EUROPEAN COMMISSION

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C(2015) 8227 final

In the published version of this decision, some information has been omitted, pursuant to articles 24 and 25 of Council Regulation (EC) No 659/1999 of 22 March 1999 laying down detailed rules for the application of Article 93 of the EC Treaty, concerning non-disclosure of information covered by professional secrecy. The omissions are shown thus […].		**PUBLIC VERSION** This document is made available for information purposes only.

Subject: **State Aid SA.38454 (2015/C) (ex 2015/N) – Hungary**
Possible aid to the Paks nuclear power station

Sir,

The Commission wishes to inform Hungary that, having examined the information supplied by your authorities on the measure referred to above, it has decided to initiate the procedure laid down in Article 108(2) of the Treaty on the Functioning of the European Union (TFEU).

1. PROCEDURE

(1) Based on press articles and informal contacts with the Hungarian authorities, on 13 March 2014, the Commission started a preliminary investigation into possible State aid involved in the construction of Paks II nuclear power plant under the case number SA.38454 (2014/CP).

(2) After several information exchanges and formal meetings the Hungarian authorities notified the measure for legal certainty on 22 May 2015 stating that the Project involves no State aid within the meaning of Article 107 TFEU.

(3) Hungary submitted additional information on 12 June 2015 and provided access to further information held by the services of EURATOM on 22 September 2015. Further information was submitted on 8 October 2015 and 29 October 2015.
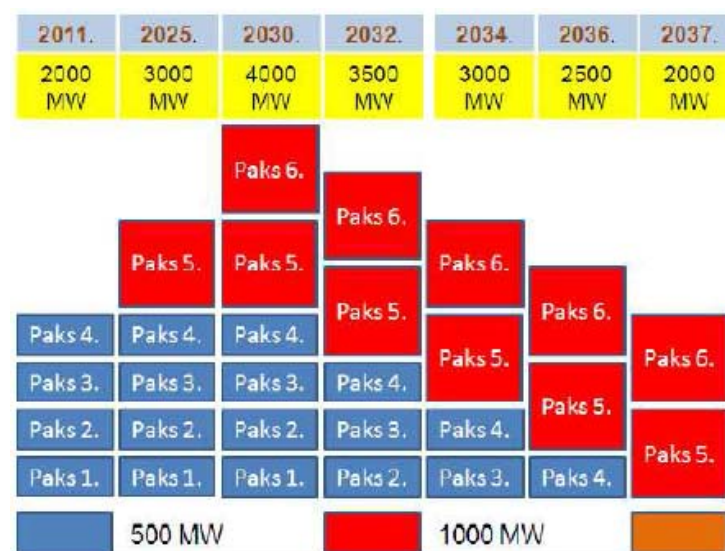
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2. DETAILED DESCRIPTION OF THE MEASURE

2.1. Description of the Project

(4) The measure consists of the development of two new nuclear reactors in Hungary that are fully financed by the Hungarian State during construction for the benefit of the entity Paks II (formerly MVM Paks II Nuclear Power Plant Development Private Company Limited by Shares) that will own and operate them.

(5) The Russian Federation and Hungary concluded an intergovernmental agreement (IGA) on a nuclear programme on 14 January 2014[1]. Based on the IGA, the countries shall cooperate in the maintenance and further development of the currently running Paks nuclear power plant (NPP). This includes the designing, construction, commissioning and decommissioning of two new power units 5 and 6 with VVER (water-cooled water moderated) type reactors with installed capacity of each power unit of at least 1 000 MW[2] in addition to the currently operating power units 1-4. The operation of power units 5 and 6 is aimed at compensating for the capacity of the operating power units 1-4 which will retire between 2032 and 2036.

Figure 1: Timeline of nuclear development on the Paks site

Source: Hungarian National Energy Strategy 2030, NFM, June 2011

(6) Pursuant to the IGA[3] both Russia and Hungary would designate one experienced State-owned and State-controlled organisation which is financially and technically capable to fulfil its obligations as contractor/owner in relation to the Project.

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[1] Agreement between the Government of the Russian Federation and the Government of Hungary on cooperation on peaceful use of nuclear energy concluded on 14 January 2014 ratified in Hungary by Act II of 2014 of the Hungarian Parliament (2014. évi II. törvény a Magyarország Kormánya és az Oroszországi Föderáció Kormánya közötti nukleáris energia békés célú felhasználása terén folytatandó együttműködésről szóló Egyezmény kihirdetéséről).

[2] The reactors are assumed by the Hungarian authorities to have 1180MW net capacity per unit.

[3] Article 3 of the IGA

(7) Russia has appointed Joint-Stock Company *Nizhny Novgorod Engineering Company Atomenergoproekt* (JSC NIAEP) to construct and Hungary has appointed *MVM Paks II Nuclear Power Plant Development Private Company Limited by Shares*[4] (now Paks II) to own and operate the two power units 5 and 6.

(8) Whilst the IGA sets out the general rights and obligations of nuclear cooperation between the two countries, the detailed implementation of the IGA is to be specified in separate agreements called the "Implementation Agreements"[5]:

   (a) the engineering, procurement and construction contract for the construction of two VVER 1200 (V491) units at the Paks site (the "EPC Contract");

   (b) the contract stipulating the terms and conditions for the cooperation on operation and maintenance of the reactors (the O&M contract);

   (c) the agreement on the terms for fuel supply and management of spent fuel.

(9) JSC NIAEP and Paks II concluded the EPC Contract on 9 December 2014 which stipulates that the two new units are meant to start operation in 2024 and 2026 respectively.

(10) Russia undertook to provide Hungary with a state loan to finance the development of the Paks NPP. This loan is governed by a Financing Intergovernmental Agreement (the Financing IGA)[6] and provides a revolving credit facility of EUR 10 billion which is limited to be used solely for the designing, construction and commissioning of power units 5 and 6. Hungary will directly finance the investments of Paks II necessary for the designing, construction and commissioning of power units 5 and 6 as set out by the Financing IGA.

(11) Other than the investment support, Hungary does not intend to grant any financial support to Paks II once power units 5 and 6 have been constructed. The new units will operate under market conditions without any fixed amount of revenues or guaranteed price.

2.2. Objective of the measure

(12) The Paks NPP is the only nuclear power plant operating in Hungary. It belongs to the electricity trader and power producer, the MVM Group[7], and is 100% publicly owned. It has a total installed capacity of 2000 MW and is divided into four different units, each of which is equipped by the Russian technology of VVER-440/V213. These units started to generate electricity gradually between 1982 and 1987. They will be gradually phased out until 2036.

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[4] Government Resolution 1429/2014. (VII. 31.) [A Kormány 1429/2014. (VII. 31.) Korm. Határozata a Magyarország Kormánya és az Oroszországi Föderáció Kormánya közötti nukleáris energia békés célú felhasználása terén folytatandó együttműködésről szóló Egyezmény kihirdetéséről szóló 2014. évi II. törvény szerinti Magyar Kijelölt Szervezet kijelölése érdekében szükséges intézkedésről]

[5] Article 8 of the IGA

[6] Agreement between the Government of the Russian Federation and the Government of Hungary on the extension of a state credit to the Government of Hungary for financing of the construction of nuclear power plant in Hungary concluded on 28 March 2014

[7] Magyar Villamos Művek Private Limited Company by Shares

(13)   Electricity generation from nuclear sources plays a strategic role in Hungary's energy mix. Approximately 50% of the overall domestically generated electricity comes from the currently operated four reactors of the Paks NPP[8].

(14)   Based on the objectives of i) maintaining a sensible share of national resources and ii) reducing Hungarian dependence on imports whilst remaining consistent with national climate policy, the Government requested MVM Group to investigate the alternatives of the expansion of electricity production in nuclear power plants. To this end, a Feasibility Study was developed by MVM Group that explored the implementation and financing of a new nuclear power plant that could be integrated into the electricity system and could be operated in an economical, safe and environmental-friendly way. Based on the Feasibility Study presented in 2008, the Government made a proposition to the Hungarian Parliament, in which the conceptual consent was requested from the Parliament to start the preparatory work for the implementation of new nuclear power plant units at the Paks Site[9]. This was supported by calculations according to which the retirement of 6 000 MW from the 8-9 000 MW gross installed capacity was forecast by 2025 due to the shutdown of the obsolete power plants, which is planned to be partly replaced by the expansion of the Paks NPP.

(15)   In 2011 the National Energy Strategy for the period up to 2030 was implemented[10]. This strategy focusses on a "Nuclear-Coal-Green" scenario for Hungary. The Hungarian Transmission System Operator (TSO), MAVIR, projects that there is a need for 5.5 GW of new generation capacity in Hungary by 2024, and 7.3 GW by 2030 as a result of the demand growth and the retirements of existing generation capacity in Hungary[11]. MAVIR also forecasts that almost all of the current coal generation fleet will have retired by 2030, and that the installed capacity of Hungary's gas-fleet will have declined by 1.5 GW.

(16)   Against the need to replace phased out capacity and to address the need for new generation capacity and Hungary's consideration that European climate objectives (especially those related to the anticipated decrease of CO_2 emissions) can be achieved with keeping nuclear generation in the fuel mix, Hungary and Russia signed the abovementioned IGA with the objective to develop new capacities at the Paks site.

2.3.   Beneficiary

(17)   The beneficiary of the measure is the company Paks II currently owned by the Hungarian State by way of the Prime Minister's Office (see recital (28)). Paks II will own and operate the reactors 5 and 6 that are paid for by the Hungarian State.

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[8]   Data of the Hungarian Electricity System (Mavir, 2014) – https://www.mavir.hu/documents/10262/160379/VER_2014.pdf/a0d9fe66-e8a0-4d17-abc2-3506612f83df, accessed on 26 October 2015.

