



EUROPEAN COMMISSION

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<p>In the published version of this decision, some information has been omitted, pursuant to articles 30 and 31 of Council Regulation (EU) 2015/1589 of 13 July 2015 laying down detailed rules for the application of Article 108 of the Treaty on the Functioning of the European Union, concerning non-disclosure of information covered by professional secrecy. The omissions are shown thus [...]</p>		<p style="text-align: center;">PUBLIC VERSION</p> <p>This document is made available for information purposes only.</p>
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Subject: State Aid SA.46874 (2017/N) – France – Project for an ocean energy farm in Normandy.

Sir,

1. PROCEDURE

- (1) Pursuant to Article 108(3) of the Treaty on the Functioning of the European Union (hereinafter referred to as TFEU), France notified the individual aid to support the construction of a tidal energy demonstration plant in Normandy. Following pre-notification contacts, the pre-notification application was submitted electronically on 10 July 2017.
- (2) France formally notified the measure on 21 November 2017.
- (3) A first request for information was sent by the Commission on 22 January 2018 to which the French authorities replied on 13 February 2018. A second request for information was sent on 13 April 2018 to which the French authorities replied on 24 May 2018.

Son Excellence Monsieur Jean-Yves LE DRIAN
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2. DESCRIPTION OF THE MEASURE

2.1. Background and objectives of the project

- (4) The measure concerns an individual aid for a demonstration project of a tidal energy farm "Projet Normandie Hydro" (the "Normandie Hydro project"). The tidal energy farm will generate renewable electricity from the kinetic energy of the ocean currents in Raz Blanchard, Normandy.
- (5) In 1st October 2013, the Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME) launched a call for interest aiming at selecting two pilot projects of tidal farm. The "Normandie Hydro project" was selected in June 2014 together with another project called NEPTHYD. The NEPTHYD project was notified by the French authorities in April 2016 and was approved by the Commission¹.
- (6) The "Normandie Hydro project" aims at testing in real-life conditions a technology for exploiting the potential of tidal energy. According to France, the project will contribute developing the technologies needed for exploiting tidal energy on an industrial scale.
- (7) France claims that these projects will help reaching its renewable energy target laid down in the directive on the promotion of the use of energy from renewable sources².

2.2. Description of the project

- (8) The "Normandie Hydro project" foresees building a tidal energy pilot farm with a total installed power of 14 MW. The farm will consist of a hub of 7 tidal turbines connected to the mainland by an underwater cable. The turbines are developed by OpenHydro Group Ltd. The farm will be located at Raz Blanchard, west of the Cotentin peninsula, in the Manche.
- (9) France considers that the project is a demonstration project, according to paragraph 45 of the Guidelines on State aid for environmental protection and energy 2014-2020 (EEAG)³. The project is a continuation of the tidal prototype installed in Paimpol-Bréhat in 2011. The project is intended to demonstrate the economical and industrial feasibility of constructing and operating a tidal farm along the French coast applying innovative solutions at a larger scale and thus to confirm the potential of producing electricity from the kinetic energy of the ocean currents.
- (10) The OpenHydro turbines have a diameter of 16 meters and an open centre design with an inner rotor coaxial to an external stator, in turn connected to a support structure with gravity foundations. The rotor has very low negative buoyancy allowing using sea water for lubrication between the rotor and the stator.

¹See decision C(2016) 4720 final on case SA.42838.

² 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 and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC

³ Communication from the Commission (2014/C 200/01)

According to France, these features represent a significant innovation compared to the state of the art.

- (11) The goal of the project is to validate the technology and quantify the risks. In particular, the project will allow quantification of the technical risks (mounting the turbines on site, wear of components, effective power and efficiency of the turbines, maintenance operations); economic risks (total ownership cost of the farm, economic performances); industrial risks (existence of a supply chain, port logistic, training) and other liabilities (environmental impact, maritime safety). France has confirmed that the project respects the environmental legislation in place, in particular the Habitats Directive⁴ and the EIA directive⁵.
- (12) The pilot tidal farm will operate for 20 years. The Normandie Hydro plant is expected to be progressively commissioned between 2018 and 2019.
- (13) The "Normandie Hydro project" will produce [25 000-30 000] MWh per year of renewable electricity over 20 years, avoiding the emission of approximately 120 000 tonnes of CO₂ according to France. By comparison, electricity production in France was 540.6 TWh in 2014. The expected production of the "Normandie Hydro project" represents a very limited part of the French electricity production.
- (14) The project total investment costs are estimated at [70 – 80] million EUR while the operating costs are estimated at approximately [40 – 45] million EUR. The farm will reach a Technology Readiness Level (TRL) of 8, which corresponds to a first of a kind commercial system, where manufacturing issues are solved.
- (15) According to the financial projections submitted by the consortium which will develop the project, the estimated Levelised Cost of Electricity (LCOE) of the pilot farm is [400 – 500] EUR/MWh.
- (16) The "Normandie Hydro project" will be jointly developed by EDF Energies Nouvelles, EDF subsidiary dedicated to the development of renewable energy, and OpenHydro, a subsidiary company of the DCNS industrial group⁶. DCNS and EDF Energies Nouvelles signed in 2009 an agreement for cooperation (or "protocole d'accord") regarding the ocean energy sector and specifically to bring together their industrial knowledge and allocate their respective tasks and responsibilities for developing the "Normandie Hydro project".
- (17) EDF Energies Nouvelles created the SAS Parc Hydrolien Normandie Hydro (or "Société de projet"), which is the structure dedicated to the project and which will be the owner and manager of the pilot project.
- (18) OpenHydro created a subsidiary in France in 2015: OpenHydro Technologie France (OHTF) and will be the prime contractor of the project.

