

[Non-confidential version]
[The information in square brackets is covered by the obligation of professional secrecy]

EFTA SURVEILLANCE AUTHORITY DECISION

of 28 November 2016

not to raise objections to individual aid in favour of Arba Follum AS for the construction of a demonstration plant for the production of black wood pellets

(Norway)

The EFTA Surveillance Authority (“the Authority”),

HAVING REGARD to the Agreement on the European Economic Area (“the EEA Agreement”), in particular to Article 61(3)(c) and Protocol 26,

HAVING REGARD to the Agreement between the EFTA States on the Establishment of a Surveillance Authority and a Court of Justice (“the Surveillance and Court Agreement”), in particular to Article 24,

HAVING REGARD to Protocol 3 to the Surveillance and Court Agreement (“Protocol 3”), in particular to Article 1(3) of Part I and Article 4(3) of Part II,

Whereas:

I. FACTS

1 Procedure

- (1) The Norwegian authorities notified an individual aid measure in favour of Arba Follum AS (hereinafter “Arba Follum”) pursuant to Article 1(3) of Part I of Protocol 3 by letter received and registered by the Authority on 21 October 2016.¹

2 Description of the notified measure

2.1 The notified aid measure

- (2) The notification concerns individual state aid in the form of a grant of NOK 138 million to Arba Follum for the construction of a demonstration plant in Follum (in Ringerike municipality), in Norway (“the notified measure”). The aid will be disbursed during the

¹ Document No 823477. The letter enclosed a notification form (Document No 823477), an explanatory document (Document No 823476) and 8 annexes (Documents No 823472 to 823475 and 823478 to 823481).

period 2016-2017. The objective of the aid is to demonstrate a complete, new and more energy efficient production process for a pelletised bio-based coal substitute, Arba pellets, in a large scale demonstration project.

2.2 Enova's New Energy Technology Programme

- (3) The notified measure will be financed from the Energy Fund, which is managed by Enova SF ("Enova"), a state enterprise fully owned by the Norwegian State via the Ministry of Petroleum and Energy. Enova was established on 1 January 2002 with the purpose of managing the Energy Fund and administering several Norwegian support programmes aimed at promoting the use of energy-efficient technologies. One is the New Energy Technology Programme ("NETP"), which assists demonstration projects for innovative technologies, in order to foster their market diffusion. By Decision No 248/11/COL,² the Authority declared the Energy Fund scheme, including the NETP, compatible with the EEA Agreement.
- (4) The NETP foresees a maximum aid intensity of 50% for large enterprises. According to Decision No 248/11/COL, an individual notification to the Authority of any aid measure above EUR 7.5 million is required.³ The notified aid exceeds this notification threshold.
- (5) Enova awarded the aid for Arba Follum's demonstration project in a decision adopted by the board of directors on 15 October 2015 (Annex 6 to the notification).⁴ The aid is conditional upon the Authority's approval.

2.3 The beneficiary

- (6) Arba Follum was established in order to plan, build and operate an up-scaled demonstration plant for the production and market introduction of Arba pellets, based on Arbaflame AS's own technology, at the Follum industrial site at Hønefoss. Arba Follum is owned by Arbaflame AS (40%), Viken Skog Holding AS (40%) and Statskog SF (20%).
- (7) Arbaflame AS is a technology development company that has a world leading patented process (steam treatment) for producing Arba pellets for replacing coal. Arbaflame AS will co-invest in industrial scale plants with established feedstock partners. The technology will also be licensed to external partners. Arbaflame AS is a Norwegian privately held company.
- (8) Viken Skog Holding AS is owned by Viken Skog SA, which is owned by forest owners in the southern part of Norway. Their aim is to ensure sustainable use of the resources in the owner's estates and secure an economically sustainable rate of return from the properties.
- (9) Statskog SF is a state-owned enterprise whose principal activities are forestry and land-use management on behalf of the Norwegian Government. Statskog SF is the landowner of about 20% of the Norwegian mainland surface.
- (10) The beneficiary does not have any pending recovery order and it is not an undertaking in difficulties; the beneficiary and its group have sound financial accounts. The beneficiary is a large enterprise.

² Decision No 248/11/COL of 18 July 2011 on the Norwegian Energy Fund scheme (OJ C 314, 27.10.2011, p.4). The full text is available at the Authority's website: <http://www.eftasurv.int/media/decisions/248-10-COL.pdf>

³ *Ibid.*, para. 58, cross-referring to point (160) of the Guidelines on State aid for environmental protection ("EAG"), published on 10 June 2010 (OJ L 144, 10.6.2010, p. 1 and EEA Supplement No 29, 10.6.2010, p. 1).

⁴ Document No 823473.

2.4 The market on which Arba Follum is active

- (11) The Arbapellets produced by Arba Follum will primarily be sold as sustainable and renewable fuel to European coal fired power plants and combined heat and power plants. This black (wood) pellet can substitute, partly or fully, fossil coal with only minor adaptations and investment cost at the relevant power plant. Thus, the primary market will be coal fired power plants that have sufficient incentives or drivers to reduce their greenhouse gas (GHG) emissions while simultaneously avoiding potentially large investment cost.
- (12) The coal-industry and the market for coal is global. More than 50 countries have commercial coal mines and coal is commercially used all over the world. Coal has several uses, most significant is for electric power generation, steel production, cement manufacturing and as a liquid fuel.
- (13) The overall international trade in coal reached 1 383 million tonnes (“Mt”) in 2014, which accounts for about 25% of the total coal consumed. Most coal is therefore used in the country where it is produced. Coal prices have historically been lower and more stable than oil and gas prices and coal has been the most affordable fuel for power generation in many developing and industrialised countries for decades. Coal-fired power plants currently fuel 41% of global electricity.

2.5 Black pellet production technologies

- (14) Black pellets have several advantages compared to traditional white wood pellets, such as better transport efficiency, higher heating value, better grindability, higher bulk energy density and higher water resistance. However, as opposed to the white pellets industry and production technologies, the black pellets industry and production technologies are still at a very early stage. The industry has been characterised by 3 pathways of black pellet production technologies;
 - Hydrothermal carbonisation
 - Torrefaction
 - Steam explosion
- (15) All the aforementioned technologies include destruction of the lignocellulosic biomass components resulting in greater brittleness, more coal like milling properties and a more hydrophobic behaviour, than white pellets.

2.6 The demonstration project

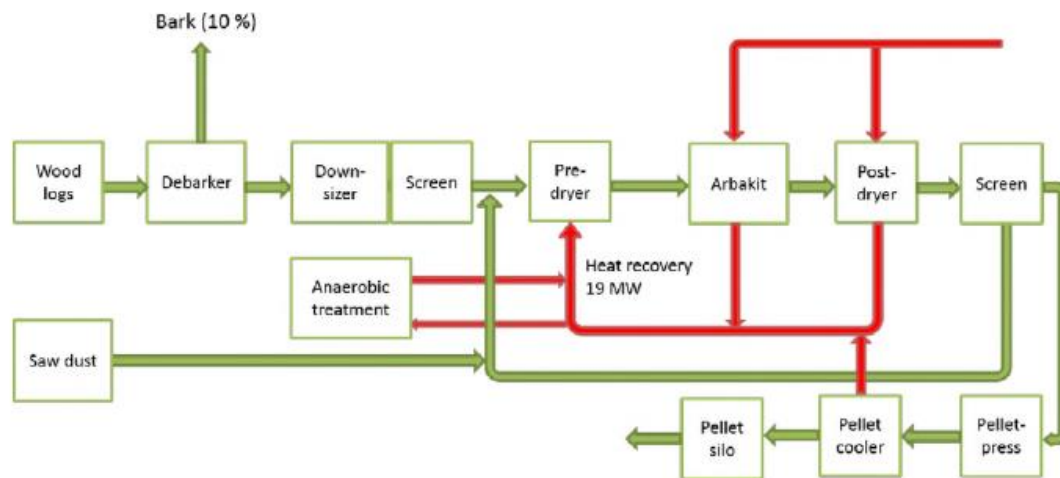
- (16) The project refers to a full-scale demonstration project at Treklyngen’s brownfield industrial site at Follum, which will produce Arbapellets, using a new, innovative, green technology.
- (17) The project will have one year of construction/installation and 15 years of operation. Therefore, the Norwegian authorities consider that the lifetime of the project is 16 years.
- (18) Aid to Arba Follum is given in the form of a direct grant, disbursed in line with the disbursement procedure laid out in Decision 248/11/COL, depending on the progress of the project and the investment cost budget. The disbursements are made as reimbursements for incurred costs on the basis of progress reports submitted by Arba Follum wherein actual incurred costs are documented.

