Estlink: a First of Many Merchant Transmission Investments in Europe?

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I. INTRODUCTION

In April 2005, the European Commission (EC) gave green light to the construction of the Estlink interconnector[1] – a High Voltage Direct Current (HVDC) underwater cable project connecting the Baltic and Nordic electricity markets. The 350 MW transmission link between Estonia and Finland is owned by the private company AS Nordic Energy Link[2], making it the first interconnector being built on a commercial basis since the issue of the EU Regulation 1228/2003 on Cross-border Exchanges[3]. Notwithstanding the European regulated monopoly structure regarding the ownership and operation of the transmission network[4], Regulation 1228/2003 also contains provisions to allow private investments in interconnection capacity. Under Article 7, owners of new interconnectors may be exempted from the 2nd Electricity Directive[5] requirements of third party access and regulated tariffs and the Regulation 1228/2003 rules concerning the use of congestion revenues, conditionally to the fulfilment of a number of criteria. By allowing owners greater operational and commercial control over their assets, it is hoped that investment in interconnectors between Member States will be more forthcoming.

Figure 1: the Estlink cable *(Source: ABB)*

The existence of sufficient interconnection capacity is essential for the development of an integrated and competitive EU market, as has been emphasized recently in the Directive 2005/89/EC on Security of Supply and Infrastructure Investment[6] and more previously in the outcome of the Barcelona Council 2002[7]. Results of the Commission's preliminary report of the Energy Sector Inquiry[8] (hereafter Sector Inquiry) show however that the current level of interconnectivity fails to meet demand, resulting in substantial and increasing congestions. In addition, adequate development of cross-border infrastructure is lacking. So far, poor incentives and lengthy procedures act as a significant barrier to (regulated) investment.

Driven by fear of underinvestment in network assets, investment by unregulated third parties or merchant transmission investment (MTI) is considered in many parts of the world. While Australia and the USA already have some experience, the approaching coming into operation of the Estlink cable[9] also puts MTI policy discussions at the forefront in Europe. Taking the approved Estlink project as the point of departure, this article aims to outline the issues at stake in the ongoing debate in Europe. Departing from literature, section II and III respectively address the questions whether MTI are desirable (*Are we willing to accept third parties to invest?)* and whether they are commercially feasible *(Are third parties willing to invest?)*. Section IV discusses the EU's current framework regarding MTI and points to shortcomings in current legislation. Analysing the conditions attached to the approval of an exemption, the Estlink transitional ownership structure will be put forward as a good example for future merchant investment projects.

II. DESIRABILITY OF MERCHANT TRANSMISSION INVESTMENTS

Apart from the well-known virtues of market forces, Brunekreeft et al.[10] generally consider 3 specific arguments to allow MTI. First, vertically integrated utilities – owning both generation and transmission assets – would have poor incentives to invest in interconnector capacities, because they increase the competition facing their own generation markets. Within Europe, the Sector Inquiry also suggests that incentives for vertically integrated transmission system operators (TSOs) to favour the affiliated generation branch in network issues are not yet eliminated, despite of the 2nd Directive unbundling measures[11]. According to several respondents, the introduction of ownership unbundling could address this issue. The second argument relies on regulatory uncertainty concerning risky new investment and the inability of regulators to commit credibly to refrain from a clawback of revenues after the investment has been sunk[12]. So far, most European countries resort to a cost$^+$ methodology for setting transmission tariffs. On the basis of postulated investment plans, regulators annually assess whether the TSO's costs are justified. Thereupon, tariffs are determined as a function of the approved costs, incorporating a fair profit margin to compensate the TSO for the capital invested. Given regulators' permanent concern to keep transmission tariffs as low as possible, investing TSOs are continuously facing a risk of rejected costs, and consequently a risk of lower profit and dissatisfied shareholders. Transition from a cost$^+$ to a price cap system could improve TSO's incentives to invest in interconnectors, unless price caps are set too rigidly. Besides, TSOs still have another source of income at their disposal for financing interconnector expansions. According to Article 6(6) of Regulation 1228/2003, revenues resulting from the allocation of congested interconnection capacity shall