⁴ See in particular article 6.3 of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, OJ L 206, 22.7.1992, p. 7–50

⁵ Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, OJ L 26, 28.1.2012, p. 1–21

⁶ DCNS is a French industrial group specialised in naval defence and marine renewable energy.

- (19) OpenHydro Technologie France will develop the technology required for the “Normandie Hydro project” and be the principal contractor for building the tidal farm. The company will be in charge of the system engineering as well as part of the engineering studies for the “Normandie Hydro project”. It will build the tidal farm and carry out the required maintenance and possibly perform part of the plant's operation work on behalf of the Project Company Parc Hydrolien Normandie Hydro. EDF EN, via the project company SAS Parc Hydrolien Normandie Hydro will operate the plant.
- (20) Each partner in the project retains the intellectual property of the knowhow it develops. All patent rights, whether patented or not, acquired by a partner prior to or independently of the works carried out within the “Normandie Hydro project” shall be retained by that partner. Starting with the decision to launch the implementation phase, the partners will negotiate concession agreements for the non-exclusive right of use of all the results generated.

2.3. Selection of the beneficiary

- (21) The “Normandie Hydro project” was selected by a call for interest within the framework of the "Programme d'Investissements d'Avenir"⁷ funding instrument. The French State commissioned the ADEME to organise a call for expression of interest in order to support construction and operation of tidal pilot farms.
- (22) The call for interest was carried out on the basis of open and transparent criteria. The call for expression of interest was launched on 1 October 2013 for projects on two pre-defined sites: Raz-Blanchard in Normandy and Fromveur in Bretagne. The eligibility criteria for the call for interest were:
- Projects should be located on the French territory on one of the suitable sites identified in the call for interest specification and connected to the national power grid;
 - The pilot farm ought to include between 4 and 10 generation units each generating at least 2500 MWh per year;
 - The technology proposed should have been had at least 6 months of open-sea operation demonstrated.
- (23) The selection criteria of the call of interest – each of which including several sub-criteria were:
- Technical content of the technology employed;
 - Quality of the financial plan;
 - Quality of the project planning;
 - Economic impact of the project (the project must accelerate the learning curve of the market for this technology);
 - Quality of the environmental plan;
 - Compatibility of the project with the European regulations (in particular with State aid rules).

⁷ Initiated by Law n°2010-237 of 9 March 2010 de finances rectificatives pour 2010 relative au programme d'Investissements d'avenir

- (24) Eight proposals were submitted on 16 May 2016. Out of these eight, four projects were pre-selected. The "Normandie Hydro project" was one of the two projects selected out of these 4 participants, together with the NEPTHYD project (see recital (5) above).

