

Case No: 62608  
Event No: 481672  
Dec. No: 503/08/COL

EFTA SURVEILLANCE AUTHORITY DECISION  
of 16 July 2008  
on Test Centre Mongstad  
(Norway)

THE EFTA SURVEILLANCE AUTHORITY<sup>1</sup>

Having regard to the Agreement on the European Economic Area<sup>2</sup>, in particular to Articles 61 to 63 and Protocol 26 thereof,

Having regard to the Agreement between the EFTA States on the Establishment of a Surveillance Authority and a Court of Justice<sup>3</sup>, in particular to Article 24 thereof,

Having regard to Article 1(3) of Part I and Article 4(3) of Part II of Protocol 3 to the Surveillance and Court Agreement<sup>4</sup>,

Having regard to the Authority's Guidelines on the application and interpretation of Articles 61 and 62 of the EEA Agreement<sup>5</sup>, and in particular the Chapter on Environmental protection thereof,

Having regard to the Authority's Decision of 14 July 2004 on the implementing provisions referred to under Article 27 of Part II of Protocol 3<sup>6</sup>

Whereas:

## I. FACTS

---

<sup>1</sup> Hereinafter referred to as the Authority.

<sup>2</sup> Hereinafter referred to as the EEA Agreement.

<sup>3</sup> Hereinafter referred to as the Surveillance and Court Agreement.

<sup>4</sup> Hereinafter referred to as Protocol 3.

<sup>5</sup> Guidelines on the application and interpretation of Articles 61 and 62 of the EEA Agreement and Article 1 of Protocol 3 to the Surveillance and Court Agreement, adopted and issued by the EFTA Surveillance Authority on 19 January 1994, published in the Official Journal of the European Union (hereinafter referred to as OJ) 1994 L 231, EEA Supplements 03.09.94 No 32. The Guidelines were last amended on 16 July 2008. Hereinafter referred to as the State Aid Guidelines.

<sup>6</sup> Decision 195/04/COL of 14 July 2004 published in OJ C 139 of 25.05.2006 p. 57 and EEA Supplement No 26 of 25.05.2006 p. 1 as amended by Decision 319/05/COL of 14 December 2005 published in OJ C 286 of 23.11.2006 p. 9 and EEA Supplement No 57 of 23.11.2006 p. 31.

## 1 Procedure

By letter of 5 July 2007 (Event No 428243), the Norwegian authorities notified the intention of the Norwegian State to invest in a company which shall construct and own the test plant known as Test Centre Mongstad (hereinafter referred to as “TCM”), pursuant to Article 1(3) of Part I of Protocol 3.

The Authority requested additional information by letters dated 21 August 2007 (Event No 434826) and 31 October 2007 (Event No 448890). The Norwegian authorities replied to the information requests by letters dated 18 September 2007 (Event No 442291) and 29 November 2007 (Event No 454711) respectively. The Norwegian authorities sent an additional letter dated 3 December 2007 (Event No 455697) with corrections to the letter dated 29 November 2007.

On 18 December 2007 (Event No 457345), the Authority sent another request for information, to which the Norwegian authorities replied by letter dated 21 January 2008 (Event No 461385).

Finally, the Authority requested additional information by letter dated 6 March 2008 (Event No 468047) which was submitted by the Norwegian authorities by letter dated 10 April 2008 (Event No 473170).

On 30 May 2008 (Event No 47894), the Authority requested the Norwegian authorities for an extension of deadline to take a decision on the notification until 16 July 2008 (Event No 47894). The Norwegian authorities replied favourably on 6 June 2008 (Event No 480295).

During this time, representatives of the Authority and the Norwegian authorities have held various meetings clarifying information and technical details of the notification.

## 2 Description of the proposed measures

### 2.1 The Mongstad site and the TCM

By letter dated 5 July 2007, the Norwegian authorities notified the intention of the Norwegian Government to invest in the company that shall construct and own the TCM (hereinafter referred to as “the Company”).

The TCM is a test facility for carbon capture at Mongstad in the municipalities of Lindås and Austrheim in the county of Hordaland in the Western part of Norway. The TCM will be connected to the Energiverk Mongstad (hereinafter referred to as “the EVM”). The TCM should be in operation from 2010 for a period of five years from start of operations.

The EVM<sup>7</sup> embraces an oil refinery owned by StatoilHydro<sup>8</sup> (79 %) and Shell (21 %), a combined heat and power plant (hereinafter referred to as a “CHP”) under construction, and a new gas pipeline from Kollsnes<sup>9</sup>. StatoilHydro also operates a crude oil terminal and a product technology and customer service centre at Mongstad.

---

<sup>7</sup> This information can be found on StatoilHydro’s website under: <http://www.statoilhydro.com/en/ouoperations/terminalrefining/prodfacilitiesmongstad/pages/default.aspx>

<sup>8</sup> StatoilHydro is the main Norwegian oil and gas company. The Norwegian State is the majority shareholder.

<sup>9</sup> Kollsnes is a gas processing plant supplying NLG to Mongstad.

The CHP will provide process heat and electricity for the Mongstad refinery and be operative from 2010. Statoil has entered into a contract with DONG Energy to build, own and operate the CHP station. The contract covers an operational period of 20 years. The CHP station will form an integrated part of the Mongstad refinery.

The Norwegian authorities have explained that the TCM is a test facility aimed at gaining access to the relevant technology components, developing these, and contributing to reducing the future CO<sub>2</sub> emission costs associated with generating, transporting and utilising oil and gas resources<sup>10</sup>. The TCM should facilitate the development of carbon capture technology that will contribute to reducing development and operating costs for future full-scale carbon capture plants. The TCM is expected to give significant learning effects, which could benefit future investments in full-scale carbon capture plants, both in Norway and elsewhere.

## 2.2 The Company operating the TCM

The TCM project is to be operated by the Company, a so-called unlimited company with shared liability<sup>11</sup>. At the time of the notification, the Norwegian authorities indicated that StatoilHydro will participate with a share of 20 % in the Company, whereas the State will cover the remaining 80 %. Should other undertakings invest in the Company, the State's share will be reduced accordingly.

The State participation will be managed by Gassnova SF, a state-owned enterprise founded under the provisions of the Act on State Enterprises<sup>12</sup>. Gassnova SF manages the Norwegian State's interest in carbon capture and storage.

As far as the investment in the Company is concerned, the Norwegian authorities have not provided a final specific sum for its investment in the Company in the notification or in the subsequent correspondence. In June 2007, at the time of entering into the so-called Cooperation Agreement<sup>13</sup>, the total investment costs in the Project were assumed to be between NOK 1 and 2 billion (approximately between EUR 125 and 250 million). By letter dated 29 November 2007, the Norwegian authorities forwarded an estimate of the discounted cash flow of the costs related to the project. For the State's 80 % share in the project, a baseline scenario gives a discounted cash flow of the costs equal to NOK 1480 million (approximately 185 million euro).

Several contractual steps shall lead to the establishment of the Company.

### *The Implementation Agreement*

On 12 October 2006, the Norwegian State and Statoil<sup>14</sup> signed the Implementation Agreement on the basis of which the parties shall co-operate in developing carbon capture technology connected to the CHP<sup>15</sup>.

---

<sup>10</sup> Two official reports on investment costs in CCS projects have been issued in Norway which demonstrate that the abatement costs for establishing large-scale CCS projects are currently very high. These reports can be found under [www.gassco.no](http://www.gassco.no) and [www.nve.no](http://www.nve.no).

<sup>11</sup> Ansvarlig selskap med delt ansvar – DA.

<sup>12</sup> Act No 71 of 30 August 1991, Lov om statsforetak.

<sup>13</sup> See below under Section 2.3.

<sup>14</sup> Subsequently, in 2007, Statoil merged with the oil and gas division of Norsk Hydro. The name of the new company is StatoilHydro ASA. In the following the Authority will refer to the company as StatoilHydro.