[9]   25/2009. (IV.4.) OGY Határozat a paksi bővítés előkészítéséről

[10]   National Energy Strategy (Ministry of National Development, Hungary, 2011): http://2010-2014.kormany.hu/download/7/d7/70000/Hungarian%20Energy%20Strategy%202030.pdf

[11]   A magyar villamosenergia-rendszer közép- és hosszú távú forrásoldali kapacitásfejlesztése (Medium- and long-term development of generation assets of the Hungarian electricity system): https://www.mavir.hu/documents/10258/15461/Forr%C3%A1selemz%C3%A9s_2014.pdf/7a379c76-a8d0-42f6-b8e6-bf8c05894a49 (Mavir, 2014)

(18)   The company with its initial name, MVM Paks II, was incorporated by the MVM Group in 2012. MVM Group is a 100% State owned company playing a leading role in the production, wholesale and retail trading of electricity in the Hungarian market. 99.91% of the MVM Group is owned by the Hungarian State and the rest of the shares are controlled by different municipalities. The right of ownership of the State is exercised by the Hungarian National Asset Management Inc *(Magyar Nemzeti Vagyonkezelő Zrt.)* which plays a leading role in the co-ordination of State-owned assets under the supervision of the Ministry of National Development.

(19)   In November 2014 all the shares of Paks II held by MVM Hungarian Electricity Ltd. were transferred to the Hungarian State and, in the same month, the rights of ownership were transferred from the Hungarian National Asset Management Inc to the Prime Minister's Office[12]. No information was submitted to the Commission as regards the price of the share transfer.

2.4. Financing Structure of the Project and Rights and Obligations under the EPC Contract

2.4.1. Financing Intergovernmental Agreement

(20)   Within the framework of the IGA[13], Russia undertook to provide Hungary a state loan in the form of a revolving credit facility of EUR 10 billion to finance the development of nuclear power units 5 and 6 in Paks. The loan bears an interest rate ranging between 3.95% and 4.95%[14]. The loan is earmarked for the designing, construction and commissioning of those power units.

(21)   Pursuant to the IGA, the loan must be used by Hungary for financing 80% of the value of the EPC Contract for execution of works and services and delivery of equipment whereas 20% of each amount payable pursuant to the EPC Contract shall be effectuated by Hungary. The loan must be used by Hungary between 2014 and 2025.

(22)   The loan must be repaid by Hungary within 21 years[15], the first instalment being due in the closest of the date of 15 March or 15 September after the date of commissioning the new nuclear power units 5 and 6, but not later than 15 March 2026.

(23)   Payments under the Financing IGA may be effectuated only once a request by the Ministry for National Development of Hungary and a notice of approval by the Ministry of Finance of the Russian Federation have been issued.

2.4.2. The EPC Contract

(24)   According to the EPC Contract, JSC NIAEP must deliver the two reactors as set out in the detailed Technical Specifications by the agreed dates and for the agreed

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*   Classified information/Business secret
[12]   Decree of the Minister of National Development No. 45/2014. (XI.14.) [45/2014. (XI.14.) NFM rendelet az MVM Paks II. Atomerőmű Fejlesztő Zártkörűen Működő Részvénytársaság felett az államot megillető tulajdonosi jogok és kötelezettségek összességét gyakorló szervezet kijelöléséről]
[13]   Article 9 of the IGA
[14]   3.95% until the first day of repayment, and from 4.50% to 4.95% in the next 21 years.
[15]   In each 7 year term: 25%, 35% and 40% of the actually utilised amount of the credit respectively.

lump sum price (EUR […]* billion). Every previously undefined cost is deemed to be included in this price […][16].

(25) The contract provides for liquidated damages[17] to be paid in specific circumstances, […]. The payable damages are expressed in a percentage related to the total contract price. […] The amount of damages is limited […]. Payment of liquidated damages […].

(26) The contract provides for a […].

(27) Neither party under the EPC Contract is liable to the other party for […].

2.4.3. Relationship between the State and the Beneficiary

(28) Initially, the Hungarian authorities had envisaged Paks II to remain a 100% subsidiary of MVM Hungarian Electricity Ltd., which itself is owned by the Hungarian State and municipalities. Since November 2014, Paks II is no longer a subsidiary of MVM Hungarian Electricity Ltd./part of the MVM Group but a 100% directly State owned company having currently no legal relation with the MVM Group.

(29) As regards the activity of Paks II, in particular the sale of electricity, the Hungarian authorities stated that no separate power purchase agreement with a separate supplier is in place or being envisaged at this stage. The Hungarian authorities envisage that the electricity generated by Paks II will be sold on the market and to electricity consumers in accordance with typical market practice base-load power sales agreements. According to the Hungarian authorities, Paks II, as a base-load generator for an expected long operation period, would be a price taker, similarly to existing nuclear power generators in Europe.

(30) Paks II will be the owner of the Paks II NPP and, during the construction phase of the two reactors, it will be fully equity financed by the Hungarian State. The Hungarian authorities consider that at this stage raising any debt directly by Paks II will not be necessary.

(31) The Hungarian authorities will not transfer the funds required to pay the purchase price for the Paks II NPP into the accounts of Paks II. The largest part of those funds will be held by […]. For each milestone event that is considered fulfilled, […]**.

(32) The rest of the financial requirements of Paks II during the construction phase will be ensured through equity from the Hungarian State. The initial earmarked amount during the construction phase will be up to EUR […] billion (difference between the amount of EUR 12.5 billion set for the nuclear project in the IGA and the actual purchase price of the Paks II NPP amounting to EUR […] billion). This is considered by the Hungarian authorities to represent a cap on the State resources that can be drawn for the construction of the Paks II NPP, at least

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*   Classified information/Business secret
[16]   […]
[17]   Liquidated damages are a set amount of damages agreed by parties of a contract to become due as compensation in case of the breach of specific obligations under the contract.
**   Classified information regarding the mechanism for the payment of the EPC Contract purchase price

without further assessment. Should, however, the equity requirements exceed such amount, the Hungarian State claims it will invest more if its assessment at the time yields that it is economic reasonable for it to do so.

(33) The Hungarian authorities claim that a sensitivity analysis on possible extra costs incurred by Paks II during the construction phase yielded that its costs would have to be multiplied by 10 for the expected IRR to decrease by 1%. Therefore, Hungary expects the impact of costs increases to be minor.

(34) The Hungarian authorities claim that, during the operation, Paks II will be able to fully cover its costs by revenues and achieve the expected IRR.

2.4.4. Costs

(35) The EPC Contract price for the construction of the two new nuclear reactors amounts to EUR […] billion (20% to be covered by the Hungarian State from own sources and 80% by the loan contracted with the Russian Federation).

(36) The maintenance costs are estimated to amount to EUR […]-[…] million per annum[18], while the total operational costs are estimated at EUR […] million per annum. Operating and maintenance costs were initially estimated to amount to EUR […]-[…]/MWh*. In a more recent submission, Hungary claimed that they are estimated at EUR [6 - 8]** MWh[19].

(37) The above calculation does not include the fuel, waste management and decommissioning costs. Fuel costs are estimated to be of EUR [5 - 6]/MWh*** taking into account […] fresh fuel assemblies to be loaded in one cycle. Waste management and storage costs are estimated to amount to EUR […] million per annum and decommissioning fund costs to EUR […] million per annum[20].

(38) Considering a […]% load factor, the Hungarian authorities submitted the calculation of the estimated costs for decommissioning and waste management of EUR 2.1/MWh (corresponds to total costs contributed over the lifetime of the plant for waste and decommissioning of EUR 2.4 billion (real 2013)). If the most conservative estimate regarding the evolution of interest rates is used, the cost would be equivalent to EUR 2.7/MWh (real 2013), with a total cost of EUR 3.1 billion (real 2013).

2.5. Hungary's position

(39) Hungary claims in the notification that the investment does not constitute State aid within the meaning of Article 107 TFEU as it does not confer an economic

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[18] More recently, the Hungarian authorities showed that the estimated average costs would be of EUR […] million per annum. See MEIP Substantiating Analysis submitted on 18 February 2015.

* Operating and maintenance cost estimates are deleted as business secrets, Public benchmarks yield a range of [7-8]/MWh (real 2013). The cost is within the range.

** The value of the estimation is considered business secret therefore it is replaced by a wider range.

[19] MEIP Substantiating Analysis, submitted on 18 February 2015.

*** Fuel cost estimate is deleted as business secret. Public benchmarks yield a range of EUR [5-7]/MWh (real 2013). The cost is within the range.

[20] Financial Analysis Description and Assumptions Range, MVM Paks II and Ministry of National Economy of Hungary, 03 September 2014, Sections 3.5 and 3.6. All figures are presented in real costs.

advantage to Paks II because the market economic investor principle (MEIP) is complied with.
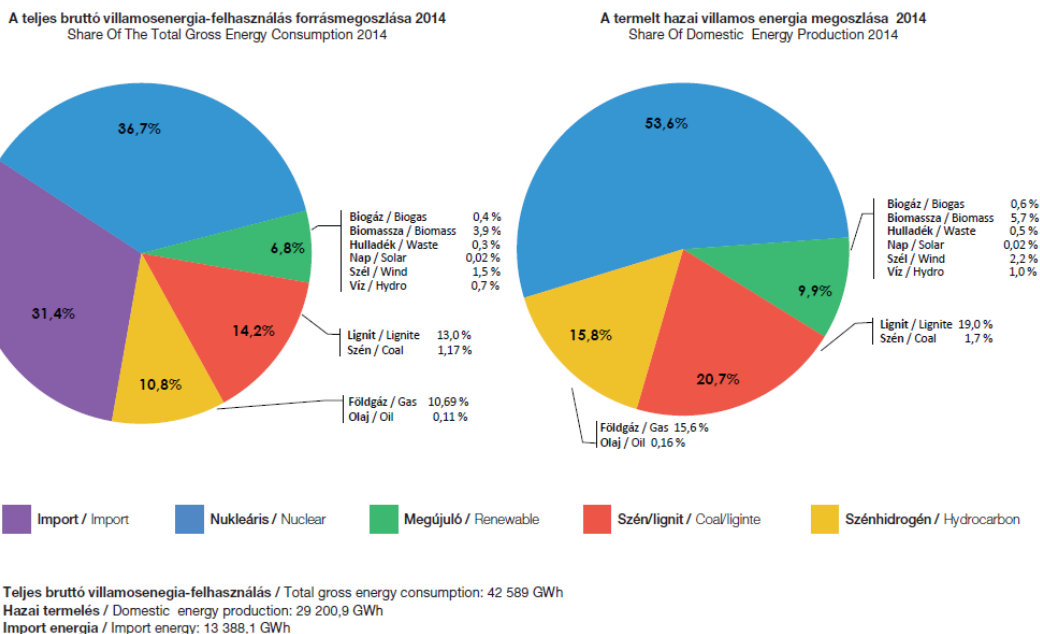
(40) Hungary argues that the Project is economically exposed to the same market risks as other market participants would face. It further claims that the measure does not confer any selective protection such as market price support, does not cause any distortions of competition and does not affect intra-Union trade. The Project is claimed to be of an economic nature within a liberalised interconnected market and the economic analysis carried out by Hungary respects the EU harmonisation and market liberalisation objectives.