2.4. Budget and duration

- (25) The measure will consist of two types of aid, investment aid and operating aid.
- (26) The project will receive 52.2 million EUR in investment aid, divided between two beneficiaries. One third of this amount or 17.4 million EUR, will be paid as a direct grant to OpenHydro Technologie France. Further 17.4 million EUR will be paid to OpenHydro Technologie France in the form of repayable advances. The remaining 17.4 million EUR will be paid to the "Société de projet" Parc Hydrolien Normandie Hydro in the form of repayable advances.
- (27) The project company will have to reimburse the repayable advances based on the tidal capacity installed in the world by EDF Energies Nouvelles and affiliated companies, whatever the ownership of EDF Energies Nouvelles in the project companies. EDF Energies Nouvelles will have to reimburse a predetermined amount for each MW of the new technology that is deployed. The first tranche will be reimbursed in a time period of three months following 31 December 2023. The second tranche will be reimbursed in a time period of three months following 31 December 2026. The addition of the two reimbursement tranches cannot exceed 110% of the updated value of the aid granted to the project company. If the addition of the two reimbursements is below 110% of the updated value of the aid granted to the project company, a third tranche will be reimbursed in a time period of three months following 31 December 2030.
- (28) OHTF will reimburse the repayable advance based on the tidal capacity that it (or its shareholders OpenHydro Technology, OpenHydro Group Ltd and DCNS) or any of the affiliated companies will sell in Europe. The sale of tidal capacity includes both the sale of turbines and the commissioning of tidal farms. The amount to be reimbursed will be split as follow: 70% of the reimbursement will be linked to the sale of turbines and 30% of the reimbursement will be linked to the commissioning of tidal farms (without the turbines). The reimbursement will be paid in five tranches on the basis of the commissioning or sales observed in 2023, 2026 and 2030. The total amount to be reimbursed cannot exceed 110% of the updated value of the aid granted to Open Hydro.
- (29) The maximum amount reimbursed cannot exceed 110% of the amount received in nominal value.
- (30) During the expected 20 years lifetime, the project will receive operating aid through a Feed-in Tariff (FiT)⁸. This FiT equals 150 EUR/MWh in 2007 value indexed to inflation. This FiT is the remuneration foreseen for tidal generators by the Decree of 1st March 2007 of the French Commission for Energy Regulation.⁹

⁸ Mécanisme d'obligation d'achat, article L.314-1 du code de l'énergie

⁹ Avis de la Commission de régulation de l'énergie du 15 février 2007, JORF du 22 avril 2007, p. 31

- (31) Due to indexation, the FiT was recalculated at 174.7 EUR/MWh on January 1st 2014. Given the expected electricity output of [25 000 – 30 000] MWh per year the project is expected to receive approximately 48.9 million EUR in operating aid over the expected 20 years lifetime. The duration of the operating aid will not exceed the plant depreciation period.
- (32) Operating aid will be paid to the project company Parc Hydrolien Normandie Hydro.
- (33) Following the commissioning of the plant, the project company Parc Hydrolien Normandie Hydro will acquire the ownership of the plant paying [25 – 35] million EUR to OpenHydro Technologie France.
- (34) Taking into account the operating aid and deducting the investment aid from the project capital costs, the estimated post-tax Internal Rate of Return (IRR) for the project company Parc Hydrolien Normandie Hydro is [9 – 11] %¹⁰.

2.5. Aid intensity

- (35) France calculated the aid intensity using the Gross Grant Equivalent (GGE) method described in the Commission Decision C(2015) 8202 final concerning case SA.42322 (see also decision C(2008)279 concerning case N 408/2007 and decision C(2016) 4720 final concerning the NEPHTYD project). France points out that this methodology was deemed appropriate by the Commission for calculating the aid intensity in the aforementioned decision, which concerned a demonstration project of tidal energy, similar to the one subject of the present notification. This method accounts for the fact that repayable advances might be repaid in part or totally depending on the success of the project. Therefore, the economic advantage to aid beneficiaries is lower in the case of repayable advances than in the case of direct grants. In order to take into account this reduced benefit, the aid intensity of repayable advances can be calculated using a gross grant equivalent methodology, or GGE.
- (36) The GGE is calculated using the following formula:

$$GGE = (T_p) * \sum_{i=0}^n \left(\frac{V_i}{(1+iref)^i} \right) + (1 - T_p) * \sum_{i=0}^n \left(\frac{V_i - R_i - (Intn * C_i) - (Tr_i * P_i)}{(1+iref)^i} \right)$$

where:

GGE = gross grant equivalent

T_p = non-reimbursement rate

V_i = payment in year i (i=0 is the date of the decision)

iref = interest rate applicable at the date of the award

R_i = reimbursement made in year i

Intn = interest rate

C_i = outstanding capital in year i

Tr_i = royalty rate applied to the fraction of products sold in year i

P_i = price of the product sold in year i

¹⁰ Considering only the “Normandie Hydro project”, there will be no profit margin for OpenHydro Technologie France French authorities explained that the Normandy Hydro project is a crucial enabler to the progression of OpenHydro's business plan in Europe. For this reason, OpenHydro's shareholders are willing to consider a low/zero margin project to enter a partnership with EDF Energies Nouvelles.

- (37) In order to calculate the eligible costs, France assumes as a counterfactual scenario an investment in a gas plant corresponding to an installed power equal to that of “the Normandie Hydro project”. Using the investment costs of a 440 MW gas plant, downscaled to account for the effective electricity production of the tidal farm (which is about 28.4 GWh/year) the counterfactual investment for the 14 MW of the "Normandie Hydro project" is estimated at 5.03 million EUR. The eligible costs amount therefore to 68.7 million EUR.
- (38) Applying the calculation method described in recital (36) above, adapted to the "Normandie Hydro project", the GGE of the repayable advances amounts to 16.93 million EUR. As noted in recital (26) above, the direct grant amounts to 17.4 million EUR. Therefore, the notified investment aid amounts to 34.33 million euros in GGE terms.
- (39) Considering investment aid of 34.33 million euros in GGE terms, the aid intensity is therefore 50%. Table 1 outlines the aid intensity calculation.