only be used for 3 purposes, including investment in interconnector facilities. Results of the Sector Inquiry yet indicate that only about one quarter of congestion revenues (CR) is used to expand cross-border infrastructure. Instead, TSOs were found to spend CR mainly on a reduction of national transmission tariffs, being possibly once again a result from the regulators constant concern for lower tariffs[13]. The third argument is related to the fact that, conditionally to the construction of a line, permission is required on both ends of the interconnector. The regulator on the "losing' side would be hesitating to agree because of his reluctance to pass through costs that benefit out-of-area users. Under EU legislation, MTI have to be submitted for approval by the regulatory authorities concerned as well, but permission will not affect tariffs, mitigating as such the problem.

Brunekreeft et al. put forward the above arguments as convincing reasons for allowing MTI, while in our view they rather describe the causes of the current situation of underinvestment. As a result, Brunekreeft et al. might give the impression of MTI being the only way to improve cross-border investment, although alternative solutions exist. ETSO[14] recently emphasized the importance of a stable and coherent regulatory framework, correct incentives for TSOs and a streamlining of authorisation procedures. The recent Directive 2005/89/EC, suggesting a removal of administrative barriers to interconnector investments, and initiatives like the TEN-E[15] program, offering funding and a cooperative framework for cross-border infrastructure projects, show the EC is taking action. Nevertheless, the full effect of these measures is only to be expected in the long term. In order to boost interconnector investment in the short term, MTI seems to offer a suitable alternative solution.

Implementation of the MTI approach as a general model for interconnector investment is however not considered suitable. Joskow and Tirole[16] show that the attractive properties of the MTI model, as found under a stringent set of assumptions, are seriously undermined when more realistic attributes of transmission networks and the behaviour of TSOs are incorporated. Accordingly, whenever merchant lines are allowed, they should be merely a complement to another (regulated) approach. Several difficulties in relying primarily on a merchant model to govern transmission investment are discussed in literature. Perez-Arriaga and Rubio[17] show that, when considering real networks, congestion rents fall significantly short of recovering total incurred network costs. Therefore, only interconnectors with high anticipated CRs will be built under the MTI approach. Littlechild[18], Hogan[19] as well as Brunekreeft[20], point to the possibility of MTI projects being crowded out by regulated projects. Merchant line operators are

continuously facing the risk of new regulated lines being built, resulting in a reduced amount of congestion on their line. Finally, Brunekreeft[21] and Camacho[22] illustrate that, given the highly discrete nature of transmission investments, merchant investors will invest in a capacity lower than optimal to retain a sufficiently large price difference to recover all costs. After all, merchant capacity choices are primarily made on net present value considerations and do not explicitly take into account optimal social welfare.

Given the unavoidable coexistence of regulated and unregulated interconnectors, rules for priority between both approaches have to be established. Within the PJM[23] market (USA), a distinction was originally made by limiting MTI to 'economic' transmission investments that were not required for 'reliability'. Joskow[24] however designated this distinction as arbitrary because of the interdependence of both concepts. Many 'economic' transmission investments – i.e. investments where CRs are expected to exceed all costs – confer 'reliability' benefits as well and vice versa. Because necessary merchant investments in response to congestion failed to occur, PJM introduced the concept of 'unhedgeable congestion'[25]. Projects characterized by unhedgeable congestion and benefit/cost ratios exceeding predefined thresholds, are now put on a list of potential regulated 'economic' transmission projects. If market participants are not interested in the identified projects, they are planned to be executed on a regulated basis. Hogan[26] advocates limiting regulated transmission to those cases where the investment is inherently 'large' to the size of the relevant market and inherently lumpy. 'Large' basically is defined as commercially unprofitable[27], so that the decision rule implies that regulated projects should be socially beneficial but not commercially feasible. In Australia, the 'slippery slope' of regulated investment crowding out merchant investment is avoided by granting merchant investors a right of conversion[28]. If the MTI project fails, the conversion can make it fall back on the pool of regulated revenues. Within Europe, Brunekreeft[29] advocates a distinction based on controllable (DC) and non-controllable (AC) flow. Due to Europe's zonal pricing approach and because of inefficiencies of MTI being far less in DC lines than in meshed AC networks[30], AC investment should be reserved for regulated TSOs. This distinction is currently included in EU legislation, which will be considered further in section IV. Camacho[31] finally stresses the importance of verifying whether the proposed merchant project is not included in the investment plan of the regulated TSO. Because merchant investors only apply for projects with expected CRs higher than the costs of the line, Camacho argues network users can benefit from paying the construction of the line as a regulated one and consequently retaining CRs.