2.6.1 The Arbaflame technology

- (19) The Arbaflame technology is based on a patented steam explosion process.⁵ The demonstration plant at Follum will be erected on a brownfield location and is designed for a yearly production capacity of 200 000 tons. Arba pellets have higher energy density than white pellets, 5.4 kWh/kg versus 4.8-4.9 kWh/kg. The plant will thus produce in total 1.1 TWh fuel energy per year.
- (20) The feedstock will be around 450 000 m³ of woodlogs at a maximum transport distance of 150 km and 50 000 m³ of sawdust from regional sawmills.
- (21) The core process technology has been developed by Arbaflame over the last 10-15 years. The Arba Follum plant is a further development and completion of the Arbaflame production technology presented at the Grasmo test plant outside Kongsvinger, Norway. The pilot plant at Grasmo produces around 10 – 15 000 tons of pellets per year, thus barely providing sufficient test volumes for potential users. The pilot plant has nonetheless been suitable for process and product improvements, product quality assessment and market development. Some 10 full-scale trials have been conducted at power plants in Europe and North America.
- (22) To enable the up-scaled demonstration plant at Follum, significant innovative steps are required, *e.g.* log handling, feedstock preparation and downsizing, thermal process integration, heat recovery, process integration for condensates handling and anaerobic biogas production and a 10-15 fold up-scaling of the complete processing.
- (23) The production route at the Arba Follum plant is schematically shown in **figure 1** below. The plant will use locally available wood resources as feedstock. The existing debarker, once part of the former Follum paper mill, will be integrated into the production line. Debarked, fresh wood logs will be fed to a one-step downsizer that will produce fine sawdust-sized particles. Alone, this is an innovative solution saving a significant amount of electric power in conventional milling operations. Thus, this technology will provide a high quality feedstock while simultaneously reducing the electric power consumption by 50 to 80% compared to conventional chippers and hammer mills. However, this new solution has so far only been demonstrated in a discontinued test facility.

⁵ In general steam explosion is a process in which biomass is treated with hot steam (180 to 240 °C) under pressure (1 to 3.5 MPa) followed by an explosive decompression of the biomass that results in a rupture of the biomass fibers rigid structure. The sudden pressure release defibrillates the cellulose bundles, and this result in a better accessibility of the cellulose for enzymatic hydrolysis and fermentation. Acetic acid is released from the wood, and this result in partial hydrolysis of the cell wall components. During steam explosion, lignin is softened, released from the cell wall and distributed evenly onto the raw material. The steam-exploded material usually gets directly into the pellet mill where it is again exerted to high pressure and temperature. Pellets from steam explosion processes are dark brown in colour, and stiffer than conventional wood pellets. They are less abrasive and more stable towards moisture than common wood pellets (white pellets). The bulk density of steam-exploded pellets is relatively high in comparison to conventional wood pellets and different values are found in literature ranging between 630 to 750 kg/m³.

Figure 1. Arba Follum plant production route



- (24) The demonstration plant will also be equipped with a reception hopper for sawdust supplied by regional sawmills, representing 10-15% of the total feedstock.
- (25) After downsizing, the feedstock will be transferred to air blown belt dryer(s), i.e. the pre-drying step, where the moisture content will be reduced to around 30-35%. Thereafter, the semi dry feedstock will be fed to the core process step: Arbaflame's proprietary high temperature reactor system, the Arbakit. In the first reactor step high-pressure steam is introduced thereby exposing the feedstock to high pressure and temperature. Following the necessary residence time, the steam pressure is rapidly released and the feedstock undergoes a steam explosion process while simultaneously being blown to the second process step, the flashtank. From the flashtank, the now even finer sized feedstock is transferred to a steam driven post-dryer in which the moisture content is reduced to around 12-15%, after which the feedstock is fed to pellet presses, the pellet cooler and into onsite storage silos.
- (26) In summary, the core process step for the production line at Arba Follum is Arbaflame AS's reactor system where the feedstock's material properties are significantly changed. The temperature exposure and the steam explosion sequence lead to chemical and physiological changes in the wood structure, as the lignin becomes glassy and some of the volatile compounds are released or dissolved.
- (27) The total energy consumption at the demonstration plant will be around 214 GWh per year, all from renewable sources.⁶

2.6.2 Expected environmental impact of the demonstration project

- (28) As previously noted, the innovations are more energy efficient compared to what has earlier been done at the pilot plant at Grasmo and to technologies that are now commercially used at traditional wood pellet (white pellet) plants.
- (29) Compared to the alternative technology to produce black pellets, which is the Arbaflame pilot plant, the different elements in the new production technology will give substantial energy savings for the production of the volume planned in the demonstration plant (200 000 tons of Arba pellets per year):
- (i) One-step, energy saving production of high quality feedstock from wood logs:
 - 10-20 GWh reduced electricity consumption per year.

⁶ 41 GWh of electricity and 173 GWh of thermal energy.

- (ii) Heat recovery from condensates with high levels of organic content:
 - 120 GWh heat recovered per year.
 - (iii) Integrated process for biogas production:
 - 22.5 GWh gas heating value produced per year.
- (30) This amounts to a total energy saving of 142.5 GWh compared to the alternative technology.

2.6.3 Technology diffusion

- (31) The technology will be spread globally through Arbaflame AS, who owns the technology rights. Arbaflame AS will both license these rights on reasonable and non-discriminatory terms through the EEA and engage in joint ventures.⁷
- (32) The marketing of the technology is already an ongoing activity and closely linked to the introduction of the Arbapelllets to its potential customers. Once demonstrated and proven, Arbaflame AS's main business idea is to licence its technology to any other interested parties globally. Arbaflame AS is already cooperating with interested parties that intend to further spread the Arbaflame technology through such licence agreements.
- (33) Arbaflame AS is actively marketing its technology to spread the technology based on licence agreements with several market players:
- Owners of coal fired power plants, heating plants and other users of Arbapelllets.
 - Established and potential new players for the set-up of production plants using the new technology.
 - Major vendors interested to deliver plant-packages based on the Arbaflame technology.
- (34) This diffusion is mainly done through participation and presentations in relevant international conferences and exhibitions, an extensive network of utilities performing co-firing tests of the Arbapelllets and through networking within the relevant industries.

2.6.4 Cost and benefits of the demonstration plants

- (35) The **accepted total investment costs** for the demonstration project are NOK 326 298 000, divided as follows:

Table 1. Total investment costs

	Investment (NOK)	Share
Dryer	46 970 000	14%
Reactor	43 860 000	14%
Feedstock handling system	24 781 000	8%
Pellet press	19 182 000	6%
Common systems	10 058 000	3%
Steam system	10 369 000	3%
Biogas production	33 179 000	10%
Building	50 184 000	15%
Electric power systems	20 219 000	7%

⁷ Document No 823480.

Automation/SRO	8 399 000	2%
VVS/HVAC	12 442 000	4%
Storage facilities	10 369 000	3%
Project administration	15 553 000	4%
Detailed engineering	20 737 000	7%
Total investment	326 298 000	100%

- (36) The **operating costs** of the project are substantial compared to the capital expenditure (“CAPEX”). Arba Follum estimates that the operating costs, at full production, will be NOK [...] million.
- (37) **Operating benefits** of the project includes income for the full production of Arbapellets of 200 000 tons. The income is calculated based on figures from December 2014 to [...] with the exchange rate from November 2015 of NOK/Euro 8.44. This results in NOK [...] per ton of Arbapellets. Therefore, the total benefits at a full production is calculated to NOK [...] million

2.6.5 Extra cost calculation

- (38) Paragraphs 117 and 118 of Decision 248/11/COL establish that the eligible costs under the NETP shall be determined as the extra investment costs established by comparing the aided investment with the counterfactual situation in the absence of state aid. Therefore, the eligible costs are calculated net of the operating benefits and operating costs related to the extra investment for energy saving and arising during the first five years of the project.
- (39) As described above, the total investment costs of the demonstration project are NOK 326.3 million. The demonstration plant project’s discounted operational revenues during the first five years of operation amount to NOK [...] million, while the discounted operational costs the first five years are NOK [...] million. The cash flow over the investment period and the first 5 years of running operations is set out in **Table 2** below.

