municipal waste.<sup>22</sup> Close to 80% of all covered GHG emissions in Norway result from fossil fuel combustion. Petroleum combustion—oil and gas extraction, gas processing plants, and the petrochemical industry—was added to the Norwegian ETS in 2008 (as a result of the 2007 amendments mentioned above) and is now responsible for 60% of all emissions covered. Offshore installations and the wood processing industry were also added in Phase II (also due to the 2007 amendments).<sup>23</sup>

CO<sub>2</sub> was the only **GHG** covered by the Norwegian ETS in Phase I. In Phase II, nitrous oxide (N<sub>2</sub>O) was added and Norway annually emits 2 million tCO<sub>2</sub>e of N<sub>2</sub>O, which amounting to 4% of the country's GHG emissions. Non-CO<sub>2</sub> emissions from aluminum and ferroalloys may be covered in Phase III.<sup>24</sup>

**AUCTION OVERVIEW:** In **Phase II**, allowances corresponding to 7.4 million tCO<sub>2</sub>e/year (**almost 50%** of the 15 million tCO<sub>2</sub>e/year total cap) have been sold at auctions or through other market mechanisms.<sup>25</sup> Beginning in **Phase III**, entities will be required to obtain **100%** of emissions allowances via auctions or secondary markets.<sup>26</sup>

**ALLOWANCE DISTRIBUTION:** In **Phase I**, 95% of allowances were **freely distributed** while in **Phase II**, free distribution was lowered to 39%.<sup>i</sup> However, certain sectors, such as offshore oil and gas production, which comprise 64% of all Phase II capped emissions, received no free allocation. By contrast, land-based industries received free allowances corresponding to 92% of annual average emissions from the period 1998-2001; 100% of annual average 1998-2001 process emissions were covered by allowances that were freely allocated, and 87% of energy-related emissions were covered via free distribution. It is estimated that 5.8 million tCO<sub>2</sub>e/year was freely allocated during Phase II. Approximately 50% of allowances for N<sub>2</sub>O emissions from industrial processes—estimated to be 0.75 million tCO<sub>2</sub>e/year—were distributed freely based on 1998-2001 average annual emissions.<sup>ii</sup> Entities eligible for free allocation received approximately 80-83% of expected emissions free of charge.<sup>27</sup> The Pollution Control Authorities, the governing body that is also in charge of issuing allowances, made these decisions about free allocation.<sup>28</sup> According to the original ETS Act, no land-based industries that were established after 2001 would receive any free allowances. A later amendment stipulated that industries established prior to the beginning of 2008 could receive free allowances.<sup>29</sup> During Phase III, free allocation will be determined based on an industry benchmark of GHG performance, with sector specific provisions for manufacturing industries and those sectors facing international competition.<sup>30</sup>

In order to link with the EU ETS, Norway was required to submit a **National Allocation Plan (NAP)** for Phase II. The NAP set the framework for allowance allocation and had to be approved by the European Free Trade Association (EFTA) Surveillance Authority (ESA) before Norwegian entities were officially allowed to transfer allowances from their accounts to accounts in the EU ETS.<sup>31</sup>

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<sup>i</sup> Of the 15 MtCO<sub>2</sub>e cap, approximately 7.4 MtCO<sub>2</sub>e of allowances are auctioned, 5.8 MtCO<sub>2</sub>e are distributed freely, and 1.8 MtCO<sub>2</sub>e are held in a reserve.

<sup>ii</sup> Installations that qualify for free allocation receive allowances corresponding to 354 tCO<sub>2</sub>e per GWh of electricity and 180 tCO<sub>2</sub>e per GWh of heat. This allocation formula is subject to a reduction factor of 0.85.