<sup>15</sup> Although the Implementation Agreement covered not only the capture test plant (TCM) but also the subsequent establishment of a large-scale capture plant, only the establishment of the TCM is part of the current notification. Originally, the notification also described the establishment of a transport and storage

According to Section 2 of the Implementation Agreement, the parties will establish a technology company, which shall construct the test plant with a capacity to capture at least 100 000 tons of CO<sub>2</sub> annually.

Under the Implementation Agreement, StatoilHydro undertook to hold 20 % of the shares in the Company whereas the Norwegian State would own the remaining 80 %, unless third parties join as owners of the company<sup>16</sup>.

The parties agree moreover to provide a capital base and to finance the operations of the TCM for up to five years. When the Company is wound up, the Company's rights and obligations shall be split between the owners according to their ownership interests<sup>17</sup>.

### ***The Co-operation Agreement***

Based on Article 2b) of the Implementation Agreement, several undertakings were contacted to participate in the Company. On 21 June 2007, the Norwegian State, Statoil, Norsk Hydro Produksjon AS, A/S Norske Shell, DONG Energy Generation A/S and Vattenfall AB entered into the so-called Co-operation Agreement. According to this Agreement, the parties manifest their intention to invest at a later stage in the Company through the establishment of a partnership regulated by a separate Participants' Agreement. This agreement is currently subject to negotiations.

The Co-operation Agreement thus has the limited scope of providing the parties with a technological and financial basis for making the decision of whether to invest in the Company that will construct and own the TCM. According to Section 13.4 of the Co-operation Agreement, a binding investment decision should be made in the first quarter of 2008. Otherwise the Agreement would become ineffective. This investment decision has nevertheless been postponed until the fourth quarter of 2008<sup>18</sup>. Thus, the parties to the Co-Operation Agreement have so far not bound themselves to invest in the TCM.

### ***The Participants' Agreement***

As mentioned above, if the parties choose to carry out the investment in the Company, the Co-operation agreement foresees the signature of a Participants' Agreement. The Participants' Agreement shall govern the relationship between the owners of the Company as well as the relationship between the owners and the Company. It will regulate the execution of the investment in the TCM and the rights and obligations of the contracting parties during the five-year period of operation of the TCM.

## **2.3 Carbon capture technologies and technology suppliers**

As mentioned above, the objective of the TCM is to test, verify and demonstrate different concepts and technologies capable of reducing costs and risks related to large scale carbon capture. Successful carbon capture produces a concentrated and segregated mass flow of CO<sub>2</sub> that is capable of being safely transported either to a final deposit or to a producing petroleum reservoir for enhanced recovery or to an industrial site for further utilisation.

---

solution for the CO<sub>2</sub> capture in the TCM. However, the Norwegian authorities have decided that this part of the original project will not be accomplished because of the high costs involved. The Norwegian authorities had estimated the costs of a temporary ship transport and storage solution at approximately NOK 3000 million over a period of five years (NOK 1800 million for CO<sub>2</sub> export facilities at Mongstad, NOK 700 million for receiving CO<sub>2</sub> at Melkøya/Snøhvit, NOK 400 million transportation costs).

<sup>16</sup> Article 2b) of the Implementation Agreement.

<sup>17</sup> Letter of 5 July 2007 (the notification) point 2.1.2.

<sup>18</sup> Letter dated April 2008.

Carbon capture will apply mainly to large power plants fired with hard coal, lignite or natural gas. It could also apply to large, single point emission sources such as refineries, cement plants, chemical plants and steel mills that can use the same or similar technology as well as transport infrastructure.

The test facilities at TCM will test post-combustion carbon capture technology<sup>19</sup> and be designed to accommodate testing of more than one technology. Based on the information provided by the Norwegian authorities, the two most relevant technologies for the moment are amine absorption and ammonium carbonate absorption (chilled ammonia). Both technologies, provided by two different suppliers, will be tested in parallel at the TCM from the start of operations on two different test facilities: the Test Facility for Chilled Ammonia and the Test Facility for Amine Technology.

The use of chilled ammonia for carbon capture is a new method and it has so far only been tested on a small scale basis. Based on estimations provided by Alstom, the capture concept with chilled ammonia seems to present a potential for lower operational expenditure than any known post-combustion carbon capture process. The process is claimed to have a lower overall energy demand and is operating with less expensive chemicals. Alstom<sup>20</sup>, who is sole provider of chilled ammonia technology worldwide, will operate the Test Facility for Chilled Ammonia.

Certain amine technology has already been tested elsewhere but the testing at TCM will be done at a larger scale. According to SINTEF<sup>21</sup>, there is room for improvement of the solvent characteristics of today's available amines. Possible improvements of the amine technology to be approached at the TCM are, *inter alia*, component optimisation and process integration. The Test Facility for Amine Technology should, amongst other things, be able to test and qualify improvements on the following eight elements<sup>22</sup>: HSE<sup>23</sup> performance, energy efficiency of carbon capture from flue gases, absorbents, scale-up properties of the carbon capture unit, improvements of flow-sheet, create and use an experimentally validated model of carbon capture from flue gases for advanced optimisation of the capture plant, cheaper and more fit for purpose construction materials and integration with the power plant.

A supplier of amine technology will operate the Test Facility for Amine Technology and be responsible for the development of carbon capture based on this technology. The Norwegian authorities have explained that in order to establish competition in the market for the supply of amine technology with a corresponding market price, a procurement procedure is currently being carried out for the selection of the provider of amine technology on the basis of competing FEEDs (front end engineering and design). The invitation to qualify for the amine study was issued by the TCM partnership in August

---

<sup>19</sup> Currently, there are three alternative technology routes that are being pursued with the objective of achieving cost-effective solutions for large scale operations when it comes to reducing CO<sub>2</sub>-emissions: 1) post-combustion system, 2) pre-combustion systems, which process the primary fuel in a shift reaction to produce a flow of CO<sub>2</sub> and hydrogen which can be separated and 3) oxy-fuel combustion systems, which use oxygen instead of air for combustion, producing a flue gas that is mainly H<sub>2</sub>O and CO<sub>2</sub> which can be easily captured after the water vapor in condensed.

<sup>20</sup> Alstom has developed the so-called "chilled ammonia" process, which may recover 90 % of CO<sub>2</sub> emissions at a lower energy input than comparable CCS processes. Alstom is the exclusive supplier of this technology worldwide due to its patent.

<sup>21</sup> SINTEF is a Norwegian independent research organisation. For more information: <http://www.sintef.no/Home/About-us/>

<sup>22</sup> A detailed description at technical level of what these eight elements could include was provided in the document "Scope of work" presented by the Norwegian authorities.

<sup>23</sup> Health, safety and environmental protection.

2007. In December 2007, two companies were chosen to do parallel FEED studies: HTC/Bechtel from Canada/USA and Aker Solutions ASA from Norway. These companies should submit their tender proposals by July 2008 on the basis of which the preferred amine vendor will be chosen in August 2008.

The Norwegian authorities have explained that the TCM will be able to capture at least 100 000 tons of CO<sub>2</sub> a year from different sources of flue gas: the CHP and the refinery (the residue catalytic cracker).

The Test Facility for Chilled Ammonia will have a capture capacity of at least 82 000 tons of CO<sub>2</sub> per year based on flue gas from the cracker and 22 000 tons based on flue gas from the CHP. The Test Facility for Amine Technology shall have a capacity of 73 000 tons based on flue gas from the cracker and at least 27 000 tons based on flue gas from the CHP. Moreover, the intention is to re-circulate CO<sub>2</sub> to be able to observe variations in performance, by varying CO<sub>2</sub> concentration in the gas to the capture plant.

