The UK Charging System on Interconnectors

Final Report*

April 2011

Marcelo Saguan, Nicole Ahner, Adrien de Hauteclocque and Jean-Michel Glachant

* The views expressed by the authors are their own and do not represent the position of the European University Institute, Robert Schuman Centre of Advanced Studies. Research for this study has been financed by TenneT.

Executive Summary

Economic Analysis

British Charges for interconnectors and completion of the EU single market in electricity:

- UK network charges applied to interconnectors create, in general, pancaking problems and cross-border inefficiencies such as:
    - Limitation of competition in the internal market
    - Restriction of efficient cross-border transactions
    - Increase of implementation costs on market integration
    - Distortion of interconnection investment incentives
- The Transmission Network Use of System (TNUoS) charges, as well as most part of Balancing Services Use of System (BSUoS) charges (excluding internal congestion costs), aim to recover UK (network and operation) fixed cost. Applying them to (hourly) cross-border transactions implies pancaking problems and an inefficient outcome.
- Applying the part of BSUoS charges corresponding to (variable) internal congestion costs to interconnectors would be justified economically only if these charges are properly implemented, i.e. if they are cost reflective with respect to cross-border transactions. Current BSUoS charges are not cost-reflective because they do not represent the supplementary cost of national balancing services due to a specific transaction. Therefore they do not give efficient signal to cross-border transactions.
- Losses 'charges' related to UK national system losses also create pancaking problems and could not be totally justified by an economic rationale; they have no locational component and do not represent the supplementary cost of national losses costs due to a specific cross-border transaction. To the opposite, losses 'charges' related to interconnector losses are rationally applied and do not create pancaking problems.

British Charges for interconnectors, compensation and harmonization issues:

- A workable EU internal electricity market can only be achieved if compensation and harmonization issues among TSOs are solved.
- The Inter-TSO compensation mechanism and the harmonization guidelines are an important step forward. However, they not all address comprehensively compensation and harmonization issues.
- As a result, there could be a case for charging interconnector users to ensure compensation and harmonization between NGET and Tennet.

- However, the existing charging system implemented unilaterally by NGET to tackle compensation or harmonization problems are far to be efficient and effective because:
    - It creates pancaking problems and cross-border inefficiencies
    - It creates automatic compensation even when compensation is not needed. When compensation is needed, charges are usually not cost-reflective
    - It does not solve the harmonization problem in the European interest
- In conclusion, compensation and harmonization issues naturally call for comprehensive and EU-wide solutions. From an economic point of view, unsolved issues should be tackled by improving current EU instruments and not by charging cross-border transactions.

Legal Analysis

British Charges for interconnectors and sector-specific legislation:

- The UK charges system as imposed to date on interconnectors does not comply with the sector specific legislation.
- Inter-TSO compensation and tariff harmonization is regulated at EU level by Regulation (EC) 714/2009 (respectively Regulation (EC) 1228/2003) on cross-border exchanges and the new implementing guidelines (Regulation 838/2010).
- Regulation 714/2009 provides for two complementary mechanisms:
    - compulsory inter-TSO compensation (ITC) scheme covering (real) costs incurred from hosting cross-border flows (Art 13)
    - harmonization of national tariffs to avoid trade distortions (Art 14); charges to be burn by producers and consumers.
- EU legislation categorizes interconnectors unambiguously as interfaces connecting national transmission systems. Since they are thus neither considered as producers nor as consumers they are not addressee of Art 14. As a consequence the charges NGET imposes cannot be justified on the basis of this provision.
- Compensation then can only be achieved under Art 13. The fact that the new binding ITC mechanism does not cover compensation of all costs NGET recovers through TNUoS/BSUoS charges does not allow for the unilateral imposition of compensation and thus circumventing the only relevant Art 13.
- The desired extended coverage of the ITC mechanism (providing for the recovery of those costs NGET recovers to date with the TNUoS/BSUoS charges) can only

happen by means of new Art. 18 guidelines. The unilateral imposition by NGET runs counter the sector specific legislation.

British Charges for interconnectors under EU competition law

- NGET as a dominant undertaking has a *special* responsibility under EU competition law vis-à-vis (i) the competition process in downstream markets and (ii) the completion of the single market in general.
- NGET is responsible under EU competition law for the competition effects of the UK charging system.
- NGET abuses his dominant position because the UK charging system creates inequality between different network users and because NGET solves an internal problem to the detriment of the completion of the single market.
- Economic or non-economic nature reasons cannot objectively justify the abuse.
- The analysis pursued under alternative legal bases (essentially free movement) yields the same result.

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Introduction

BritNed is a joint venture between National Grid and TenneT. Its goal is the construction and operation of an electricity DC cable between Great Britain (Isle of Grain, Kent) and the Netherlands (Maasvlakte, near Rotterdam, see figure 1). The cable is under construction. It is meant to be operational by 2011 with a capacity of 1,000 MW and a length of 260 km. The cost of the project has been estimated at €600 million.

Benefits are expected for both British and Dutch consumers by supporting security of electricity supply in both markets and by allowing customers to participate in European markets. Power will be transmitted in both directions driven by price differentials and demand patterns between the two power markets. The linkage is expected to facilitate competition and contribute to the creation of the European Internal Electricity Market (IEM).

BritNed will be a "merchant" interconnector, funded and operated independently by National Grid and TenneT. Customers will have open access to the capacity via a combination of 'implicit' auctions facilitated by APX, and short term 'explicit' auctions.

Figure 1: BritNed Cable

Source: BritNed

Under the current tariff systems in place in the UK and the Netherlands, BritNed and its users will be treated differently on the British and the Dutch sides. The cable connects two national networks managed by two different Transmission System Operators (TSOs). As a result, NGET (the UK transmission subsidiary of National Grid in charge of the GB transmission network) applies the British tariff regime whereas Tennet (TSO of the Dutch transmission network) applies the Dutch one. One of the particularities of the British regime is that interconnectors are considered as any other UK generator or consumer for the purpose of compensating NGET for the use of the transmission system and system operation services. Conversely, under the Dutch regime interconnectors are understood as part of the network. Accordingly, interconnector owners or users are not charged for using the Tennet network.

The UK electricity network charges regime is currently under review. The aim of this report is to provide an economic and a legal analysis of the existing charging system. It aims to answer the following questions: 1) Are UK charges applied to BritNed impairing the EU internal market efficiency? 2) Are UK charges applied to BritNed an efficient solution to tackle problems of harmonization and compensation in the EU internal market? 3) Is the UK charges regime compatible with the EU sector specific legislation? 4) Could the imposition of BSUoS charges on interconnectors by NGET be considered an abuse of a dominant position?

The analysis focuses on the BritNed interconnector. However some part of it might be extrapolated to other UK interconnectors (i.e., current interconnectors as Moyle North Ireland-Scotland and IFA UK-France or projected ones such as East-West interconnector Eire-Wales).

Part A: Economic Analysis

1. UK charges on interconnectors: cross-border efficiency analysis[1]

Starting with the first European Electricity Directive (96/92/EC), enormous effort has been made to achieve a workable and efficient IEM. Ensuring its economic efficiency implies the eventual elimination (or reduction) of all kinds of cross-border trade barriers.

Under the UK network tariff regime interconnectors are considered as any other UK generator or consumer. The main rationale behind such assumption is the compensation of NGET for the use of the transmission system and system operation services. Such charging practices could create cross-border trade barriers and inefficiencies. This section analyzes the impact of the British charging practice on cross border efficiency.

Network users' charges under the current British regime are:[2]

- Connection charges that recover the (one time) cost of connection of a new facility (in 2009/2010, these charges represented around £140M),
- Transmission Network Use of System (TNUoS) charges that recover the cost of installing and maintaining transmission assets (in 2009/2010, these charges represented around £1600M),
- Balancing Services Use of System (BSUoS) charges that recover the cost of operating and balancing the transmission system (in 2009/2010, these charges represented around £1000M), and,
- System losses charges[3] that allow for the cost of energy lost in the transmission (in 2009/2010) to be recovered, these costs represented around £300M).

This report focuses on TNUoS, BSUoS and losses charges since these charges cover the most important part of the network cost and are continuously applied to network users.[4]

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[1] We focus here on cross-border efficiency which is in line with the EU goal of creating a workable Internal Electricity Market. Transmission tariff regimes also have an impact on the national efficiency of power systems (for instance, giving locational signals to consumers or generators). A complete analysis should take into account all these efficiencies.

[2] Cf. National Grid (2010), "Charging Tutorial", National Grid, Patrick Hynes June 2010, (www.nationalgrid.com). For the sake of completeness: interconnectors are also exposed somehow to imbalance charges. The imbalance costs are charged to interconnectors as the Interconnector Error Administrator in case of capacity shortage where interconnectors need to guarantee physical firmness, and for small deviations between commercial and technical flows resulting from technical operational limitations on the link.

[3] Strictly speaking there are no system losses "charges" in the British network charges regime (cf. section III.4). However the losses regime has similar consequences on network users as if it had charges applied by NGET.

The starting point for an analysis of the impact of each type of charge on cross-border efficiency will be an introduction to one of the main origins of inefficiencies: tariff pancaking.