Table 2. Cash flow during the first 5 years of operation

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Total investment	32 629 828	293 668 452	0	0	0	0
Annual income	0	0	[...]	[...]	[...]	[...]
Operating costs	0	[...]	[...]	[...]	[...]	[...]
Cash flow	-32 629 828	-306 168 452	-16 286 600	19 241 440	26 084 120	32 926 800

- (40) The Norwegian authorities consider that the counterfactual scenario is no investment.⁸ Therefore, the eligible costs of the demonstration project are calculated on the basis of the entire investment costs of the project, which amount to NOK 326 298 000. Once the operating costs and benefits have been taken into account, the eligible extra costs are NOK 293.4 million. See **Table 3** below.

Table 3. Eligible extra costs calculation

	Demonstration plant (MNOK). Nominal value	Counterfactual MNOK
Investment costs	326.3	0
Operating costs	[...]	0

⁸ The NETP envisages that eligible costs will normally be calculated by reference to a counterfactual investment. However, it foresees that a “no investment” counterfactual may be a more realistic counterfactual alternative under certain circumstances (Decision No 248/11/COL, para. 142).

Operating benefits	[...]	0
Eligible extra costs	293.4	

- (41) The proposed aid amount of NOK 138 million results in an aid intensity of 47% of the eligible extra costs, as described in **Table 4** below.

Table 4. Aid calculations

	Aid in Nominal value MNOK
Investment costs	326.3
Eligible costs	293.4
Maximum aid intensity according to Decision No 248/11/COL	50%
Maximum aid amount according to Decision No 248/11/COL	146.7
Aid to Arba Follum	138
Aid intensity	47%

- (42) Thus, the aid intensity is below the maximum aid intensity permitted under the NETP.

3 Comments by the Norwegian authorities

3.1 Legal framework for the assessment of the measure

- (43) According to the Norwegian authorities, the notified measure should be assessed in line with Decision No 248/11/COL as aid granted under the NETP of the Energy Fund scheme, which the Authority declared compatible with the functioning of the EEA Agreement on the basis of Article 61(3)(c) of the EEA Agreement.⁹
- (44) Since the measure has an environmental objective, the Norwegian authorities use the guidelines for environmental protection adopted in 2010 (hereinafter “EAG”¹⁰) and the guidelines on state aid for environmental protection and energy 2014–2020 (hereinafter “EEAG”¹¹) as general insights into relevant principles for their compatibility assessment.
- (45) In their analysis, the Norwegian authorities have firstly assessed whether the project is eligible for aid under the NETP. Secondly, they have appraised the compatibility of the measure in line with the conditions laid down in Decision No 248/11/COL. In that regard, Norway has verified that: (i) the aid is aimed at a well-defined objective of common interest, (ii) there is a need for State intervention, (iii) the aid measure is an appropriate instrument to achieve the foreseen objective, (iv) there is an incentive effect, (v) the aid measure is proportionate, and (vi) the distortions of competition and effects on trade are limited.

⁹ With reference to Commission Decision N 521/2008, *Alpha Ventus*, the Authority concluded that the programme fell within a gap between the scope of the EAG and the R&D&I Guidelines. See Decision No 248/11/COL, paras. 132-137. State aid guidelines for environmental protection (“EAG”), OJ L 144, 10.6.2010, p. 1 and EEA Supplement No 29, 10.6.2010, p. 1. Decision No 248/11/COL refers to the former R&D&I state aid guidelines (“R&D&I Guidelines”), OJ L 305, 19.11.09, p.1 and EEA Supplement No 60, 19.11.09.

¹⁰ State aid guidelines for environmental protection (“EAG”). See footnote 13.

¹¹ Guidelines on state aid for environmental protection and energy 2014-2020 (“EEAG”). OJ L 131, 28.5.2015, p. 1 and EEA supplement to the OJ No 30, 28.5.2015, p.1.

- (46) The Norwegian authorities have also confirmed that the transparency obligation will be complied with for all aid granted from July 2016, in line with the transparency requirements laid down in Section 3.2.7 of the EEAG.

3.2 Eligibility of the project under the NETP

- (47) The Norwegian authorities explain that all applications under the NETP are subject to the following procedure.
- (48) First, Enova carries out an individual assessment of the information provided by the applicant on the technical potential of the project and the relevant costs and benefits.
- (49) Secondly, Enova undertakes a financial analysis of the project in order to determine the aid required to ensure a normal return on capital, taking into account operating benefits and costs. Projects with an estimated return on capital that exceeds what is considered normal for the relevant industry are not eligible for aid.
- (50) Thirdly, Enova compares the aid required to ensure a normal return on capital with the applicable maximum aid intensities.
- (51) Finally, Enova gives priority to projects according to the level of aid needed (per kWh saved), as well as the likely future environmental impact of the new technology to be verified, until the annual budget is allocated. Thus, projects that qualify under steps one to three of the assessment might in the end not be awarded aid due to budgetary limits and competition from other, more efficient projects.
- (52) According to Decision No 248/11/COL, demonstration projects have to fulfil a number of criteria in order to be eligible for aid under the NETP. The fulfilment of these criteria are supervised by Enova. The criteria are:

3.2.1 Limited market dissemination and no prior full-scale testing¹²

- (53) The technology has been tested on a smaller scale by Arbaflame AS. However, the demonstration project proposed by Arba Follum is the first implementation at a commercial scale of the technology. The technology has not yet been tested in a full-scale demonstration plant, and therefore not used in production on a commercial scale. The technology thus has not yet been introduced into the market.

3.2.2 End-user participation¹³

- (54) Arba Follum intends to put the technology to commercial use in its pellet production. Consequently, the project involves an end-user participation in line with Decision No 248/11/COL.

3.2.3 Full scale testing under typical operating conditions¹⁴

- (55) The purpose of the demonstration project is to achieve the environmental objective of testing and verifying the new technology for black pellets production in typical full-scale operating conditions. The objective is to reduce technological risks in future full-scale deployments of the energy saving production method and increase the probability for further development of the production process towards even more energy efficient and environmentally

¹² Decision No 248/11/COL, para. 111.

¹³ Decision No 248/11/COL, para. 112.

¹⁴ Decision No 248/11/COL, para. 113 and 114.

sustainable solutions. The technology will be tested under the same industrial operating conditions at a possible future full-scale plant.

3.2.4 *Minimum two-year operational period*¹⁵

- (56) The project will require one year of construction/installation and have an operational period of 15 years. The requirement for a minimum two-year operational period is thus fulfilled.

3.2.5 *Measurable energy result and positive cash flow*¹⁶

- (57) If successful, the project allows for a reduction of energy consumption by 142.5 GWh per year compared to the alternative technology.
- (58) According to Arba Follum's projections, the demonstration plant is expected to generate a positive cash flow in during the first five years of its operating phase, *i.e.* the revenue generated by the production of the plant is expected to exceed operating costs. According to the aforementioned projections, the discounted operational revenues during the first five years of operation amount to NOK [...] million, while the discounted operational costs the first five years are NOK [...] million.
- (59) The Norwegian authorities therefore consider that the requirement for a measurable energy result and a positive cash flow during the operating phase as set out in Decision No 248/11/COL is met.

3.2.6 *Sufficient market diffusion of the new technology*¹⁷

- (60) It follows from Decision No 248/11/COL that the long-term aim of the NETP is to contribute to environmental protection by promoting the diffusion of new and more energy efficient technologies. Sufficient market diffusion of the new technology – once verified in the demonstration plant – is therefore a necessary condition for a project to be eligible for aid under the NETP.
- (61) As noted in Section 2.6.3 above, the technology will be diffused globally through Arbaflame AS. Arbaflame AS will both license these rights on reasonable and non-discriminatory terms throughout the EEA and engage in joint ventures.¹⁸ Once demonstrated and proven, Arbaflame AS's main business objective is to licence its technology to any other interested parties globally. Arbaflame AS is already cooperating with interested parties that intend to further spread the Arbaflame technology through such licence agreements.
- (62) In light of the above considerations, the Norwegian authorities consider that the requirement for market diffusion as set out in Decision No 248/11/COL is fulfilled.