(41) The Hungarian Government submitted two economic studies aiming to demonstrate that the investment in Paks II fulfils the MEIP test and hence there is no aid involved. The first submission ("Market Economic Investor Principle substantiating analysis", hereinafter "MEIP study") was received by the Commission on 18 February 2015 and the second ("Economic analysis for the Paks II nuclear power project"), on 8 October 2015. On 29 October 2015, the Hungarian authorities submitted further information substantiating the values of the WACC and IRR they had submitted. More details as regards the position of the Hungarian authorities are contained in Section 3.1.2.1.

2.6. Hungarian Electricity Market

2.6.1. Description of the Hungarian Electricity Market

(42) The current structure of the Hungarian electricity market took shape around 1995, when the majority of large power plants, public utility suppliers as well as distribution companies were privatised. The State retains a dominant position in the sector through the state-owned vertically integrated energy company MVM Group.

(43) As a generator, MVM Group has a significant market presence, due to its main generation asset, Paks NPP which provided 53.6% of domestically generated electricity. As Figure 2 shows, the MVM Group also plays a significant role in the total gross energy consumption due to its subsidiary Paks NPP.
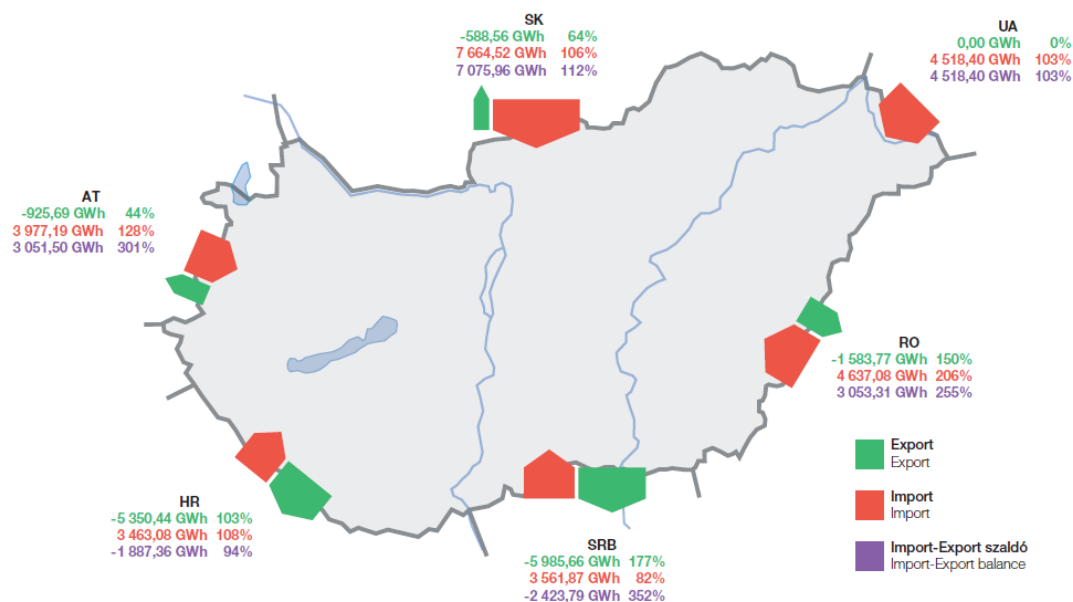
Figure 2: Composition of consumption and production in 2014

A teljes bruttó villamosenergia-felhasználás forrásmegoszlása 2014
Share Of The Total Gross Energy Consumption 2014

36,7%
6,8%
31,4%
14,2%
10,8%

Biogáz / Biogas	0,4 %
Biomassza / Biomass	3,9 %
Hulladék / Waste	0,3 %
Nap / Solar	0,02 %
Szél / Wind	1,5 %
Víz / Hydro	0,7 %

Lignit / Lignite	13,0 %
Szén / Coal	1,17 %

Földgáz / Gas	10,69 %
Olaj / Oil	0,11 %

A termelt hazai villamos energia megoszlása 2014
Share Of Domestic Energy Production 2014

53,6%
9,9%
15,8%
20,7%

Biogáz / Biogas	0,6 %
Biomassza / Biomass	5,7 %
Hulladék / Waste	0,5 %
Nap / Solar	0,02 %
Szél / Wind	2,2 %
Víz / Hydro	1,0 %

Lignit / Lignite	19,0 %
Szén / Coal	1,7 %

Földgáz / Gas	15,6 %
Olaj / Oil	0,16 %

Import / Import   Nukleáris / Nuclear   Megújuló / Renewable   Szén/lignit / Coal/lignite   Szénhidrogén / Hydrocarbon

Teljes bruttó villamosenegia-felhasználás / Total gross energy consumption: 42 589 GWh
Hazai termelés / Domestic energy production: 29 200,9 GWh
Import energia / Import energy: 13 388,1 GWh

Source: Data of the Hungarian Electricity System (Mavir, 2014)

(44)   Hungary is a net electricity importer with imports accounting for ca. 30% of the Hungarian electricity consumption. The country is well interconnected with neighbouring countries – interconnection capacity for electricity was 30% in 2014, above the 2020 target[21]. In 2014 the Czech-Slovak-Hungarian-Romanian market coupling became operational, resulting in an increase of the liquidity of the Hungarian power exchange (HUPX) and a decrease in price volatility. Figure 3 below summarises the data of electricity exchange with neighbouring countries in 2014.

Figure 3: Electricity exchange between Hungary and neighbouring countries

SK
-588,56 GWh   64%
7 664,52 GWh   106%
7 075,96 GWh   112%

UA
0,00 GWh   0%
4 518,40 GWh   103%
4 518,40 GWh   103%

AT
-925,69 GWh   44%
3 977,19 GWh   128%
3 051,50 GWh   301%

RO
-1 583,77 GWh   150%
4 637,08 GWh   206%
3 053,31 GWh   255%

HR
-5 350,44 GWh   103%
3 463,08 GWh   108%
-1 887,36 GWh   94%

SRB
-5 985,66 GWh   177%
3 561,87 GWh   82%
-2 423,79 GWh   352%

Export / Export
Import / Import
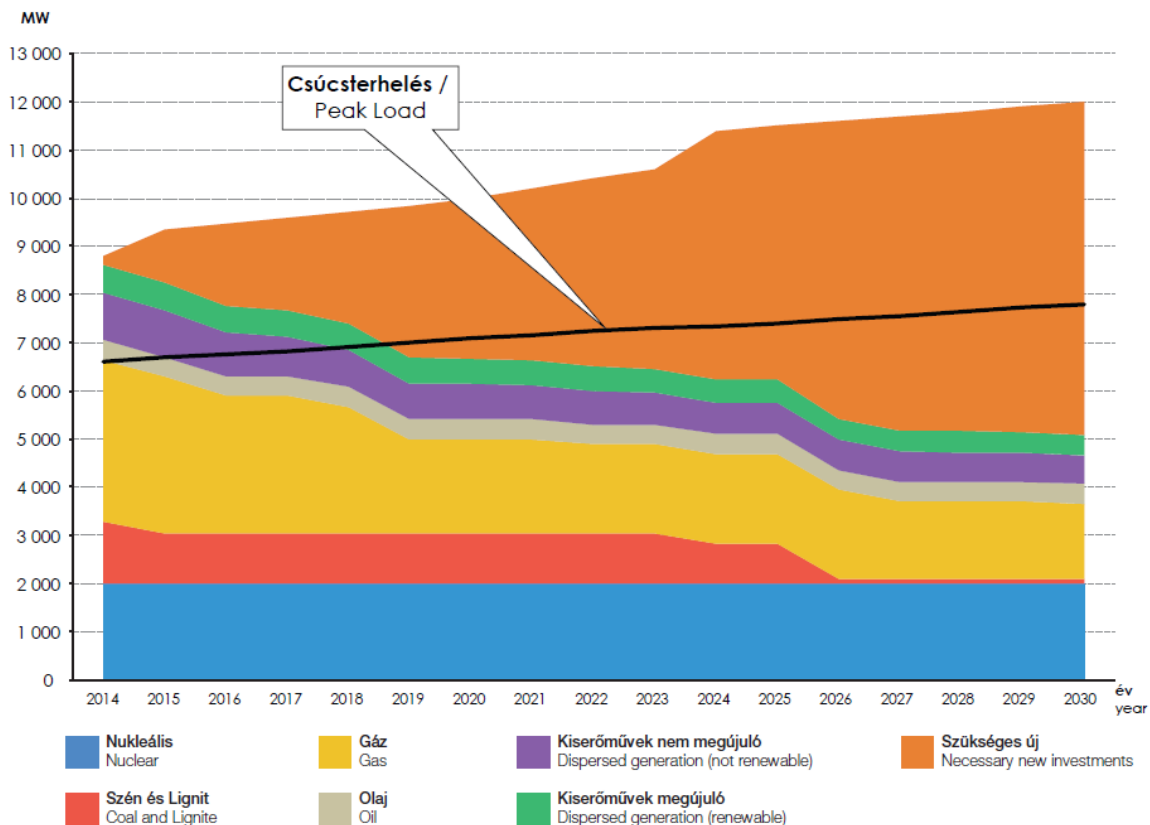Import-Export szaldó / Import-Export balance

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[21]   Hungarian Energy Country Report (European Commission – 2014): https://ec.europa.eu/energy/sites/ener/files/documents/2014_countryreports_hungary.pdf, accessed on 26 October 2015.