1.1. Tariff Pancaking and its Impact on Efficiency

If there was a single TSO covering all European networks, there would be a symmetric and harmonized transmission pricing system which would ignore political and administrative borders. This ideal situation corresponds to the so-called "single system paradigm" in which purchasing network access in one Member State provides access to all Member States without distorting incentives to trade across borders.[5] The actual European organization does not correspond to this situation. In fact, each European country has its own TSO managing the network and setting tariffs.[6]

The "simple" approach for dealing with cross-border trade in a multi-TSOs set-up would be to treat each cross-border transaction as a local generator or demand placed at the corresponding border node. This approach however leads to network tariff pancaking and consequently creates barriers to cross-border trade and economic inefficiencies.[7]

Network tariff pancaking occurs when a transmission user is forced to pay separate network tariffs for a transaction that crosses two or more interconnected transmission systems or TSO zones. In the case of interconnectors, pancaking works in the following way: Suppose a hypothetical (and oversimplified) system in which two national networks, A and B, have recently been linked by an interconnector, AB (cf. figure 2). Suppose that before the coupling, only consumers (loads)[8] were charged with transmission tariffs and suppose that tariffs were equal to T in both countries (which corresponds to perfect harmonization in transmission tariff level and structure). Countries A and B decide to apply transmission tariff T also to the interconnector. Since only charges for load exist, the interconnector will be charged only when it takes power from one of the systems, i.e. only export transactions (A to B and B to A) are subject to interconnector tariff T. Additionally, when comparing national and cross border

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[4] TNUoS charges are applied to interconnector owners whereas BSUoS charges and losses 'charges' are applied to interconnector users. However, as interconnector owners pass-through TNUoS to users, the three types of charges create similar effects (see section III.2).

[5] See for instance, Pérez-Arriaga, I.J. (2002), "Cross-border tarification in the internal electricity market of the European Union" in Proc. 14th PSCC, Sevilla, Spain, June 24–28, 2002; or Pérez-Arriaga, I.J. (2008), "Transmission issues in cross-border trading of electricity. Internal compensation charges in the EU", Presentation at the Energy Policy research Seminar of KSG Harvard.

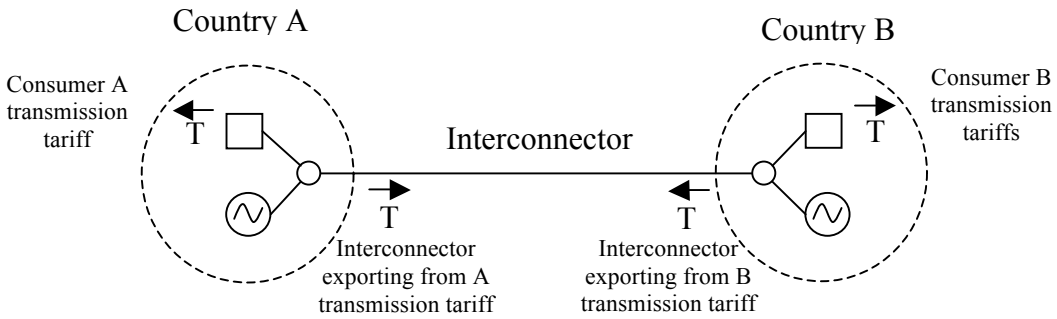
[6] Some countries have several TSOs (e.g., Germany).

[7] Cf. Brunekreeft, G., Neuhoff, K. And Newbery, D., (2005). "Electricity Transmission: An Overview of the Current Debate," Utilities Policy, vol. 13(2), pages 73-93, June 2005; Joskow P., (2005), "Transmission Policy in the United States" Utilities Policy vol. 13(2), June 2005, Pages 95-115.

[8] Note that the same conclusions would apply if all the costs were allocated to generators.

transactions, we see that the tariff applying to cross-border transactions (now 2T – because T is applied once on export from one country and once on load in the other country) is twice the tariff applying to national transactions (T).

Figure 2: Transmission Tariff *Pancaking*



Eliminating the pancaking phenomenon has been a major goal in achieving regional electricity market integration in many places over the world.[9] Pancaking creates four types of economic distortions with the corresponding cross-border inefficiencies: (i) limitation of competition in the internal market, (ii) restriction of efficient cross-border transactions, (iii) in implementation costs on market integration platforms and (iv) distortion of interconnection investment incentives increase.

- *Limitation of competition in the internal market.* Pancaking makes it more expensive to trade across borders and thereby limits competition. Consider generator GA selling to load CA in country A while generator GB sells to load CB in country B (figure 2). With this arrangement, both pay transmission charges for only one country, which amounts to T. Under a pancaked charging system, if generator GA sells to load CB and generator GB sells to load CA, they will both have to pay an additional charge of T. Since generators produce the same amount of power (assuming the transactions were for the same amount) and since loads consume the same amount of power, the entire physical activity of the system remains unchanged. The same power will flow

[9] This was notably the case for the creation of Regional Transmission Organizations (RTOs) in the United States and for the integration of European regional electricity markets. Cf. Hogan W., (1999). "Market-Based Transmission Investments and Competitive Electricity Markets", mimeo; Costello K., & Burns R., (2000). "Regional Transmission Organizations and the coordination of regional electricity markets: a review of FERC order 2000", report; FERC (1999). "Regional Transmission Organizations", Order No. 2000, Docket No. RM99-2-000, 1999; Perez-Arriga I., (2002). "Cross-border tarification in the internal electricity market of the European union," in Proc. 14th PSCC, Sevilla, Spain, June 24–28, 2002; NERA (2004). "Review of GB-Wide Transmission pricing" A Report for Scottish Power UK Division, 26 July 2004.

through the same lines. The result of the additional charge is a reduced competition. If there is only one electricity generation company in country A with marginal cost X, this company can raise its price at least to X+T before the generator in country B can start competing.[10] Note that high regional competition is crucial for an efficient EU electricity market given that national markets are highly concentrated.[11]

- *Restriction of efficient cross-border transactions.* Efficient cross-border transactions should be driven exclusively by the energy marginal cost and the price differential between the two borders. Of course, this includes the (opportunity) cost of cross-border capacity if the interconnector is congested. In order to ensure short term efficiency (i.e. to minimize total production cost and maximize consumers surplus), costs other than the short term marginal cost of using the system should not have any influence on the short term decisions. Allocating transmission charges to the interconnector would imply an artificial transaction cost and would limit the opportunities of having beneficial trades taking place.

- *Increase in implementation costs on market integration platforms.* It is well-known that implicit auctions design (i.e., market coupling) has better economic properties than explicit auctions or administrative mechanisms (e.g. pro-rata, etc.).[12] Applying transmission charges to the interconnector can make implicit auctions implementation harder. Firstly, within an implicit auction framework it is not possible to identify the auction participants who are "using" the interconnector (internal energy transactions and cross-border transactions are settled at the same time). Secondly, the inclusion of related (flow) interconnector charges in the implicit auction algorithm is far from being simple. *Ad hoc* solutions have to be implemented, leading to potential distortions. Moreover, algorithm solutions are more complex when the market coupling includes different interconnectors with different transmission network tariffs (e.g., market coupling between FR-BE-NL and UK). These implementation difficulties may create a barrier for the implementation of efficient solutions to achieve market integration with the corresponding economic efficiencies.

- *Distortion of interconnection investment incentives.* Applying transmission charges to an interconnector reduces the incentives to invest in new interconnection capacity. Indeed, this would lower the economic interest that investors and, more broadly, the EU community have in the interconnector, possibly to a point where the project would no longer be profitable.

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[10] Cf. Stoft S., (1998). "MW-Mile Charges: Do They Work?", Working Paper ; Pierce R., Trebilcock M, and Thomas E., (2005). "Regional Electricity Market Integration: A Comparative Perspective." Working Paper.

[11] Cf. Smeers Y., (2009). "How well can one measure market power in restructured electricity systems?", In: Electricity Reform in Europe, ed. J-M Glachant and F. Lévêque, Edward Elgar Publishing, 2009.

[12] Cf. Smeers Y., Ehrenmann A., (2005). "Inefficiencies in European congestion management proposals," Utilities Policy 13(2), 135-152 (2005).

Most of the costs recovered via transmission tariff are fixed costs. Since the system operator needs to ensure total recovery of costs, network users have to pay for fixed costs. In order to do so while minimizing distortions with respect to the first best economic equilibrium (the "efficient outcome"), the economic theory recommends charging fixed costs to the least price-elastic players (i.e. certain consumers).[13] Interconnector users or parties involved in cross-border transactions are very elastic to prices and costs and should therefore be the ones paying the smallest part of the costs (i.e. a share proportional to the inverse of their price elasticity)[14]. This implies that transmission tariffs should not be transaction-based. More generally, it would be justified to have transmission tariffs dependent on the connection point to the network, on the nature of the agent (producer or consumer), on the amount of power injected or retrieved from the network and on the time of injection or withdrawal, but not on the commercial transactions made cross-border. Said differently, agents making cross-border transactions and agents making internal transactions should be treated in the same way in order to avoid distortions and inefficiencies.

To sum up, network tariff pancaking creates barriers to cross-border trade and economic inefficiencies. In the following sub-sections, we analyze how the UK charges applied to interconnectors create pancaking problems and inefficiencies.

1.2. TNUoS Charges

What are TNUoS charges?

TNUoS charges reflect the cost of installing and maintaining the transmission system for the Transmission Owner (TO), being NGET. That TO activity is undertaken to allow the flow of power between connection sites and to provide transmission system security.

The main goal of TNUoS is to collect the fixed costs of the transmission system and to give long term locational signals to generation and demand.[15] TNUoS charges are calculated annually and should completely cover NGET total allowed revenue for the TO activity. NGET TO allowed revenues for the period 2007 to 2012 have been defined in the Transmission Price Control Review (TPCR4).[16] The allowed revenues were around £1300M for 2007/2008, around £1400M for 2008/2009 and around £1600M for 2009/2010. The important increase in allowed revenues is explained by the increase in transmission network investments made by NGET.

UK TNUoS tariffs are applied to three types of transmission users: (i) generators, (ii) consumers and (iii) interconnector owners. In terms of tariff application, interconnectors

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[13] Cf. Ramsey, F. (1927). A Contribution to the Theory of Taxation, Economic Journal, 37, pp. 47-61.

[14] Cf. Pérez-Arriaga I., Smeers Y. (2003). "Guidelines on tariff setting" in Transport Pricing of Electricity Networks, (ed. François Lévêque).

[15] Cf. National Grid (2010), "Charging Tutorial", National Grid, Patrick Hynes June 2010, (www.nationalgrid.com).