The CO<sub>2</sub> content of the emissions from a gas-fired power plant is between 3-4 % and the CO<sub>2</sub> content from the refinery cracker is between 10-15 %. According to the explanations of the Norwegian authorities, capturing CO<sub>2</sub> from two different sources makes it possible to test the technology under different conditions. In general it is more demanding to capture CO<sub>2</sub> from a flue gas with a low concentration of CO<sub>2</sub> because a larger volume has to be taken through the facility. Further, it makes it possible to test the technology and prove it for use, not only for gas-fired power plants, but also on emissions from the cracker whose CO<sub>2</sub> content is close to those from coal-fired power plants and other industrial sources.

Part of the test program will consist of finding the optimum design parameters for both technologies, chilled ammonia and amine. Therefore, the size and functionality of the individual test facilities shall be such that relevant design parameters necessary for scaling up to full scale commercial capture plants can be developed.

The Norwegian authorities have explained that the testing at TCM of post-combustion technologies, which can be retrofitted to existing facilities and applied to different types of power plants will enlarge the possibilities of a successful outcome in the development of commercial CCS applications.

#### **2.4 The result of the testing activities at the TCM and the regulation of intellectual property rights**

The Norwegian authorities have explained that the Company shall not develop its own technologies. The parties owning the Company (at present StatoilHydro and Gassnova) are technology users and not technology suppliers. The partners of the Company will accumulate know-how and experience in buying and testing such technology. As mentioned above, the carbon capture technologies will be provided by Alstom and an amine technology supplier. For the vendor companies or technology suppliers, who deliver the various technology components, the project will serve as a laboratory for testing and developing their technology solutions. They will retain the ownership and marketing rights on the tested technologies.

According to Section 2(2)d of the Implementation Agreement, the distribution of intellectual property rights in the TCM will be subject to further clarifications in the Participants' Agreement. This agreement is, as mentioned above, was currently negotiated with a view to being signed at the end of 2008.

Nevertheless, the Norwegian authorities have explained that the point of departure for the understanding of the distribution of intellectual property rights in the TCM is to analyse the differences between business objectives and activities of the contracting parties on the one hand, and the vendors on the other hand. The basic principle is that IP rights will evolve with the vendors and will belong to these companies.

The technology users benefit from the co-operation by gaining know-how on the application of the technology and benefit from the availability of technology for their future activities.

The technology vendors will benefit from the testing and verification activities of the users of the technology to improve and better accommodate their technology to the users' needs.

According to the explanations provided in the notification, this principle seems to be the most suitable tool to achieve one of the objectives of the Norwegian authorities, namely the widespread application of technology on carbon capture management through improved know-how for the owners of the TCM and the vendors. The setting-up of the TCM has several similarities with the innovation processes in other parts of the oil and gas industry, where technologies are developed through symbiotic interactions between the oil and gas companies and the technology providers.

This principle is already reflected in Section 8 of the Co-operation Agreement which regulates intellectual property rights and know-how for the period until signature of the Participants' Agreement. According to Section 8.1, *"[t]he parties shall through their participation in the Project Planning Activities with their commercially reasonable endeavours contribute with experience, know-how, technical expertise and information relevant to the Scope of this Agreement, but within the boundaries of any applicable mandatory law e.g. competition law prohibitions. Unless otherwise provided for in this Agreement, [...] these contributions shall be given free of charge with rights of use that are irrevocable, non-exclusive and available in all aspects, to the extent possible without breaching any Third Party's or Vendor's right."*

According to the information provided by the Norwegian authorities, data and information owned by a party and made known to the others remain the property of that party unless otherwise agreed. Moreover, subject to the parties sole discretion, their patents can be made available to the so-called Project Planning Activities through separate agreements based on normal commercial conditions.

Should the Project Planning Activities result in any patent rights or other intellectual property rights, such rights shall be the property of the party or parties who created them unless the right is created by a vendor or a third party which have already established such rights. In this case, the parties shall seek to obtain joint rights of use for all parties along with the rights to extend such rights of use to the Company.

Section 8.2 of the Co-Operation Agreement further foresees that *"[i]n relation to such patent rights or other intellectual property rights, each Party, its Affiliates and the Company shall be granted a non-exclusive, world-wide, royalty free, license (i) under any such patent right or intellectual property right to make, use, sell or offer for sale any invention embodied in any such patent right or other intellectual property right; and (ii) under any copyright, trademark, trade name or any other intellectual property right, registerable or not."*

Schedule 3 of the Co-operation Agreement sets out the principles that regulate the intellectual property rights under the Participants' Agreement. It determines that “[t]he business model of the Company in relation to intellectual property rights shall be based on contributions by the participants to the Company and the competition based participation by Vendors, which shall provide for a wide spread application of any know-how obtained as a result of the activities of the Company through the Vendors' development of any further intellectual property rights and the accumulation of experience and know-how with the participants.”

### **3 Comments from the Norwegian authorities**

#### **3.1 Background**

The Norwegian authorities have explained that StatoilHydro was granted a CO<sub>2</sub> emission permit to build a CHP plant at Mongstad. One of the conditions was to establish full scale carbon capture and storage from the CHP plant by the end of 2014. Moreover, the Norwegian authorities required in the permit that at least 100 000 tons of CO<sub>2</sub> per year must be captured and stored from the start of operations of the CHP plant foreseen for 2010.

In the assessment of the Norwegian authorities, under the current regulatory framework, the costs for engaging in CCS technology, i.e. investing in a system and running it, are higher than buying allowances for CO<sub>2</sub> emissions<sup>24</sup>. StatoilHydro and the Norwegian Government started negotiations regarding the obligation related to carbon capture which concluded with an Agreement between StatoilHydro and the State under which StatoilHydro committed to cover 20 % while the State would cover the remaining of the costs of the TCM.

#### **3.2 The application of the market economy investor principle**

In their letter dated 5 July 2007 as well as in subsequent correspondence with the Authority, the Norwegian authorities have claimed that the State's investment in the Company does not constitute state aid because this investment will be made in accordance with the market economy investor principle.

The Norwegian authorities have elaborated on the business model applied by the State for the investment in the TCM. The Norwegian State earns high revenues from the petroleum sector<sup>25</sup>. The State as investor may continue to retain substantial parts of future exploration and production of the petroleum reserves on the Norwegian continental shelf. Through ownership of interests in a number of oil and gas fields, pipelines and onshore facilities the Norwegian State is one of the world's largest producers of fossil fuels<sup>26</sup>. For this reason, the Norwegian authorities have stated that the Norwegian State is heavily exposed to all current and future risk factors associated with the exploitation, production and marketing of oil and gas.

---

<sup>24</sup> According to PointCarbon (5 February 2008), the price of a CO<sub>2</sub> emission allowance for use in the period 200/-2012 is EUR 19.95 – 22.60 per ton of CO<sub>2</sub>. Based on an assumed price of emission allowances of EUR 20 per ton of CO<sub>2</sub> and an exchange rate of 8 NOK/EUR, the cost of buying allowances for 100 000 tons of CO<sub>2</sub> would amount to NOK 16 million per year or about to NOK 80 million for the planned testing period.

<sup>25</sup> In 2006, 36 % of the state revenues originated from the petroleum sector. These revenues consist of the following elements: taxation of oil and gas activities, charges/fees, direct ownership in fields on the Norwegian Continental Shelf, and dividends from ownership in StatoilHydro.

<sup>26</sup> The Norwegian State currently holds interests in 112 production licences and 41 fields on the Norwegian Continental Shelf and is by far the largest investor on it.

The Government's point of departure has been that future carbon regimes could impact on the market availability and demand for oil and gas in particular in Europe, which is the most important export market for the State's oil and gas production<sup>27</sup>. It will be necessary for the Norwegian State to take measures to secure its long term commercial interests as a producer of oil and gas. This has prompted the State to embark upon the development and testing of CCS technologies.