Because allowance distribution is determined by a 1998-2001 base period, entities that took emissions reduction action after this base period but before Phase I benefitted, receiving more free allowances, based on emissions levels in previous years rather than on their current-year emissions.<sup>32</sup>

**FLEXIBILITY PROVISIONS:** The Norwegian ETS and EU ETS have similar designs, and these similarities manifest themselves in many of their flexibility guidelines. **Banking** of allowances was not allowed between Phase I and Phase II, but unlimited banking was permitted within Phase I and within and between Phase II and Phase III. There is effectively year-ahead **borrowing** within trading periods, but no further borrowing is allowed (i.e. borrowing is not allowed between phases).<sup>33</sup>

Regarding **offsets**, up to 3 million tCO<sub>2e</sub>/year, or **20% of the annual total quantity of allowances**, may derive from Certified Emission Reductions (**CERs**) and Emission Reduction Units (**ERUs**) in Phase II. The maximum quantity of CERs and ERUs that an individual entity is allowed to submit corresponds to **13% of emissions from the previous year**, with the resulting cumulative quantity of CERs and ERUs from all covered entities being less than 3 million tCO<sub>2e</sub>. This ceiling may be increased/decreased if usage of CERs and ERUs in early years is less/greater than expected in absolute terms. As is the case in the EU ETS, offsets from nuclear activity, carbon sinks, and large-scale hydro power plants are not permitted within the Norwegian ETS.<sup>34</sup> In addition, in May 2013, Norway committed to stop buying offsets, for its Kyoto target compliance, generated by wind and hydro projects, opting instead to purchase offsets from systems at risk of folding due to low carbon prices.<sup>35</sup> In September 2013, the Norwegian government agreed to extend the purchase of offset credits into the second commitment period of the Kyoto Protocol (2013-20) so long as the quantity of international offsets does not exceed the allowed amount for compliance. The government and the Nordic Environment Finance Corporation (NEFCO) signed a contract to procure up to 30 million credits from UN-approved projects that are in danger of cancellation due to low carbon prices.<sup>36</sup>

In January 2015, the Ministry of the Environment released the results of the first Call for Proposals (CfP1) for the Norwegian Carbon Procurement Facility (NorCap) that closed in January 2014. A total of 18.86 million CERs have been contracted from ten projects or bundles of projects at an average price of €2.19 per unit.<sup>37</sup> The contracted projects were selected from a total of 232 project proposals submitted. The key criterion for the selection was vulnerability of the project not taking place without carbon finance and cost effectiveness. A second call, CfP2, was launched as a joint call with the Nordic Environment Finance Corporation (NEFCO) Carbon Fund (NeCF) in September 2014, and closed for submissions on 5 December 2014.<sup>38</sup>

When the **EU ETS expanded to include Norway**, Iceland, and Liechtenstein on 26 October 2007, it “highlighted that for nations or regions to join the EU’s program, their emissions trading systems must be mandatory, set absolute limits on emissions, have robust registry systems, and have strict monitoring and compliance measures in place.”<sup>39</sup> The Norwegian ETS was designed to be compatible with the EU ETS, so many of the features of the two programs are similar.<sup>iii</sup> As mentioned earlier, the Norwegian ETS was amended in June 2007 and February 2009 to bring its features in line with Directive 2003/87/EC and thereby facilitate compatibility with the EU ETS during the Kyoto commitment period (Phase II, 2008-2012). The two programs officially linked in Phase II, and they are fully harmonised in Phase III.<sup>40</sup>

In Phase I, the Norwegian ETS participated in a one-way **linkage** with the EU ETS; Norwegian entities could purchase EU allowances for compliance, but EU entities could not purchase Norwegian allowances.<sup>41</sup> A bilateral linkage with the

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<sup>iii</sup> The Norwegian ETS is designed in a similar way to the EU ETS, and many of the flexibility guidelines for the two programmes are the same. Banking was not allowed between Phase I and Phase II, but unlimited allowances were permitted to carry over between Phase II and Phase III, and between years in Phase I. Borrowing is not technically allowed, but there is effectively year-ahead borrowing within trading periods. As is the case with the EU ETS, offsets from nuclear activity, sinks, and large-scale hydro power plants are not permitted within the Norwegian ETS. Failure to perform other mandatory duties also results in installation fines. For Phase II, the fine for excess emissions is €100/tCO<sub>2e</sub>. In addition, the names of installations that fail to comply with their obligations are published as a shaming mechanism, and the following year the installation must submit allowances equivalent to the deficit in the previous year, on top of the initial cap. In Phase I, this fine was €40/tCO<sub>2e</sub>.