Table 1: Project aid intensity.

	Estimated project costs (M€)	Costs CCGT (M€)	Difference
Investment costs	73.7	5.03	68.7
Eligible costs			[65 – 70]
Gross Grant Equivalent			34.33
Aid intensity (%)			50%

2.6. Reporting, transparency and cumulation

- (40) France will ensure that detailed records regarding all measures involving the granting of aid are maintained. Those records will be kept for the duration of the project plus an additional period of ten years, including all information relevant to demonstrating that the terms of the project have been complied with.
- (41) Detailed information about the project funding has been published on ADEME's website¹¹ and on the Ministry for Environment and Energy¹². When the aid will be granted it will be published on a comprehensive website in order to comply with

¹¹ <https://appelsaprojets.ademe.fr/app/AMI%20FERMES2013-39>

¹² <http://www.developpement-durable.gouv.fr/Appel-a-manifestations-d-interet.35239.html>

the provisions of section 3.2.7 of the Guidelines on State aid for environmental protection and energy 2014-2020 (EEAG).¹³.

- (42) The project is not eligible for any other type of investment or operating aid other than those described in Section 2.4 above.

2.7. National regulatory framework

- (43) The measure will be enacted by the French authorities through a Decree-Law. Legal basis for that decree is the law n 2013-1278 of 29 December 2013.

3. ASSESSMENT OF THE MEASURE:

3.1. Existence of aid

- (44) A measure constitutes State aid in the meaning of Article 107 (1) TFEU if it is "*granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods [...] in so far as it affects trade between Member States.*"
- (45) The investment aid will be granted by the ADEME. ADEME is a public agency under the control of the State. The French authorities acknowledge that the investment aid is imputable to the French State.
- (46) The notified measure will provide a selective advantage to the beneficiary selected by the call for interest. The notified measure will allow the beneficiary to receive an investment subsidy and compensation for the electricity sold beyond what it would obtain on the French electricity market. The notified measure will therefore confer an economic advantage to the beneficiary.
- (47) Electricity is widely traded, including between Member States, and therefore the notified measure is likely to distort the competition on the electricity market and affect trade between the Member States. In this particular case, France is interconnected with the United Kingdom, Belgium, Germany, Italy and Spain. The measure is therefore liable to affect electricity trade between France and neighbouring Member States.
- (48) In conclusion, the notified measure constitutes State aid in the meaning of Article 107(1) TFEU.

3.2. Legality

- (49) The French authorities did not put the aid measure into effect before a final Commission decision. Thus, France has complied with the stand-still obligation set out in Article 108(3) TFEU.

¹³ OJ C 200 of 28.06.2014

3.3. Compatibility under the Guidelines on State aid for environmental protection and energy 2014-2020

- (50) The Commission notes that the notified measure aims at providing investment and operating aid to the generation of electricity from renewable sources. As it regards support for electricity from renewable sources, the notified measure falls within the scope of the EEAG.
- (51) The Commission has therefore assessed the notified measure based on the compatibility provisions for individually notified aid to energy from renewable sources set out in sections 3.2 and 3.3 of the EEAG.

3.3.1 Objective of common interest

- (52) The aim of the notified aid measure is to help France to achieve the long term climate change and energy sustainability targets set by the European Union as part of its energy policy. The measure will help France to diversify the portfolio of renewable energy technologies available on the market. In line with paragraphs 30 and 31 of the EEAG, France defined the objective of the measure and explained the expected contributions toward ensuring a competitive, sustainable and secure energy system. In line with paragraph 33 EEAG, France quantified the contribution toward the objective by increasing production of renewable electricity as explained in recitals (7) and (13) above.
- (53) The Commission considers that the notified aid measure is aimed at an objective of common interest in accordance with Article 107(3)(c) of the Treaty.

3.3.2 Need for State intervention

- (54) According to subsection 3.2.2 of the EEAG, Member State needs to demonstrate that there is a need for State intervention and in particular that the aid is necessary to remedy a market failure that otherwise would remain unaddressed.
- (55) France demonstrated that, despite the current policies for supporting renewable energy, insufficient resources are invested in developing tidal energy technologies. For the moment, this technology is still at the beginning of its development which induces high level of technical and industrial risks. Moreover, the investment costs and production costs are very high. Therefore it is difficult to find private financing for this type of project.
- (56) Because the project presents a developing technology, France notified the project as a demonstration project, according to the definition in paragraph (45) of the EEAG. According to paragraph (45), a demonstration project is "a project demonstrating a technology as a first of its kind in the Union and representing a significant innovation that goes well beyond the state of the art". The French authority explained why, in their view, the project qualifies as a demonstration project.