Recalling the provisions of the Authority's State Aid Guidelines on the application of state aid provisions to public enterprises in the manufacturing sector, the Norwegian authorities contended in their letter dated 29 November 2007 that the State as investor on the continental shelf has similar commercial incentives and interests as other oil and gas producing private undertakings to reduce its exposure and mitigate future risk factors in order to safeguard the long term value of its oil and gas resources. With this investment, the Norwegian authorities would pursue the objective of obtaining commercially and technically available CCS solutions to meet a future potentially high carbon cost regime. This would allow the State as petroleum owner to market its products at competitive prices in the future. Accordingly, the Norwegian authorities maintained that the State's investment in the TCM would follow a commercial approach not driven by the ownership of intellectual property rights in specific CCS technologies but to contribute to the development of a functioning CCS technology supply market.

With their letter of 29 November 2007, the Norwegian authorities submitted to the Authority a net present value calculation undertaken by the consultancy firm ECON Pöyry to demonstrate that the State will act as a private market investor<sup>28</sup>. According to the Norwegian authorities, the calculation made by ECON Pöyry demonstrates that the investment in the TCM is commercially profitable for the State and that, accordingly, no state aid within the meaning of Article 61(1) of the EEA Agreement will be granted.

The Norwegian authorities consider that in order to evaluate whether the State's investment in the TCM complies with the market economy investor principle, the Authority should not limit its assessment to the five years of operation of the TCM. On the contrary, it should also take into account substantial revenues or reduced investment costs which will arise in the future as a result of the state investment in the TCM. According to the Norwegian authorities, a private investor would thus operate with a longer horizon on the investment than simply to obtain a positive cash-flow from the TCM as such.

### **3.3 The assessment of compatibility**

In the event that the Authority would not share the Norwegian authorities' opinion on the non-application of Article 61(1) of the EEA Agreement, the Norwegian authorities have argued that the TCM is an important project of common European interest within the meaning of Article 61(3)(b) of the EEA Agreement. In the alternative, the Norwegian authorities have also argued that Article 61(3)(c) of the EEA Agreement would be applicable to justify the investment in the Company.

The Norwegian authorities consider that the establishment of the TCM with the objective of reducing technical and financial risks in future large-scale CCS-projects by significantly contributing to make the technology available to the industry, is a key

---

<sup>27</sup> The Norwegian authorities considered that the policies of the European Commission entail a move towards requesting CO<sub>2</sub> capture and storage not only for new coal-fired power plants but, in the longer term, for all existing power generation.

<sup>28</sup> ECON Pöyry's report is dated 28 November 2007.

measure to combat climate change. CCS technology would be developed within the European borders and deployed internationally.

In their view, “[s]een in light of the objective of article 61(3)b of the EEA, to increase the competitive powers of European technology-based industries compared to competitors located elsewhere in the world, the Norwegian initiative on the development of CCS technologies and later international deployment, fall directly into the core of that objective”.

The Norwegian authorities have, moreover, referred to the Government’s strong policy focus on sustainability, environmental issues and the challenges of climate change. An objective of high priority is to contribute to the development and world-wide deployment of cost efficient CCS technologies. They have argued that these policy objectives are to a large extent similar to the policy objectives of the European Union.

First, the Norwegian authorities noted that development of low carbon technologies is a key element in the Seventh Research Framework Programme. The objective of energy research is to adapt the current energy system into a more sustainable, competitive and secure one.

Furthermore, according to the Norwegian authorities, the TCM will provide facilities to establish a technology which is commercially available and will thus contribute substantially to environmental protection as a key objective for the Community. In the opinion of the Norwegian authorities, the TCM represents a step forward from a R&D&I point of view towards actual use of technologies for carbon capture. This work will entail a valuable experience related to technology solutions for full scale capture, both at the CHP plant and in other future gas fired power plant projects<sup>29</sup>.

The Norwegian authorities have claimed that the advantage achieved by the project will be extended to the Community as a whole as the TCM is open for all undertakings to test and verify their technology and is thus not limited to Norwegian undertakings or the owners of the TCM.

Second, pursuant to section 1 of the SET Plan Communication<sup>30</sup> “*Europe needs to act now, together, to deliver sustainable, secure and competitive energy. The inter-related challenges of climate change, security of energy supply and competitiveness are multifaceted and require a coordinated response. We are piecing together a far-reaching jigsaw of policies and measures: binding targets for 2020 to reduce greenhouse gas emissions by 20 % and ensure 20 % of renewable energy sources in the EU energy mix; a plan to reduce EU global primary energy use by 20 % by 2020; carbon pricing through the Emissions Trading Scheme and energy taxation; a competitive Internal Energy Market; an international energy policy. And now, we need a dedicated policy to accelerate the development and deployment of cost-effective low carbon technologies.*”

Third, in the SET Plan Technology Map Document, the European Commission has identified the main barriers to progressing further with low carbon technologies. “[...] *the high cost of first-of-a-kind plants, needed for demonstrating key technological components and building of confidence in CO<sub>2</sub> emission reduction potentials has been cited as one of the main barriers to progressing further with the technology [...] Focal points of*

---

<sup>29</sup> Letter dated 21 January 2008.

<sup>30</sup> Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions – A European Strategic Energy Technology Plan (SET-Plan). [http://ec.europa.eu/energy/res/setplan/communication\\_2007\\_en.htm](http://ec.europa.eu/energy/res/setplan/communication_2007_en.htm).

*additional work in capture and storage are [...] the development of innovative and more cost-effective capture processes.”*

In the opinion of the Norwegian authorities, the market failure hampering the economically efficient outcome of the market is linked to external costs of emissions from gas and coal-fired energy production and the external effects, which might result from further development of CCS technologies. The market price of allowances is not sufficient for the power producers to recuperate costs associated with carbon management through increased sales/reduced purchases of allowances in the market. In their view, there is a need for Governments to create incentives to progress further with the R&D&I activities in the field of carbon capture technologies with the objective of enhancing security of supply without increasing CO<sub>2</sub> emissions. Thus, in the opinion of the Norwegian authorities, as long as the alternative CO<sub>2</sub> abatement measure is less expensive than the cost of carbon capture management, private undertakings will not realise such projects themselves, unless the State intervenes financially. Therefore, they argued that the state investment in the TCM addresses “*a clearly identified and acknowledged market failure, in that the market alone cannot achieve an optimal economic outcome, and thus deliver the carbon capture technologies needed.*”

Finally, the Norwegian authorities considered that the European development of CCS technologies falls also into line with a key objective of the Lisbon Agenda to develop a technology based economy.

## II. ASSESSMENT

### 1 The presence of state aid

#### 1.1 Introduction

This Decision is based on a notification of a project, the TCM, which is in a planning phase. There are *inter alia* uncertainties regarding whether there will be other participants in the Company than StatoilHydro and the State, the holding of each participant, who will be the vendor of amine technology, and the final conditions in the agreement with both vendors of technology. Nonetheless, the Authority will base its decision on the available information as the factual situation is today. In particular, the Authority will base its Decision on the assumption that the State’s participation in the Company will amount to a maximum of 80 % and that StatoilHydro will participate with a 20 % shareholding. The decision is also based on the information currently at hand for the Authority as far as the role of the technology vendors is concerned.

#### 1.2 Is the market economy investor principle applicable?

As mentioned above, in their letter dated 5 July 2007 as well as in subsequent correspondence with the Authority, the Norwegian authorities have claimed that the State investment in the Company which will construct and own TCM does not constitute state aid because this investment will be made in accordance with the market economy investor principle.

In accordance with established case law<sup>31</sup>, the Authority will firstly assess whether, in similar circumstances, a private investor operating in normal conditions of a market economy would have entered into the transaction in question on the same terms. If the behaviour of the State complies with the market economy investor principle, there is no

---

<sup>31</sup> Case T-16/96 *Cityflieger Express v Commission* [1998] ECR II-757, paragraph 51, and Case T-228/99 and T-233/99 *Westdeutsche Landesbank Girozentrale a.o. v Commission* [2003] ECR II-435, paragraph 245.

state aid within the meaning of Article 61(1) of the EEA Agreement. The comparison between the conduct of public and private investors must be made by reference to the attitude which a private investor would have had at the time of the transaction in question, having regard to the available information and foreseeable developments at that time<sup>32</sup>.