2.6.2. Description of the Envisaged Evolution of the Hungarian Electricity Market

(45) Based on the abovementioned study issued by MAVIR[22], almost all of the coal generation fleet will have retired by 2030, and the installed capacity of Hungary's gas-fleet will have declined by 1.5 GW. Compared to its estimates of peak demand growth, available generation capacity from domestic power producers is expected to fall below peak load by 2021. As a result, MAVIR estimates that the Hungarian market requires 3 GW of additional new generation capacity by 2019, 5.5 GW by 2024, and 7.3 GW at the end of the forecast period in 2030.

Figure 4: Additional capacity requirement in the Hungarian electricity sector

Source: Medium- and long-term development of generation assets of the Hungarian electricity system (Mavir, 2014)

(46) Hungary explains that, despite the claimed relatively large requirement for new generation capacity, data from Platts Powervision suggests that relatively little new capacity is actually being built, as shown in Table 1 below. Hungary also puts forward that according to Platt's data, a 44 MW waste-to-energy plant is the sole power station which is currently under construction in Hungary. Hungary, furthermore, explains that while there are investor plans to build larger (gas-fired) plants, none of these projects can be considered confirmed, as investors have not

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[22]   A magyar villamosenergia-rendszer közép- és hosszú távú forrásoldali kapacitásfejlesztése (Medium- and long-term development of generation assets of the Hungarian electricity system): https://www.mavir.hu/documents/10258/15461/Forr%C3%A1selemz%C3%A9s_2014.pdf/7a379c76-a8d0-42f6-b8e6-bf8c05894a49 (Mavir, 2014), accessed on 26 October 2015.

yet incurred substantial expenses (such as construction costs) that could not be recovered which would demonstrate commitment to actually undertake the Project.

Table 1: New capacities to be built in the Hungarian electricity sector

Plant	Plant Type	Primary Fuel	Nameplate MW	Online Year	Status
Dunaujvaros Chp	Waste	Biomass	44	2016	Under Constr
Szeged Ccgt	CC/Cogen	Natural Gas	460	2017	Advan Develop
Szeged Ccgt	CC/Cogen	Natural Gas	460	2017	Advan Develop
Csepel III	CC/Cogen	Natural Gas	430	2018	Advan Develop
Tolna	Wind	Wind	260	2018	Early Develop
Gyor Region	Wind	Wind	300	2019	Early Develop
Szazhalombatta - Dunai Refinery	CC	Natural Gas	860	2020	Advan Develop
Almasfuzito	Coal	Coal Generic	435	2020	Proposed

Source Platts Powervision, data accurate as of September 2015

3. **ASSESSMENT OF THE MEASURE**

   3.1. Existence of Aid

(47) A measure constitutes State aid within the meaning of Article 107(1) TFEU if it fulfils four conditions. First, the measure is funded by the State or through State resources. Second, the measure confers an advantage to a beneficiary. Third, the measure favours certain undertakings or economic activities (selectivity). And fourth, the measure has the potential to affect the trade between Member States and to distort competition in the internal market.

   3.1.1. Transfer of State Resources and Imputability

(48) Hungary will finance the Project during the construction period with State funds originating from the loan from the Russian Federation (80%) and own funds (20%). Hungary will finance directly all the investments which are necessary for the designing, construction and commissioning of power units 5 and 6, as set out by the Financing IGA.

(49) Therefore, the Commission concludes that the measure entails a transfer of resources of the Hungarian State.

(50) The measure is imputable to the Hungarian State as the Hungarian authorities have taken the decision to invest into the Project and will decide on the disbursement of the necessary funds for the payment of the EPC Contract Purchase Price and the equity financing of Paks II.

3.1.2. Economic Advantage

(51)   The MEIP test is the test that addresses the question of economic advantage. As recognized by case-law[23], this test considers whether a market investor would have invested in the Project on the same terms and conditions as the public investor at the time when the decision to make the public investment was taken. This is equivalent to the condition that the expected internal rate of return (IRR) of the investment is higher than a purely market based benchmark weighted average cost of capital (WACC)[24] for the firm invested in.

3.1.2.1. Hungary's Position

(52)   In the notification, the Hungarian authorities argued that the measure does not constitute State aid, as it fulfils the MEIP test. Hungary claims that the IRR of the Project is higher than a purely market based benchmark WACC for Paks II. The Hungarian authorities presented a financial analysis for the Project dated 3 September 2014 and a study regarding the evolution of future electricity prices of KPMG dated 11 September 2014.

(53)   In particular, according to the notification, the economic analysis for the Project shows a [6.5]%-[9.5]%* post tax project return (IRR) during operations in a wide range of market forecasts and sensitivity scenarios. Furthermore, the appropriate WACC range to benchmark the nuclear power plant Paks II is considered to be the interval 6.4%-7%. Therefore, the Hungarian authorities claim that, given these value ranges, the IRR is higher than the WACC and hence the state investment is profitable, i.e. in compliance with the MEIP test.

(54)   The corresponding WACC and IRR figures in the notification are substantiated in the study "*Market Economic Investor Principle substantiating analysis*", (henceforth "*MEIP study*") submitted by the Hungarian Government on 18 February 2015 together with a project cash flow financial model (henceforth, "*the original financial model*") submitted by the Hungarian Government on 16 March 2015.[25]

(55)   The Hungarian authorities later extended the analysis to substantiate the notification. The results of this extended analysis are presented in the "Economic analysis for the Paks II nuclear power project" (henceforth, "*subsequent economic analysis*") submitted on 8 October 2015 and in a letter to the Commission (henceforth, "*subsequent economic letter*") submitted on 16 October 2015. An updated version of the original financial model (henceforth, "*the updated financial model*"), claimed to include a more accurate representation of some clauses in the EPC Contract, was submitted along with the subsequent economic letter. The Hungarian authorities submitted further information on 29 October

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[23]   T-319/12 and T-321/12 – Spain and Ciudad de la Luz v Commission, ECLI:EU:T:2014:604, para.40, T-233/99 and T-228/99 - Landes Nordrhein-Westfalen v Commission, ECLI:EU:T:2003:57, para 245

[24]   Typically, there are two broad sources of capital: equity capital and (financial) debt capital. The total cost of capital is the weighted average cost of capital (WACC), taking into account the proportion of equity capital and the proportion of debt capital.

*   The IRR range is considered as business secret and replaced by wider IRR range.

[25]   During discussions between the Hungarian Government and the Commission, it turned out that the original financial model did not accurately reflect the conditions of the EPC Contract, a feature that limited its use for certain types of sensitivity analysis regarding the impact of change in certain model inputs on the value of the IRR.

2015 which substantiates their calculation of the WACC and clarifies certain assumptions used in the calculation of the IRR as regards the risks incurred by Paks II.

3.1.2.2. Hungary's position on the WACC

(56)   The MEIP study submitted by the Hungarian Government undertakes different exercises to benchmark the market weighted average cost of capital (WACC) for Paks II:

(a)   a benchmarking analysis of the costs of equity and debt for the Project taking European regulated and integrated utilities as references;

(b)   a bottom-up analysis of the cost of equity and debt using various sources to benchmark the components of these costs.

(57)   A key claim in Hungary's submission is that current macroeconomic conditions mark a decreasing trend in the required returns on capital investments and low costs of funding in turn.

(58)   Firstly, as regards the benchmarking analysis, the following value ranges for the WACC were identified[26]:

(a)   5.8-7.0% for integrated utilities and generators that do *[not] face market price risk;

(b)   5.1-9.0% for generation businesses;

(c)   8% for EDF's entire UK nuclear business (existing and newly built) as valued by brokers;

(d)   5.4-8.0% for nuclear plants of European integrated utilities (EDF, RWE and GDF Suez).

(59)   In addition, the "(fixed price) turnkey" feature of the EPC Contract, […], is identified as a WACC-reducing factor.

(60)   Secondly, as regards the bottom-up approach, the MEIP study separately estimates the cost of equity and debt and uses gearing-based weighting average to determine the Project's WACC.

(61)   The cost of equity is estimated through the CAPM, according to the following formula:

$$E(R_e) = R_f + \beta \times (E(R_m) - R_f)$$

where R_f is the risk-free rate, $E(R_m)$ is the expected market return and β is a measure of how (expected) market price movements are translated into (expected) individual share price movements. The second term, $\beta \times (E(R_m) - R_f)$, can be

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[26]   Data from the MEIP study submitted by the Hungarian authorities on 18 February 2015 quotes the following sources: Factet, Broker research, Company information, UK Office of Water Services (Ofwat), UK Gas and Electricity Markets Authority (Ofgem) and own research analysis of the consultants drafting the study.

*   **Should be read as following due to a clerical error/ citation mistake**

perceived as business risk, with the term $E(R_m) - R_f$ also being called the equity risk premium.

(62)   The risk free rate in Hungary is derived as the sum of the risk free rate in Germany and the asymmetric country risk premium for Hungary (over Germany). In particular, the German risk free rate is taken to be equal to the average yield on the 30-year sovereign German Euro-denominated bonds over the year 2014 (2%). Furthermore, the asymmetric country risk is quantified as the difference of 2.2-2.7% between Hungarian and German bond yields (of equivalent tenor).

(63)   The Hungarian equity risk premium is estimated to be of the magnitude of 4%, which is based on the 10 years historical equity market performance over the past 10 years. The Project β is proxied by company-level βs of power generating utilities, with an average value of 0.92. The study applies a conservative choice of 1.1 for the Project β.

(64)   Finally, an additional asymmetric Project risk of 0.5% is added to the sum of the risk free rate and the business risk as a charge for the potential cost overruns and delay, even if most of this risk is being absorbed by the EPC Contract.

(65)   The components of the cost of equity add up to a cost of equity of 8.7%-9.7%, with a mean of 9.2%.

(66)   The cost of debt is taken to be 4.5%, the average interest rate of the Hungarian-Russian IGA loan. The use of this cost figure is supported by a reference to the 3% yield of the longest dated (15 years) Hungarian government bond at the date of writing the study (2015) and of a 1.5% premium for longer maturity and project risks. The latter figure of 1.5% is quoted as being in line with the approved rate that the OECD would allow for export credits and trade-related aid to finance nuclear projects, i.e. 130bp above the 18 year commercial interest reference rate (CIRR) (currently at 3%).