EU ETS was established in early 2009 when Norway's revised national allocation plan, a document it was required to craft as a member of the EU ETS,<sup>iv</sup> was accepted by the European Commission. Since then, necessary amendments have been made to the GGETA, and the Norwegian ETS has been linked with a few mutually accepted adaptations. For Phase II of the EU ETS, auctions are capped at 10% of overall allowances; however, in the Norwegian ETS during the same phase almost 50% of allowance distribution is auctioned.<sup>42</sup> In addition, Norway has kept the right to withdraw from the Kyoto Protocol and/or buy allowances to comply with its Kyoto commitment.<sup>43</sup> If Norway is at risk of falling short of its strengthened Kyoto commitment of 9% below 1990 levels for 2008-12 through domestic reductions, the government also has the option to purchase Kyoto-eligible units.<sup>44</sup>

The 2005 GGETA establishes an **allowance set-aside** that is reserved for new gas fired power plants that use carbon capture and storage (CCS) technology, as well as for licensed high-efficiency combined heat and power plants. The total size of the allowance set-aside for Phase II is 9million tCO<sub>2</sub>e, or 1.8million tCO<sub>2</sub>e/year.<sup>45</sup> In a later amendment, the allowance set-aside for new gas fired power plants that use CCS was removed from the system. Further, new entrants—those entering the system after January 1, 2008—cannot receive free allowances from the allowance set-aside, unless they are “highly efficient combined heat [or] power plants.”<sup>46</sup>

**MARKET REGULATION & OVERSIGHT:** As enumerated in the GGETA, the Norwegian Emissions Trading **Registry** “shall contain information on the allocation, issue, holding, transfer, surrender and cancellation of allowances.” Any entity or individual is allowed to open an account within the Registry and account holders may transfer allowances to other account holders.<sup>47</sup>

By March 1 each year, covered entities must **report** their emissions for the previous year to the Pollution Control Authorities who **verify** these submitted reports.<sup>48</sup> By 1 May each year, entities covered by the ETS must submit allowances corresponding to their emissions from the previous calendar year. Registry information is available to public authorities.<sup>49</sup>

If an installation's reporting is not complete by April 1<sup>st</sup> of a given year, its privileges to trade within the Registry are temporarily suspended. Further failure to report may result in a **state fine** that must be paid for as long as unlawful behaviour continues to persist. Failure to perform other mandatory duties may also result in a fine. In Phase I the **fine for excess emissions** fine was EU€40/tCO<sub>2</sub>e,<sup>50</sup> in Phase II this fine is EU€100/tCO<sub>2</sub>e. In addition, entities that fail to comply with their obligations have their names published, as a **shaming** mechanism,<sup>51</sup> and must submit additional allowances in the following year equivalent to the deficit from the previous year.

**COMPLEMENTARY & SUPPLEMENTARY MEASURES:** Since 1991, Norway has enforced a **CO<sub>2</sub> tax** on the following **sectors**: gasoline, light and heavy fuel oil, oil and gas in the North Sea, pulp and paper, fishmeal, domestic aviation, and domestic shipping.<sup>52</sup> In 2005, the tax covered 68% of CO<sub>2</sub> emissions and 50% of GHG emissions. For at least the Kyoto compliance period, the tax did not apply to land-based industries covered by the Norwegian ETS. Offshore petroleum installations covered by the Norwegian ETS are also taxed, but the rate was lowered between 2007 and 2008 in order to compensate for the increased costs due to the emissions trading system. In 2007, the CO<sub>2</sub> tax for offshore petroleum installations was NOK0.8/Sm<sup>3</sup> (NOK340/tCO<sub>2</sub>e), which dropped to NOK0.45/Sm<sup>3</sup> (NOK160/tCO<sub>2</sub>e)<sup>53</sup> in 2008. In the petroleum and transportation sectors, taxes specific to the various activities encompassed by these sectors have been the primary means for GHG mitigation.<sup>54</sup> In 2013, the Norwegian government raised the CO<sub>2</sub> tax on offshore petroleum production by NOK200 per tonne. The intention is to reduce the tax in the future if allowance prices in the EU ETS rise from the levels when the tax increase was implemented.<sup>55</sup>