III. COMMERCIAL FEASIBILITY OF MERCHANT TRANSMISSION INVESTMENTS

MTI is basically founded on remuneration by arbitrage between differently priced regions. It is important to distinguish carefully between the implementation of MTI in the USA on the one hand and Europe and Australia on the other hand. The nodal pricing system in the USA allows a more sophisticated merchant system than the zonal pricing approach in Europe and Australia. In the USA, revenues for MTI are based on what is called incremental Financial Transmission Rights (FTRs)[32], which incorporate network effects by taking price effects on al relevant nodes into account. MTI revenues in Europa and Australia are simply derived from the differences in spot prices between the two ends of the interconnector.

Merchant investors in Europe and Australia are thus exposed to a substantial commercial risk. MTI revenues cannot be guaranteed and can, amongst others, be negatively affected by a parallel regulated line being built. Consequently, the potential reduction in regulatory risk following MTI, might be offset by the increase in commercial risk. As mentioned before, Australia's right of conversion was established to mitigate this risk. In the USA by contrast, FTRs allow merchant investors to hedge against volatility in nodal price differences. As discussed in Rious[33], these FTRs do however not take into account certain externalities inherent in the electricity network. The existence of parallel currents and reliability issues in a meshed network are shown to be badly internalized by the FTR system. The establishment of PJM's principle of unhedgeable congestion has to be seen in the light of these FTR limitations.

Such as a total reliance on the MTI model was undesirable from a societal viewpoint, commercial interest in MTI is only guaranteed in certain situations. According to Rious, the commercial development of the electricity transmission network in Europe is only economically feasible when the following conditions are fulfilled. First, the technological choice of a merchant investor is limited to DC lines because of the EC's obligation[34] that a merchant line should be able to be dispatched anytime, meaning that it should always be possible to control the transported amount of current. Consequently, merchant interconnectors are comparable to traders buying energy in an export zone and reselling it in an import zone. Secondly, the capacity of the investment must be low relative to the level of production and consumption in the zones to be connected. Finally, price differences between the zones to be linked should be permanent. Although the last condition can never be guaranteed, it will be quasi certainly fulfilled when specific conditions concerning

the provision of primary energies are met, such as topological constraints in one of the interconnected areas or differences in the energy mix between both zones.

IV. THE EUROPEAN REGULATORY FRAMEWORK FOR MERCHANT TRANSMISSION INVESTMENTS: APPLICATION TO THE ESTLINK CASE

As shown in section II and III, some regulation of MTI is desirable, not only from a societal point of view but from the point of view of a merchant investor as well. The European approach is laid down in Regulation 1228/2003 which entered into operation on July 1, 2004. In first instance, the Regulation addresses issues related to congestion management and the allocation of cross-border capacity, but under Art. 7 owners of new interconnectors may be exempted from the provisions of Art. 6(6) of the Regulation and Art. 20, 23(2), (3) and (4) of the 2nd Electricity Directive. While the former prescribes requirements concerning the allocation of CRs to specific purposes, the latter imposes third party access to the network and regulated tariffs. Decisions on exemptions are taken by the regulatory authorities of the Member States concerned, in consultation with each other. Thereupon, the exemption decision has to be notified to the Commission, which may request an amendment or withdrawal of the exemption approval. The exemption regime normally only applies to DC lines, but exceptions can be made for AC lines. As mentioned before, this distinction is recommended because of Europe's zonal pricing approach. Exemptions are only granted on a case-by-case basis, providing a set of conditions is met, of which the most important are:

a) The investment must enhance competition in the electricity market
b) The investment is risky, such that it is unlikely to take place if regulated
c) The interconnector is legally unbundled from the TSOs to whose network it is connected
d) The exemption is not to the detriment of competition