(67)   Furthermore, the study also notes that the cost of debt will be lower under the operation period due to the base-load operation mode of the plant and the resulting stable revenues. The cost of debt for this period is benchmarked to the interest rate (4.2% on average) of European nuclear utilities corporate bonds.

(68)   Finally, the Hungarian tax rate of 19.0% needs to be factored into the cost of debt, resulting in a cost of debt of 4.5% x (1-19%) = 3.6%.

(69)   The gearing level E/(D+E), of the Project is assumed to include 100% equity funding until its commercial operations start and a more balanced gearing level of 50-60% afterwards.

(70)   These results, reiterated in the subsequent economic analysis, lead to a nominal post-tax WACC of 6.2%-7.0%. The lower bound of the interval range corresponds to a gearing of 50% and a cost of equity of 8.7% whereas the higher bound is based on a gearing of 60% and a cost of equity of 9.2%. It is not clear from the submission how the 10-year period of pure equity financing of Paks II, i.e. a gearing of 100%, affects the overall WACC of the Project.
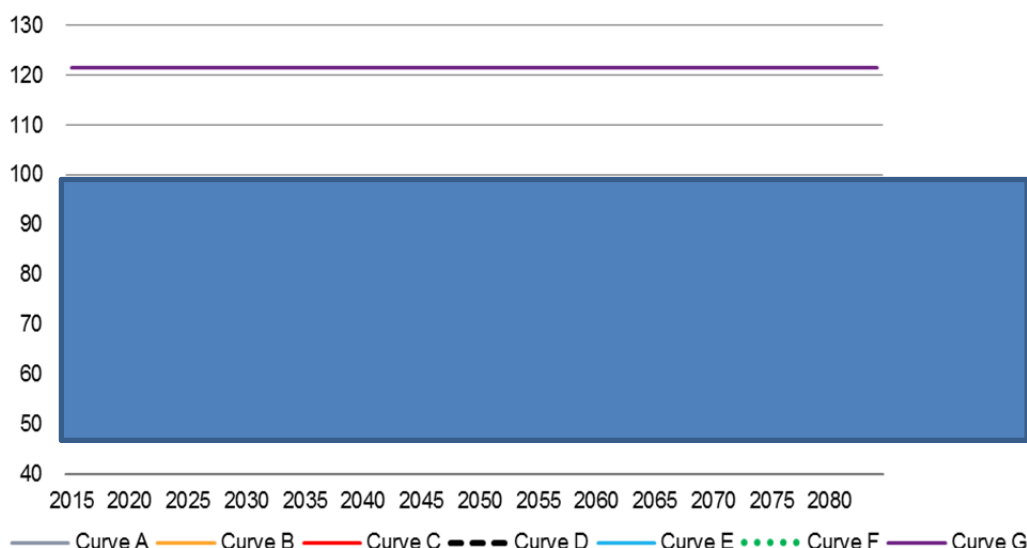
3.1.2.3. Hungary's position on the IRR

(71) The notification indicates a [6.5]%-[9.5]% post tax IRR during operations in a wide range of market forecasts and sensitivity scenarios. These values and the underlying sensitivity scenarios were derived and assessed by using the original financial model. The central estimated value for the Project's IRR was indicated to be […]%.

(72) The NPV calculation of the future cash flows of the Project (as used in the original financial model) has the following building blocks:

(a) cash flows during the investment periods (up to 2025 for Block 1 and up to 2026 for Block 2) when the company has only investment costs and no revenues;

(b) cash flows during the operation period (60 years) when the company obtains revenues from the sales of electricity produced, and incurs operating costs to run the nuclear power plant.

(73) The cash flows in the investment period follow a predetermined schedule of spending the total investment costs as specified in the fixed price turn-key EPC Contract. Delays in the schedule potentially lead to a delay in cost spending as well as in the revenues derived from the operation of the plant. This triggers liquidated damages payment by the Contractor ([…]).

(74) The cash flows in the operation period result from future revenues and operation costs. Future revenues are derived on annual basis as the product of the forecasted price and the quantity of electricity. Future costs include fuel costs, personnel costs, maintenance costs, other operation costs, waste and decommissioning costs, depreciation, various taxes, regulatory costs, etc.

(75) The original financial model sets a central scenario that assumes no delays and baseline values for all key relevant input variables, including forecasted price, load factor, exchange rate, inflation, fuel costs, operating costs, maintenance costs and waste and decommissioning costs. The estimated IRR value for the central scenario is […]%. A sensitivity analysis looking at variation in the values of the aforementioned input variables around their baseline case indicates that even if one allows for a reasonable deviation from the baseline value of the model's key input parameters, the IRR is most likely to fall in the range of [6.5]%-[9.5]% indicated in the notification[27].

(76) The sensitivity analysis performed by the Hungarian Government also showed that the IRR estimate is most sensitive to the price forecast used to quantify future revenues. The following figure illustrates the electricity price forecasts considered in the estimation of the Project IRR.

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[27] The majority of the input variables, like the expected inflation or forecasted operating costs, can deviate in both directions from the baseline case. However, there are certain variables, like the delays in the construction that can deviate only in one direction from the baseline case of no delays. This results in an asymmetric distribution of possible IRR values around the baseline case, with larger deviations possible downwards as a delay in construction is most likely to decrease the IRR.

Figure 5: Long-run electricity price forecast curves (€/MWh)*

Source: The MEIP study and the original financial model
* *The curves are considered as confidential information/business secret.*

(77) Curves A-C are the first price forecasts prepared for the Hungarian Government by its economic consultants and are based to a large extent on 2013 data. Curves D-E are updated price forecasts that were based on the scenarios attributed to various policies set out in the 2014 International Energy Agency's World Economic Outlook (IEA WEO). Curve G corresponds to the average regulated contract for difference price set for the Hinkley Point C nuclear power plant in the UK, which is not relevant for the current case as it does not reflect market conditions that could be relevant for Hungary and it involves a measure receiving State aid from the United Kingdom. Curve F, yet another price forecast prepared for the Hungarian Government by its economic consultants was not included in the MEIP study or the original financial model; instead, it was submitted with the updated financial model.

(78) The baseline IRR value of […]% for the Project was computed based on curve D, the most conservative of price forecast curves D-E. These price forecast curves are based on the IEA WEO, which is publicly available and widely used by businesses and non-business organisations.

(79) The updated submission of the Hungarian authorities from October 2015 included adjustments on the various building blocks for the calculation of the NPV of the Project, including the electricity price forecasts as well as certain elements of the cost forecasts of the plant for the operation period. The updated submissions also included an update on the estimation of the Project IRR, leading to an upward shift of its range, from [6.5]%-[9.5]% (the range in the notification) to […]%–[…]%.

(80) This upward shift was triggered by choosing a different electricity price forecast as the baseline scenario for future revenues and by using the updated financial model. This new baseline price forecast, shown by Curve F in Figure 5, was prepared as a result of a subsequent international benchmark analysis prepared for the Hungarian Government by its economic advisors. The IRR associated to this

price forecast curve is [...]%, lying close to the middle of the [...]%-[...]% interval set for the IRR in the subsequent economic analysis.

(81) The updated financial model differed on two main points from the original financial model. First, it eliminated a modelling element previously allowing for a [...] (which was found not to be consistent with the EPC Contract) and adding an assumption mirroring [...], as specified in the EPC Contract. These two modifications affected the precise end-points for the estimated range of the IRR, but the key driver for the substantial upward shift of the range was the change in the choice of the baseline electricity price forecast.

3.1.2.4. Commission's Assessment

(82) Before committing funds on the scale invested into Paks II, a hypothetical market investor would examine thoroughly the business plan and the assumptions on which such plan is based. In the context of a State aid investigation, Article 107(1) TFEU, as interpreted by the Court, requires the Commission to carry out its own assessment of the facts[28].

(83) The MEIP analysis requires that only evidence contemporaneous with the investment decision is taken into account. The Commission has established a timeline of the decision making process as regards Paks II in order to determine which information was available to investors at the moment of taking the decision to proceed with the Project of the nuclear power plant.

(84) The notification submitted to the Commission by the Hungarian Government states that the IGA was signed on 14 January 2014. The Financing IGA was signed on 28 March 2014. The EPC Contract setting the terms (including the price) of the construction of Paks II was signed on 9 December 2014. The Hungarian authorities themselves show in their submissions that they took the initial investment decision at the moment of the execution of the IGA and of the Financing IGA.

(85) Based on these facts, it is likely that the main decision cornerstone figures regarding Paks II were available as early as in 2013, prior to the signing of the IGA, although the Commission has not received any business plans dating from 2013. Nevertheless, for the assessment of the WACC, the Commission takes into account data from 2014, the year by the end of which the EPC Contract was signed. This can be considered conservative, in light of Hungary's claims that both the price of long term bonds as well as the required return on investments in the equity market are decreasing in the recent macroeconomic context. This is

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[28] In *Valmont*, the CFI considered that the Commission should not have simply relied on the existence of an independent expert's assessment to determine whether a sale of land involved the granting of State aid. The CFI required that the Commission should also have verified its evidential value, something which the CFI then did itself. (T-274/01 - Valmont v Commission, ECLI:EU:T:2004:266) In Hamsa (T-152/99 - HAMSA v Commission, ECLI:EU:T:2002:188) and Lenzing (C-525/04 P - Spain v Lenzing, ECLI:EU:C:2007:698), the Court recognised that the Commission has a wide margin of discretion with regard to economic matters. However, the Court found that the Commission must base itself on evidence that is factually accurate, reliable and consistent and contains all relevant information (C-525/04 P - Spain v Lenzing, ECLI:EU:C:2007:698, para 56-57). In a judgment on *EDF*, the Court stated that, if a Member State provides such (contemporary) evidence, it is for the Commission to carry out a global assessment taking into account – in addition to this evidence – all other relevant evidence enabling it to determine whether the Member State took the measure in question in its capacity as a shareholder or as a public authority (C-124/10P – Commission v Électricité de France, ECLI:EU:C:2012:318).

also consistent with the Hungarian authorities' submissions that the relevant information date from 2014 and the fact that a financial analysis regarding the Project dating from 3 September 2014 was available.