The Authority has set out its general approach to public authorities' holdings in its State Aid Guidelines, in the chapter "Public authorities holdings". Paragraph 6 c) of this chapter lists certain situations where the contribution would contain state aid as the contribution would not be acceptable to a private investor operating under normal market economy conditions. The first point enlisted concerns the situation where the financial position of the company is such that a normal return (in dividends or capital gains) cannot be expected within a reasonable time from the capital invested.

The TCM is foreseen to operate for five years and no revenue or coverage of the cost of the investment is foreseen for this period. The Norwegian authorities have however argued that the investment is profitable for the Norwegian State as such. They have submitted a report from an independent expert, ECON Pöyry<sup>33</sup>, which estimates the net present value of the investment project. Although the report indicates that the net present value is positive, this result is based on several unsubstantiated assumptions of what the TCM project would achieve in terms of longer-term benefits. Among the alleged benefits mentioned are enhanced value of Norwegian gas reserves and cost savings for the future full scale carbon capture plant at Mongstad and other potential CCS projects.<sup>34</sup>

However, at the present stage, it is uncertain what the outcome of the TCM will be in terms of enhanced carbon capture efficiency and possible cost reductions which would apply to a full scale capture plant. Further, at this stage it cannot be assumed that the investment in the full scale carbon capture plant will be made in line with the market investor principle. On the contrary, it is the Authority's understanding that the obligation to operate full scale carbon capture storage for the EVM as from 2014 is a regulatory requirement imposed on StatoilHydro in its emission licence. The Norwegian State has subsequently committed itself in the Implementation Agreement to cover a significant share of the costs of the full scale carbon capture and storage solution. The Authority fails to see that the State in its commitment towards the licence holder has acted as a private investor.

The Norwegian authorities have claimed that the State's investment in TCM follows a commercial approach to contribute to the development of a functioning CCS technology supply. They have indicated that Norway is a leading nation in the oil and gas sectors and that the State has a commercial interest in the field through its participation in many sites throughout the continental shelf. In the Authority's view, this does not however *per se* justify that the State's participation in the TCM complies with the market economy investor principle.

---

<sup>32</sup> Case T-16/96 *Cityflieger Express v Commission*, cited above, paragraph 76.

<sup>33</sup> The ECON Pöyry report was drafted in November 2007, after the notification was submitted and the Co-Operation agreement was signed.

<sup>34</sup> With regard to the potential savings for the State Direct Financial Interest (SDFI) in the petroleum sector, in the ECON Pöyry report, the net present value range of a full-scale carbon capture plant at Mongstad is calculated to NOK 900-1810 million, which constitutes more than 90 % of the preliminary cost figure. The effect related to cost savings at one additional full-scale CCS plant owned by the State is estimated at NOK 725-1450 million. The net present value effect is reduced to NOK 250-500 million if the state participation reflects the SDFI's part of the total remaining reserves on the Norwegian Continental Shelf.

Due to the fact that the Norwegian State is the sole owner of all unexploited oil and gas resources on Norwegian territory, it is difficult to compare it with other economic operators in this sector. The Authority is nevertheless of the opinion that future costs savings or increased revenue relating to the State's ownership in oil and gas fields might be taken into consideration for the assessment of the market investor principle, provided that the measures taken by the State can be based on commercial grounds leaving other considerations such as energy policy or public service aside.

The Norwegian authorities have argued that lower carbon capture costs of gas could impact on the future gas price. The Authority considers that although future impact on the gas price could be positive for the State as owner of oil and gas resources, both the report and the notification are too vague and speculative concerning potential effects in this respect. The Authority cannot verify whether a normal return can be expected within a reasonable time from the capital invested<sup>35</sup>. On this basis, the Authority cannot conclude that a private market investor would have made a similar investment decision.

For the assessment of whether the State acts as a market investor, it would be relevant if other investors were to undertake the same investment on the same terms and conditions as the State. At the present stage, however, only StatoilHydro has committed itself to invest in the Company. StatoilHydro has however a particular interest in participating in the company, as it is under an obligation arising from the emission permit to capture 100 000 tons CO<sub>2</sub> from the CHP plant to be able to operate it. Moreover, the operator of the CHP plant is required to undertake full scale carbon capture from 2014. Investing in the Company is one way for StatoilHydro to comply with its obligation under the emission permit. The investment of 20 % in the company by StatoilHydro does therefore not constitute a sufficient indication to determine that the State has acted in line with the market investor principle. At the present stage, no other undertakings have made any investment decision with regard to the TCM.

Thus, despite the fact that the Norwegian State has commercial interests in the oil and gas sectors, interests that would be best protected in the case where cost-efficient and well-functioning CCS technologies were in place, the Authority fails to see a sufficient connection between this long-term consideration and the current investment decision taken by the State to cover 80 % of the costs and risks in the TCM project. In fact, no credible investment analysis on market economy principles has been presented.

For these reasons, and based on the information submitted, the Authority concludes that the behaviour of the Norwegian State cannot be compared with that of a market economy investor.

In the following, the Authority will assess whether the conditions laid down under Article 61(1) of the EEA Agreement for a measure to constitute state aid have been fulfilled.

### **1.3 Are the criteria of Article 61(1) of the EEA Agreement fulfilled?**

Article 61(1) of the EEA Agreement reads as follows:

*“Save as otherwise provided in this Agreement, any aid granted by EC Member States, EFTA States or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of*

---

<sup>35</sup> Reference is made to Section II.1.1 of this decision and to the Chapter on Public authorities holdings of the State Aid Guidelines.

*certain goods shall, in so far as it affects trade between Contracting Parties, be incompatible with the functioning of this Agreement.”*

### *1.3.1 State resources*

Thus, in order to constitute state aid, the measure must be granted by the State or through state resources. In the case at hand, the State decides to invest in the Company which will own and construct the TCM. Therefore, state resources are involved.

The fact that the state investment is channelled through and managed by a state-owned company called Gassnova SF does not alter this conclusion.

### *1.3.2 Selective advantage*

In order to qualify as state aid within the meaning of Article 61(1) of the EEA Agreement, the measure must also favour certain undertakings or the production of certain goods to be considered state aid. First, the aid measure must confer on its recipient advantages that relieve it of charges that are normally borne from its budget. Second, the aid measure must be selective in that it favours “*certain undertakings or the production of certain goods*”.

The State has decided to invest in this particular undertaking, the Company that will construct and own the TCM. The Authority has already considered in previous state aid cases<sup>36</sup> that the state investment in a situation where no private investor was willing to participate under the same conditions or with the same, or a proportional amount, of capital, conferred an advantage to the individual company recipient of the state investment.

#### *- The Company as an undertaking within the meaning of Article 61(1) of the EEA Agreement*

A question arises, however, whether the Company is an undertaking carrying out an economic activity within the meaning of Article 61(1) of the EEA Agreement. In the five-year life span of the notified Company, it is apparently not supposed to sell any services as no estimate of future revenues has been established. Nevertheless, the Authority holds no information that the Company would be prevented from doing so if the occasion arose. In addition, as mentioned above in page 3 of this Decision, the Norwegian authorities have explained that the State, StatoilHydro and other potential owners shall participate on equal terms providing competence and capital and gaining user rights to resultant technological innovations. Furthermore, there is no doubt that the aim of the Company is to create value through the testing activities. If such possible value is not retained in the Company for the purpose of commercial utilisation, it would accrue to the owners of the Company, StatoilHydro and the State, through Gassnova SF.