Following Nordic Energy Link's request of exemption, both the Estonian[35] and Finnish[36] competent authority examined the appliance of the Estlink project with the above conditions. As shown by the arguments below, all criteria were found to be fulfilled.

a) From an Estonian point of view, the Estlink cable would increase competitive pressure on Estonian electricity generators, who so far, almost only compete with their Baltic neighbours. Furthermore, a participation of Estonian generators in a well functioning Nordic electricity market would create a better functioning electricity market in the Baltic region as well. From a Finnish point of view, the Estlink cable would further enhance competition in the Finnish

market, though Finland is already facing sufficient competitive pressure from imported Swedish capacity.

b) The Commission's Note on exemptions from certain provisions of the third party access regime[37] (hereafter the Commission's Note) states that 'risky' should be interpreted as follows. The investment should be 'major', meaning that costs, if remunerated through regulated transmission tariffs, would have a significant impact on customers (> 10 €/ customer), it should concern a sunk cost and the projected benefits should be subject to a range of possibly occurring events. Within Estonia, it is shown that a regulated investment in the Estlink cable would result in a capital cost of more than 90 € per customer. Furthermore, regulated investment would only take place in a later stage, because other projects with a larger impact on security of supply are prioritized[38]. The 2 other conditions are shown to be met as well. Future profits would be uncertain due to fluctuating electricity prices in the Nordic electricity market. When Nordic and Baltic prices start converging, for example following a good water year, the electricity trade from the Baltic to the Nordic region could become unprofitable. In such situation the fixed costs of the DC interconnection could result in losses. It should however be noted that merchant investors will face this price volatility uncertainty as well.

c) The Estlink cable will be owned by Nordic Energy Link, a company established as a separate legal person. None of its shareholders are TSOs to whose systems the cable will be connected.

d) The Estonian authority expects competition will not be damaged thanks to measures such as the auctioning of available capacity and the implementation of the use-it-or-lose-it principle. The Finnish authority comes to the same conclusion, after an assessment based on economic indices.

However, some controversy regarding the suitability of these requirements exists. First, criteria a) and d) are difficult to assess because all economic tools measuring competitiveness are insufficiently adapted to some specific features of electricity markets[39]. Furthermore, Brunekreeft[40] indicates that competition and welfare effects may contradict so that requiring an increase in welfare would be more efficient. Criterion b) refers to the (regulatory) risk regulated investors are faced with. However, merchant investors as well are subject to (commercial) risk, making this condition arbitrary as well. Criterion c) would be more effective if not only legally, but also ownership unbundling was imposed. Moreover, Brunekreeft suggests adding an ownership limitation for dominant generators.

Furthermore, Art 7(4) allows regulators to attach extra conditions to the approval of an exemption, related to mechanisms for capacity allocation and management, the length of an exemption period, non-discriminatory access, and whether the exemption is for all or some of the capacity. As stated in the Commission's Note, these conditions might help assuring that the scope and duration of the exemption is proportional to the objective being pursued. Brunekreeft[41] argues that regulators' decision power should be further strengthened by giving them the right to decide whether provisions such as the use-it-or-lose-it principle (Art. 6.4), now automatically required for all MTI, have to be met[42].

In the Estlink case, the Estonian and Finnish competent authorities attached a temporal condition to the approval of the exemption. Because the Finnish and Baltic TSOs declared to be prepared of making the investment of the submarine cable at a later stage, the exemption has to be terminated at the latest in 2013. As a result, the ownership and operation of the Estlink cable will take place in two phases (Cf. figure 2). Until 2009-2013, the cable will be owned and operated on a merchant basis, with capacity being used by the owners conditionally to the use-it-or-lose-it principle. At a later specified moment, depending on the completion of the Fennoskan-2 project, the ownership of the interconnection is intended to be transferred to the Finnish and Baltic TSOs. Transmission capacity will then be opened to all market participants.