3.3.2.1. Demonstration of a significant innovation that goes beyond the state of the art

- (57) First, the turbine developed by OpenHydro for the project consists of an "Open centre Turbine", which is unique and a crucial innovation, going beyond the state of the art. The turbines have a reduced impact on the environment because the

gravity foundation on which the turbines are settled will be placed directly on the ground with a deployment barge with a specifically adapted design. Its design is simplified in order to adapt to the extreme natural conditions of the Raz Blanchard area, characterised by powerful currents. The components of the turbines are more robust and minimise the number of components under water. Furthermore, the turbine is equipped with a "venturi" which has the purpose of mitigating the tide current's turbulences and accelerating its speed.

- (58) Second, the project will use a system of Turbine Control Centre (TCC) which is an innovative feature compared to similar tidal energy projects. Furthermore, it will be the first project benefiting from a dedicated industrial infrastructure and a new generation of innovative connectors (type "DRYM"). OpenHydro has also developed a specific algorithm allowing the calculation of the farm's availability according to the time slots where the farm is accessible depending on the tide and the reliability of its components.
- (59) Third, OpenHydro will be responsible for the entire management chain of the farm, as explained in recital (19), from the turbines management to the electricity delivery station on the cost. This positioning is unique and constitutes an innovation in the tidal energy sector.
- (60) The innovations put forward by the "Normandie Hydro" project aim at lowering the frequency of intervention on the turbines in order to achieve a higher return. The project will be operated for 20 years, to test for a longer period, the robustness of its components.

3.3.2.2. Demonstration of a technology as a first of its kind in the Union

- (61) The French authorities explained that when the project was selected in November 2014, no project aiming at testing tidal farm of the same kind, and with the same conception were already financed or operational.
- (62) The project is a continuation of the tidal prototype installed in Paimpol-Bréhat in 2011. This project was a first prototype using the technology at hand, with a total installed capacity of 2 MW. Through this project, the project owners made a first test of the technology, in particular the turbines and the connectors. This first test allowed the project owners to improve the technology, notably on the turbines' reliability, the selection of materials, foundations, maintenance technic and power connection. Therefore, the "Normandie Hydro project" constitutes the next step in developing the technology because it will allow testing an improved technology at a bigger scale and for a longer period, which creates further challenges. In particular, it will allow the project owners to internalise the impact of the turbines to one another, which was not tested with the prototype, only composed of two turbines.
- (63) In 2014, when the project was selected, the most advanced project was MEYGEN phase 1 which was built in Scotland to test a different electrical architecture. Each turbine has a dedicated subsea array cable laid directly on the seabed and brought ashore via a horizontal directionally drilled borehole within the foreshore bedrock and an onshore power conversion unit. However, this project does not have an electrical architecture centralising current flows between the different machines, which represents, in the light of the connection costs for commercial installations,

an essential technological step for further deployment of commercial farms. The architecture of the Normandie Hydro farm is unprecedented in the European Union, with its single cable connection to the terrestrial network for an amount of turbine units representative of a commercial farm. This higher number of turbines compared with other experiments in Europe will allow appreciating the impact of their positioning in relation to each other, when generating electricity, the wake effect and the hydrodynamic blocking. The electrical architecture uses several major innovations in the field of underwater connectors, operations in ocean waters and maintenance of the turbines. In particular, the electronic system applied to each turbine allowing converting the electricity is unique in the world because it is decentralised and underwater, unlike the MEYGEN Project, which has opted for a centralised converter installed on the land. According to France, in the future, this important innovation brought by the project “Normandie Hydro”, will allow connecting an even larger number of turbines and increasing the distance from the coasts.

- (64) The French authorities also explained that the “Normandie Hydro project” presents specific risks in comparison with the NEPTHYD project, selected through the same call for interest.
- (65) The foundations, the pales and the absence of orientation of the turbines are innovative compared to the NEPTHYD project. The "open" turbines are simplified and their lubrication does not require engine oil but only water. By comparison, the project NEPTHYD put forward a technology aiming at optimising the load factor to the detriment of maintenance plan, thus making it more costly.
- (66) The French authorities consider that, even if the maintenance costs of the “Normandie Hydro project” will be lower than the NEPTHYD project, it is more risky because numerous innovation will be tested for the first time to achieve these low maintenance costs.
- (67) Moreover, the French authorities justified why they selected two projects for demonstrating tidal energy in the same location.
- (68) First, they explain that, because the tidal energy is still an emerging technology, there is a high risk of failure. This has been noted by the French authorities in 2014 when they selected the projects and further confirmed by a number of interrupted or abandoned projects. They estimate the risk of failure of a one-in-two chance. Thus, the French authorities decided to choose two projects to balance the risk.
- (69) Moreover, as explained in recitals (64) and (65) above, they decided to select two projects aiming at achieving a lower LCOE with different strategies. The NEPTHYD project aims at optimising the load factor and the “Normandie Hydro project” put forward innovation of the turbines, foundations, conversion elements and control of the turbines to make them more robust. These two different strategies could both lead to a level of LCOE allowing for launching commercial farms.
- (70) The French authorities have provided technical explanations and patents belonging to this project that demonstrate that the project will improve the functioning of tidal technology in comparison with other renewable technologies,