The concept of an undertaking encompasses every entity engaged in economic activity, regardless of the legal status of the entity and the way in which it is financed. In the Authority’s opinion, the activity of testing and developing carbon capture technology is an economic activity which is performed by many companies with the aim of making profit. Whether the Company chooses to seek profit or not is therefore immaterial.

#### *- Other beneficiaries*

---

<sup>36</sup> See EFTA Surveillance Authority’s Decision No 227/06/COL of 19 July 2006 with regard to state aid in favour of Farice hf. (Iceland), page 16.

The Authority has further considered whether the Company constitutes a mere vehicle to grant aid to its shareholders. In this case, Gassnova SF (as the manager of the state participation in CCS) as well as StatoilHydro being the shareholders of the Company, may be considered beneficiaries. The State has decided to invest in this testing centre and this will allow both StatoilHydro and Gassnova to gain user experience in the carbon capture technologies tested which other competitors will not have. They will get an advantage in the acquisition of know-how on the use of carbon capture technologies which is commonly known as first movers advantage. The measure would therefore give StatoilHydro and Gassnova SF a selective advantage. Even if Gassnova SF should not be an undertaking within the meaning of Article 61(1) of the EEA Agreement, this would naturally have no effect on the conclusion with respect to StatoilHydro.

Moreover, the Authority must assess whether the measure may benefit StatoilHydro and/or DONG Energy in connection with the CHP plant. The CO<sub>2</sub> emission permit for the CHP plant at Mongstad was granted pursuant to Section 11 of the Pollution Control Act. In accordance with Section 16 of the same act, certain conditions were imposed on StatoilHydro in the emission permit. One of the conditions is that from the start-up of the plant, at least 100 000 tons of CO<sub>2</sub> has to be captured per year. Under Norwegian law StatoilHydro is thus under a legal obligation to capture 100 000 tons of CO<sub>2</sub> a year. The State investment in the TCM will relieve StatoilHydro from part of the burden of the costs of capturing the CO<sub>2</sub> and hence give StatoilHydro an advantage. As mentioned above, Statoil has entered into a contract with DONG Energy to build, own and operate the CHP plant. The contract covers an operational period of 20 years. For the present assessment of whether state aid is present it is not necessary to determine whether StatoilHydro, DONG Energy or both would be the ultimate beneficiary of the measure. In the following, the beneficiary is sometimes referred to as StatoilHydro even if StatoilHydro has contracted the ownership and operation of the CHP to DONG Energy.

*- The technology suppliers*

A question also arises as to whether the vendors will receive any advantages. The provider of amine technology to be tested in the TCM will be selected on the basis of an open tender procedure. In the absence of the outcome of this tender procedure, it cannot be assessed whether the agreement with the vendor of amine technology will be concluded on market terms. At this stage, however, the Authority has no reason to consider that the price paid for the provision of the services should not correspond to their market value. In this respect, it should also be mentioned that StatoilHydro, a commercial business operator, takes part as a buyer in the selection procedure. Therefore, at this stage, the Authority has no reason to assume that an advantage should be granted to the vendor of amine technology selected in the framework of a properly conducted tender procedure.

Regarding the provider of chilled ammonia technology, the Norwegian authorities have explained that Alstom and StatoilHydro have been collaborating on chilled ammonia capture technology since 2005. They negotiated a bilateral Agreement in June 2007, prior to the signing of the Co-operation Agreement. According to the statements of the Norwegian authorities, this agreement was based on commercial conditions. The Alstom – StatoilHydro agreement is currently being re-negotiated with the participants of the Co-Operation Agreement<sup>37</sup> with a view of testing the chilled ammonia technology at the TCM. Also with respect to this agreement, the Norwegian authorities have stressed that it

---

<sup>37</sup> The parties to the Co-operation Agreement are for the moment Gassnova, representing the Norwegian State, StatoilHydro, Shell, Vattenfall and Dong.

will be negotiated on commercial terms. At this stage, there is no indication that the re-negotiated agreement would not correspond to market terms<sup>38</sup>.

As mentioned above, according to the information provided with the notification, Alstom will deliver, install, and, together with the participants in the TCM, operate the Test Facility for Chilled Ammonia. The final and concrete participation of the shareholders of the Company and the providers of technology will be determined in the final agreement between the parties to the Co-operation Agreement and Alstom. The Norwegian authorities have explained that since the parties to the Co-Operation agreement are currently five undertakings (Gassnova, StatoilHydro, Shell, Vattenfall, Dong Energy), it is the intention that Alstom shall fund approximately 1/6 of the costs of operating the Test Facility for Chilled Ammonia at the TCM. Alstom will, in addition to the funding, contribute with knowledge and development of the Chilled Ammonia technology.

From the information provided by the Norwegian authorities, it seems that the approach followed for the participation of Alstom in the test facility is in line with the principle of shared risk – shared cost. Therefore, at this stage, the Authority has no reason to assume that an advantage would be granted to Alstom.

### *1.3.3 Distortion of competition and effect on trade*

Finally, to fall within the ambit of Article 61(1) of the EEA Agreement, the measure must distort or threaten to distort competition and have an effect on trade between the Contracting Parties to the EEA Agreement. The state investment allows the creation of a company which will carry out a very specific project, the TCM, in which multinational business operators participate. The TCM concerns an activity, carbon capture, subject to trade between the Contracting Parties.

Regarding StatoilHydro, the undertaking competes internationally, and any aid granted to it will be liable to distort competition and affect trade. The same would apply to DONG Energy as well as to any of the undertakings that have signed the Co-operation Agreement, should they finally enter into the Participants' Agreement and become shareholders of the Company.

For these reasons, the Authority considers that the measure would be liable to distort competition and affect trade between the Contracting Parties.

### *1.3.4 Conclusion*

Based on the foregoing considerations, the Authority concludes that the state investment in the Company that will own and construct TCM constitutes state aid within the meaning of Article 61(1) of the EEA Agreement.

## **2 Procedural requirements**

Pursuant to Article 1(3) of Part I of Protocol 3, *“the EFTA Surveillance Authority shall be informed, in sufficient time to enable it to submit its comments, of any plans to grant or alter aid (...). The State concerned shall not put its proposed measures into effect until the procedure has resulted in a final decision”*.

By submitting notification, with a letter dated 5 July 2007 (Event No 428243), of the intention of the Norwegian State to invest in a Company which shall construct and own

---

<sup>38</sup> As current sole vendor of the chilled ammonia technology worldwide, Alstom has also entered into agreements with other parties: WE Energy in Wisconsin, US, E.ON Karlshamm in Sweden or America Electric Power in West Virginia, US.

the TCM, the Norwegian authorities have complied with the notification requirement. The measure has not been put into effect and is conditional on the Authority's approval. Norway has therefore complied with the standstill obligation.

The Authority can therefore conclude that the Norwegian authorities have respected their obligations pursuant to Article 1(3) of Part I of Protocol 3.

### **3 Compatibility of the aid**

#### **3.1 Introduction**

At this stage of development of carbon capture technologies, in line with EU policies concerning climate change and energy<sup>39</sup>, there seems to be a need to grant state support to carbon capture related projects in order for the technologies to gain the required commercial viability within the EEA.

Therefore, in the following, the Authority will assess whether the state investment in the Company that will construct and own TCM can be considered compatible with the state aid rules of the EEA Agreement. In particular, the Authority will assess whether any of the compatibility grounds foreseen under Articles 61(3)(b) or (c) of the EEA Agreement can be applicable to the notification of the State's investment in the Company that will own and construct TCM.

According to Article 61(3)(b) of the EEA Agreement "*aid to promote the execution of an important project of common European interest*" can be considered compatible with the functioning of the EEA Agreement.

According to Article 61(3)(c) of the EEA Agreement, "*aid to facilitate the development of certain economic activities or of certain economic areas, where such aid does not adversely affect trading conditions to an extent contrary to the common interest,*" may also be considered compatible.