3.3 Contribution to an objective of common interest

- (63) The Norwegian authorities argue that the project responds to an objective of common interest, namely environmental protection. The Norwegian authorities also recall that promoting research and development and innovation is in itself an important EEA objective laid down in Articles 1(2)(f) and 78 of the EEA Agreement.

¹⁵ Decision No 248/11/COL, para. 115.

¹⁶ Decision No 248/11/COL, para. 116.

¹⁷ Decision No 248/11/COL, para. 11.

¹⁸ See letter of confirmation to from Arbaflame AS to Enova on how Arbaflame AS intends to spread the technology, Document No 823480.

3.4 Need for State intervention

- (64) The Norwegian authorities recall that the most common market failure in the field of environmental protection is related to negative externalities. Undertakings acting on their own have no interest in taking into account the negative externalities arising from their activity.
- (65) Without the aid, Arba Follum will have insufficient incentives to increase environmental protection in its production process. As a consequence, the state aid intends to correct a market failure that leads to a sub-optimal level of environmental protection.

3.5 Aid as an appropriate instrument

- (66) The Norwegian authorities argue that state aid represents an appropriate instrument to achieve the environmental objective discussed in Section 3.3 above.
- (67) The Norwegian legislation does not impose upon the industry to construct plants using new innovative technologies instead of more conventional production facilities/state of the art technologies. Provided that they respect the standards applicable (notably as regards air pollution or building codes), conventional production facilities/buildings using conventional technologies known to the market may be authorised and built.¹⁹
- (68) Furthermore, according to the Norwegian authorities it is not possible to use a regulatory instrument to achieve the same result in terms of environmental protection as with the aid. The Norwegian authorities could only set certain standards but not impose a specific technology upon the industry. Moreover, standards may provide a less efficient incentive for further improving a given technology compared to the aid.
- (69) According to the Norwegian authorities, less distortive aid instruments, *e.g.* a loan or a guarantee, would not be suitable to trigger investment in the project. The main barrier for the Arba Follum demonstration plant is the lack of profitability, since the project has an internal rate of return (“IRR”) of 2.7% without support from Enova. The profitability of the Arba Follum plant is heavily dependent on the operational margins, which will fluctuate dependent on the costs of the raw material and the sale price of the pellets. The fluctuations may be short term and could imply that the profitability may change from month to month. This variability introduces a risk that will be reflected in the ability of Arba Follum to obtain lending. The Norwegian authorities conclude that aid instruments other than a grant would have a limited impact on the net present value (“NPV”) calculation and would therefore be less suitable to address the funding gap compared to an aid grant.²⁰

3.6 Incentive effect of the state aid

- (70) As already stated, the NETP foresees that for a demonstration plant, the assessment may be undertaken based on a “no investment” counterfactual. The Norwegian authorities argue that such a “no investment” counterfactual approach is particularly appropriate in the case of the proposed demonstration plant for the following reasons.
- (71) Arba Follum has not considered a counterfactual in the form of an alternative reference investment. The purpose of the demonstration plant project is to demonstrate the technology in a fully operational production line.

¹⁹ See para. (135) of Decision No 37/15/COL of 4 February 2015 not to raise objections to individual aid in favour of Hydro Aluminium AS for the construction of the Karmøy demonstration plant, para. 141 (OJ C 193, 11.6.2015, p. 6), (“*Hydro decision*”).

²⁰ *Ibid.* para. (136).

- (72) This will not be possible at a conventional production plant. The increased production that may occur as a result of introducing this technology will be a consequence of the project, but not the purpose of the investment.
- (73) As set out in Decision No 248/11/COL, in case of a “no investment” counterfactual the following elements need to be assessed, in order to determine whether the aid has an incentive effect: (i) whether any relevant EU or national standards will be introduced in the foreseeable future; (ii) whether the investment in the relevant project represents normal market behaviour; (iii) the level of risk connected to the project; (iv) whether the investment, without the aid, would generate an appropriate profit; (v) the project’s level of increased environmental protection; and (vi) the extent of the production advantages obtained by the aid recipient.²¹

(i) Relevant EU or national standards

- (74) The Norwegian authorities submit that to their knowledge, there are no on-going negotiations on EU or national level to introduce new or higher mandatory standards (in the production of wood pellets) which the investment aid in favour of Arba Follum would help the company to achieve faster than its competitors or gain any other advantages from.

(ii) Normal market behaviour

- (75) Even though there is a strong incentive for all industries to improve or develop their production processes by reducing their energy consumption, the investment in a full-scale demonstration plant based on technology that is not proven is not considered normal market behaviour.
- (76) The market for the black pellets is immature and in order to be further developed, it is dependent on incentives in the coal industry to reduce their CO₂ emissions. There are few companies in this business and so far no commercial production of black pellets exists. Based on this, Enova has concluded that the aid gives Arba Follum an incentive to invest in environmental protection that would not have been realised without the aid.

(iii) Level of risk

- (77) The Norwegian authorities highlight that the aid is granted net of any operating benefits. The project also involves both technical and financial risk. The upscale and the integration of the new energy efficient elements have not been tested before. There are uncertainties related to regularity, operability and the quality of the product and it will take some time before all integration is steadily working and the total production line is robust. During this period, there are no guarantees for stable deliveries, and income will be uncertain. In addition, there are uncertainties within the black pellet market. Pricing is still not mature and introducing new volumes will always be a risk, but is necessary in order to develop the market. Because of the risk profile of the investment, the project will not take place without the aid.

(iv) Profitability of the project

- (78) According to the Norwegian authorities, due to the risk profile and the unprofitability of the investment, Arba Follum will not undertake the investment without aid.

²¹ Decision No 248/11/COL, para. 142.

- (79) The NPV analysis shows that with the proposed aid of NOK 138 million the project will have a NPV of NOK -1.7 million and an IRR of 9.4%. Without the aid, the project has a NPV of NOK -129 million and an IRR of 2.7%.
- (80) The Arba Follum demonstration project is not by any standard a normal pellet production venture. Even though the NPV calculation serves to demonstrate that the project will have a positive cash flow in the operation phase, the profitability is limited even with the aid. According to the Norwegian authorities, the IRR of 9.4% is acceptable in light of the inherent risks associated with the investment. Moreover, the owners of Arba Follum have confirmed that they would normally require an IRR of 11.5%, nominal and before tax, which corresponds to 9.5% in real value.²²
- (81) The aim of the project is of a long-term strategic nature in the sense that a successful demonstration of the Arba Follum technology entails that it will be introduced to the market. Arba Follum's investors are not prepared to carry all the costs of the demonstration project.

(v) Level of environmental protection

- (82) The notified project will increase the level of environmental protection as compared to the counterfactual scenario, i.e. no investment.
- (83) A successful demonstration of the energy efficient production process for black pellets will make it possible to produce black pellets in an energy efficient way. The process will if verified, use 142.5 GWh less energy in processing 200 000 tons of Arbapellets than the reference process (the Arbaflame pilot plant). Furthermore, by comparing the calculated energy consumption of the Arba Follum plant to that of a conventional wood pellet plant, with a production resulting in the same energy content, an energy saving of 65 GWh is found.

(vi) The extent of the production advantages

- (84) The aid concerns an investment in a production plant that aims to verify a new production technology for black pellets production. If successfully verified, the technology, will provide for an energy and cost efficient production of black pellets. Thus, the aid will lead to some production advantages. Moreover, black pellets do indeed qualify as a new and higher quality product, compared to the primary commodity of coal and white pellets. However, the Norwegian authorities argue that the project does not imply production advantages that could negatively affect the incentive effect.

3.7 Proportionality of the state aid

3.7.1 The aid is limited to the minimum necessary

- (85) The Norwegian authorities acknowledge that according to points (78) and (79) of the EEAG, for individual aid, compliance with the maximum aid intensities is not sufficient to ensure proportionality. As a general rule, individually notifiable aid will be considered to be limited to the minimum if the aid amount corresponds to the net extra costs of the aided investment, compared to the counterfactual scenario in the absence of aid.
- (86) The calculation of eligible costs of the project at hand is based on Section II.7 of Decision 248/11/COL, as well as point (68) of the EEAG, i.e. they correspond to the extra costs

²² Document No 823474.

necessary to meet the environmental objectives.²³ As the NPV analysis demonstrates, operational benefits have been subtracted from the additional investment costs. The extra costs as calculated for Arba Follum project are thus net of all operational benefits.