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<sup>iv</sup> Due to its linkage with the EU ETS, Norway was required to submit a National Allocation Plan (NAP) for Phase II. This plan set the framework for allowance allocation. The NAP had to be approved by the EFTA Surveillance Authority (ESA) before Norwegian installations were officially allowed to transfer allowances from their accounts to accounts in the EU ETS.



The tax rate varies across sectors. For example, higher rates apply to petroleum-related activities, whereas mineral oils are subject to lower rates. Some high-energy, trade intensive industries that are exposed to international competition are exempt from the tax.<sup>56</sup>

Enova SF, the Norwegian national energy agency that is owned by the Ministry of Petroleum and Energy, is in charge of promoting Norway's integrated strategy to increase **renewable energy** production and **energy efficiency**. By the end of 2011, Enova's new renewable energy production goal was 18 terawatt hours (TWh). For 2020, this goal increased to 40 TWh.<sup>57</sup> For its energy efficiency measures, Enova targets the building, household and industrial sectors.<sup>58</sup>

Other Norwegian climate change measures, as outlined in a 2012-13 White Paper to the Norwegian, are:<sup>59</sup>

- At least NOK3 billion pledged for **deforestation reduction** in developing countries (see below),
- An action plan for the domestic building sector to reduce emissions by 2020 and phase out oil-fired boilers,
- Encouraging sustainable and increased domestic forestry through conservation efforts, and a ban on cutting down young trees,
- Contributing to the Green Climate Fund (GCF) for international emissions reductions, and
- Scaling up research and development on climate change

Specific to Norway's efforts to assist deforestation reduction in developing countries, the Norwegian government launched Norway's International Climate and Forest Initiative (NICFI), which "supports the **development of the REDD+** international agenda and architecture," in 2008. NICFI has received annual pledges up to NOK3 billion (US\$517 million), and it "contributes to several multilateral and bilateral initiatives including the Brazilian Amazon Fund, Congo Basin Forest Fund, Forest Carbon Partnership Facility, and Forest Investment Program." NICFI has contributed up to US\$1 billion to the Brazilian Amazon Fund alone.<sup>60</sup>

**RESULTS:** As with the EU ETS, Phase I of the Norwegian ETS was designed as a pilot phase. The purpose of this phase was to gain experience with functioning procedures and applications, such as the development of a competent registry, allowance allocation, monitoring, reporting, and verification. In this phase, supply exceeded demand and the **market price** fell sharply when this was revealed. The price eventually declined to zero as banking of permits between phases was not permitted.<sup>61</sup> In 2014 Norway submitted a report to the UNFCCC on its Kyoto assigned amounts; Norway has an assigned amount of 250,576,797 tCO<sub>2e</sub>.<sup>62</sup>



## What Distinguishes This Policy?

### UNIQUE ASPECTS

1. Norway is one of the few countries in which a **carbon tax and an ETS significantly overlap**.
2. In the Norwegian ETS, **allowance allocation** is weighted more heavily towards auctions than in the majority of other emissions trading systems.

### CHALLENGES

1. Combining a **CO<sub>2</sub> tax** on the petroleum sector with the **European Union Emissions Trading Scheme (EU ETS)**, without providing multiple price signals for carbon emissions.