[16] Cf. www.ofgem.gov.uk/Networks/Trans/Archive/TPCR4/Pages/TPCR4.aspx

are considered as generators in importing situations (i.e., flows going into UK) and as consumers in exporting situations (i.e., flows leaving UK). TNUoS tariffs are usually passed-through to the interconnector users (i.e., users who buy cross-border interconnector capacity such as generators, consumers, suppliers, traders, etc.). The TNUoS charge is split with a ratio 27:73 respectively between users exporting onto the system (Generators/Interconnectors importing) and users importing from it (Suppliers/Interconnectors exporting).

The basis of charging to recover the allowed revenues is the Investment Cost Related Pricing (ICRP) methodology.[17] This model computes network long-run marginal cost for each zone and allows integration of a locational signal in the tariff, reflecting whether the generation/load contributes to or alleviates the need for additional transmission investment. Long-run marginal cost is adjusted twice, first to ensure that charges allow total network costs to be recovered and second to ensure that the tariff recovers 73% of cost from demand and 27% from generation. Indeed, without the adjustment, the locational element (marginal cost) would only account for approximately 20% of TNUoS needed revenues.

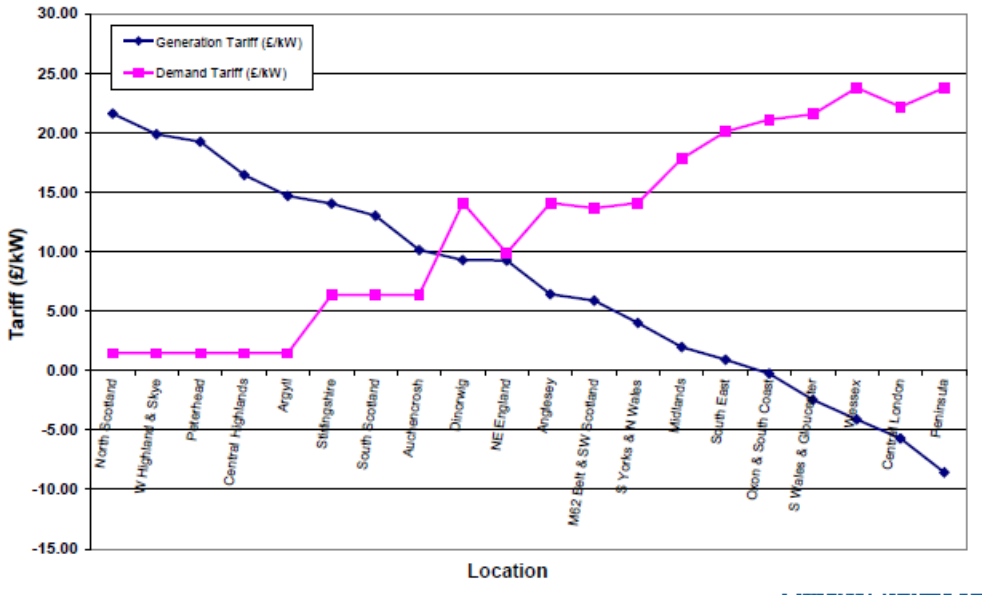
Network users are charged a zonal charge dependent on which tariff zone they are connected to. Zonal tariffs differentiate between two types of usage of the network (i.e., generation or demand):

- **Generation TNUoS Charges**: There are currently 20 generation TNUoS tariff zones. The charges for these zones display a north to south differential and vary from positive tariffs in the north to negative tariffs in some southern zones. The basis of the generation charge is the highest Transmission Entry Capacity (TEC)[18] applicable over the year for positive tariff zones, or the average of the three highest metered volumes over the winter period for negative tariff zones.
- **Demand TNUoS Charges**: There are 14 demand TNUoS tariff zones. The supplier TNUoS tariffs display a reverse north to south differential relative to the generation tariffs. Suppliers' charges for (half-hourly) metered demand are based on the average of the actual demand supplied during the Triad. The Triad is defined as the three half-hour settlement periods of highest transmission system demand between November and February of a financial year, separated by 10 clear days.

[17] National Grid (2010), "The Statement of the Use of System Charging Methodology", (www.nationalgrid.com)

[18] The Transmission Entry Capacity (TEC) of a power station is defined as the access capacity that the generator has requested to export power into the main transmission system.

Figure 3: TNUoS charges (2007)



Source: National Grid

Are TNUoS charges applied to interconnectors creating "panckaking" problems?

The current UK TNUoS regime creates the same economic problems as "pancaking" does. Even though this is a very particular case,[19] i.e. that interconnector owners are charged with network tariffs only on one side (UK), potential distortions exist and they can be substantial.

Allocating TNUoS charges to the interconnector creates an artificial transaction cost and restricts the opportunities for beneficial trades to take place.[20] It could be argued that TNUoS charges imposed on interconnector owners are flat charges and therefore do not play any role in short term decisions (and consequently with short term efficiency). However this argument does not hold. Although TNUoS charges have been designed to be applied to installed capacity or maximal capacity use of a facility, the impact of these tariffs on generators or loads is not the same as their impact on interconnector users. Indeed the interconnector owners "pass-through" TNUoS charges to the users (i.e., generators, consumers, suppliers, traders, etc). The pass-through to the users is using some sharing rule related to bought/sold cross-border capacity or nomination. Thus the

[19] Moyle cable, linking Scotland and North-Ireland, is an exception. We understand that transmission tariffs are applied on both sides of the interconnector.

[20] Bunn D., Zachmann G., (2010). "Inefficient arbitrage in inter-regional electricity transmission", Journal of Regulatory Economics, Springer, vol. 37(3), pages 243-265, June.

short term decisions of interconnector users incorporate this extra cost in their arbitrage decisions and this is the source of distortions.

Concerning the BritNed cable, where the main part of transmission network cost is allocated to load in the two interconnected countries (73% UK and 100% the Netherlands), the most affected cross-border transactions will be exports from the UK to the Netherlands. Cross-border transactions in this direction will account for about half of the exchanges between the two countries.[21] Under the current TNUoS regime, UK-NL cross-border transactions will have to pay additional network tariffs corresponding to withdrawals at the interconnector. British and Dutch generators will not compete on equal ground and inefficiencies will appear.

Note that the size of potential inefficiencies could be large. This can be seen when looking at the impact of the current regime on the minimal energy price differential necessary to make a cross-border transaction happen. Indeed, given the existence of TNUoS transaction costs, interconnector users would only perform a cross-border transaction if the energy price differential is higher than the transaction cost plus the border capacity price. The minimum required price differential in case of a Triad warning[22] would need to be very high (more than £5,000 per MWh).[23] Inefficiencies could also arise in NL-UK transactions despite that they would not be as big as for UK-NL transactions.[24]

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21 Historical simulations of hourly flow direction indicate that NL to UK cross-border efficient transactions (i.e., those where energy price in NL is higher than energy price in UK) represent almost 50% of the hours. Cf. Moss Ian, (2009), "APX-ENDEX, Market Coupling & BritNed", BritNed Connect Seminar, 10th December 2009.

22 Triad measures maximum demand readings three times a year and uses the average of these readings to calculate Transmission Network Use of System (TNUoS) consumer charges. Triad is an *ex post* mechanism as consumers know the periods corresponding to Triad after the fact. In March of each year National Grid publishes the three highest maximum demand readings that have occurred between November of the previous year and February of the current year. "Triad warnings" indicate to consumers when the probability of a Triad is high. Triad mechanisms have been criticized for their lack of predictability which can lead to further inefficiencies. Cf. Ofgem (2010), "Electricity interconnector policy", consultation document; National Grid (2010), "Triad and Interconnector Charges", TCMF 27th January 2010 National grid.

23 Currently, Transmission Network Use of System Demand Charges corresponding to the connection point of BritNed cable (South East zone) are about 25.19 £/kW. For a capacity of 1000 MW, the yearly total amount (supposing that during Triad interconnector is exporting) which has to be recovered is 25,190,000 £/year. Depending on the rule of allocation of these costs between the interconnector users, this could represent a minimum of 3 £/MWh (if TNUoS are allocated for all capacity in this direction, i.e. 25,190,000 £/1000 MW * 8760 hours) and a maximum of 8400 £/MWh (if TNUoS cost is allocated within users exporting during ex post Triad).

24 Currently, Transmission Network Use of System Generation Charges corresponding to the connection point of BritNed cable (South East zone) are about 1.21 £/kW. For a

We have shown that applying TNUoS charges to interconnectors has a negative impact on the creation of the IEM. They lead to pancaking problems and create several inefficiencies (e.g., limitation of competition in the internal market, restriction of efficient cross-border transactions and increase in implementation costs on market integration platforms).[25]

Following a public consultation by NGET in the summer of 2010, Ofgem has recently changed the UK network charges regime: from the implementation date, interconnectors will be treated as a separate class of transmission users, distinct from generation or demand, and they will be exempted from TNUoS charges.[26]

1.3. BSUoS Charges

What are BSUoS charges?

As GB System Operator, NGET has a responsibility to keep the electricity system in balance (energy balancing) and to maintain quality and security of supply (system balancing). The Balancing and Settlement Code (BSC) sets out how the System Operator's (SO) balancing costs are recovered from network users. The costs incurred by the SO for energy and system balancing are charged to all BSC parties (i.e., generators, suppliers and interconnector users) via the BSUoS charges.[27]

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capacity of 1000 MW, the yearly total amount which should be recovered is 1,210,000 £/year. Depending on the rule of allocation of these costs between the interconnector users, this could represent a minimum of 0.14 £/MWh (i.e. 1,210,000 £/1000 MW * 8760 hours) and an estimated value of 0.28 £/MWh considering imports of 1000 MW for 50% of the time.

[25] It could be argued that charging interconnectors would be justified in order to give long term locational signals to optimize the development and the use of the UK national network. This argument seems to be weak. Concerning generators and demand locations, it is not (theoretically and empirically) clear how long term signals are needed for generation/load location in the presence of short term signals (i.e., the difference in electricity prices between two countries). Moreover, other factors not related to network tariff or electricity prices are also very important in the location of new generators and loads (e.g., water or fuel availability, permits, etc.). Finally, concerning new interconnectors, locational issues could be treated at the moment of granting the exemption or with connection charges.