in accordance with the European objective sets in the Strategic Energy technology plan (SET Plan)¹⁴.

- (71) In light of the above, the Commission finds that the “Normandie Hydro project” concerns a technology that is first of its kind in the Union and represents a significant innovation that goes well beyond the state of the art. Thus, the Commission concludes that this project constitutes a demonstration project, according to paragraph (45) of the EEAG.
- (72) Because of the level of risk inherent to demonstration projects they are confronted to a lack of sufficient private financing. Private financing requires demonstrating the ability for a project to achieve a predefined economic objective that can only be reached, at this stage of the technology maturity, by a smaller project. The "Normandie Hydro" project will be of a larger scale, hence making private financing impossible without public support.
- (73) Therefore, the Commission concludes that the State intervention is necessary to address this market failure.

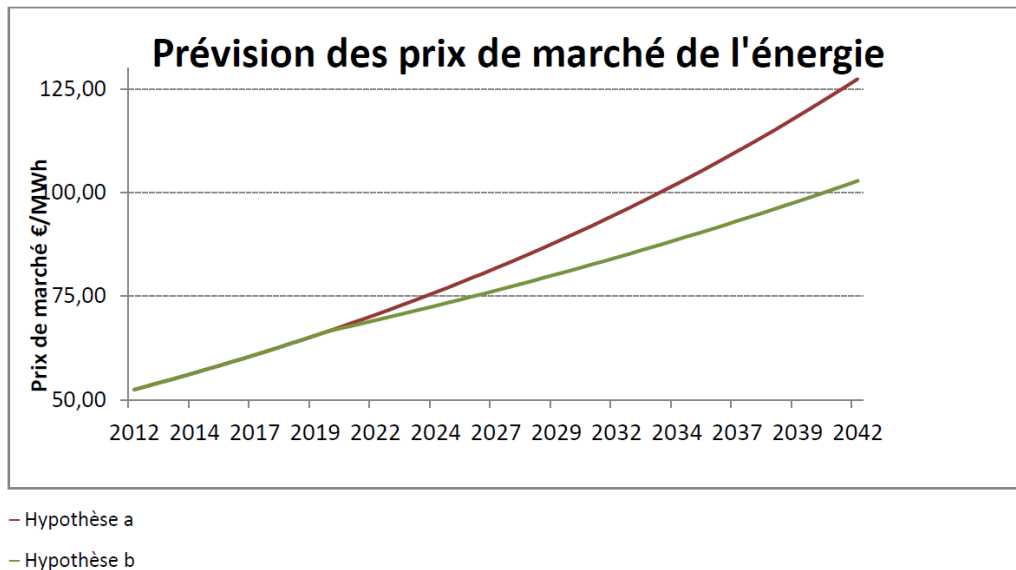
3.3.3 Appropriateness and incentive effect

- (74) According to paragraph 40 of the EEAG, the proposed measure must be an appropriate instrument to address the policy objective concerned. According to paragraph 116 of the EEAG, the Commission presumes the appropriateness of the aid measure and its limited distortive effects provided that all other conditions are met.
- (75) The investment aid consists of a direct grant and a repayable advance. According to paragraph (46) EEAG, the repayable advance constitutes an appropriate instrument when the actual revenues are uncertain.
- (76) According to paragraph 49 of the EEAG, the incentive effect occurs if the aid induces the beneficiaries to change their behaviour towards reaching the objective of common interest which they would not do without the aid.
- (77) The French authorities demonstrated that the LCOE of tidal energy technology would be higher than the expected market price (see recital (15) above). The French authorities provided estimation of the market price from 2012 to 2020 (end date of the project) based on an opinion published by the French regulatory authority (CRE)¹⁵ and an annual inflation rate of 3% (hypothesis a) and 2% (hypothesis b).