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## REFERENCES

- <sup>1</sup> Norwegian Ministry of the Environment (December 2009). "Norway's Fifth National Communication under the Framework Convention on Climate Change." Available at <http://www.regjeringen.no/upload/MD/Vedlegg/Rapporter/T-1482E.pdf>
- <sup>2</sup> Norwegian Environment Agency, 2014. Greenhouse Gas Emissions 1990-2012, National Inventory Report. Chapter two: Trends in Greenhouse Gas Emissions. Page. 33 Available at: [unfccc.int](http://unfccc.int)
- <sup>3</sup> Norwegian Environment Agency, 2014. Greenhouse Gas Emissions 1990-2012, National Inventory Report. Chapter two: Trends in Greenhouse Gas Emissions. Page. 33 Available at: [unfccc.int](http://unfccc.int)
- <sup>4</sup> Norwegian Ministry of the Environment (December 2009). "Norway's Fifth National Communication under the Framework Convention on Climate Change." Available at <http://www.regjeringen.no/upload/MD/Vedlegg/Rapporter/T-1482E.pdf>
- <sup>5</sup> Norwegian Ministry of the Environment, 2012. Norwegian Climate Policy. Report No.21 (2011-2012) to the Storting (white paper) Summary. Available at: [https://www.regjeringen.no/contentassets/aa70cfe177d2433192570893d72b117a/en-gb/pdfs/stm201120120021000en\\_pdfs.pdf](https://www.regjeringen.no/contentassets/aa70cfe177d2433192570893d72b117a/en-gb/pdfs/stm201120120021000en_pdfs.pdf)
- <sup>6</sup> Holton, Thea (May 2011). "The Norwegian Emissions Trading System from an Institutional Perspective." Norwegian University of Life Sciences. Available at [http://brage.bibsys.no/umb/bitstream/URN:NBN:no-bibsys\\_brage\\_20426/1/Master%20thesis%20Thea%20Holten.pdf](http://brage.bibsys.no/umb/bitstream/URN:NBN:no-bibsys_brage_20426/1/Master%20thesis%20Thea%20Holten.pdf)
- <sup>7</sup> Government of Norway (December 2004). "Act of 17 December 2004 No. 99 Relating to Greenhouse Gas Emission Allowance Trading and the Duty to Surrender Emission Allowances." Available at <http://www.regjeringen.no/en/doc/laws/Acts/greenhouse-gas-emission-trading-act.html?id=172242>
- <sup>8</sup> European Commission, 2015. Roadmap for a low carbon economy by 2050; Norway. Available at: [http://ec.europa.eu/clima/consultations/docs/0005/ms/p\\_norway\\_ministry\\_of\\_environment\\_en.pdf](http://ec.europa.eu/clima/consultations/docs/0005/ms/p_norway_ministry_of_environment_en.pdf)
- <sup>9</sup> Norwegian Ministry of the Environment (March 2008). "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>10</sup> European Commission (EC) (February 2012). "Preparing the EU's Quantified Emission Limitation or Reduction Objective (QELRO) based on the EU Climate and Energy Package." Commission Staff Working Document. Available at [http://ec.europa.eu/clima/policies/international/negotiations/docs/swd\\_13022012\\_en.pdf](http://ec.europa.eu/clima/policies/international/negotiations/docs/swd_13022012_en.pdf)
- <sup>11</sup> Norwegian Ministry of the Environment (March 2008). "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>12</sup> European Commission, 2015. Roadmap for a low carbon economy by 2050; Norway. Available at: [http://ec.europa.eu/clima/consultations/docs/0005/ms/p\\_norway\\_ministry\\_of\\_environment\\_en.pdf](http://ec.europa.eu/clima/consultations/docs/0005/ms/p_norway_ministry_of_environment_en.pdf)