- (87) The Norwegian authorities have provided an NPV calculation to demonstrate that the aid does not exceed the project's lack of profitability, based on what is considered a normal rate of return required for comparable investments in the industry. Even with the aid and with an extra cost calculation based on 15 years of operation with a positive cash flow, the project does not reach a positive NPV using a discount rate of 9.5 %. In light of this, the Norwegian authorities consider that the aid amount does not exceed the expected lack of profitability (including a normal rate of return) over the time horizon for which the investment is fully depreciated.
- (88) The Norwegian authorities note that the start-up investment of the demonstration project is high. However, as long as the operating profit remains positive during the lifetime of the demonstration project, the state aid from Enova does not alleviate Arba Follum of any operating costs. Thus, the state aid is solely granted to the investment in the demonstration project, in order to achieve the environmental objective of testing and verifying the new technology for black pellets production in normal full-scale running operations. The objective is to reduce technological risks in future full-scale deployments of process and increase the probability for further development of the production process towards even more energy efficient and environmentally sustainable solutions.
- (89) In light of the above, the Norwegian authorities argue that the aid amount is limited to the minimum needed to achieve the higher level of environmental protection in the form of the investment in a demonstration project for the verification of the energy efficient production process of black pellets. Hence, the calculation of eligible costs, the selection process and the lack of profitability ensures that the aid to Arba Follum is proportionate.
- (90) Finally, the Norwegian authorities highlight that Enova's competitive selection process among eligible investment projects leads to the selection of beneficiaries that can address the environmental objective using the least amount of aid or in the most cost-effective way. The selection process as described above (paragraphs (48) to (51)) is conducted in a non-discriminatory, transparent and open manner without excluding any undertakings that may compete with projects addressing the same environmental objective falling within the ambit of the respective aid program.
- (91) Under the programme for NETP, Enova gives priority to projects that could lead to energy change in the long term, and where the demonstration result is fit to enhance the competence and reduce the barriers for new installations. In sum, the level of subsidy is determined by a technical and financial evaluation of each project. Priority is given to those projects where the technology being tested has the potential of saving or producing the highest amount of kWh per subsidised NOK. This leads to a competition between projects for the receipt of public funds with the aim being to grant aid to the potentially most efficient projects. The Norwegian authorities provided the following table depicting the cost effectiveness of past demonstration projects which Enova has supported under the NETP. The chart shows that the Arba Follum project is considerably more cost efficient compared with other NETP demonstration projects.

²³ This concept implies that, in order to establish how much aid can be granted, all the economic benefits accrued by the investment have been subtracted from the additional investment costs.

Table 5. Comparison of cost effectiveness of NETP projects

Project	kWh/NOK	NOK/kWh
Hydro Karmøy	0.061 kWh/NOK	16.4 NOK/kWh
Tizir	0.180 kWh/NOK	5.55 NOK/kWh
Glencore	0.092 kWh/NOK	10.9 NOK/kWh
Arba Follum	1.032 kWh/NOK	0.97 NOK/kWh

- (92) In addition to being cost efficient, the Arba Follum project has a significant potential for triggering energy saving and GHG emission reductions. This indicates a substantial contribution to strengthening the energy change in the long term. In light of Arba Follum's market diffusion plan, Enova has furthermore assessed the project as fit to enhance competence and reduce barriers for new installations.

3.7.2 Aid intensity

- (93) The maximum aid intensity laid down in Decision No 248/11/COL for projects covered by the NETP is 50%. However, the Norwegian authorities recognise the difficulty in fully taking into account all the economic benefits that Arba Follum could derive from the investment. In order to be proportionate, the Norwegian authorities consider that the aid amount must normally be less than the maximum aid intensity. In this case, the aid amount of NOK 138 million is equivalent to an aid intensity of 47%, which is below the maximum aid intensity of 50%.

3.7.3 Adjustment of the aid amount

- (94) The Norwegian authorities note that Arba Follum is not automatically entitled to the full aid amount. The amount of NOK 138 million effectively represents a maximum threshold for aid. In accordance with the rules for disbursements of aid under the Energy Fund Scheme as explained in Chapter I.7 of Decision 248/11/COL, the aid amount will be reduced in case the incurred investment costs are lower than budgeted. In case of realised savings, the aid amount will be proportionately reduced. Furthermore, Arba Follum is not free to redistribute costs between budget posts. Changes are subject to Enova's approval. The adjustment of the aid is facilitated by the fact that Enova holds back the last 20% of the aid until the project is completed and will only disburse the remaining aid when it has approved an audited final project report with audited final project accounts.
- (95) Furthermore, the assessment of profitability and appropriate aid level is based on available data/estimates updated at the time of Enova's board decision to grant the aid to Arba Follum. The basis for the estimates could change further before Arba Follum takes the decision to initiate the project, which will happen when the Authority has approved the aid from Enova.

3.8 Limited distortion of competition and trade

3.8.1 The relevant markets

- (96) The Norwegian authorities consider it relevant to assess possible distortions of competition in the market for wood pellets and coal. As Arbaflame AS plans to license out its technology, possible distortions of competition in a market for wood pellets production technology is also assessed. However, regarding the possibility to provide feedstock for liquid biofuel production, this opportunity has not yet been explored sufficiently and there are at present, no concrete plans for external sales. Hence, Arba Follum will not compete in with other providers of biofuel feedstocks in the foreseeable future.

3.8.2 *The lack of distortive effects*

- (97) The Norwegian authorities note that “*if the aid is proportional, notably if the calculation of the extra investment or operating costs has taken into account all advantages to the undertaking; the negative impact of the aid is likely to be limited*”.²⁴
- (98) The extra cost approach is based on (i) a credible counterfactual (no investment) and (ii) the investment aid is granted net of any operating benefits. Moreover, the aid intensity in the demonstration plant project is 47%, which is below the applicable maximum aid intensity of 50%. Enova has further submitted a NPV analysis showing that the project will not be sufficiently profitable as it gives a low return on investment even with the aid. Consequently, the Norwegian authorities consider that the effect on competition is limited and outweighed by to the positive effects on the environment.
- (99) Black pellets aim to substitute coal, which is a globally traded and used commodity. The Arba Follum demonstration project will have an annual production of 200 000 tons of black pellets. Compared to the 1 383 Mt of coal globally traded yearly, this is an insignificant amount that cannot be expected to have any impact on global prices.
- (100) Furthermore, even though black pellets, compared to the primary commodity of coal, qualify as a new and higher quality product, Arba Follum is not likely to benefit from tangible advantages in terms of an improved product image. Coal is the primary and dominant energy carrier worldwide, maintaining a high share (41%) on energy markets. Arbapellets qualify as a substitute of coal that does not aspire to replace the use of the primary energy source of coal overnight but in the long term.
- (101) One of the main constrains for black pellet market growth is the requirement from the majority of black pellet developers to sign long-term off-take agreements with utilities in order to finance and build their first commercial plants. Furthermore, the power industry is conservative and, according to Arba Follum, will require proof that Arbapellets are sufficiently available and technically proven through substantial commercial production capacity before entering into any agreements.
- (102) Arba Follum has been chosen as eligible in a non-discriminatory, open and transparent selection process, without excluding any undertakings that may compete with projects addressing the same environmental objective falling within the ambit of the respective aid programme.²⁵ The selection process helps ensure that the most cost efficient project was chosen and that the negative impact of the aid is limited.
- (103) Finally, according to the Norwegian authorities the sales revenues are based on estimated market prices and volumes. They are taken into account and subtracted in the NPV analysis, and thus not eligible for aid. Due to uncertainty related to the pellets’ sales prices, it may be that the subtracted revenues on the income side of the NPV analysis are too high. Therefore, these potential advantages were fully taken into account and subtracted, in order to limit the potentially distortive effect of the aid.

3.8.3 *Dynamic incentives/crowding out*

- (104) The Norwegian authorities acknowledge that the investment undertaken by Arba Follum is innovative and as such technologically strategic. Thus, if verified, the new technology may possibly provide Arba Follum with a first mover advantage.

²⁴ Points (176) of the EAG and (93) of the EEAG.

²⁵ As emphasised at point (94) of the EEAG.

- (105) After the successful demonstration, Arbaflame AS will license the technology to other companies in the industry throughout the EEA and worldwide.
- (106) The Norwegian authorities consider that the testing and possible market introduction of the technology will be a driver towards further innovation and development amongst other market players that develop production technology for proprietary use and/or licencing.