[26] Cf. Ofgem (2010), Decision letter in relation to Use of System Charging Methodology Proposal GB ECM-26 "Review of interconnector charging arrangements", October 2010 (http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=132&refer=Networks/Trans/ElecTransPolicy/Charging)

[27] It is worth noting that BSUoS charges do not include imbalance charges. Indeed, out-of-balance parties are exposed to imbalance (cash-out) prices designed to reflect the costs of energy balancing. Imbalance cash-out rules are designed to provide incentives on parties to balance their aggregated input and off-takes from the system on a half-hourly basis, where it is cheaper for the parties than for NGET to do so. When NGET balances on behalf of parties, those parties should face the costs of NGET's balancing actions. Hence cash-out

They include the actual costs incurred for balancing and securing the system and the costs of the SO function. Thus, they have two main components: i) an "internal" BSUoS component which includes internal SO costs as staff, building, IT costs, etc. and ii) an "external" BSUoS component which includes all the costs of the services used to balance and to secure the system (cf. figure 4)[28].

Internal SO costs are quite stable and represent around £100M per year. External SO costs are more variable as they depend on the wholesale electricity prices and on network conditions (e.g., network constraints). In 2009/2010, these costs were of £807M.[29] External SO costs include two main components: i) "System" balancing costs within the balancing mechanism (CSOBM) (which mainly includes system balancing costs not covered by imbalance charges)[30] and SO balancing costs outside the balancing mechanism, which are related to contracts between NGET and market participants providing different ancillary services (BSCC). External SO costs are mainly costs incurred to resolve transmission constraints, sub-half-hourly imbalances or frequency response (which are below the granularity of the settlement rules) and reserves availability payments (which cannot be associated with a particular imbalance and therefore are not included in the imbalance charges). In 2009/2010 transmission constraints accounted for 26 % of total SO external costs (~£206M), frequency response accounted for 23% of total SO external costs (~£182M) and reserve procurement accounted for 33% of total SO external costs (~£262M). All together, these three cost components accounted for over 80% of total external costs (i.e. £650M compared to a total of £807M).[31]

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prices should reflect the costs NGET faces when resolving market wide energy imbalances at half-hourly granularity, and out-of-balance parties should be subject to these costs. Interconnectors are also exposed somehow to imbalance charges (see footnote 2).

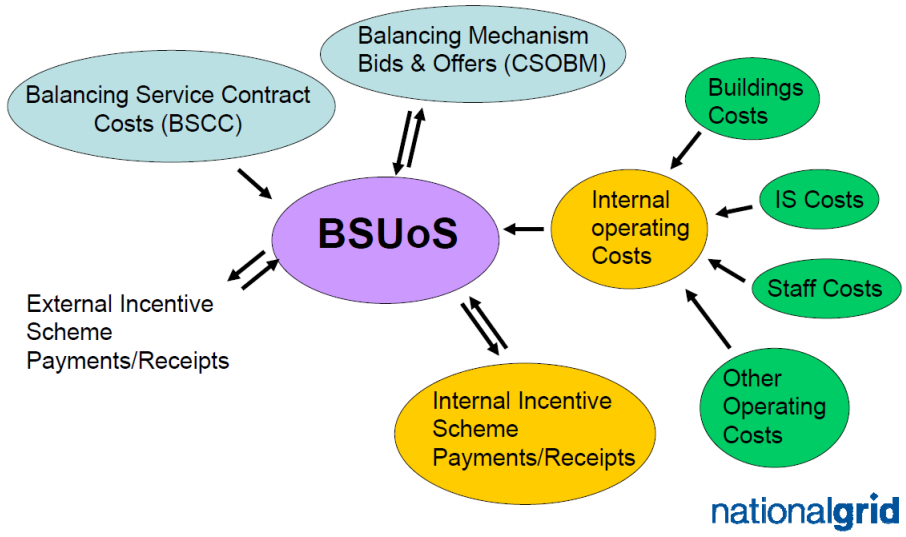
[28] BSUoS charges also include incentive payments/receipts (cf. "An introduction to National Grid Electricity Transmission System Operator (SO) Incentives. A Balancing Services Incentive Scheme Reference Document", November 2009, http://www.nationalgrid.com/NR/rdonlyres/EC31124A-8BC5-41AA-A87C-DA8C949C6E74/39632/BSISReferenceDocument.pdf).

[29] Cf. National Grid (2009), "Historic and Forecast Balancing Services Incentive Scheme Costs", November 2009 (cf.http://www.nationalgrid.com/NR/rdonlyres/1B6B81A0-7583-4EC0-B16D-A814E2100546/38603/ElectricitySOIncentivesHistoricForecastCosts.pdf). Values correspond to the 2009/2010 latest forecast (total balancing costs).

[30] Given the positive difference between System Buy Price (SBP) for negative imbalance and System Sell Price (SSP) for positive imbalance, the aggregated imbalance system normally has a positive net cash flow (i.e., the amount of money paid by BRPs for negative imbalances is higher than what NGET pays to BRPs for positive imbalances). This cash-flow is named the Residual Cash-flow Reallocation Cash-flow (RCRC). It is rebated to all parties on a per MWh basis, offsetting the energy balancing component of BSUoS for those parties who are in balance.

[31] Other system services costs included in the BSUoS charges are, for instance, the cost of the reactive power services, the cost of black start services, etc.

Figure 4: Balancing Services Use of System charges



Source: NGET (2007)[32]

Transmission constraints and reserve procurement costs have increased considerably since 2006/2007. Transmission constraints costs have increased from around £100M in 2006/2007 to £200M in 2009/2010.[33] This has been mainly due to transmission constraints between England and Wales and Scotland zones (i.e., constraints costs at Cheviot boundary increased from £25M to £106M from 2006/2007 to 2009/2010). Reserves procurement costs have increased from £152M to £262M. The increase in External SO costs has resulted in a considerable increase in BSUoS charges. Table 1 shows the evolution of BSUoS charges since 2006.

[32] Cf. National Grid (2007), "Transmission Charging Tutorial", National Grid, 6 December 2007 (www.nationalgrid.com).

[33] Forecasted values for 2010/2011 indicate that transmission constraints costs will be of 322 £M. (cf. National Grid (2010), "Balancing Services Incentive Scheme", David Smith, February 2010, http://www.nationalgrid.com/NR/rdonlyres/03E4B551-1BC1-4F0F-8CEB-0F932BFAC7AF/39949/Feb2010_Incentives_Scheme.pdf)

Table 1: Average BSUoS[34]

	Average BSUoS (£/MWh)	Average BSUoS (€/MWh)
2006-2007	0.95	1.14
2007-2008	1.00	1.20
2008-2009	1.50	1.80
2009-2010	1.54	1.84
2010-2011 (forecast)	1.62	1.94
2011-2012 (forecast)	1.92	2.30

Source: National Grid[35]

BSUoS charges are applied separately to production (generation or imports from interconnectors) and consumption (demand or export to interconnectors) accounts with overall charges split 50:50 between generation and demand. BSUoS charges are recovered on a per MWh basis based on throughput (i.e., based on their energy taken from or supplied to the GB transmission system) and are calculated every settlement period (each half-hour). The BSUoS charges do not have any locational component.

Are the BSUoS charges applied to interconnectors creating "pancaking" problems?

As mentioned before, BSUoS charges mainly cover national system operator costs, national balancing services costs and national network constraints (i.e. internal congestion) costs. In most (continental) European countries these costs, often called "system services costs", are usually recovered via network tariffs (or specific system services tariffs) applied only to national/native load and/or generators.[36] System services costs are not charged to interconnector users or to network users located in other TSO zones. For instance, a German supplier buying electricity in France has to pay system services charges only in Germany and does not have to pay any system charges in France. This is in line with the "single system paradigm" which implies that paying national network tariffs provides access to the entire EU network and that only national network

[34] We assume a constant exchange rate of £1=€1.2.

[35] http://www.nationalgrid.com/uk/Electricity/Balancing/bsuos/rfpricescharges/

[36] This needs to be confirmed for UK interconnectors (IFA and Moyle) and their corresponding interconnected countries (France, and Ireland). In France, most system services costs are covered by network tariffs (TURPE). These tariffs are not applied to interconnectors. However, there is a proportional charge in the balancing mechanism of around ~0.11€/MWh. This charge is presumably applied to IFA interconnector users. We do not have any information on the system charges in Ireland.

users have to pay for internal network costs (including system services costs[37]) (FSR, 2005)[38].

In this respect, the current UK BSUoS regime creates "pancaking" problems. They occur when a network user is forced to pay several system tariffs for a transaction that crosses two or more interconnected transmission systems or TSO zones. Indeed, the UK regime is charging network users outside the UK with part of the cost of the UK system balancing even though these users are already paying for the balancing services costs of their own country. This situation, which is different from other continental border ones, may be a source of inefficiencies.

BSUoS charges imposed on interconnector users are limiting cross-border trade and competition and are making it more difficult to implement efficient market integration solutions (e.g., market coupling with implicit auctions)[39]. Any charge on the use of the interconnector is internalized in the behaviour of market participants when they decide on cross-border transactions (i.e., in the bidding process to acquire capacity rights in explicit auctions; or in the special rules used in the market coupling algorithm in implicit auctions). For instance, a BSUoS charge of 2 €/MWh applied to cross-border transactions (imports or exports) implies that each time the energy price spreads between two countries (e.g. UK-France or UK-Netherlands) is less than 2 €/MWh, no flow/transaction would take place. (See box n° 1 concerning the quantitative assessment of loss of welfare due to BSUoS charges).

More generally, all resulting cross-border transaction volumes are negatively affected by BSUoS charges. This impact naturally depends on the level of the charges but also on their uncertainties. As BSUoS charges are not known exactly at the time when cross-border transaction decisions are taken, their impact is even higher. BSUoS charges are *ex post* charges. Since they depend on total injections and off takes, their actual level can only be known after taking the cross-border transactions decisions. In case of uncertainties, "risk averse" market players overreact and may further reduce their cross-border transactions.