- <sup>13</sup> Economic Instruments in Environmental Policy (June 2008). "Emissions Trading Scheme (Norway)." Available at <http://www.economicinstruments.com/index.php/climate-change/article/100->
- <sup>14</sup> Norwegian Ministry of the Environment (March 2008). "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>15</sup> The ETS will annually contribute 6 MtCO<sub>2</sub>e to the 8-9 MtCO<sub>2</sub>e of reductions relative to BAU for Norway to achieve its Kyoto Pledge. Source: *Supra*, Note 2.
- <sup>16</sup> Norwegian Ministry of the Environment, 2009. "Norway's Fifth National Communication under the Framework Convention on Climate Change." Available at <http://www.regjeringen.no/upload/MD/Vedlegg/Rapporter/T-1482E.pdf>
- <sup>17</sup> Norwegian Ministry of the Environment, 2010. "Norway's emissions targets 30-40 per cent by 2020." Available at <http://www.regjeringen.no/en/dep/md/Whats-new/News/2010/Norways-emissions-targets-30-40-per-cent-by-2020.html?id=592502>
- <sup>18</sup> UNFCCC, 2015. Submission to the ADP: Norway's Intended Nationally determined Contribution. Submitted. 27 March 2015/ Available at: <http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx>
- <sup>19</sup> Norwegian Environment Agency, 2014. Greenhouse Gas Emissions 1990-2012, National Inventory Report to the UNFCCC. Chapter two: Trends in Greenhouse Gas Emissions. Available at: [unfccc.int](http://unfccc.int)
- <sup>20</sup> Norwegian Ministry of the Environment, 2008. "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>21</sup> Norwegian Ministry of the Environment, 2008. "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>22</sup> Government of Norway, 2004. "Act of 17 December 2004 No. 99 Relating to Greenhouse Gas Emission Allowance Trading and the Duty to Surrender Emission Allowances." Available at: <http://www.regjeringen.no/en/doc/laws/Acts/greenhouse-gas-emission-trading-act.html?id=172242>
- <sup>23</sup> Norwegian Ministry of the Environment, 2008. "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>24</sup> Alstadheim, Elen R. "Cap and Trade – Achievements and Lessons Learnt – The Norwegian Experience." Norwegian Ministry of Environment. Available at [http://icapcarbonaction.com/phocadownload/tokyo\\_conf/icap\\_tokyo\\_conf\\_plenarythree\\_alstadheim.pdf](http://icapcarbonaction.com/phocadownload/tokyo_conf/icap_tokyo_conf_plenarythree_alstadheim.pdf)
- <sup>25</sup> Norwegian Ministry of the Environment, 2008. "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>26</sup> Norwegian Ministry of the Environment, 2008. "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>27</sup> Norwegian Ministry of the Environment, 2008. "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>28</sup> Government of Norway, 2004. "Act of 17 December 2004 No. 99 Relating to Greenhouse Gas Emission Allowance Trading and the Duty to Surrender Emission Allowances." Available at <http://www.regjeringen.no/en/doc/laws/Acts/greenhouse-gas-emission-trading-act.html?id=172242>
- <sup>29</sup> EFTA Surveillance Authority, 2009. "EFTA Surveillance Authority Decision." Case No: 62345, Event No: 505862, Dec. No: 100/09/COL. Available at [http://ec.europa.eu/clima/policies/ets/allocation/2008/docs/no\\_nap\\_dec\\_en.pdf](http://ec.europa.eu/clima/policies/ets/allocation/2008/docs/no_nap_dec_en.pdf)