3.8.4 Maintaining inefficient firms afloat

- (107) As previously noted, Arba Follum is a new undertaking, established by several Norwegian undertakings. The Norwegian authorities believe that the owners of Arba Follum are efficient undertakings with sound financial accounts. Consequently, the Norwegian authorities are of the opinion that the aid granted is not used to maintain an inefficient firm afloat.

3.8.5 Market power/exclusionary behaviour

- (108) The Norwegian authorities do not consider that the aid will create or enhance market power, neither in the pellet market nor in the relevant technology market. Consequently, neither the market structure as such nor Arba Follum's behaviour will be altered as an effect of the aid.
- (109) Concerning the pellet market, Arba Follum currently has no market share as the company is a start-up. The co-owner Arbaflame AS currently has a 15 000 ton pilot plant production capacity of Arbapellets. The capacity of the Follum demonstration plant will be negligible compared to the international trade in coal.
- (110) It is estimated that Arbapellets will be sold mainly to customers traditionally acquiring coal. Taking into account the size of the global coal market, as well as the capacity and strength of the market players, the amount of Arbapellets produced at the demonstration plant at Follum will not under any circumstances influence the market. This is emphasized by the novelty and cost of the product, as well as costs and risks related the retrofitting of existing coal plants.
- (111) In addition, if Arba Follum succeeds in their demonstration, the project will be an important contribution to the development of the black pellets industry. This will encourage other enterprises in the market to either buy licenses for the Arbaflame technology (enabling the spreading of the environmental effects of the aid), enter into joint ventures with Arbaflame AS or to further develop their own technologies and subsequently enter the market. Consequently, the aid is not expected to prevent new entries, discouraging expansion or inducing the exit of competitors.

- (112) The Norwegian authorities conclude that the aid will not have as an effect that the beneficiary can strengthen or maintain market power in the market.

3.8.6 Effects on trade and location

- (113) When the technology has been sufficiently verified at the demonstration plant it will, in case of positive results from the testing, be used permanently in the Arba Follum production facility. The results will also be spread through licensing by the technology developer Arbaflame AS.
- (114) Moreover, the production plant will not result in the Follum area benefiting from more favourable production conditions in general, neither in terms of comparably lower production cost or in higher production standards. The aid is only granted to one beneficiary. The Norwegian authorities consider it unlikely that the aid will attract more investments in

the region where the demonstration plant is located. Therefore, the aid will not have a significant effect on trade and location.²⁶

3.9 Cumulation

- (115) Arbaflame AS has previously received aid from Enova to develop energy efficient production, which does not overlap with the aid for the demonstration plant. Arba Follum has also received NOK 1.7 million from Innovasjon Norge for feasibility studies. The Norwegian authorities have confirmed that Arba Follum has not received other aid for this project, neither from Enova nor from other public authorities, and that the aid to Arba Follum does not cumulate with any other aid from the Norwegian authorities.

²⁶ See points (84), (88), (96)(d) and (98) of the EEAG, as well as Decision No 491/10/COL on the aid to Norsk Miljø Energi AS for the Lista wind park, p. 14 and Decision No 110/11/COL on the aid to Midtfjellet Vindkraft AS for the Midtfjellet wind park pp. 15–16.

II. ASSESSMENT

1 The presence of state aid

- (116) Article 61(1) of the EEA Agreement states that a measure constitutes state aid within the meaning of Article 61(1) of the EEA Agreement if the following conditions are cumulatively fulfilled: the measure: (i) is granted by the State or through state resources; (ii) confers an economic advantage on the beneficiary; (iii) is selective; and (iv) is liable to distort competition and to affect trade between Contracting Parties.
- (117) In Decision No 248/11/COL approving the Energy Fund (including the NETP), the Authority concluded that disbursements to undertakings under the Energy Fund constitute state aid within the meaning of Article 61(1) of the EEA Agreement.²⁷ There is nothing in the current notification to alter that conclusion.
- (118) Arba Follum will be awarded a grant by Enova under the Energy Fund, the funding of which comes from various sources controlled by the State, and therefore constitutes state resources.
- (119) An individual grant will be awarded to Arba Follum, which will thus receive an economic advantage it would not have received in the normal course of business. Given that the aid is granted to a single undertaking, it is selective.
- (120) Arba Follum produces Arbapellets, black pellets which are a bio-based coal substitute. The black pellets will mainly be sold to customers traditionally acquiring coal which is traded throughout the EEA. All black pellets are thus subject to competition and trade within the EEA. The economic advantage conferred on Arba Follum by the notified measure is therefore liable to distort competition and affect trade between the Contracting Parties to the EEA Agreement.
- (121) For these reasons, the Authority concludes that the notified measure constitutes state aid within the meaning of Article 61(1) of the EEA Agreement.

2 Procedural requirements

- (122) 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*”.
- (123) The notified measure is based on the NETP under the Energy Fund scheme as authorised by Decision No 248/11/COL. That decision foresees the obligation to notify individual aid grants over EUR 7.5 million to the Authority for a detailed assessment.²⁸
- (124) The Authority notes that under the Energy Fund, the award of aid above this threshold is conditional upon the Authority’s approval.²⁹ Accordingly, the Norwegian authorities have not yet implemented the individual aid measure in favour of Arba Follum. Furthermore, by submitting the notification received and registered by the Authority on 21 October 2016, the Norwegian authorities have complied with the notification requirement.

²⁷ Decision No 248/11/COL, para. 54.

²⁸ *Ibid.*, para. 58, cross-referring to point (160) EAG.

²⁹ *Ibid.*, para. 57.

(125) The Authority therefore concludes that the Norwegian authorities have respected their obligations pursuant to Article 1(3) of Part I of Protocol 3 and Decision No 248/11/COL.

3 Compatibility of the state aid

3.1 Legal framework

(126) The Norwegian authorities have conducted their assessment to grant aid to Arba Follum according to the procedures approved by the Authority for the NETP in its Decision No 248/11/COL (see paragraph (43) above). For the reasons provided by the Norwegian authorities (see paragraphs (47) to (62) above), the Authority finds that the notified aid is eligible for aid under the NETP. The Authority refers, in particular, to the license commitment from Arba Follum.³⁰ The Authority considers that its terms and limitations are able to ensure the market diffusion of the supported technology within the EEA.

(127) The NETP was assessed directly on the basis of Article 61(3)(c) of the EEA Agreement.³¹ The Authority considers that this is also the correct legal framework for the compatibility assessment of the aid to Arba Follum. However, since the aid to Arba Follum has an environmental objective, the Authority finds that the EAG and the EEAG can be used for general insight into relevant principles for this assessment.³²

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

(129) In order to confirm that this is the case regarding the notified measure, and in line with Decision No 248/11/COL, a detailed assessment of the measure must be carried out. In order to do so, the following issues have been assessed:³³

1. contribution of the measure to a well-defined objective of common interest;
2. need for the State intervention;
3. appropriateness of the state aid;
4. existence of incentive effect;
5. proportionality of the aid amount (aid limited to the minimum necessary); and
6. avoidance of undue negative effects on competition and trade.

3.2 Detailed assessment of the notified measure

3.2.1 Contribution to a well-defined objective of common interest

(130) State aid must aim at a well-defined objective of common interest. An objective of common interest is an objective that has been recognised by the Contracting Parties as being in their common interest. The Authority acknowledges that the protection of the environment is an objective of common interest.

³⁰ Document No 823480.

³¹ The Authority concluded that the NETP fell outside the scope of the R&D&I Guidelines. It also concluded that many of the projects to be supported by the NETP will not, due to their inherent characteristics as demonstration projects, follow the economic logic of the EAG. Therefore, the NETP was assessed directly under the EEA Agreement. See also footnote 8.

³² See Decision No 476/15/COL of 11 November 2015 not to raise objections to individual aid in favour of Tizir Titanium & Iron AS for the construction of a demonstration plant in Tyssedal (OJ C 73, 25.2.2016, p. 8) (“*Tizir decision*”), para. 171.

³³ Decision No 248/11/COL, para. 139, cross-referring to para. 87.