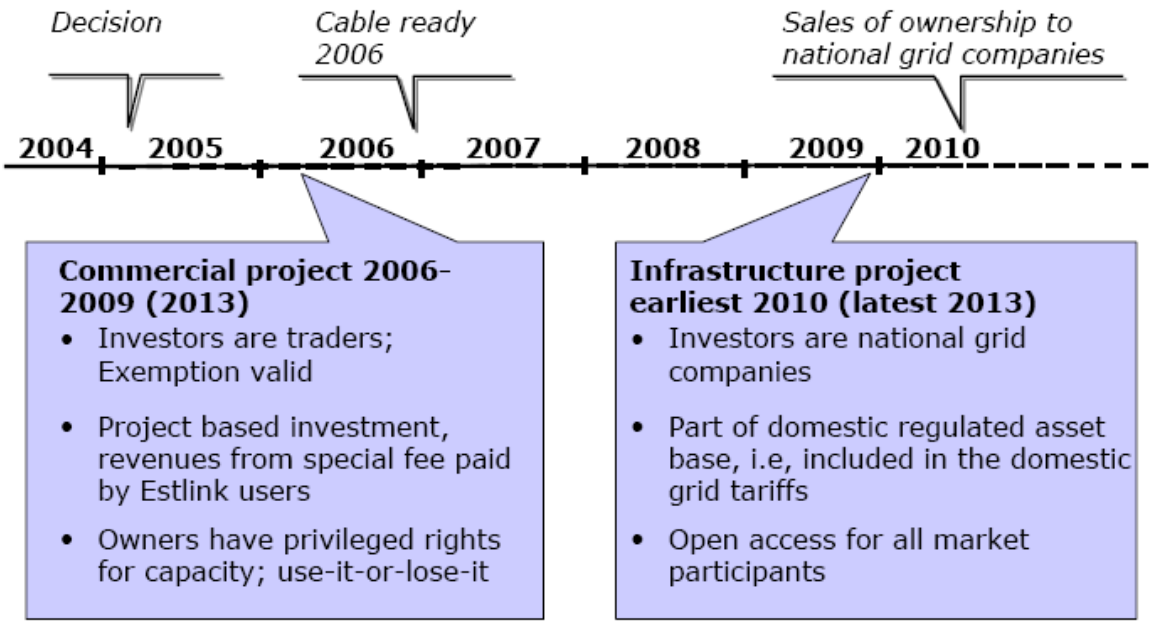

Figure 2: two phases in the operation of Estlink (Source: Nordic Energy Link)

Stimulating MTI without loosing out of sight Europe's choice for a mainly regulated transmission network, Estlink's transitional ownership structure sets a good precedent for future MTI projects. Therefore, it is the authors' opinion that the temporal limitation of exemptions should not remain optional, but should become a strict requirement in EU legislation. Similar to Australia's right of conversion and regulation holiday, such a restriction in duration would respectively mitigate commercial as well as regulatory risk. The temporal limitation should be determined on a case-by-case basis[43].

V. CONCLUSION

Initiated by the approaching coming into operation of the Estlink cable, this paper discussed the suitability of Merchant Transmission Investments (MTI) in dealing with the current situation of underinvestment in cross-border infrastructure in Europe. From a societal point of view, MTI seems to be an appropriate tool to boost interconnector investment in the short run. However, a total reliance on the MTI model is not considered suitable. Instead, a combination of regulated and merchant investments can be implemented, especially in the short run. In the long run, it is indispensable to improve the regulatory framework for non-merchant or so-called regulated investments.

However, due to merchant investors' high exposure to commercial risk, a good regulatory framework on MTI is key for them as well. Two main suggestions to improve the European regulatory framework on MTI, as laid down in Art. 7 of Regulation 1228/2003, were made. First, the criteria to be fulfilled for exemption approval as well as the extra conditions to be attached, could be defined more clearly so that too much flexibility in interpreting them is avoided. Secondly, the transitional ownership structure in the Estlink case is a good practice for future MTI projects. Therefore, it is advisable that the temporal limitation of exemptions becomes a strict requirement in EU legislation.