- <sup>30</sup> European Commission, [http://ec.europa.eu/clima/policies/ets/cap/allocation/index\\_en.htm](http://ec.europa.eu/clima/policies/ets/cap/allocation/index_en.htm)
- <sup>31</sup> Norwegian Ministry of the Environment, 2008. "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>32</sup> Norwegian Ministry of the Environment, 2008. "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>33</sup> Norwegian Ministry of the Environment, 2009. "Norway's Fifth National Communication under the Framework Convention on Climate Change." Available at <http://www.regjeringen.no/upload/MD/Vedlegg/Rapporter/T-1482E.pdf>
- <sup>34</sup> Norwegian Ministry of the Environment, 2008. "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>35</sup> Twidale, Susanna, 2013. "Norway to stop buying CO2 credits from wind, hydro." Reuters Point Carbon. Available at <http://www.pointcarbon.com/news/1.2338739?ref=searchlist>
- <sup>36</sup> NORCAP, 2013. Available at: <http://www.regjeringen.no/en/dep/kld/press-centre/Press-releases/2013/norcap-call-for-carbon-credits-launched.html?id=746321>
- <sup>37</sup> NEFCO, 2015. CfP1 results. Available at: [http://www.nefco.org/sites/efco.viestinta.org/files/NorCap\\_screen.pdf](http://www.nefco.org/sites/efco.viestinta.org/files/NorCap_screen.pdf)
- <sup>38</sup> NEFCO, 2014. Joint call for proposals for the NEFCO Norwegian Carbon Procurement Facility and the NEFCO Carbon Fund. Available at: [http://www.nefco.org/news/carbon\\_funds\\_receive\\_good\\_response\\_to\\_the\\_second\\_call\\_for\\_proposals](http://www.nefco.org/news/carbon_funds_receive_good_response_to_the_second_call_for_proposals)
- <sup>39</sup> Mace, M.J., Ilona Millar, Christoph Schwarte, Jason Anderson, Derik Broekhoff, Robert Bradley, Catherine Bowyer and Robert Heilmayr (2008). "Analysis of the Legal and Organisational Issues Arising in Linking the EU Emissions Trading Scheme to Other Existing and Emerging Emissions Trading Schemes: Final Report," study commissioned by the European Commission, Foundation for International Law and Development, London. Available at [http://www.field.org.uk/files/Linking%20emission%20trading%20schemes\\_0.pdf](http://www.field.org.uk/files/Linking%20emission%20trading%20schemes_0.pdf)
- <sup>40</sup> Holton, Thea (May 2011). "The Norwegian Emissions Trading System from an Institutional Perspective." Norwegian University of Life Sciences. Available at [http://brage.bibsys.no/umb/bitstream/URN:NBN:no-bibsys\\_brage\\_20426/1/Master%20thesis%20Thea%20Holten.pdf](http://brage.bibsys.no/umb/bitstream/URN:NBN:no-bibsys_brage_20426/1/Master%20thesis%20Thea%20Holten.pdf)
- <sup>41</sup> Ranson, Matthew and Robert Stavins, 2012. "Post-Durban Climate Policy Architecture Based on Linkage of Cap-and-Trade Systems." *The Chicago Journal of International Law*.
- <sup>42</sup> Holton, Thea (May 2011). "The Norwegian Emissions Trading System from an Institutional Perspective." Norwegian University of Life Sciences. Available at [http://brage.bibsys.no/umb/bitstream/URN:NBN:no-bibsys\\_brage\\_20426/1/Master%20thesis%20Thea%20Holten.pdf](http://brage.bibsys.no/umb/bitstream/URN:NBN:no-bibsys_brage_20426/1/Master%20thesis%20Thea%20Holten.pdf)