3.1.2.5. The Commission's position on the WACC

(86)   The Commission acknowledges the analysis performed by the Hungarian authorities for the WACC. Nevertheless, the Commission notes the following regarding the final WACC benchmark put forward by the Hungarian authorities:

(a)   The interval range obtained in the benchmarking exercise is wider than the one derived in the bottom-up approach, including much higher values; given the uncertainties surrounding this type of exercise, the Hungarian authorities do not provide a sensitivity analysis showing that results are robust also in the less favourable scenarios. In particular, nuclear generation is often not separated from non-nuclear generation and this is important because nuclear generation may entail different types of risks. Moreover, in the benchmarked intervals, there is no distinction between already operating nuclear plants and ones yet to be constructed. Having noted the turn-key nature of the EPC Contract, the Commission also observes that there may be residual risks that make nuclear plants under construction more risky for investors than the operating ones. Therefore, the Commission has doubts that, within the wider interval [5.1%-9%] put forward by the Hungarian authorities in the benchmarking exercise, the most accurate subset of WACCs should be limited to [6.2%-7%] as presented in the bottom-up approach.

(b)   Furthermore, the value of the equity risk premium used in the bottom-up approach by the Hungarian authorities should be further justified. In particular, there is no justification why the last 10 years' historical equity market performance is the appropriate benchmark for the Hungarian equity risk premium, where finance literature casts doubts on this approach, especially as regards the emerging markets.[29] Some further arguments for not using historical risk premium relate to the market behaviour after the 2008-crisis which was found to be at odds with pre-crisis periods. Therefore, the Commission wonders whether estimation based on contemporaneous surveys would not be more appropriate.

(c)   Moreover, the cost of debt used in the WACC bottom-up calculation is benchmarked with the current government bond yield of 3%. As explained, the MEIP principle requires that only information contemporaneous with the moment when the decision is taken into account, which would, in the present case, correspond to 2014 values, i.e. the year when the contracts were signed. The data presented by Hungary corresponds to 2015.

(87)   In order to check the accuracy and robustness of the benchmarks proposed by Hungary, the Commission has assessed, under two alternative methodologies

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[29]   See Damodaran, A. "Equity risk premium (ERP): Determinants, estimation and implications – The 2015 Edition" (2015), section Estimation Approaches – Historical Premiums, p.24, available at http://pages.stern.nyu.edu/~adamodar/, by following the sequence of tags: Writing → Papers.

(which were similar to the methodology used by Hungary), benchmarks calculated on the basis of different data sources that have been widely referred to in other State aid decisions.

(88) The first methodology used by the Commission derives a sector and country specific benchmark WACC. The main data source is the global equity risk premium and cost of capital database developed by Professor Aswath Damodaran (Damodaran henceforth)[30].

(89) In particular, this approach follows the following three steps[31]:

- The first step uses Damodaran's industry-level WACC database for Western Europe to calculate the WACC for industries that could be argued of being good proxies for the nuclear power generation industry (i.e. "Green and Renewables", "Power" and "Utilities (General)" sectors).[32] There are four Hungarian companies included in the pool of companies used to calculate these WACC-levels.

Cost	E/(D+E)	Green & Renewables	Power	Utilities (General)	Generation and utilities (average)
Debt		3.58%	3.18%	3.18%	3.31%
Equity		10.27%	9.13%	10.63%	10.01%
WACC	50%	6.92%	6.15%	6.90%	6.66%
WACC	60%	7.59%	6.75%	7.65%	7.33%

The cost of debt includes the tax rate of 19% as set forth in the MEIP study.

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[30] See http://people.stern.nyu.edu/adamodar/New_Home_Page/data.html. This database is widely used and cited in the finance world.

[31] For the database on country-specific equity risk premia, see http://www.stern.nyu.edu/~adamodar/pc/datasets/ctryprem.xls. For the database on sector-specific WACC estimates see labels "Data" → "Current data" → "Cost of capital by industry" – "Europe" on http://pages.stern.nyu.edu/~adamodar/.

[32] See labels "Data" → "Current data" → "Cost of capital by industry" – "Europe" on http://pages.stern.nyu.edu/~adamodar/.

- The second step uses Damodaran's country-level equity risk premium database to calculate the debt and equity risk premia that the Hungarian firms included in the industry-level WACC database require over the average firm from the selected industries in that database[33].

	Developed Europe	Hungary	Difference
Country risk premium (bonds)	1.09%	2.41%	1.32%
Country risk premium (equity)	1.63%	3.62%	1.99%

- In the third step, the respective country risk premia for Hungary (above the ones for Western Europe) identified in the second step need to be added to the cost of debt and equity. Subsequently WACC figures are derived. The following table summarizes the results.

Cost	E/(D+E)	Green & Renewables	Power	Utilities (General)	Generation and utilities (average)
Debt		4.65%	4.24%	4.24%	4.38%
Equity		12.61%	11.15%	13.08%	12.28%
WACC	50%	8.63%	7.70%	8.66%	8.33%
WACC	60%	9.42%	8.39%	9.54%	9.12%

(90) This methodology would suggest a Project WACC for Paks II in the range of 8.33%-9.12%, with a possible medium value of 8.73%. This range is based on the gearing values of 50%-60% set out in the MEIP study. However, it is not clear how the 10-year period of pure equity financing for Paks II, i.e. a gearing of 100%, would affect (most likely increase) the overall WACC of the Project.

(91) The second methodology applied by the Commission to estimate Paks II's Project WACC uses a bottom-up approach similar to the one presented by Hungary, but using slightly different sources for benchmarking the components of the WACC, given by the following formula:

$$WACC = \frac{D}{D+E}(1-t)R_d + \frac{E}{D+E}R_e$$

where D and E denote debt and equity and R_d and R_e denote the costs of debt and equity capital. Importantly, R_d and R_e are the expected (forward-looking) costs of debt and equity capital respectively, at the time of the investment, not historical costs. Finally, t is the marginal corporate tax rate which in Hungary is 19%.

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[33] A key element of the estimation is that Damodaran defines the country risk premium as the value of the country's default spread. He uses this figure as the measure of the country's bond market risk premium. He also argues that the country risk premium for the equity market should be higher because of the higher volatility of equity returns and multiplies the country risk premium for bonds by 1.5 to obtain the country risk premium for equity. For further technical details see worksheet "Explanation and FAQ" of the database.

(92) The cost of equity is, as defined above:

$$E(R_e) = R_f + \beta \times (E(R_m) - R_f).$$

(93) For the risk free rate, R_f, market practice[34] suggests to take the long-term (typically 10-15 years) government bond rate in the country of operation (these are considered the least risky investments). The average annual return on 15 year government bonds in Hungary in 2014 was 5.1%[35]. For the market risk premium, Fernandez et al (2014)[36] provides a value of 8.3% for Hungary in 2014 based on a market-wide survey. And finally, for the estimate of β, the Commission takes a conservative value of 0.92 as proposed by Hungary in the MEIP submission[37]. Provided these values, the cost of equity estimated by the Commission would lie around the value of 12.7%.

(94) The cost of debt would be the Hungarian risk free rate (5.1%) plus a commercial debt risk premium on top of government bonds (2.2%)[38]. Overall, after applying the 19% tax rate, the debt component of the WACC is 5.9%.

(95) The methodologies used by the Commission would imply a WACC range of [8.3%-10.0%] corresponding to a gearing level of 50% to 60% respectively. The caveat made in paragraph (90) about the uncertainty of the impact of the full equity financing of Paks II during the construction period remains valid in case of these estimates too.

3.1.2.6. The Commission's position on the IRR

(96) The Commission acknowledges the IRR calculation provided by the Hungarian authorities. Nevertheless, in order to check its accuracy and robustness, it engaged in a preliminary assessment of the estimation of the range for the IRR in the MEIP study and the original financial model. In particular, the Commission undertook a preliminary evaluation of all the building blocks of the NPV calculations of future cash flows, namely the investment costs as well as the revenues and costs during the operation period.

(97) The magnitude and schedule of the construction costs, as regards the price to be paid to the contractor, is fixed in the EPC Contract and is undisputable. The Commission only considered the impact of delays as postponing operating cash flows in relation to this building block of the financial model.

(98) From the point of view of calculating the NPV of future cash flows, the input having possibly the largest impact and being subject to potentially largest

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[34] See for e.g. Brealey and Myers, 2000, Principles of Corporate Finance, Sixth Edition (Chapter 8)

[35] The use of benchmarks for the risk free rate from other countries (such as Germany, as proposed by the Hungarian authorities) is not justified given that public data is available for Hungary. Data published on Hungarian Government bonds covers maturities of up to 15 years.

[36] See http://www.valuewalk.com/wp-content/uploads/2015/07/SSRN-id2450452.pdf

[37] The betas put forward by Hungary in the subsequent economic letter and corresponding to Utilities, Renewables and Power sectors respectively, are all higher than 1

[38] See http://www.mnb.hu/statisztika/statisztikai-adatok-informaciok/adatok-idosorok, sequence "XI. Deviza, penz es tokepiac" → "Allampapir piaci referenciahozamok" for the former and https://www.quandl.com/data/WORLDBANK/HUN_FR_INR_RISK-Hungary-Risk-premium-on-lending-lending-rate-minus-treasury-bill-rate for the latter. In relation to the latter value, some caution is recommended due to the small size of the Hungarian corporate bond market.

discretion is the future electricity price forecast which is the main risk in the operation of a nuclear power plant due to its long and complex life cycle. Following discussions with the Hungarian Government, as well as checking the sources used to compute the figures shown in Figure 5 above, the Commission formed a preliminary view that curve D in Figure 5 could be taken, at this stage of the assessment, as an acceptable baseline price forecast for the NPV calculation for the Project and the related sensitivity analysis for the Project IRR.