¹⁴ <https://ec.europa.eu/energy/en/topics/technology-and-innovation/strategic-energy-technology-plan>

¹⁵ Opinion from the Commission de régulation de l'énergie, 5 avril 2012

Figure 1 Estimation of market price



Source Notification

- (78) The study shows that the market price is estimated at 66.5 EUR/MWh in 2020, which is below the estimated [400 – 500] EUR/MWh LCOE of the project.
- (79) Without the aid and under normal market conditions, the return on investment for tidal energy projects would be negative. Under this condition EDF Energies Nouvelles would not undertake the project and the OpenHydro group would not undertake the project alone.
- (80) Moreover, thanks to the demonstration project, the beneficiary shall improve their technological and commercial handling of this type of project, which will ultimately stimulate the development of new projects.
- (81) The Commission notes that the applicants were required to submit an application in order to participate in a transparent selection process. In accordance with paragraph (51) EEAG, they have demonstrated that in a counterfactual scenario without the aid they would not have undertaken the project.
- (82) The Commission concludes that without the aid the project would not be commissioned. The aid therefore causes the beneficiaries to change their behaviour and invest in the renewable project.
- (83) Consequently, the Commission considers that the aid for the notified project is necessary, granted by means of an appropriate instrument and provides the necessary incentive effect to address the objective of common interest.

3.3.4 Proportionality

- (84) According to paragraph 69 of the EEAG, environmental aid is considered to be proportionate if the aid amount per beneficiary is limited to the minimum needed to achieve the environmental protection objective aimed for.

- (85) The Commission assessed proportionality of the aid under the provisions of Section 3.3.2 EEAG for the operating aid and Sections 3.3.1 and 3.2 for the investment aid.
- (86) As explained in section 2.5 of the decision, the aid intensity should be calculated according to the GGE methodology, which was deemed appropriate for this kind of demonstration projects.
- (87) The French authorities estimated the aid intensity of the investment aid according to the methodology explained in section 3.2.5 EEAG. For this purpose, the French authorities consider a gas plant. As explained in recital (37) above, they used the investment costs of a 440 MW plant, downscaled to account for the reduced size and load factor of the tidal plant, the counterfactual investment for the 14 MW Normandie Hydro project is estimated at 5.03 million EUR. The eligible costs amount therefore to [65 – 70] million EUR.
- (88) As shown in Table 1, considering investment aid of 34.33 million euros in GGE terms, the aid intensity is 50%. According to Annex 1 of the EEAG, the maximum aid intensity for investment aid for renewable energy is 45% for large enterprises.
- (89) According to paragraph 78 (c) EEAG, higher aid intensity may be justified under certain conditions in case of eco-innovation which can address a double market failure linked to the higher risks of innovation, coupled with the environmental aspect of the project. The aid intensity may be increased by 10 percentage points, provided that the following cumulative conditions listed in paragraph 78 (c) (i), (ii) and (iii) EEAG are fulfilled:
- i. the eco-innovation asset or project must be new or substantially improved compared to the state of the art in its industry in the Union
 - ii. the expected environmental benefit must be significantly higher than the improvement resulting from the general evolution of the state of the art in comparable activities; and
 - iii. the innovative character of the assets or projects involves a clear degree of risk, in technological, market or financial terms, which is higher than the risk generally associated with comparable non-innovative assets or projects
- (90) First, as explained in recitals (53) to (69) the “Normandie Hydro project” is a demonstration project according to the definition in paragraph 45 of the EEAG. As such, it constitutes a significant technological innovation that goes well beyond the state of the art.
- (91) Second, the project aims at proving a technology aiming at producing renewable energy while limiting visual impact of the construction because no component of the farm will be visible. Moreover, the lower need for maintenance and the absence of engine oil for the lubrication of the turbines limit the polluting risk of the project.
- (92) Third, for the first time, a tidal farm will be built in Raz-Blanchard, a zone with very strong currents, which makes this project risky on a technological level. This risk adds up to the financial risks which bear all demonstration projects, as explained in recital (71).