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[37] Strictly speaking, this argument is stronger for "synchronized" countries (i.e., sharing the same network frequency) often connected with AC lines. Indeed, these countries are really sharing ancillary services (mainly primary and secondary reserves) to maintain network frequency and stability. However, this concept can also be applied to non synchronized countries, i.e. connected by DC cables. Considering the EU wide transmission system as a whole network, every sub-system (i.e. national) should ensure its own ancillary services in order to support national and EU cross border transactions.

[38] Cf. FSR (2005), "A study on the inter-TSO compensation mechanism", October 2005 (http://www.eui.eu/RSCAS/Research/FSR/pdf/051031-ITCStudy-FinalReportCover_000.pdf)

[39] Cf. Moss Ian, (2009), "APX-ENDEX, Market Coupling & BritNed", BritNed Connect Seminar, 10th December 2009.

Box 1 – Quantitative assessment of loss of welfare due to BSUoS charges

Assessing the loss of welfare due to export/import charges is a difficult task in terms of methodology and required data. Two main issues should be considered concerning the impact of these charges: i) the impact on cross-border efficient trades and ii) the impact on market power and cross-border competition. The methodology and the necessary data are different depending on the issues and the related assessment of loss of welfare.

The impact of export/import charges on cross-border efficient trades

Leaving aside the problem of market power, historical data could be used to estimate the loss of welfare provoked by the "non-realization" of efficient cross-border trades. We would estimate the loss of value of transactions that were efficient but that have not taken place because of the export/import charges. For instance, this will be the case when a cheap generation plant is available in one country but its capacity is not exported to the other country because of the export/import charges. This would happen when export/import charges are higher than the price differential between these neighbour countries.

Complete calculation of these cross-border inefficiencies requires important quantity of data. Indeed this assessment needs hourly supply and demand curves for all the involved countries and the hourly availability of interconnection capacity for the same period. Hourly electricity price data for the different countries could also be used to estimate elasticity and the loss of welfare. Without this data, it is impossible for us to estimate precisely the loss of welfare provoked by the non-realization of cross-border trades.

It is possible however to make a rough estimate of the loss of welfare making several simplifying assumptions. We can suppose that the value of cross-border trades that do not take place because of import/export charges corresponds to the loss of welfare. For instance, we can roughly estimate the potential loss of welfare of these charges for UK for 2011, with an average BSUoS charge of 2 €/MWh. Considering the interconnection capacity of UK of 3.5 GW (2 GW IFA, 0.5 GW Moyle and 1 GW BritNed), the loss of welfare only due to inefficient trade would be around 60M €/year (8760 hours x 2 €/MWh x 3500 MW). Of course this figure represents a maximal estimation of the loss of welfare related to the impact of export/import charges on cross-border efficient trades. Indeed this estimation makes a key assumption: it supposes that price differential is just a bit lower than 2 €/MWh at every hour of the year. In fact actual price differential will be sometimes higher and sometimes lower than 2 €/MWh and taking into account these both cases would reduce estimation of loss of welfare.

The impact of export/import charges on cross-border competition and market power

The welfare losses would be considerably higher if we consider the competition effect of cross-border trade. However a estimation would require the use of an equilibrium market model and large amount of detailed data (see for instance Hobbs et al, 2004, "Strategic Generation With Conjectured Transmission Price Responses in a Mixed Transmission Pricing System- Part II: Application").

However, applying these charges to an interconnector could be justified if they are directly linked to actual operating costs and are based on a sound economic rationale. It is not the case there and we will show that it is not efficient to allocate these charges to interconnector users. It supposes answering two questions: (i) can current BSUoS charges be justified by the short-term signals they give to exporters/importers? and (ii) are current BSUoS charges cost reflective?

Do system services costs included in BSUoS charges depend on cross-border flows?

As mentioned before, BSUoS charges cover three main types of costs: i) system operator internal costs, ii) frequency response & reserves procurement (i.e., availability capacity payment) costs, and iii) transmission constraints (i.e., internal congestions) costs. We want to analyze here how a marginal cross-border transaction could modify the level of each of these costs.

Firstly, it is clear that the system operator internal costs do not depend on the cross-border transactions. It is because these costs are essentially staff, building and IT costs and they are not related to the level of cross border flows. Thus, charging interconnector users for these costs – which represent in the UK around 12% of total balancing charges – is not giving any short term efficient signal.

Secondly, it is similar for frequency response and reserves procurement costs included in the BSUoS charges. For the most part, these costs do not depend on the cross-border transactions. Frequency response and reserves costs depend on the volume of each type of service needed to maintain a certain level of security of the system. Required reserve volumes are generally assessed using extreme scenarios (as a very high demand, the tripping of the largest power plant or even the tripping of the largest interconnector). Thus, the actual hourly level of cross-border transaction has no significant impact on these costs. So, charging interconnector users for these costs – which in the UK represent around 50% of total balancing charges – is not giving any short term efficient signal.

Thirdly, congestion costs, representing around 23% of BSUoS charges, may be influenced by cross-border transactions. Depending on the interconnection, the direction of the flows and the actual network usage in the UK system, a new cross border transaction may have a positive or a negative impact on congestion costs. Thus, at first glance, we cannot say whether charging interconnector users for these costs would be efficient or not.

In conclusion, we can say that 60% of the BSUoS charges are based on "fixed" costs and charging them to interconnector users implies an inefficient outcome.[40] For the share of BSUoS charges corresponding to internal congestion, the analysis should be deepened. The key issue here is to know whether the current BSUoS charging system is giving appropriate short term signals (i.e., if they are cost-reflective) to cross border transactions in order to make them internalize congestion costs.

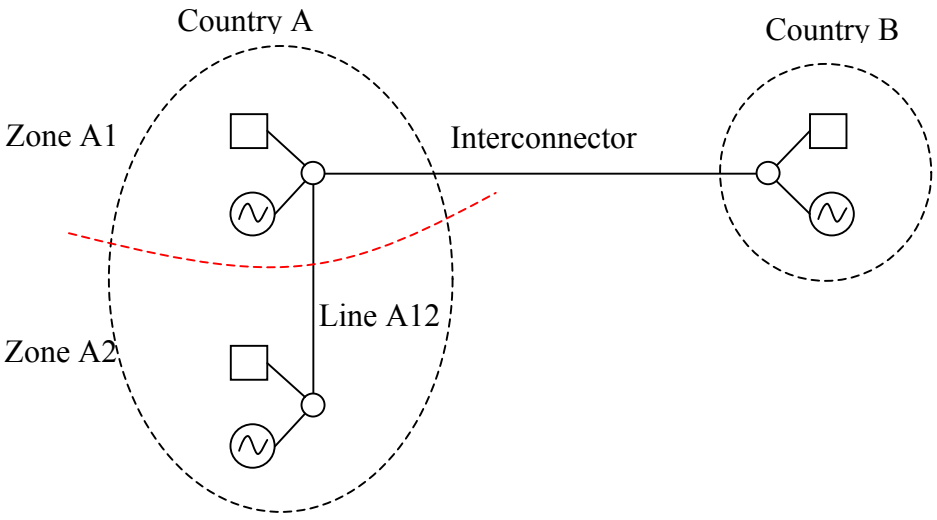
[40] This "fixed cost" argument is only a necessary condition to reject the application of charges on interconnector users. Indeed, the system operator needs to ensure total cost recovery and therefore network users have to pay for fixed costs. In order to ensure cost recovery and to minimize distortions with respect to an efficient outcome (first best), the economic theory recommends charging fixed costs to the less elastic players. Interconnector users are very elastic to prices and costs and therefore they will then be the ones that should pay for the smallest part (an inverse share to their elasticity).

Are BSUoS charges cost reflective with respect to transmission constraints?

The question is whether current BSUoS charges are perfectly reflecting the increase (or decrease) in internal congestion costs when there is an extra flow of energy from/to the interconnector every half hour. If (the congestion part of) BSUoS charges were cost reflective, applying these charges to interconnector users might have a sound economic rationale. Indeed, network users would include the negative or positive externalities of their decisions for the UK system when deciding on cross-border transactions and would make the global outcome more efficient.

An example of cost reflective national congestion charges is the case when an interconnector links two countries and one of them is using an internal zonal pricing (e.g., the interconnector between Denmark and Norway). Figure 5 shows an example of such a case. Country A is divided in two zones (A1 and A2) and zonal energy prices are different when line A12 is congested. The difference between zonal prices (P_A1 and P_A2) and the price that would prevail in country A without considering internal constraints could be interpreted as if there were locational BSUoS charges.[41] Consider for instance the situation where there is a surplus of energy in zone A1. The power line A12 is congested in the direction A1 to A2 and the price at A1 is lower than price at A2. This locational price signal (low P_A1) indicates that extra imports (resp. extra exports) to zone A1 from the interconnector increase (resp. decrease) the internal congestion costs. Cost-reflective charges should be coherent with this zonal pricing mechanism, i.e. imports should be charged positively and exports should be charged negatively. The signs of the charges should be inversed if the internal congestion is in the other direction (i.e. from A2 to A1).

Figure 5: BSUoS Charges and Zonal Pricing



[41] Note that the price in zone A (P_A) resulting if internal constraints were not considered in energy pricing (i.e., no zonal pricing) would be between P_A1 and P_A2. So the differences between P_A1 and P_A and between P_A2 and P_A act as locational balancing charges.