(99) The Commission also undertook a preliminary analysis of the new material submitted in October 2015. While the submission was sent after Hungary claimed that the notification was complete and there is no evidence that this new analysis was available to the Hungarian authorities at the moment of the investment decision (2013-2014), the Commission still considered this submission to ensure the robustness of its assessment.

(100) The main element of the new submissions regarding the updated estimation of the Project IRR was a change in the choice of the baseline electricity price forecast. In particular, the new baseline electricity price forecast curve was chosen to be curve F in Figure 5, lying above the price forecast curves considered previously. (The higher curve G only represents the average regulated contract for difference price set for the Hinkley Point C nuclear power plant in the UK and is not relevant for the current case as it does not reflect market conditions that could be relevant for Hungary and it involves a measure receiving State aid from the United Kingdom).

(101) However, the Commission doubts that the new baseline electricity curve could be taken into account. The subsequent economic analysis did not include any new information that was not available prior to the notification; therefore, there is no justification as to why the curve was established and it is surprising that this was not already included in the previous reports. Moreover, the shape of the curve does not appear to be consistent with any price forecast curves as it is much less steep in the early years of the forecast than any other electricity price forecast curve. [39] In addition, the uncertainty of the market price risk appears to be very high leading to efforts for ensuring mechanisms mitigating such risks for similar projects[40]. Therefore, if anything, the baseline electricity curve taken into account for the assessment should be lower and not higher.

(102) The Commission also assessed the updated financial model and used it for sensitivity analysis. A preliminary sensitivity analysis regarding small changes in inflation, the exchange rate, the load factor, the life extension, fuel costs and other

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[39] See also page 205 in "Energy prices and costs", Commission Staff Working Document, (2014), available at http://eur-lex.europa.eu/resource.html?uri=cellar:ba385885-8433-11e3-9b7d-01aa75ed71a1.0001.01/DOC_4&format=PDF. The referred price forecast forecasts a retail price increase of 21% between 2015 and 2020 for the EU28 and an additional increase of 2% up to 2025. This is a good proxy for changes in wholesale electricity prices over the same period if one makes the reasonable assumption that retail mark-ups stay the same over the same 5-year period.

[40] As regards Czech Republic see: http://www.world-nuclear.org/info/country-profiles/countries-a-f/czech-republic/, accessed on 26 October 2015, as regards Lithuania see: http://www.world-nuclear.org/info/Country-Profiles/Countries-G-N/Lithuania/, accessed on 26 October 2015, as regards Bulgaria see: http://www.world-nuclear.org/info/Country-Profiles/Countries-A-F/Bulgaria/, accessed on 26 October 2015. As regards Romania see: http://www.nuclearelectrica.ro/user/file/AGA/22.10.2015/MOU/MoU_initializat_final_romana_site.pdf, accessed on 26 October 2015.

operating and maintenance costs, as well as waste management and decommissioning costs, causes the Project IRR to change by +/-0.2%. This implies that such changes applied to a central value of […]% of IRR (by taking curve D as the baseline electricity price forecast curve) causes its value to move in the [7.6]%-[9.0] %* range. [41]

(103) Operating, maintenance, fuel, waste management and decommissioning estimated costs are presented in brief in Section 2.4.4. In regard to such costs, the Hungarian authorities provided a benchmarking of the estimated costs for the Paks II NPP based on publicly available information. However, the Commission notes that, at least, the operating and maintenance costs estimates are at the lower end of the range determined by way of the benchmarking exercise.

(104) Therefore, the Commission considers that, at this point, it does not have sufficient information to check whether the costs estimates provided by the Hungarian authorities for the Paks II NPP in view of the technology used and its specificities are accurate estimates or whether these costs will, in reality, be higher. The Commission would require further information to substantiate its assessment on this point and refine the IRR assessment.

(105) Moreover, changes in the delay of the Project could have larger impact on the IRR. While short delays (of a few months) actually benefit Paks II (and potentially increase the IRR) as the liquidated damages paid by the Contractor more than offset the losses of Paks II incurred because of the delayed positive operating cash flows, delays that are longer, e.g. last for several years (which is common in the building of nuclear plants) could decrease the Project IRR rather significantly.[42] In particular, the Commission found that delays of 5 years in the Project could decrease the Project IRR by as much as 0.9%, e.g. from […]% to […]% (by taking curve D as the baseline electricity price forecast curve).[43] Applying this decrease to the range of [7.6]%-[9.0]%** of the IRR, the Commission obtained the range [6.7]%-[9.0]%** for the IRR.

3.1.2.7. The Commission's Doubts

(106) Given the different estimates arrived to by the Commission for the WACC and the IRR than the ones submitted by the Hungarian authorities, the Commission would invite the Hungarian authorities to justify the underlying basis for their calculations in view of the specific concerns raised by the Commission in Section 3.1.2.4 above.

(107) The Commission also requires information regarding the costs to be incurred by Paks II and how the full equity financing of Paks II during the construction period affects the WACC.

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*   The IRR range is considered as business secret and replaced by wider IRR range.
[41]   The baseline IRR value of the Project attached to price forecast curve D increased from […]% in the original financial model to […]% in the updated financial model. The reasons of this small change are unclear.
[42]   The Commission found that delays of 5 years in the Project can decrease the Project IRR by as much as 0.9%, e.g. from […]% to […]%.
[43]   The choice of delay of 5 years seems a reasonable choice as such delays are not uncommon in the building of nuclear plants. For example, Flamanville 3 (France) 5 years; Olkiluoto 3 (Finland) 7 years; Kudankulam 1 (India, construction started in 2002): 5 years, Temelin 1-2 (Czech Republic): 11 years, Bushehr 1 (Iran): 10 years.
**   IRR ranges deleted as business secrets and replaced by wider ranges.

(108) At this stage of the assessment, it cannot be excluded that the measure entails an advantage for Paks II deriving from the fact that it is the beneficiary of the two new nuclear power units fully financed by the Hungarian State.

(109) The potential amount of State aid is the total value of Hungary's investment into the two new reactors, i.e. the EUR 12.5 billion estimated for the nuclear project in the IGA and any further amounts, in addition, which Paks II may require as financing during the construction phase.

3.1.3. Selectivity

(110) A measure is deemed selective if it favours only certain undertaking(s) or the production of certain goods.

(111) The Commission concludes that the measure is selective because it concerns only one undertaking, insofar Hungary appointed Paks II under Government Resolution 1429/2014. (VII. 31.) as the Hungarian Authorised Organisation who will be the owner and operator of the new nuclear generation units. If the measure entails an advantage, this advantage would therefore be selective.

3.1.4. Effect on Trade and Distortion of Competition

(112) The electricity market has been liberalised in the EU and electricity producers are engaged in trade between Member States. In addition, the Hungarian electricity infrastructure is relatively strong, containing robust interconnections (equal to 30% of domestic installed capacity) with the neighbouring countries. Although Hungary is a net importer, Figure 3 above shows that Hungary also exports electricity, not only to the coupled Czech-Slovak-Hungarian-Romanian day-ahead market (operational since 2014) but also to Austria and Croatia.

(113) The notified measure will enable the development of a large capacity which might otherwise have been the object of private investment by other market operators using alternative technologies, from either Hungary or from other Member States. Furthermore, as electricity is traded across borders any selective advantage to a company has the potential to affect trade within the EU.

(114) Therefore, there is at least a risk that the measure will distort competition.

3.1.5. Conclusion on the Existence of State aid

(115) Based on the above, the Commission concludes that, at this stage, there are doubts that the measure does not include State aid.

3.2. Legality of the Aid

(116) The Commission takes note that a series of agreements have already been signed and the initial investment decision has already been taken. The initial investment decision coinciding with the signing of the IGA and of the Financing IGA has been taken in spring 2014 and the EPC Contract was signed in December 2014. The EPC Contract entered into force on 1 January 2015, but the final investment decision by which Paks II commissions irrevocably the construction works of the

two new reactors [44] is still to be taken and no payments have been made as of yet under the EPC Contract. By notifying the measure before its implementation, the Hungarian authorities have fulfilled their stand-still obligation according to Article 108(3) TFEU.

3.3. Compatibility

(117) Given the doubts as regards the existence of State aid, the Commission has further examined whether any possible State aid that the measure entails could be considered as compatible with the internal market.

(118) However, according to settled case-law, it is for the Member State to put forward any grounds of compatibility and to demonstrate that the conditions thereof are met[45]. The Commission notes that, given that the Hungarian authorities consider that the measure at hand does not constitute State aid, they have not brought forward any grounds for its compatibility.

(119) In particular, the structure and role of Paks II and of its electricity output in the Hungarian electricity market are still unclear, as well as which specific market failures as regards investments in new nuclear energy projects in Hungary would justify the need for State aid. At this juncture, the Commission does not have sufficient elements to conclude whether the conditions to find the aid compatible with the internal market are met.

3.3.1. Legal Basis for Assessment

(120) Article 107(1) TFEU provides for the general principle of prohibition of State aid within the Union. Article 107(2) and 107(3) TFEU provide for exemptions to the general incompatibility set out in Article 107(1).

(121) Article 107(3)(c) TFEU provides for the authorisation of State aid granted to promote the development of certain economic sectors, where such aid does not adversely affect trading conditions to an extent contrary to the common interest. According to the case-law, the Commission may declare State aid compatible with the internal market if the aid contributes to the attainment of an objective of common interest[46], is necessary for the attainment of this objective[47], and does not adversely affect trading conditions to an extent contrary to the common interest.

(122) The aid measure under assessment does not fall within the scope of the Communication from the Commission — Guidelines on State aid for environmental protection and energy 2014-2020[48] since these do not cover measures in the field of nuclear energy and radioactive waste. No other Guidelines are applicable to the notified measure. However the Commission may

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[44] The EPC Contract provides that the development of the new reactors is split into two phases with the first one consisting solely of […] and the second one of […]. Paks II is not obligated to proceed to phase two, but has a choice whether to do so.

[45] Case C-364/90 Italy v Commission [1993] ECR I-2097, paragraph 20; Joined Cases T-132/96 and T-143/96 Freistaat Sachsen and Others v Commission [1999] ECR II-3663, paragraph 140.