- (131) The determination to protect the environment is already established in the EEA Agreement, when the Contracting Parties defined themselves as “*determined to preserve, protect and improve the quality of the environment*”. This determination is reflected in Chapter 3 of Part V of the EEA Agreement, entitled “Environment” (Articles 73 to 75). In particular, Article 73(1) of the EEA Agreement states that “*action by the Contracting Parties relating to the environment shall have the following objectives: (a) to preserve, protect and improve the quality of the environment*”.
- (132) Furthermore, the Authority has already recognised that the protection of the environment by means of the reduction of CO₂ emissions are in the common interest of the Contracting Parties to the EEA Agreement.³⁴ Both the EU Member States and the EEA EFTA States have made a commitment to achieve at least a 20% reduction in GHG emissions compared to 1990 and at least a 20% saving in energy consumption compared to the projections for 2020.³⁵
- (133) The notified project has positive environmental effects. As already described in paragraph (29) above, if successful, the project will result in a reduced energy consumption of 142.5 GWh per year. Moreover, the Norwegian authorities have highlighted that the Arbapellets can replace coal for several purposes, and thus contribute to a substantial reduction in GHG emissions. The yearly produced amount of Arbapellets can replace around 120 000 tons of fossil coal. If used for energy production in existing power stations, this substitution represents a reduction of CO₂ emissions by 400 000 tons per year.
- (134) The project also contributes to developing a new, more efficient production technology. Therefore, the project promotes innovation within the EEA. Research and innovation is covered by Protocol 31 to the EEA Agreement. The promotion of innovation thus falls under the scope of the EEA Agreement. Research and innovation is, in particular, one of the core objectives of the Europe 2020 Strategy for smart, sustainable and inclusive growth.³⁶ Norway is an associated country of the Horizon 2020 programme.³⁷
- (135) Based on the above, the Authority concludes that the aid measure is aimed at well-defined objectives of common interest, i.e. the promotion of environmental protection and innovation.

3.2.2 Need for state intervention

- (136) In order to assess whether state aid is effective to achieve the identified objective of common interest, it is necessary first to diagnose and define the problem that needs to be addressed. State aid should be targeted towards situations where aid can bring a material improvement

³⁴ See the Authority’s Decision No 150/15/COL of 21 April 2015 on the state aid measures in favour of electric vehicles (OJ C 231, 16.7.2015, p. 13.), *Hydro* decision and *Tizir* decision.

Full text of those decision is available at the Authority’s website: <http://www.eftasurv.int/media/decisions/150-15-COL.pdf> and <http://www.eftasurv.int/media/state-aid/-aid-to-Hydro-Aluminium-AS-final.pdf>

³⁵ Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources, incorporated into point 41 of Annex IV to the EEA Agreement by Joint Committee Decision No 162/2011 (OJ L 76, 15.3.2012, p. 49 and EEA Supplement No 15, 15.3.2012, p. 56).

³⁶ Further information regarding the 2020 Strategy is available at: http://ec.europa.eu/europe2020/index_en.htm

³⁷ Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe’s global competitiveness. More information is available at: <http://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020> See further: http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/3cpart/h2020-hi-list-ac_en.pdf

that the market alone cannot deliver, for example by remedying a market failure or addressing an equity or cohesion concern.

- (137) As recognised by the Authority in its Decision No 248/11/COL, the primary objective of state aid under the NETP is to introduce new energy technologies to the market.³⁸ The substantial environmental benefits pursued by the program are more effective energy production and saving technologies. The NETP attempts to favour the market diffusion of such technologies and to address a market failure in the sense that the long-term positive externalities such as knowledge spill-overs stemming from the testing and deployment of new technologies are not sufficiently taken into account when profit-seeking undertakings make investment decisions. Due to the perceived unattractive rates of return from a commercial perspective, the number of investments in this field are sub-optimal from a community perspective.³⁹
- (138) The notified measure is aimed at addressing this market failure. The purpose of the demonstration plant is to verify a new and more effective energy saving technology, which will be made available to the market once the verification has been successful. Without the aid, the project would not materialise.
- (139) The Authority concludes therefore that state aid is needed to address the defined market failure

3.2.3 *Appropriateness of state aid*

- (140) State aid must be an appropriate instrument to address the identified objective of common interest. An aid measure is not compatible with the functioning of the EEA Agreement if the same positive contribution to the common objective is achievable through other less distortive policy instruments or other less distortive types of aid instruments.
- (141) In Decision No 248/11/COL, the Authority found that state aid represents an appropriate instrument to achieve the objective of common interest identified above.
- (142) This finding was based on the information provided by the Norwegian authorities that there are no other, less distortive instruments to achieve the same results, and that the goals of the NETP could not be attained through regulation.⁴⁰
- (143) Regarding the notified measure, the Authority notes in particular that the Norwegian legislation does not require undertakings to construct plants using new innovative technologies (see paragraph (74) above).
- (144) In the present case, the Authority also notes that it is not possible to use a regulatory instrument to achieve the same result in terms of environmental protection as with the aid. The Authority considers that the Norwegian authorities could set certain standards but could not impose a specific technology upon the industry. However, standards may provide a less efficient incentive for improving a technology than granting state aid. Therefore, in the current situation the Authority concludes that investment aid constitutes an appropriate instrument to pursue the objective of environmental protection, given that less distortive instruments will not achieve the immediate objective of the aid, i.e. the implementation of the project.

³⁸ Decision No 248/11/COL, para. 106.

³⁹ *Ibid.*, para. 140.

⁴⁰ *Ibid.*, para. 141.

(145) The Norwegian authorities have also demonstrated that a less distortive aid instrument, e.g. a loan or a guarantee, would not be suitable to trigger investment in the new technology (see paragraphs (66) to (69) above).

(146) The Authority concludes therefore that the notified measure is an appropriate instrument.

3.2.4 Incentive effect

(147) State aid is only compatible with the functioning of the EEA Agreement if it has an incentive effect. An incentive effect occurs when the aid induces the beneficiary to change its behaviour to further the identified objective of common interest, a change in behaviour which it would not undertake without the aid.

(148) As set out in Decision No 248/11/COL, state aid generally does not present an incentive effect for the beneficiary in cases where the project has already started prior to the aid application to Enova.⁴¹ Arba Follum's application for aid to Enova was submitted before the start of the project.

(149) State aid for environmental protection must result in the recipient of the aid changing its behaviour so that the level of environmental protection will be higher than if the aid had not been granted. The Authority thus has verified that Arba Follum would not, without the aid, build the demonstration plant because of its intrinsic benefits.

(150) The NETP foresees that the incentive effect will normally be assessed by reference to a counterfactual investment.⁴² However, as the Norwegian authorities correctly point out, Decision No 248/11/COL recognises that in some cases, aid applicants may not have considered an alternative investment.⁴³ For many investors, the key element for a demonstration project is to reduce the perceived risk of investing in the innovation on a larger scale, and to increase the user acceptance of a new alternative technology or solution. A demonstration project is a risk mitigation measure related to future investment decisions. Alternative investments may be further research, technology monitoring or to wait until others have made the investment necessary to demonstrate the technology.⁴⁴

(151) As set out in paragraph (71) above, Arba Follum has not considered a counterfactual in the form of an alternative reference investment. The purpose of the notified project is to demonstrate the relevant technology in a full-scale production line. This objective of the project is not to increase Arba Follum's production, but rather to verify technology enabling the reduction of environmental footprint. The Authority notes that this objective cannot be attained by building a conventional production plant using the existing technology.

(152) The Authority accepts therefore that the business as usual scenario would be a credible counterfactual scenario in the present case. If no aid would be granted, it does not seem realistic to assume that other investments would be considered. The Authority has reached similar conclusions in previous cases,⁴⁵ as has the Commission.⁴⁶ Consequently, the

⁴¹ Decision No 248/11/COL, para. 142.

⁴² *Ibid.*, para. 142.

⁴³ Annex 2 to the EEAG contains a list of relevant counterfactual scenarios for various kinds of environmental measures. The list does not contain a counterfactual scenario for situations of aid to energy efficiency. The project at hand is an integrated project, i.e. it is a technological project but ensures some energy efficiency.

⁴⁴ Decision No 248/11/COL, para. 142.

⁴⁵ See the *Hydro* decision, para. 141 and the *Tizir* decision para. 194.

⁴⁶ In the AMEH case, the Commission approved aid from Germany to Arcelor Mittal Eisenhuettenstadt GmbH for the deployment of a Top Gas Recycling (TGR) demonstration project at a steel production plant. The Commission found that in absence of aid AMEH would not invest in TGR, but would follow the

Authority accepts that the counterfactual is a no-investment decision and that the alternative investment costs are thus zero.