Are current UK BSUoS charges functioning this way? No. BSUoS charges are not cost reflective for at least three reasons: i) BSUoS charges have no locational component, ii) BSUoS charges are equal for imports and for exports and iii) BSUoS charges are not based on marginal or incremental cost. Firstly, BSUoS charges have no locational component and every network user, wherever located, is paying the same charges. Applied to interconnector users, the BSUoS current regime entails inefficient short-term signals to cross-border transactions. Indeed, for a given settlement period and network flow situation, two different cross-border transactions under two different interconnectors will pay the same level of charges even if their impact on internal congestion costs is completely different (e.g., Moyle cable connected into the Scottish system or IFA cable connected into the southern England system). Secondly, for a given interconnector, BSUoS charges are equal whatever the direction of the interconnector flow (i.e., imports or exports) is. In general, import or export flows will induce opposite effects on internal congestion costs, so cost-reflective charges should have different signs. Thirdly, BSUoS charges are "average" prices (i.e., for each settlement period they are computed as the sum of settlement period cost divided by total injected and off-taken energy). Cost reflective charges should be based on marginal or incremental cost.

In conclusion, our analysis indicates that there is a weak economic rationale in applying current UK BSUoS charges to interconnector users. Their application has an insignificant effect on minimizing internal system services costs as it limits cross-border competition and efficient trade. However, further quantitative analysis would be necessary to precisely determine, for each interconnector, how changes in charging rules (i.e. exempting interconnector users from BSUoS charges) could affect the level of system services costs.

1.4. Losses Costs Charges

What are the losses costs charged to UK network users?

The physical process of transferring power across the transmission system implies that some of the electrical power is 'lost'. This lost power is known as "Transmission Losses" and typically accounts for about 2 % of the energy transferred across the GB network.[42] The total losses cost depends on the cost of the wholesale electricity in each year. Rough estimations indicate that for an electricity price of 50 £/MWh, annual cost related to transmission losses is around £300M (50 £/MWh x 6 TWh x 10^6 MWh/TWh).

[42] Transmission losses consist of two components, fixed and variable. Fixed or "iron" losses occur in transformers, overhead lines and cables. Most fixed losses occur in transformers where energy is dissipated in the iron core due to the alternating magnetic field. Variable or "copper" losses are caused by current flowing through the transmission lines, transformer and cables causing them to heat up and dissipate energy. These losses account for most of the electricity lost in the Transmission System. They are variable with respect of the volume of power transferred and increase with the distance electricity has to travel.

Strictly speaking there are no system losses "charges" in the British network charges regime. Losses costs in the GB system are recovered by applying loss adjustment factors to energy transactions, i.e., network users include the volume of energy corresponding to average system losses in their transactions.[43] Losses are allocated to Balancing and Settlement Code (BSC) parties by scaling the output of generators and the demand attributed to suppliers using Transmission Loss Multipliers (TLMs). For instance, to schedule a transaction of 100 MWh, the generator and the supplier should correct this volume to take into account the losses. A generator TLM of 0.9, for example, means that, for 100 MWh of generation, the company would be attributed 90 MWh. Likewise, a supplier TLM of 1.1 means that, for 100 MW of actual demand, the supplier would be attributed 110 MWh. Total scaling of all generation and demand should exactly recover the level of transmission losses. TLMs are set in a way that transmission losses are split between generators and suppliers with a ratio of 45:55.

Losses are currently recovered/allocated on a uniform basis across the country, i.e., there are no locational signals.[44] However losses are calculated for each settlement period which indicates that generators and loads using more the network during period with higher losses contribute more. Transmission Loss Multipliers represent average GB transmission losses and are set in such a way that all transactions can recover total GB transmission losses for each settlement period.

Interconnection users have a special treatment concerning losses. Interconnection transactions are not corrected by variable national average TLM but a fixed loss factor representing the actual interconnector losses. For instance, IFA transactions are scheduled with respect to mid-channel (the middle of the cable) and they are corrected by a fixed loss factor of 1.17 % (this would represent total losses of the cable of 2.34% which correspond to real losses on that cable).[45] Moyle transactions are corrected by a fixed loss factor of 2.26%.[46] BritNed transactions are expected to be corrected by a fixed loss factor of 4% which corresponds to expected losses on the interconnector.[47]

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[43] Although NGET is not responsible for "buying" energy for losses on behalf of network users as it is typically the case in other countries (e.g., France), it is incentivized to minimize the losses volume. Indeed as NGET can reduce losses by modifying the investments or the operation of the network behavior, it is incentivized to minimize losses as part of the Balancing Services Incentive Scheme.

[44] There have been several attempts to introduce a zonal differentiation of losses allocation. However none has succeeded (see for instance Bialek et al. (2005), "Average zonal transmission", http://www.see.ed.ac.uk/~jbialek/AZTL.pdf).

[45] Turvey (2000), "Interconnector Economics: Electricity", http://www.bath.ac.uk/management/cri/pubpdf/turvey/Interconnectors.pdf

[46] See AIP (2006), "The Single Electricity Market: Treatment of Transmission Losses". A Consultation Paper, May 2006.

[47] The losses are estimated to about 3.5% of transmitted energy (see BritNed (2009), "Questions and Answers from the BritNed Connect Seminars", www.britned.com)

Are losses "charges" applied to interconnectors creating "pancaking" problems?

UK cross-border transactions are adjusted (or are charged) for losses in two different manners: first, for interconnector losses and second, for UK national system losses. These losses "charges" have to be analysed separately.

"Charges" related to interconnectors losses do not seem to create any pancaking problems. In fact, interconnector users are duly covering losses incurred in the interconnector. If the fixed loss factor applied to interconnector transactions is established on the basis of actual interconnector losses, the fixed loss factor represents properly the average loss factor on the interconnector, and the current losses allocation mechanism is economically sound. For instance, in the case of BritNed, if a trader sells 100 MWh delivered in UK (at the arrival of the interconnector), he will have to schedule a transaction from the Netherlands to the UK of 104 MWh. The cost of the additional 4 MWh is paid by the trader. This is economically justified because this represents the cost of losses incurred in the interconnector and those losses would not occur if the cross-border transaction were not realized. As a consequence, if the losses cost to transmit energy between the two countries is higher than the expected benefit (i.e., the price spread between the two countries) a trader should envisage the transaction, and this is in line with welfare maximizing behaviour.

"Charges" related to UK national system losses create the same type of pancaking problems than BSUoS charges. As mentioned before, Transmission Loss Multipliers mainly cover national system losses costs. In most (continental) European countries these costs are usually recovered via network tariffs applied only to national/native load and/or generators. Thus cross-border transactions are paying twice the cost of losses incurred in national networks.

Yet, applying these charges to a cross-border transaction could be justified if they are directly linked to actual losses costs and are based on a sound economic rationale. It does not seem the case given that losses adjustments are not perfectly cost-reflective. This is mainly due to the lack of locational signal in losses adjustments applied to transactions which implies that a cross-border transaction that increase UK losses will be pay the same that a cross-border transaction reducing UK losses.

1.5. Conclusions of the Cross-border Efficiency Analysis

In general UK network charges applied to interconnectors create cross-border inefficiencies. They lead to pancaking problems and create inefficiencies such as a limitation of competition in the internal market, restriction of efficient cross-border transactions and increase in implementation costs on market integration platforms).

Applying TNUoS charges to interconnectors has a negative impact on the creation of a single EU electricity market. For BSUoS charges, 60% of these charges are based on "fixed" costs and charging them to interconnector users implies an inefficient outcome. For BSUoS charges corresponding to internal congestion, the economic rationale in applying current UK BSUoS charges to interconnector users is still weak; applying

BSUoS charges to interconnector users may only have a very low effect on internal system services costs whereas it limits cross-border competition and efficient transactions. Losses 'charges' related to UK national system losses create pancaking problems and could not be totally justified by an economic rationale; they are not perfectly cost reflective. On the contrary, losses 'charges' related to the interconnector losses are rationally applied on interconnectors and do not create any pancaking problem. Interconnector users are only covering losses incurred in the interconnector.

Some UK network charges could be justified if they would bring some real benefits for the UK electricity system (for instance, locational signals to generators, load and interconnectors). Although a quantitative cost-benefit analysis would be necessary to compare potential UK internal benefits with cross-border inefficiencies and costs, we have seen that the current UK tariff regime on interconnectors mainly creates barriers within the EU IEM and consequently brings inefficiencies that overcome possible internal benefits.

Having seen where the cross-border inefficiencies of current UK tariff regime on interconnector are, in the next section, we investigate other possible justifications of this charging scheme: compensation and harmonization problems in a multi-TSOs system.

2. UK Charges on Interconnectors: Compensation and Harmonization Analysis

The "single system paradigm" implies that purchasing network access in one Member State provides access to all Member States without distorting incentives to trade across borders. This would replicate a situation with a single TSO covering all European networks and transmission pricing perfectly harmonized, which ignored political borders.

As previously stated, the actual European organization does not correspond to this situation. In fact, each European country has its own transmission network operated by an independent TSO which can set its own tariffs. In this setting with multiple TSOs, there are a number of problems compared to the single system paradigm, namely compensation and harmonization issues.

Although these issues between TSOs relate to a problem of fairness (i.e., allocating fixed costs), solving these issues is absolutely necessary to ensure a sustainable and workable IEM and has important consequences on long-run efficiency. For instance, if compensation problems are not solved properly, TSOs/network users losing money will refuse to collaborate with the creation of the necessary infrastructure for an integrated market. Moreover, the lack of harmonization does not allow a perfect levelised field and can distort the long-run competition.

In this section we analyze compensation and harmonization issues resulting from a network managed by several TSOs. We first briefly show three types of related issues and the reasons why specific mechanisms are needed to tackle them. The existence of these issues calls for regional and comprehensive solutions. This has been the way forward chosen in Europe by implementing the EU Inter-TSO compensation (ITC) mechanism and tariff harmonization guidelines. In the second part of this section we present the current version of the ITC mechanism and harmonization guidelines. Although they have not solved all the issues, they have considerably improved the situation. Unsolved issues could serve as a basis to justify the application of network charges to interconnector users. However in the third part of this section we show why this would not be the most effective and efficient solution.