[46] Case T-162/06 Kronoply v Commission [2009] ECR II-1, especially paragraphs 65, 66, 74 and 75.

[47] Case T-187/99 Agrana Zucker und Stärke v Commission [2001] ECR II-1587, paragraph 74; Case T-126/99 Graphischer Maschinenbau v Commission [2002] ECR II-2427, paragraphs 41-43; Case C-390/06 Nuova Agricast [2008] ECR I-2577, paragraphs 68-69.

[48] OJ C 200, 28.6.2014, p. 1–55

declare an aid measure compatible directly under Article 107(3)(c) TFEU if it is necessary and proportionate and if the positive effects for the common objective outweigh the negative effects on competition and trade. The Commission considers that the conditions for compatibility with the Internal Market under Art 107(3)(c) TFEU are met if the measure satisfies the following conditions: (i) it aims at an objective of common interest in accordance with Article 107(3) TFEU; (ii) it is targeted towards a situation where aid can bring about a material improvement that the market alone cannot deliver (for example because it addresses a market failure); (iii) the proposed aid measure is an appropriate policy instrument to address the objective of common interest; (iv) it has an incentive effect; (v) it is proportional to the needs based on which it is deployed; and (vi) it does not unduly distort competition and trade between Member States..

3.3.2. Objective of Common Interest

(123) The aid measure must aim at a well-defined objective of common interest. When an objective has been recognised by the Union as being in the common interest of EU Member States, it follows that it is an objective of common interest.

(124) Hungary has not put forward compatibility arguments. It has, however, claimed that projections of demand growth and the retirements of existing generation capacity show that there is a need for 5.5 GW of new generation capacity in Hungary by 2024 and 7.3 GW by 2030. Hungary claims that, therefore, Paks II contributes to a certain extent to ensure security of supply. It might, therefore, be argued that the measure aims at pursuing the objective of security of supply.

(125) The Commission would, however, require additional information from the Hungarian authorities demonstrating how the Project helps to achieve security of supply in Hungary and the alternative scenarios considered by the Hungarian authorities.

(126) The Commission notes that the measure entails specific support for nuclear technology. In this regard the Commission notes that the Euratom Treaty establishes in Art 2(c) that the Community shall "*facilitate investment and ensure, particularly by encouraging ventures on the part of undertakings, the establishment of the basic installations necessary for the development of nuclear energy in the Community.*" Art 40 of the same Treaty envisages the Community publishing of illustrative programs "*to stimulate investment, indicating production targets.*"

(127) The measure envisaged by Hungary aimed at promoting nuclear energy could, therefore, be viewed as pursuing an objective of common interest.

(128) The promotion of investments in nuclear energy must be carried out in such a way so as not to distort competition. It therefore needs to be clarified, whether State aid is necessary, for example due to an existing market failure.

3.3.3. Necessity of the Aid and Market Failure

(129) In order to determine whether State aid is necessary, the Commission has to determine whether the State aid measure is targeted towards a situation where aid can bring about a material improvement that the market alone cannot deliver, for example by remedying a well-defined market failure.

(130) Nuclear energy is characterised by extremely high fixed, sunk costs, and by very long time periods during which such costs need to be amortised. This implies that investors considering entry into nuclear energy generation will find themselves exposed to considerable levels of financing risks. Indeed, funding for the type of investment size and duration that characterise nuclear power plants could be considered unparalleled.

(131) Since the Hungarian authorities have not submitted compatibility grounds for the measure, the Commission lacks the necessary information to assess at this stage if State aid is necessary and, in particular, if there are market failures that affect new investments into nuclear projects in Hungary and what these market failures are. The Commission requires information regarding the possibilities of new nuclear investments (without State support) and their timing given the specificities of the Hungarian electricity market and its expected evolution and market modelling in this respect.

3.3.4. Incentive Effect

(132) In order for the measure to have an incentive effect it needs to change the behaviour of the undertaking concerned in such a way that it engages in additional activity which it would not carry out without the aid or which it would carry out in a restricted or different manner.

(133) In the case at hand, on the basis of the available information, it is not yet clear if the Paks II NPP Project would go ahead without State aid.

3.3.5. Appropriate instrument

(134) The Commission has to determine in its assessment whether the proposed aid measure is an appropriate policy instrument to address the objective of common interest of the promotion of nuclear energy.

(135) In case the measure involves State aid, this would take the form of investment aid granted by the Hungarian State to Paks II for the development of the Project. The Hungarian authorities do not plan to grant any operating support to Paks II, but will only cover its investments costs for the realization of the Project.

(136) The Hungarian authorities did not provide any alternative instruments that could serve for incentivizing new nuclear investments. However, given the specificities of the Project and the magnitude of the necessary resources, the Commission considers that investment aid might in principle constitute an appropriate instrument for incentivizing the construction of Paks II NPP.

3.3.6. Proportionality

(137) To assess the proportionality of an aid measure, the Commission must ensure that aid is limited to the minimum necessary that enables the successful realisation of the Project for the attainment of the common objective pursued. In the case at hand, the beneficiary will receive generation assets without running any risk linked to refinancing costs which other market operators would face. The beneficiary should therefore compensate the State for having made available the plant and should not retain extra profits beyond what is necessary to ensure its economic operation and viability.

(138)   The Hungarian authorities claim that no aid is involved and have not submitted any arguments regarding the proportionality of the measure. It is, at this stage, not clear how and to which extent Paks II will remunerate the State's investment.

(139)   The Commission therefore invites the Hungarian authorities to provide information as regards the proportionality of any possible State aid granted to Paks II.

3.3.7. Overall balancing

(140)   The Commission observes that unless it can conclude that all the conditions for the compatibility of a possible State aid with the internal market are met, it cannot proceed to an assessment as to whether the aid does not adversely affect trading conditions to an extent contrary to the common interest.

(141)   At this stage of the assessment, the Commission observes that the measure may restrict competition and affect trade in a number of areas.

(142)   The Hungarian electricity generation market is characterised by a relatively high market concentration with the current nuclear power station Paks NPP providing some 50% of domestic generation (see recital (13)). At this stage not much new capacity is known to join the market, despite the projected generation gap. Paks II will represent at least one third of expected demand in 2030. When it comes online, together with the still running/not yet retiring reactors of Paks NPP it could lead to enhancing the market concentration. The electricity generation by Paks I and Paks II at the same time, throughout its duration, is likely to satisfy an even greater portion of the market demand. Unless the operators of Paks I and Paks II are held entirely separately and can be considered independent and unconnected within the meaning of competition rules[49], this would have an even greater distortive impact on the Hungarian market.

(143)   Furthermore, aid to such base load capacities characterized by a high load factor and a lower level of levelised cost of energy may serve as a barrier to entry for new market players and displace further down the merit curve certain amount of existing higher cost generation capacity.

(144)   The Commission also notes that the operation of Paks II may also cause a certain wholesale market liquidity risk by limiting the number of supply offers available in the market. Depending on the decision Hungary eventually takes regarding the commercialization of the electricity produced by the new reactors, if Paks II is linked to another state undertaking having operations in the retail sector or to an undertaking having a significant share of the retail market, liquidity could be significantly affected, barriers to entry could be raised and competition could be reduced on the retail market.

(145)   Based on the above, the Commission has doubts that any aid to Paks II does not adversely affect trading conditions to an extent contrary to the common interest. In order to conduct a comprehensive assessment, the Commission would require information addressing the doubts above and market modelling showing alternative investments that would have taken place in the counterfactual.

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[49]   COMP/M.5549 – EDF/Segebel; C(2009)9059 – 12/11/2009

3.4. Conclusion - Commission's Doubts

(146) The Commission has come to the preliminary conclusion that there are doubts that the development of two new nuclear reactors in Hungary that are fully financed by the Hungarian State during construction for the benefit of the entity Paks II, that will own and operate them, does not entail State aid within the meaning of Art 107(1) TFEU.

(147) At this stage, based on the information submitted, the Commission does not have sufficient elements to conclude whether the conditions for the compatibility of any possible aid with the internal market in accordance with Article 107(3)(c) TFEU are met, in particular whether the aid is necessary. Furthermore, the Commission has doubts that the notified measure is proportionate. It is also concerned about its distortive effects on competition.

(148) The Commission has therefore, at this stage, doubts as to the compatibility with the internal market and, in accordance with Article 4(4) of Council Regulation (EU) No 2015/1589, it has decided to open the formal investigation procedure, thereby inviting Hungary to submit its comments as well as the requested information. The formal investigation procedure will also give the opportunity to third parties whose interests may be affected by the granting of the aid to comment on the measure.

(149) In light of both the information notified by the Member State concerned and that provided by any third parties, the Commission will re-assess the measure and will take its final decision.

4. DECISION

In light of the foregoing considerations, the Commission, acting under the procedure laid down in Article 108(2) of the Treaty on the Functioning of the European Union, requests Hungary to submit its comments and to provide all such information as may help to assess the measure, within one month of the date of receipt of this letter. It requests your authorities to forward a copy of this letter to the potential recipient of the aid immediately.

The Commission wishes to remind Hungary that Article 108(3) of the Treaty on the Functioning of the European Union has suspensory effect, and would draw your attention to Article 14 of Council Regulation (EC) No 659/1999, which provides that all unlawful aid may be recovered from the recipient.

The Commission warns Hungary that it will inform interested parties by publishing this letter and a meaningful summary of it in the Official Journal of the European Union. It will also inform interested parties in the EFTA countries which are signatories to the EEA Agreement, by publication of a notice in the EEA Supplement to the Official Journal of the European Union and will inform the EFTA Surveillance Authority by sending a copy of this letter. All such interested parties will be invited to submit their comments within one month of the date of such publication.

If this letter contains confidential information which should not be published, please inform the Commission within fifteen working days of the date of receipt. If the Commission does not receive a reasoned request by that deadline, you will be deemed to agree to publication of the full text of this letter. Your request specifying the relevant information should be sent by registered letter or fax to:

European Commission,
Directorate-General Competition
State Aid Greffe
B-1049 Brussels
Stateaidgreffe@ec.europa.eu

Yours faithfully
For the Commission

Margrethe VESTAGER
Member of the Commission