- (153) As also set out in section 3.6 of Part I above, NPV calculations have been used to examine whether the aid has an incentive effect. NPV calculations determine how much aid is needed in order to trigger a given investment. A project is normally triggered when it reaches an NPV of zero with a reasonable rate of return using an appropriate discount rate.
- (154) The data submitted by the Norwegian authorities indicate that, without the aid, the project has a NPV of NOK -129 million and an IRR of 2.7% (see paragraph (79) above). With estimated eligible cost of NOK 293.4 million, the proposed aid of NOK 138 million and cash flows discounted at 9.5%, the project will have a NPV of NOK -1.7 million and an IRR of 9.4%.
- (155) Based on the above premises, the Authority concludes that the NPV calculation demonstrates that the project is not viable without the aid.
- (156) As set out in Decision No 248/11/COL, in case of a “no investment” counterfactual the following further elements need to be assessed in order to determine whether the aid has an incentive effect: (i) whether any relevant EU or national standards will be introduced in the foreseeable future; (ii) whether the investment in the relevant project represents normal market behaviour; (iii) the level of risk connected to the project and whether the investment, without the aid, would generate an appropriate profit; (iv) the project’s level of increased environmental protection; and (v) the extent of the production advantages obtained by the aid recipient.⁴⁷
- (157) As stated in section 3.6 (i) of Part I above, the Norwegian authorities have confirmed that there are no ongoing negotiations at EU or national level to introduce new or higher mandatory standards in respect of which the aid would result in any advantages to Arba Follum. Furthermore, the Norwegian authorities have explained that the construction of demonstration plants without state support to verify a completely new environmentally friendly production technology does not represent normal market behaviour. This is mainly due to the risks involved and the highly unprofitable nature of the investment.
- (158) As regards the levels of risk and profitability, as well as the extent of production advantages, Enova’s financial analysis of the project using an NPV calculation has taken into account all production advantages, as well as the levels of risk and profitability over the lifetime of the project (see section 3.7.1 of Part I above). These factors do not affect the findings of the NPV calculation that the investment is not viable without the aid.
- (159) Finally, as regards the likely level of environmental protection resulting from the aid, the Authority refers to the estimate of the environmental impact of the technology provided by the Norwegian authorities as set out paragraph (83) above.
- (160) Having assessed these factors, the Authority concludes that Arba Follum, with the aid and if the technology is successfully verified, will change its behaviour so that the level of environmental protection will be higher than if the aid had not been granted. Thus, the notified measure fulfils the conditions regarding the incentive effect.

business as usual scenario. State aid case – Germany – N 450/2009 Top Gas Recycling (TGR). Project - Aid to ArcelorMittal Eisenhüttenstadt GmbH. (OJ C 94, 14.4.2010, p. 9.)

⁴⁷ Decision No 248/11/COL, para. 142.

3.2.5 Proportionality

- (161) A state aid measure is proportionate if the measure is designed in such a way that the aid is kept to the minimum necessary.
- (162) Enova carries out a competition for aid under the NETP. The competition contributes to promoting an efficient use of state resources and limiting the risk of overcompensation. However, given the influence of qualitative elements (e.g. the potential of a new technology to create future energy savings) in the selection process, competition for aid does not by itself ensure that the notified measure is proportionate. An *ad hoc* assessment of this criterion is required. As previously noted, the Norwegian authorities have provided information concerning the cost effectiveness of past demonstration projects which Enova has supported under the NETP. As shown in table 5 above, the Arba Follum project is considerably more cost efficient compared with other NETP demonstration projects.
- (163) The calculations presented by the Norwegian authorities (see Table 4 – paragraph (41) above) show that the aid intensity of the notified measure is 47%. This is below the maximum aid intensity of 50% for large enterprises under the NETP.
- (164) As explained in Decision No 248/11/COL, Enova also carries out an NPV calculation to ensure that the aid amount is limited to the amount necessary to trigger the project. The result of the NPV calculation – as described in paragraphs (79) to (80) above – demonstrates the extent of the funding gap for the project and that the aid amount does not exceed this funding gap. Moreover, the IRR of 9.4% is below the IRR of 9.5% that the owners of Arba Follum would normally require for such an investment.⁴⁸
- (165) Finally, the rules for disbursements of aid under the Energy Fund Scheme, as explained in paragraphs (94) to (95) above, ensure that there is no overcompensation in case the investment costs or the main profitability drivers change between the date of this decision and the implementation of the project.
- (166) The Authority also notes that the aid will not be cumulated with other aid for the same project as described in paragraph (115) above.
- (167) On the basis of the above, the Authority concludes that the aid measure is proportionate.

3.2.6 Avoidance of undue negative effects on competition and trade

- (168) For state aid to be compatible with the functioning of the EEA Agreement, the negative effects of the aid measure in terms of distortions of competition and impact on trade between Contracting Parties must be limited and outweighed by the positive effects in terms of contribution to the objective of common interest.
- (169) Based on the information provided by the Norwegian authorities and summarised in paragraphs (96) to (114) above, the Authority has examined the potential for distortions of competition and an effect on trade, in the light of the foreseeable impact of the aid on competition and trade between undertakings in the relevant markets.

⁴⁸ Document No 823474.

- (170) The Authority notes that, as a general rule, if the aid is proportionate, its negative impact on trade and competition is likely to be limited.⁴⁹ As set out above in section 3.2.5 of Part II, the Authority has concluded that the aid is proportionate.
- (171) Furthermore, the Authority has received detailed information from Norway (summarised in paragraphs (96) to (114) above) showing that the effects of the measure in the affected markets would be limited, and outweighed by the positive effects in terms of contribution to the objective of common interest.
- (172) Regarding the pellets market, Arba Folium currently has no market share. The co-owner Arbaflame AS currently has a 15 000 ton pilot plant production capacity of Arbapellets. The capacity of the Follum demonstration plant will be negligible compared to the international trade in coal. It is estimated that the Arbapellets will mainly be sold to customers traditionally acquiring coal. Taking into account the size of the global coal market, as well as the capacity and strength of the market players, the Authority considers that the amount of Arbapellets produced at the demonstration plant at Follum will have a marginal impact on the relevant market.
- (173) The Authority believes that if the results of the new technology are positive, Arba Follum will have a first mover advantage. However, Arbaflame AS will grant licenses to the new technology on reasonable and non-discriminatory terms through the EEA and engage in joint ventures.⁵⁰ The Authority underlines the importance of the license commitment described in paragraphs (60) to (62) to ensure that the supported technology will be spread to the industry in order to outweigh the negative effects on competition and trade linked to the measure.
- (174) For these reasons, the Authority concludes that the aid measure has limited effects on competition and intra-EEA trade.

3.2.7 Transparency

- (175) The Authority finally notes the Norwegian authorities' commitment to meet the transparency obligation laid down in Section 3.2.7 of the EEAG.

3.2.8 Conclusion on the compatibility assessment

- (176) Based on the detailed assessment set out above, the Authority has balanced the positive and negative effects of the notified measure. The Authority concludes that the distortions resulting from the notified measure do not adversely affect trading conditions to an extent contrary to the common interest.

⁴⁹ For instance the former EAG stated that: “if the aid is proportional, notably if the calculation of the extra investment or operating costs has taken into account all advantages to the undertaking; the negative impact of the aid is likely to be limited”. The EEAG similarly indicate that “if the aid is proportionate and limited to the extra investment costs, the negative impact of the aid is in principle softened” (point (93)).

⁵⁰ Document No 823480.

4 Conclusion

(177) On the basis of the foregoing assessment, the Authority considers that the notified individual aid to Arba Follum is compatible with the functioning of the EEA Agreement pursuant to Article 61(3)(c) thereof.

HAS ADOPTED THIS DECISION:

Article 1

Not to raise objections to the individual state aid to Arba Follum AS for the construction of a demonstration plant in Follum, in Ringerike municipality, on the grounds that it is compatible with the functioning of the EEA Agreement pursuant to its Article 61(3)(c).

Article 2

The implementation of the measure is authorised accordingly.

Article 3

This Decision is addressed to the Kingdom of Norway.

Article 4

Only the English language version of this decision is authentic.

Done in Brussels, on 28 November 2016.

For the EFTA Surveillance Authority

Sven Erik Svedman
President

Frank J. Büchel
College Member

Helga Jónsdóttir
College Member

Placeholder for digital signature. Please do not delete.