2.1. Compensation and Harmonization Issues in a System with Several TSOs

In this subsection, we consider three specific situations which exemplify the types of issues which can arise with several TSOs. We start with the transit flow example, in which a flow of electricity between two countries transits via a third country. The second example is related to two neighbouring countries, in a situation where one of them is a net exporter to the other and uses part of its transmission network exclusively for transmission to clients in this other country. Finally, the last example stresses the issue related to the lack of harmonization between network tariff regimes. Note that the two first issues refer directly to compensation problems while the third issue, related to

harmonization, has only an indirect impact on compensation. In the real world all these three problems often appear together. However for pedagogical purposes we present them separately.

The problem of transit flows.

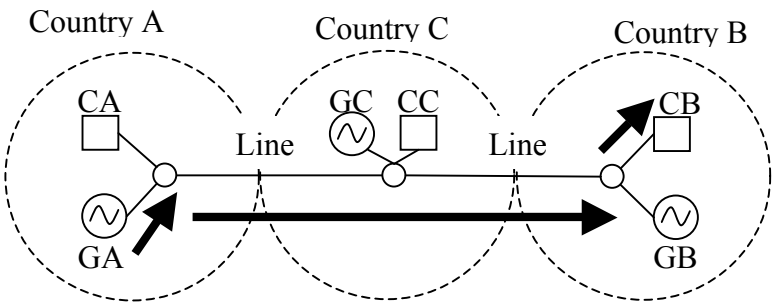
A transit flow materializes when a power transaction between two countries creates flow in a third country.[48] The following example shows how transit flows are created and what consequences they have in terms of compensation.

Suppose a hypothetical system where three national networks, A, B and C, are linked with the transmissions lines 1 and 2 (cf. Figure 6). Each country owns the section of interconnection line which is located on its national territory. In this example, a typical flow pattern is a flow from country A to country B (generator GA is exporting energy to consumers CB). Country A exports are flowing through all interconnection lines for consumption in country B. In this setting, generators in country A and consumers in country B are benefiting and effectively using the transmission network of country C. They should therefore be entitled to cover part of country C's transmission network costs.

In the ideal situation with a single TSO for the entire network spanning over the three countries, the way costs are shared between network users is not an issue. The TSO can easily set its tariffs taking into consideration that generators in country A and consumers in country B are benefiting from the use of the network of country C. Even if network costs are different across the entire region, given that the same TSO is in charge of the three networks, these costs will be recovered efficiently. The TSO would charge to recover all its costs incurred across the entire network. Financial transfers within a region covered by a single TSO are possible, and compensation problems are therefore easily solved.

[48] In meshed network the definition of "transit" flows is broader and is often linked with loop flows (Cf. Daxhelet and Smeers, 2005), "Inter-TSO Compensation Mechanism"). For instance, in this situation a transit flow can also be generated by a transaction within a single country. Daxhelet and Smeers (2005) give such an example. They consider a subset of European transmission operators, composed of German, French, Dutch and Belgian system operators, in a configuration such that Germany is interconnected to the Netherland which is connected to Belgium, which is in turn connected to France, which is finally connected to Germany. In this configuration, they take the example of a large wind-based power generation in the north of Germany which supplies power to a large consuming centre in the south of the country. Although this is an intra-national transaction, given the configuration of the network, the large flow of power flowing from the North to the South of Germany will induce loop flows through the Netherlands, Belgium and France. This example shows that given the meshed configuration of the network, a transit flow can also be generated by an intra-national transaction.

Figure 6: The Problem of Transit Flows



In the multiple TSOs case, in which each country A, B and C, has its own TSO, for each national network, the costs are supported by the TSO in charge of this national network. In other words, each TSO has the following budget constraint: the revenue coming from national network tariffs should be in balance with the national network costs. Consequently, for the power generated in A and designated to consumption in B, neither the generator in A nor the consumer in B is entitled to pay for network charges in country C, even though part of the flow is transiting by country C and is therefore inducing costs to the TSO in country C.

In this setting, it would be reasonable to have local network users in country B supporting part of the network costs incurred in country C. In other words, it would be justified in finding a mechanism which would enable the compensation of the TSO of country C for the costs induced by the flow transiting through its network but designated for clients in a foreign country.

It is worth noting that, by using country C's network, country B might be inducing an incremental cost for C for all types of costs, be there network infrastructure and operation costs, system services costs or losses costs.[49] Therefore, the compensation issue created by transit flow would be valid for all these types of costs.

Thus it is clear that in these types of transit situations there is a compensation problem given the multi-TSO organisation. To solve this compensation problem, TSOs could impose cross-border tariffs at the border (trying to 'catch' transit flows) or by a specific compensation mechanism designed to ensure the necessary financial transfers.

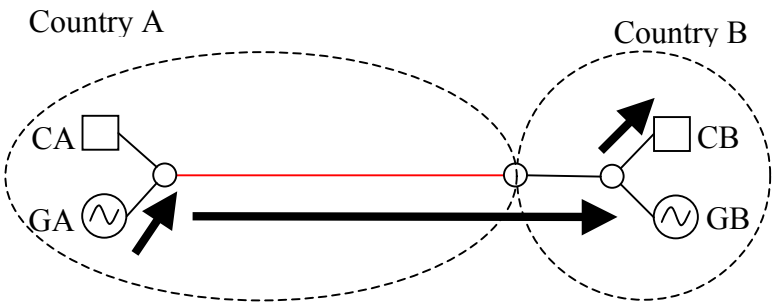
[49] Transits might also create benefits for the transit country, for instance creating counter flows and consequently decreasing internal losses or creating flows which increase other cross-border congestion rents. Thus, these benefits should also be included in the compensation mechanism. See for instance, Sintef (2007), "Transit in the European Power Market", SINTEF Energy Research, November 2007.

The problem of exporting/importing countries.

A problem of compensation also arises when the use of external networks is considerably asymmetrical between two countries. Although flows created between these two countries cannot be considered *per se* as 'transit' flows (i.e., there is not a third country), they lead to similar compensation issues.

Let us consider the following example of a hypothetical system composed of two interconnected national networks, A and B (cf. figure 7). Suppose also that in both countries the network costs are only supported by consumers (load). Moreover, assume that in this system one country (A) is constantly exporting to the other country (B) and within the exporting country, an important section of the domestic transmission network is (almost) exclusively used for exported electricity (red section). Thus the network costs of the exporting country are higher than what they would be in a situation without cross border flows.

Figure 7: The Problem of Exporting/Importing Countries



As explained before, in the ideal situation where there is a single TSO for the entire network of the two countries, allocating costs between network users is not an issue. The TSO can easily set its tariffs taking into consideration that consumers in country A are benefiting from the use of the network of country B.

In the multiple TSOs case, a problem of compensation arises because each TSO should ensure his own budget constraint, i.e. that the national network costs are only covered by domestic users. Consumers in country A have to pay for the full costs of the network in A even though the largest section of this network is used by consumers in country B. Again, as explained in the previous example, a consumer in country B is only entitled to pay charges in country B. In this configuration, compensation between the TSO of country B and the TSO of country A would also be justified in order for users in country B to cover part of the network costs incurred by country A.

Again, as in the previous case with three countries and transit flows, this problem could be compelling for all types of costs, and therefore there would be a compensation issue

not only for network infrastructure and operating costs, but also for systems services and losses costs.

It is important to note that compensation problems only arise in specific situations: there should be clear asymmetrical use of the neighbour network or clear asymmetrical cost. If the network and costs are symmetrical between the two countries and if there is a symmetrical use of the system in the two countries (for instance half of the time one country exports and the other half imports), there would not be any compensation issue. If it is not the case, then there will be a compensation issue, and network users would pay more or less than it would in a single TSO configuration.

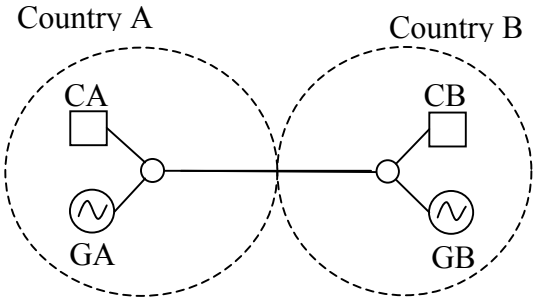
Thus, in the case where compensation is needed, it could be implemented by imposing cross-border tariffs at the border or by a compensation mechanism.[50]

The problem of the lack of harmonization.

Besides the compensation issues described above, there is a third type of problem resulting from a multi-TSOs organization: the lack of tariff harmonization between TSOs.

To illustrate this idea, we have chosen a case as example that can arise with two countries in the absence of harmonization between these two countries. Suppose a hypothetical system with two interconnected national networks, A and B (cf. Figure 8). In each country (country A and country B), there is one generator (G) and one load (or consumer, C). Both systems are identical except in terms of their tariff regime and of their network charging regime. We can take for instance the extreme case in which in country A, network tariffs are paid exclusively by load (i.e. G=0% and L=100%), and in country B, network charges are solely recovered from generators (G=100% and L=0%).

Figure 8: The Problem of the Lack of Harmonization



[50] Note that this kind of compensation problem could also be solved by sharing differently the network cost between generators and loads. For instance, if the part of the network cost that is only due to export in country A is allocated to GA, the problem of compensation disappears. However, this creates harmonization problems as it will be seen in the third example.

In this setting, if the generator in country B (GB) wants to export to the load or consumer in country A (CA), then GB will incur network charges in country B, and CA will pay network charges in country A. On the contrary, if the generator in country A (GA) wants to export electricity to the load in country B, neither GA nor CB will be entitled to pay network charges. A generator in country A can therefore export electricity to country B without paying any network charge.

In this example, we clearly have an asymmetric situation which favours generators in country A for their exports, and consumers in country B for their imports. Consequently this situation also favours flows from country A to country B, and deters power flows from country B to country A. This situation creates two types of issues. Firstly, the situation creates a clear impediment to the establishment of an Internal Electricity Market given that competition field is not levelised. Moreover this situation can create distortion of investment decisions. Secondly, the lack of harmonization modifies and complicates the compensation issues given that allocating the cost of the network between consumers and generators will define the allocation of costs within network users and this allocation could or could not be in line with network benefits.