Endnotes:

[1] More information with regard to the technical aspects of the Estlink project is to be found on the website of the constructor of the cable, namely ABB group:
http://www.abb.com/cawp/gad02181/fd74043145b157aec1256fa30036f52f.aspx

[2] AS Nordic Energy Link was founded by 3 Baltic power utilities – Eesti Energia (39.9% of shares), Latvenergo (25%) and Lietuvos Energija (25%) – as well as Pohjolan Voima and Helsingin Energia (together 10.1%) of Finland. (www.nordicenergylink.com)

[3] European Commission, *Regulation No 1228/2003 of the European parliament and of the council of 26 June 2003 on conditions for the access to the network for cross-border exchanges in electricity*, Official J. Eur. Union, L 176, 2003, 1-10.

[4] Whereas electricity liberalisation introduced competition in generation and retail, the existence of natural monopolies caused transmission - as well as distribution - to remain regulated monopolies. As laid down in the 2nd Electricity Directive (cf footnote 5), regulated Transmission System Operators (TSOs) are charged, inter alia, with ensuring reliable transmission within their network as well as with developing sufficient interconnection capacity with neighbouring Member States.

[5] European Commission, *Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity and repealing Directive 96/92/EC*, Official J. Eur. Union L 176 , 2003, 37 – 56, Article 8 -12

[6] European Commission, *Directive 2005/89/EC of the European Parliament and of the Council of 18 January 2006 concerning measures to safeguard security of electricity supply and infrastructure investment*, Official J. Eur. Union, L 33, 2006, 2 -27

[7] The Barcelona European Council on 15 and 16 March 2002 set a target for (import) interconnector capacity of at least 10% of production capacity per Member State by 2005.

[8] European Commission, *Preliminary Report Sector Inquiry under Art 17 Regulation 1/2003 on the Gas and Electricity Markets*, 2006, available at http://europa.eu.int/comm/dgs/competition/

[9] The Estlink cable is due to be completed by the end of November 2006.

[10] See, for instance, Brunekreeft G. and Newbery D. (2005). *Should merchant transmission investment be subject to a must-offer provision?*, Working Paper EPRG 05-03, University of Cambridge; Brunekreeft G. (2004). *Market-based investment in electricity transmission networks: controllable flow*, Utilities Policy, 12(4), pp. 269-281;Brunekreeft G., Neuhoff K. and Newbery D. (2005). *Electricity transmission: An overview of the current debate*. Utilities Policy, 13(2), 73-93

[11] The 2nd Directive requires legal unbundling – in addition to accounting and management unbundling - between network activities (transmission and distribution) and all other activities. In practice this means that transmission and distribution system operators must be independent in their legal form, organisation and decision making (separate headquarters and separate board of directors).

[12] The problem of regulatory uncertainty was put forward in the Australian discussion concerning MTI. As a possible way out, a "regulation holiday" – i.e. a commitment to refrain from regulation for a pre-determined number of years – was introduced.

[13] While the Sector Inquiry principally blames the TSOs for insufficiently using CR to invest in interconnection capacity, Meeus et al. (Meeus L., Purchala K., Van Hertem D. and Belmans R., *Regulated*

Cross-Border transmission investments in Europe, accepted for publication in European Transactions on Electrical Power) point out the regulators as main cause for the lacking cross-border investments.

[14] ETSO, *Position Paper on Roles and Responsibilities of TSOs and other actors in Cross-Border Network Investment*, 19 July 2006

[15] European Parliament and European Council, *Decision of the European Parliament and of the Council laying down guidelines for trans-European networks and repealing Decision 96/391/EC and Decision No 1229/2003/EC*, to be published in Official J. Eur. Union

[16] Joskow P. and Tirole J. (2005). *Merchant transmission investment*, The Journal of Industrial Economics, 53(2), 233-264

[17] Perez-Arriaga J.I. and Rubio F.J. (1995). *Marginal pricing of transmission services: An analysis of cost recovery*. IEEE Transactions on Power Systems, 10(1), 546-553

[18] Littlechild S. (2003). *Transmission regulation, merchant investment, and the experience of SNI and Murraylink in the Australian National Electricity Market*. Mimeo, June 2003, downloadable from http://www.ksg.harvard.edu, HEPG Harvard

[19] Hogan W. (2003). *Transmission market design*. Presented at Electricity deregulation: where to from here?, Conference at Texas A&M University, April 4th, 2003

[20] Brunekreeft G. (2004). *Market-based investment in electricity transmission networks: controllable flow*, Utilities Policy, 12(4), 269-281

[21] Brunekreeft G. (2005). *Regulatory issues in merchant transmission investment*, Utilities Policy, 13(2), 175-186

[22] Camacho L. ((2006). *Diseno regulatorio de la actividad de transporte en mercados de electricidad regionales*, Universidad Pontificia Comillas de Madrid, PhD Thesis

[23] PJM stands for Pennsylvania – New Jersey – Maryland Interconnection.