- (93) In light of the above, higher aid intensity is justified for this project. As explained in recital (88), the aid intensity may be increased to 55%. The aid intensity of the measure is 50%. The Commission concludes that the measure complies with the provisions of paragraph 77 EEAG.
- (94) Considering the exceptions for demonstration projects set out in paragraph 125 of the EEAG, the Commission concludes that, for the “Normandie Hydro project”, the operating aid in the form of a FiT is compatible with the provisions of section 3.3.2.1 of the EEAG. Furthermore the Commission notes that the obligation of selecting the project through a competitive bidding process does not apply to a demonstration project, on the basis of paragraph 127 of the EEAG.
- (95) As the aid is not granted through a competitive bidding process, in line with point 128 of the EEAG, the proportionality of the operating aid is assessed on the basis of point 131 of the EEAG.
- (96) According to point 131(a) and 131 (b), the aid per unit of energy does not exceed the difference between the total levelised costs of producing energy ('LCOE') from the particular technology in question and the market price of the form of energy concerned. The LCOE may include a normal return on capital. Investment aid is deducted from the total investment amount in calculating the LCOE.
- (97) As described in recital (15) above, the LCOE is estimated at [400 – 500] EUR/MWh taking into account an Internal Rate of Return (IRR) post tax of [9 – 11] %. As described in recital (30) above, the feed in tariff paid to the project amounts to 150 EUR/MWh and is lower than the estimated LCOE of [400 – 500] EUR/MWh.
- (98) Taking into account the investment and operating aid and the estimated investment and operating costs of the project, the French authorities calculated an IRR of approximately [9 – 11] % for the project company. France considers such rate of return appropriate since the technology is in the demonstration phase of development and considerably riskier than a comparable investment using conventional technology. The total costs of the project are 73.7 M€. The eligible costs are 69.175 M€. As explained above, OpenHydro will receive 17.4 M€ in repayable and advance and a direct grant of 17.4 M€. The amount of aid expressed in GGE terms is equal to 34.33 M€. The French authorities explained that the contract between OpenHydro and the project company fixes a price of 34.383 M€ for transferring the plant from OpenHydro to the project company. Therefore, OpenHydro will earn negligible margin in building and transferring the tidal farm to the project company.
- (99) The Commission considers that France has sufficiently demonstrated that the IRR for the project (after deducing investment aid, as required by paragraph 131 of the EEAG) is not exceeding a normal return for this type of projects and notes that this rate is consistent with the ones previously approved by the Commission for non-conventional ocean energy technology projects (see references in Footnote 1).
- (100) Point 131 (c) of the EEAG states that the production costs are updated regularly, at least every year. As explained in recital (30) above, the project will receive operating aid through a Feed-in Tariff, regulated by Article L.314-1 and following of the French energy code. Article L.314-4 of the French energy code

states that the condition under which the tariff is attributed is subject to a periodic control in order to account for the evolution of the production costs.

- (101) Finally, the Commission notes that, in line with paragraph 131 (d) of the EEAG, aid is only granted until the plant has been fully depreciated (see recital (31) above).
- (102) In light of the above and without prejudice to the assessment of the 2007 Decree enacted the measure (see recital (43) above), the Commission concludes that the aid granted to the “Normandie Hydro project” satisfies the conditions in sections 3.2.5 and 3.3.2.1 of the EEAG and is, therefore, proportionate.

3.3.5 Distortion of competition and balancing test

- (103) According to paragraph 90 of the EEAG, the Commission considers that aid for environmental purposes will, by its very nature, tend to favour environmentally friendly products and technologies at the expense of other, more polluting ones. Furthermore, the effect of the aid will in principle not be viewed as an undue distortion of competition since it is inherently linked to its very objective.
- (104) The Commission notes that the capacity of the project (14 MW) and the amount of electricity generated ([25 – 30] GW/an) is negligible compared to the size of the French electricity market (see recital (13) above). Therefore, the small size of the project which aims at testing a technology will not create undue distortion of competition even if the SPV will be owned by EDF EN.
- (105) In light of the above, and having regard for the provisions of paragraph 108 of the EEAG, the Commission considers that the overall balance of the proposed scheme is positive and the measure does not have undue distortive effects on competition and trade.

3.3.6 Transparency

- (106) Under paragraph 104 of the EEAG, Member States have the obligation to ensure the transparency of the aid granted, by publishing certain information on a comprehensive State aid website. In line with paragraph 106 of the EEAG, Member States are requested to comply with this obligation as of 1 July 2016.
- (107) France committed to comply with the transparency requirements in paragraphs 104 – 106 of the EEAG (see recital (41) above).

3.3.7 Conclusion with regard to the compatibility of the measure

- (108) In light of the above, the Commission considers that the notified investment aid pursues an objective of common interest in a necessary and proportionate way without unduly affecting competition and trade, and that therefore the aid is compatible with the internal market on the basis of the EEAG.

4. CONCLUSION

The Commission has accordingly decided:

not to raise objections to the aid on the grounds that it is compatible with the internal market pursuant to Article 107(3)(c) of the Treaty on the Functioning of the European Union.

If any parts of this letter are covered by the obligation of professional secrecy according to the Commission communication on professional secrecy and should not be published, please inform the Commission within fifteen working days of notification of this letter. If the Commission does not receive a reasoned request by that deadline, France will be deemed to agree to the publication of the full text of this letter. If France wishes certain information to be covered by the obligation of professional secrecy, please indicate the parts and provide a justification in respect of each part for which non-disclosure is requested.

Your request should be sent electronically in accordance with Article 3(4) of Commission Regulation (EC) No 794/2004,

Yours faithfully
For the Commission

Margrethe VESTAGER
Member of the Commission