- <sup>43</sup> Norwegian Ministry of the Environment, 2008. "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>44</sup> Norwegian Ministry of the Environment, 2009. "Norway's Fifth National Communication under the Framework Convention on Climate Change." Available at <http://www.regjeringen.no/upload/MD/Vedlegg/Rapporter/T-1482E.pdf>
- <sup>45</sup> Norwegian Ministry of the Environment, 2008. "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>46</sup> EFTA Surveillance Authority, 2009. "EFTA Surveillance Authority Decision." Case No: 62345, Event No: 505862, Dec. No: 100/09/COL. Available at [http://ec.europa.eu/clima/policies/ets/allocation/2008/docs/no\\_nap\\_dec\\_en.pdf](http://ec.europa.eu/clima/policies/ets/allocation/2008/docs/no_nap_dec_en.pdf)
- <sup>47</sup> Government of Norway, 2004. "Act of 17 December 2004 No. 99 Relating to Greenhouse Gas Emission Allowance Trading and the Duty to Surrender Emission Allowances." Available at <http://www.regjeringen.no/en/doc/laws/Acts/greenhouse-gas-emission-trading-act.html?id=172242>
- <sup>48</sup> Norwegian Government, 2004. Greenhouse Gas Emission Trading Act, 2004. Entered into force December 17, 2004. Available at: <https://www.regjeringen.no/en/dokumenter/greenhouse-gas-emission-trading-act/id172242/>
- <sup>49</sup> Government of Norway, 2004. "Act of 17 December 2004 No. 99 Relating to Greenhouse Gas Emission Allowance Trading and the Duty to Surrender Emission Allowances." Available at <http://www.regjeringen.no/en/doc/laws/Acts/greenhouse-gas-emission-trading-act.html?id=172242>
- <sup>50</sup> Economic Instruments in Environmental Policy (June 2008). "Emissions Trading Scheme (Norway)." Available at <http://www.economicinstruments.com/index.php/climate-change/article/100->
- <sup>51</sup> Government of Norway, 2004. "Act of 17 December 2004 No. 99 Relating to Greenhouse Gas Emission Allowance Trading and the Duty to Surrender Emission Allowances." Available at <http://www.regjeringen.no/en/doc/laws/Acts/greenhouse-gas-emission-trading-act.html?id=172242>
- <sup>52</sup> Sumner, Jenny, Lori Bird, and Hillary Smith (December 2009). "Carbon Taxes: A Review of Experience and Policy Design Considerations." National Renewable Energy Laboratory (NREL). Available at <http://www.nrel.gov/docs/fy10osti/47312.pdf>
- <sup>53</sup> NOK340 in 2007 was equivalent to ~US\$62, and NOK160 was ~US\$29. Source: Oanda, 2012. "Historical Exchange Rates." Available at <http://www.oanda.com/currency/historical-rates/>
- <sup>54</sup> Norwegian Ministry of the Environment, 2008. "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>55</sup> [http://www.regjeringen.no/pages/38117723/PDFS/STM201120120021000EN\\_PDFS.pdf](http://www.regjeringen.no/pages/38117723/PDFS/STM201120120021000EN_PDFS.pdf)
- <sup>56</sup> Norwegian Ministry of the Environment, 2009. "Norway's Fifth National Communication under the Framework Convention on Climate Change." Available at <http://www.regjeringen.no/upload/MD/Vedlegg/Rapporter/T-1482E.pdf>
- <sup>57</sup> For perspective, 128.1 TWh of electricity was generated in Norway in 2011. Source: Norwegian Water Resources and Energy Directorate. "Electricity disclosure 2011." Available at <http://www.nve.no/en/Electricity-market/Electricity-disclosure-2011/>
- <sup>58</sup> Norwegian Ministry of the Environment, 2009. "Norway's Fifth National Communication under the Framework Convention on Climate Change." Available at <http://www.regjeringen.no/upload/MD/Vedlegg/Rapporter/T-1482E.pdf>
- <sup>59</sup> Norwegian Ministry of the Environment, 2008. "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>60</sup> Climate Funds Update. "Norway's International Climate and Forest Initiative." Heinrich Boll Stiftung, The Green Political Foundation. Available at <http://www.climatefundsupdate.org/listing/norway-s-international-climate-and-forest-initiative>
- <sup>61</sup> Norwegian Ministry of the Environment, 2008. "Norwegian National Allocation Plan for the Emissions Trading System in 2008-2012." Available at [http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP\\_FINAL\\_ESA\\_260308.pdf](http://www.regjeringen.no/upload/MD/Vedlegg/Planer/NAP_FINAL_ESA_260308.pdf)
- <sup>62</sup> UNFCCC, 2007. Report of the review of the initial report of the Kingdom of Norway. Available at: [http://unfccc.int/files/kyoto\\_protocol/compliance/plenary/application/pdf/cc-ert-ir-2007-10\\_report\\_of\\_review\\_of\\_ir\\_of\\_the\\_konorway.pdf](http://unfccc.int/files/kyoto_protocol/compliance/plenary/application/pdf/cc-ert-ir-2007-10_report_of_review_of_ir_of_the_konorway.pdf)