The Authority has acknowledged the need to grant aid in the context of CCS technologies and indicated under Point 69 of the Authority's Guidelines on State aid for Environmental protection that projects in the field of carbon capture and storage should be assessed under Article 61(3)(b) or Article 61(3)(c) of the EEA Agreement directly, as at the present stage it is too early to give guidelines relating to such aid:

*"Finally, some of the means to support fossil fuel power plants or other industrial installations equipped with CO<sub>2</sub> capture, transport and storage facilities, or individual elements of the Carbon Capture Storage chain, envisaged by EFTA States, could constitute state aid but, in view of the lack of experience, it is too early to lay down guidelines relating to the authorisation of any such aid. Account must be taken of the strategic importance of this technology for the EEA in terms of energy security, reduction of greenhouse gas emissions. Reference may also be made to the Community long-term objective to limit climate change to 2°C above pre-industrial levels and the Commission's stated support for the construction of industrial-scale demonstration plants up to 2015, provided that they are environmentally safe and contribute to environmental protection. On this basis the Authority will have a generally positive attitude towards state aid for such projects. Projects could be assessed under Article 61(3)(c) of the EEA Agreement or be eligible as important projects of common European interest under the conditions set out in Article 61(3)(b) of the Agreement and point 147 of these Guidelines."*

---

<sup>39</sup> See EU Commission's Package of implementation measures for the EU's objectives on climate change and renewable energy for 2020, published on 23 January 2008.

As mentioned above, there are significant uncertainties regarding this project. There is not sufficient information available for the moment to assess whether the TCM constitutes a project of common European interest. Hence, without excluding that the project may be eligible under Article 61(3)(b) of the EEA Agreement, the Authority will assess whether the project is eligible under Article 61(3)(c) of the EEA Agreement, based on the present situation.

### 3.2 Assessment under Article 61(3)(c) of the EEA Agreement

In order to be compatible with Article 61(3)(c) of the EEA Agreement, the aid must pursue an objective of EEA interest in a necessary and proportionate way. In this context, a balancing test between the positive and negative effects of such an aid measure should be carried out. To this extent, it is appropriate to assess the following issues:

- 1) Is the aid measure aimed at a well-defined objective of EEA interest (for example: environment, energy security, etc.)?
- 2) Is the aid well designed to deliver the objective of EEA interest that is to say, does the proposed aid address a market failure or other objectives?
  - a) is state aid an appropriate policy instrument?
  - b) is there an incentive effect, namely does the aid change the behaviour of undertakings?
  - c) is the aid measure proportional, that is, could the same change in behaviour be obtained with less aid?
- 3) Are the distortions of competition and effect on trade limited, so that the overall balance is positive?

#### 3.2.1 *The project aims at a well defined objective of EEA interest*

The protection of the environment is according to the Authority's guidelines regarded as an objective of EEA interest. To reduce emissions of CO<sub>2</sub> is an important environmental challenge today.

In its Communication "An energy policy for Europe"<sup>40</sup>, the Commission set out a target to "design a mechanism to stimulate the construction and operation by 2015 of up to 12 large-scale demonstrations of sustainable fossil fuels technologies in commercial power generation in the EU 25" and "provide a clear perspective when coal- and gas-fired plants will need to install CO<sub>2</sub> capture and storage." In line with other efforts in the EEA, Norway has adopted a policy towards environmental protection and climate change and has committed itself to carbon reduction<sup>41</sup>. A necessary tool to achieving these commitments is the existence of cost-efficient and successful carbon capture technology which is currently not on the market. This project, which aims at testing and developing

<sup>40</sup> European Commission Communication from the Commission to the European Council and the European Parliament – An energy policy for Europe. COM(2007) 1 final.

<sup>41</sup> The Norwegian authorities have informed the Authority of their Government policy regarding carbon capture. The point of departure is the Government's so-called "Soria Moria Declaration", which succeeds the 2001 Sem Declaration. There is a broad political consensus in Norway regarding carbon capture management as an appropriate and necessary measure to combat climate change. The Norwegian authorities have stated that the new concessions to gas fired power plants shall be based on carbon capture management. "The Government has expressed that it does not intend to change or revoke concessions given by previous governments, but has, however, expressed a willingness to realise carbon capture and storage projects".

technologies for capturing CO<sub>2</sub>, could contribute significantly to the development of carbon capture technologies. The size and functionality of the TCM should be designed in such a way that upgrading to full scale commercial capture plants is feasible. The TCM must be regarded as a well defined project of EEA interest that can contribute as a preparatory step to the full chain demonstration at large scale envisaged by the Communication.

The objective of the TCM is to test, verify and demonstrate different concepts and technologies capable of reducing costs and risks related to large carbon capture. The TCM project will contribute to the common interest in the field of energy, climate change and environmental protection by ways of testing and verifying two different carbon capture technologies (chilled ammonia and amines) on two different sources of flue gases (a gas-fired CHP whereby the CO<sub>2</sub> content of exhaust gases only amounts to 3 %, and a cracker of a refinery which pollutes with a 12 % CO<sub>2</sub> concentration). The Norwegian authorities have indicated that these four lines of testing will provide the necessary evidence for the technologies to develop and mature towards its application to several industries. The development of carbon capture technologies is in the Community's and the EEA's interest.

The Norwegian authorities have indicated their intention to contribute to the development of efficient carbon capture technologies, which can be widespread. It is for this reason that the Norwegian State decided to regulate the intellectual property rights arising from the testing and verifying exercise at the TCM in such a way that it is the vendors of the technology who will retain the IP rights. Vendors have, by nature, an interest in selling their technology and are unlikely to discriminate between potential clients. Thus, know-how acquired by vendors will be available to all interested users. Should the testing and verification at TCM reach a successful outcome in the sense that the development of cost-efficient technologies will be possible thereafter, the project will contribute to the development of safe, efficient and environmental friendly technologies.

Moreover, the fact that the project concerns testing activities and is foreseen for a limited duration of five years, starting in 2010, is a positive element for consideration in the compatibility assessment. Within this defined time horizon, the goal is to achieve improvements in the tested carbon capture technologies regarding future applications to both coal and gas-fired power plants as well as other industries in a cost-efficient and commercially viable way. The ultimate objective pursued by the investment in the TCM is the supply of carbon capture technologies available for use on a range of undertakings so that the environmental objective of CO<sub>2</sub> reduction could be better achieved.

In the Authority's opinion, for the above-mentioned reasons, the TCM must be regarded as aimed at a well defined objective of EEA interest.

### *3.2.2 Addressing market failure and designing the aid to meet the objective of EEA interest*

#### *3.2.2.1 Introduction*

At this stage of the development of carbon capture technologies, there is not sufficient experience of the application of the technologies on carbon emitting plants, on users. Some technologies have been tested at laboratory level or on a small scale. For the moment it is too costly and too risky to apply them on a large scale in an undertaking. Given the commercial and regulatory risks, there is a market failure hampering the development of carbon capture technologies, which may prevent the market from reaching the optimal output and lead to an inefficient outcome from a societal point of view.

A number of projects may have an unattractive rate of return from a commercial perspective, even though the projects would be beneficial for society. Consequently, projects which follow objectives of broader interest may not be pursued unless governments intervene.

There are technical and economical risks generally associated with carbon capture projects. The technical risk relates in particular to the use of non-proven technologies and the application of new processes that have not yet been commercialised. Should the TCM testing be successful and improve the commercial possibilities of using carbon capture technologies, two solutions may be available for use not only on low-polluting gas-fired power plants but also on coal-fired power plants. The TCM project represents an attempt to develop commercial carbon capture technologies which can be retrofitted to numerous undertakings in the world.

However, there are no immediate market incentives for a project of the nature of the TCM project given the high risks involved and given that there is no guarantee of success for a cost effective solution in the short term. In the view of the Authority, the TCM project addresses a situation characterised by market failure. Therefore, without the Government's intervention, the project would most likely not have been pursued.