[24] Joskow P. (2005). *Transmission policy in the United States*, Utilities Policy, 13(2), 95-115

[25] Simply said, PJM defines unhedgeable congestion as congestion which cannot be hedged with the existing portfolio of FTRs.

[26] Cf. endnote 19

[27] Commercially unprofitable is to be interpreted as having such an impact on market prices that the ex post value of FTRs does not justify the investment.

[28] This right of conversion is controversial. The Australian case of Murraylink, extensively discussed by Littlechild (Littlechild S. (2004). *Regulated and merchant interconnectors in Australia: SNI and Murraylink revisited*, Working paper CMI EP 37, University of Cambridge) illustrates this.

[29] Cf. endnote 20

[30] In a meshed AC network, a new line can be privately profitable but socially detrimental due to loopflow effects. The European zonal approach is not able to take these network effects into account. Furthermore, economies of scale – causing a merchant investor to invest in a capacity smaller than optimal – are larger for AC projects than for DC projects. Next, market power is primarily a problem of AC networks because it

is technically impossible for parallel AC lines to compete in capacity. Finally, investment risk is larger for AC projects because a perfect hedge can be difficultly found.

[31] Cf. endnote 22.

[32] For a discussion on the merits of FTRs, see, for instance, Bushnell J. and Stoft S. (1996). *Grid investment: can a market do the job?* The Electricity Journal, 9(1), 74-79 or Chao H. and Peck S. (1996). *A market mechanism for electric power transmission.* Journal of regulatory economics, 10, 25-29

[33] Rious V. (2006). *Quelle place pour la concurrence dans le développement du réseau?*, Working paper, Groupe Réseaux Jean Monnet, Université Paris-Sud XI, available at http://www.grjm.net/

[34]The obligation is included in Regulation 1228/2003, as will be further discussed in section IV.

[35] Estonian Ministry of Economic Affairs and Communications (2005). *Exemption decision Estlink project*, available at http://ec.europa.eu/energy/electricity/index_en.htm

[36] Finnish Energy Market Authority (2005). *Exemption decision Estlink project*, available at http://ec.europa.eu/energy/electricity/index_en.htm

[37] EC (2004). *Note of DG Energy & Transport on Directives 2003/54-55 and regulation 1228\03 in the electricity and gas internal market*, available at http://ec.europa.eu/energy/electricity/index_en.htm

[38] Both parties inter alia indicate that the Estlink cable can difficultly be materialised until Fenno-skan 2, the Finnish-Swedish submarine cable, has been completed.

[39] For a discussion on the applicability of economic tools measuring competitiveness, see Vandezande L., Meeus L., Delvaux B., Van Calster G., Belmans R. (2006). *Evaluation of economic merger control techniques applied to the European electricity sector***,** Electricity journal, 19(6), 49-56.

[40] Brunekreeft shows that an interconnection between 2 regions A and B, with B characterized by market power on its electricity market, results in a positive competition effect. However, if generation costs are higher in A, the interconnector will trade high-cost power from region A to the low-cost, but high-priced region B, resulting in a negative import effect. Which effect predominates, depends on a number of factors.

[41] Brunekreeft G. and Newbery D. (2005). *Should merchant transmission investment be subject to a must-offer provision?*, Cambridge working paper in economics, University of Cambridge

[42] Brunekreeft suggests not requiring a must-offer provision for MTI because it may adversely affect investments decisions.

[43] According to the British regulator Ofgem and the British Department of trade and Industry (DTI/Ofgem (2003). *LNG facilities and interconnectors: EU legislation and regulatory regime – DTI/Ofgem initial views*, London) the duration of an exemption should be limited to periods up to 15 years.