#### 3.2.2.2 Aid as an appropriate policy instrument and incentive effect

Norway has decided to give momentum to carbon capture technologies by investing in the promotion and development of carbon capture technologies. The current notification concerns the State's investment in TCM where two different carbon capture technologies (chilled ammonia and amine) will be tested on flue gases with very different CO<sub>2</sub> concentrations depending on whether the source is the CHP or the refinery cracker. According to the information provided by the Norwegian authorities, amines have been tested and are in use partially in various plants in Europe without providing a fully satisfactory cost-effective solution. Furthermore, chilled ammonia, a new technology in the area of carbon capture patented by Alstom, will be tested and verified at TCM on a new scale.

Emitting CO<sub>2</sub> is currently not expensive enough to encourage research activities to reduce pollution in the scale and for the amount of investment foreseen under the TCM. Other instruments at legislative level which the Norwegian authorities could have put in place such as permits, taxes or other economic measures would not have achieved the objective, which is encouraging the development of cost-efficient and commercially viable carbon capture technologies by testing them at a plant level. There does not seem to exist any better or more plausible alternative for the State to achieve its objective of reducing CO<sub>2</sub> emissions than to give momentum to the development of carbon capture technologies itself. According to the information provided by the Norwegian authorities, the only suitable instrument to encourage testing at plant level, as will be done at the TCM, seems to be the financial participation of the State in the project.

According to the Authority's knowledge, without the concrete state participation in the TCM project, the testing project would most likely not be realised. The Authority does not question that other carbon capture related projects exist or that they could be prepared successfully without the state intervention. However, it seems that the scale of the TCM, which constitutes a testing plant at a level of a polluting undertaking, far beyond laboratory scale testing, constitutes something new and is the core of the project. Moreover, due to the State's participation in the venture, third parties, may also take part

in the research project. Thus, in the Authority's view, there is an incentive effect of the state support in this case.

### 3.2.2.3 Proportionality of the aid measure – could the objective be obtained with less aid?

The Norwegian authorities have stated on several occasions during the preliminary investigation phase that the participation of the State in the Company currently at 80 % of the Company's shares will be reduced according to the possible participation of third parties in the project. Negotiations are still ongoing and third parties will only make their investment decision at the end of the year. The Authority understands that the Norwegian authorities' intention has always been to limit the participation of the State to the minimum necessary for the project to be carried out. For this reason, they have contacted various undertakings in the sector that could be interested in the TCM project.

The Norwegian authorities have argued that the start-up investment of the TCM is high, with no foreseen revenues during the years of operation of the TCM. Thus, as the Norwegian authorities explained, due to the lack of profitability of the investment in the TCM, the alternative for StatoilHydro, when the company was granted the conditional emission permit from the licensing authorities in Norway, was not to establish the CHP plant. As mentioned above, based on the conditions set out in the emission permit, the Norwegian Government required StatoilHydro as a condition for the construction of the CHP plant to 1) establish and cater for capture of at least 100 000 tons of CO<sub>2</sub> per year from the start up of the CHP plant and 2) establish full scale carbon capture from the CHP plant at Mongstad by the end of 2014.

StatoilHydro has been imposed an obligation to capture CO<sub>2</sub> which, even if it is in line with the environmental policy of the Norwegian Government, goes beyond the environmental standards applicable in the EEA. The Authority considers that the state intervention helps this undertaking to test technologies with the aim of achieving a higher environmental protection in as far as its investment shall make it possible for StatoilHydro to capture 100 000 tons of CO<sub>2</sub> required by the emission permit to build the CHP. The Authority notes however that the state support does not alleviate the undertaking of any other operating costs. The state aid is solely given to the TCM to achieve the environmental objective of testing carbon capture technologies.

Moreover, the Authority has positively valued the fact that the TCM is foreseen to be operative for a limited period of five years.

In light of this, the State's participation into the TCM project, which can contribute to the development of these technologies can be considered proportionate.

### 3.2.3 *A limited distortion of competition and effect on trade*

It is the understanding of the Authority on the basis of the information provided by the Norwegian authorities, that the Company is a sort of a joint venture for a short duration, i.e. for as long as the testing and verifying process in the TCM takes. This has been stipulated to last for a limited period of time, up to five years.

Due to the temporary nature of the Company, the Authority considers that this aid will not have any permanent effect on the localisation of economic activities across the EEA States since it does not seem to be sufficient for the establishment of a cluster in carbon capture technology vendors and/or users on a long term perspective.

Climate change is a global problem. Energy accounts for 80 % of all greenhouse gas emission in the EU<sup>42</sup>. It is at the root of climate change and most air pollution<sup>43</sup>. However, energy is essential for Europe to function. In this scenario, the need for more energy means a clear requirement for more clean energy. One of the ways of achieving clean energy is the use of functioning carbon capture technologies in particular on highly polluting energy producing undertakings.

If regulatory requirements to capture CO<sub>2</sub> are introduced for all undertakings or on all electricity producers, electricity will be very expensive for consumers unless carbon capture is made economically viable. These technologies can only be spread and used to efficiently combat climate change if they are commercially available and affordable.

The testing at the TCM will possibly give a so-called first-movers advantage to the participants in the Company, at the current stage mainly StatoilHydro, which may be distorting of competition. However, in the opinion of the Authority, this advantage is outweighed by the positive spill-over effects that the availability of commercially accessible and cost-efficient carbon capture technologies will have for consumers and society if the project turns out to be successful. If the project should not give the results hoped for, there is no reason to be concerned about distortion of competition.

Moreover, participation of other undertakings in the Company could additionally lead to less distortion of competition.

In the Authority's view, the State's participation in the Company that will own and construct the TCM shows the need for state support for the development of projects in the important field of CCS for enhanced environmental protection. The CCS solutions are in their starting phase and the State's support to the project at hand is necessary for its realisation. In a wider European context the economic support and political impulse given to the current project is a building block with the aim of enabling capture technologies and industries to gain momentum and become profitable. Only if carbon capture technologies become economically viable and cost-effective there will be a real option for their application.

For these reasons, in the Authority's view, there is a positive balance between the possible negative effects of the state support to the Company which will own and construct the TCM with the overall positive effects related to introducing and improving technologies, and to enhancing research into carbon capture technologies.

#### **4 Conclusion**

For these reasons, the Authority concludes that at this point of the development of carbon capture technologies and taking into account the issue of climate change, the State's investment in the Company that will own and construct the TCM can be considered compatible with Article 61(3)(c) of the EEA Agreement.

It is emphasised that this conclusion is reached on the basis that the support is to testing activities and that the project has a limited time duration of five years.

The Authority request the Norwegian authorities to provide a copy of the Participants' Agreement once it is signed.

---

<sup>42</sup> Source – European Environment Agency.

<sup>43</sup> Communication from the Commission to the European Council and the European Parliament – An energy policy for Europe. COM (2007) 1 final.

The Norwegian authorities are also reminded that all plans to modify or prolong the State's investment at the TCM beyond the initial period of five years must be notified to the Authority.

The Norwegian authorities are reminded about the obligation resulting from Article 21 of Part II of Protocol 3, in conjunction with Article 6 of Decision 195/04/COL, to provide annual reports on the implementation of the aid.

HAS ADOPTED THIS DECISION:

Article 1

The EFTA Surveillance Authority has decided not to raise objections to the investment of the Norwegian State in the Company which will construct and own the TCM and operate it for a five year period on the basis of Article 61(3)(c) of the EEA Agreement.

Article 2

This Decision is addressed to the Kingdom of Norway.

Article 3

Only the English version is authentic.

Done at Brussels, 16 July 2008

For the EFTA Surveillance Authority,

Per Sanderud  
President

Kristján Andri Stefánsson  
College Member