Here again, to remedy to this situation, two possibilities can be considered:[51] obviously, harmonizing network charges across all the TSO or by imposing special charges on the border.

How to tackle compensation and harmonization issues?

In the introduction we have briefly described the single-TSO hypothetical case as the reference case in which a "single system paradigm" would be achieved. In the presence of several TSOs, we have shown that compensation and harmonization issues between these TSOs could arise and should be solved to get closer to the "single system paradigm" situation while maintaining several TSOs.

If these issues are not solved several problems could arise and the system would be unsustainable. Indeed if compensation problems stay, losers will refuse to collaborate with the creating of a regional market. They can do that by not investing in nation infrastructure needed for cross-border trade, by refusing to cooperate to increase the interconnection capacity or by refusing to cooperate in other forms of market integration as the use of efficient market mechanism to increase the efficiency of cross border trade (e.g., the creation of market coupling platforms). Moreover, long run distortion in the cross-border competition will appear if the harmonization problem is not solved.

Therefore, in order to ensure a workable and sustainable IEM, compensation and harmonization issues should be tackled. Although cross-border and transit tariffs could solve, at least partially, the compensation and harmonization problems, the latter requires regional, comprehensive and adapted solutions. This has been the way forward chosen in Europe, when implementing the EU ITC mechanism and tariff harmonization guidelines.

[51] In a way, this asymmetry issue could also be solved by using a compensation mechanism, but in fact, this would be equivalent to harmonizing the ways network charges are applied.

2.2. The Role of the EU Inter-TSO Compensation Mechanism and the Tariff Harmonization Guidelines

In Europe two instruments are being implemented to tackle compensation and harmonization problems. These instruments are key milestones in order to achieve a sustainable "single system paradigm". These two instruments are the EU ITC mechanism and a set of tariff harmonization guidelines. In this subsection, we briefly describe the principles of these mechanisms and point out their current capabilities.

The EU ITC mechanism

An annual voluntary Inter-TSO Compensation scheme was introduced in 2002. A legal basis for a mandatory ITC mechanism was eventually introduced in July 2004 with the adoption of EC Regulation 1228/2003.[52] This regulation proposed the adoption of binding guidelines for the ITC mechanism but this did not happen till today. Respectively, a voluntary compensation mechanism has evolved and the number of countries involved have considerably increased since 2002 (see appendix 1 for a brief description of the ITC mechanism history). Following several studies and difficult negotiations, in September 2010 new legally binding guidelines were approved with the release by the EC of the final regulation (Regulation (EC) No 838/2010))[53]. Nevertheless, the new guidelines keep the main design characteristics of the former voluntary ITC mechanism (in particular, the mechanism still only includes transit flows, infrastructure costs and losses, see below).

The Inter-TSO Compensation mechanism provides compensation to a national TSO for the use of its network by parties based in other countries. The compensation mechanism is composed of two components. There is a compensation for losses incurred on national transmission system as a result of cross-border flows of electricity, and there is a compensation for provision of infrastructure for cross-border flows of electricity (see appendix 2 for a more detailed explanation of the current ITC mechanism).

- Compensation for losses: The level of transmission losses compensation payment is based on two factors, namely the value of transit losses and the level each participating country contributes to the total network losses. The value of transmission losses costs resulting from cross-border flows is calculated on a With or Without Transit ("WWT") method[54]. This method is based on a comparison of the

[52] Regulation (EC) No 1228/2003 of the European Parliament and of the Council of 26 June 2003 on conditions for access to the network for cross-border exchanges in electricity.
[53] OJ L250.
[54] For losses, the total size of the compensation fund is computed as the sum of individual compensations due to all countries, while the required contribution of each TSO is calculated on the same basis as for compensation for provision of infrastructure. As highlighted by Olmos Camacho and Pérez-Arriaga (2007), one of the serious drawbacks of the WWT method is that the algorithm does not determine which countries have to contribute to the compensation due to another country and to what extent each of them

flows on the network between two scenarios, the first one corresponding to the actual system operation (i.e. actual network flows), and the second one being a load flow situation resulting from excluding transit flows, i.e. in which transits are removed and the hypothetical network flows needed to maintain system stability are calculated. The difference in network usage indicates the extent to which the network has been used to host transit flows and thus the extent to which, if at all, a TSO is entitled to compensation. The losses component is subject to ex-post adjustment to reflect deviations from ex-ante scheduled import and exports.

- Compensation for provision of infrastructure: The level of infrastructure compensation payment is based on two factors: the value of the infrastructure assets used to host transit flows and the level of transit flows between participating countries.

EU tariff harmonization guidelines.

Harmonization aims at facilitating competition of the interconnected transmission system across Europe and at avoiding the distortion of long-run investment decisions. Article 8 of Regulation 1228/2003[55] provides that the guidelines should "*also determine appropriate rules leading to a progressive harmonisation of the underlying principles for the setting of charges applied to producers and consumers*", without setting specific rules.

In 2005, ERGEG prepared draft guidelines on transmission tarification after extensive consultation. They proposed that 'G' charges should be harmonized on the basis of the national average level of G-charges.[56] After proposing these guidelines on transmission tarification, ERGEG launched a public consultation. In 2010, following this consultation, the EC could have notably decided either to take no action regarding harmonization, to adopt the 2005 draft ERGEG guidelines or to amend them by adjusting the range of allowable generation tariffs for using transmission system. The decision was finally taken to adopt the ERGEG guidelines.

Regulation (EC) No 838/2010 also sets the *'guidelines for a common regulatory approach to transmission charging'*.[57] The regulation clarifies the way transmission charges should be calculated. And it sets ranges for all Member States for annual average transmission charges paid by producers. More precisely, the final regulation sets a range

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must contribute to this compensation. As mentioned below, the global compensation fund is derived from the aggregation of compensations due to all countries and then, contributions to the fund are computed on the basis of the net exports and imports of each country.

[55] Article 8

[56] Harmonization could have been envisaged as setting out rules to ensure that generators charges are assessed on the same basis across the internal market (in terms of proportion of network costs borne by generators and how network costs are calculated) or directly as setting a range of allowable charges for generators.

[57] Part B of Regulation (EC) No 838/2010.

for each country within which transmission charges should be.[58] The draft guidelines provide a range of 0-0.5 €/MWh for generation charges for continental Europe, but it allows for a larger range for average generation charges in the Nordel system, Ireland, Great Britain, Northern Ireland and Romania. More precisely, the value of annual average transmission charges paid by producers should be within a range of 0-1.2 €/MWh in Denmark, Sweden and Finland; of 0-2.5 €/MWh in Ireland, Great Britain and Northern Ireland; and of 0-2.0 €/MWh in Romania.[59] The Agency for the Co-operation of Energy Regulators is responsible to monitor the appropriateness of the ranges of allowable transmission charges, and doing so should notably take into consideration the impact these charges have on the financing of transmission capacity needed by Member States and their impact on system users in general.

Assessment of the current EU ITC mechanism and harmonization guidelines.

An ideal compensation scheme will ensure all needed compensations between the TSOs. This mechanism and the corresponding pass-through to each TSO tariff and charges should exactly replicate the payments that network users would realize if there was a unique EU TSO or the "single system paradigm". An ideal compensation scheme should include all the costs and should measure how network users located in particular zones should share the network and operating costs of other zones.

The current EU ITC mechanism and harmonization guidelines have made an important step toward a single system paradigm. Its implementation has served to suppress all the cross-border tariffs within continental Europe and to contribute considerably to the establishment of the internal market. However, the current EU ITC mechanism does not correspond to the ideal design we have presented earlier. There are several issues that are not addressed by the current design of the mechanism and we describe some of them below.

Besides the critics related to the chosen "use-of-the-network" methodologies[60], the current ITC mechanism has two main drawbacks: i) it does not consider all the flows and,

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[58] It also gives some precisions on the way these charges should be calculated for comparison with the ranges set out in the regulation.

[59] Yet, the regulation does not clarify on the actions to be taken for a greater harmonization across European countries.

[60] The current ITC mechanism has also been criticized for several methodological problems. For instance, the WWT method used for losses requires the definition of the 'without' scenario, which is dependent on the location of political borders; therefore the method is not consistent with the 'single system paradigm' (Olmos and Pérez-Arriaga, 2007)). Moreover the WWT method computes the compensation entitlements of the different TSOs separately from their responsibility in financing the overall compensation fund. There is no intrinsic consistency in the way compensation entitlements and responsibilities are computed. Put differently, the mechanism employed to determine the TSO's entitlement to compensation does not provide any indication regarding the allocation of responsibility for such compensation and ad hoc criteria need to be used (FSR, 2005). Consequently, each TSO is

ii) it only covers specific network costs (losses and infrastructure costs). The current mechanism focuses on "transit" cost compensation.[61] Even though analyses suggested the importance to include all cross-border flows, the final regulation only considers transit flows for the calculation of compensations for losses and for provision of the infrastructure. Yet, one of the criteria for a good mechanism is that it should take into consideration all flows.[62] Moreover, the compensation scheme only includes losses and network costs. For instance, system services costs are excluded from the ITC mechanism,[63] although ETSO was arguing for a scheme which took into consideration other types of costs.

Regarding harmonization guidelines, the critics have been focused on their high flexibility. In fact, as harmonisation guidelines only set ranges of allowed tariffs, they would not give enough indications of what would be a perfectly harmonized tariff system. Moreover, as shown in Table 2, except for Austria and Norway, the required maximum annual average transmission charge paid by the producers as set in the regulation is actually lower than the average generation tariff paid by generators in the year 2009. Therefore, the harmonisation rules do not seem to be restrictive and will not change the situation.

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assumed to pay every TSO in the region the same fraction of the total compensation due to the latter, irrespective of the geographical or electrical proximity of the grids of the two TSOs. Finally, the 'without' scenario in the WWT method may result in lower flows over specific elements of the regional grid. This method therefore allows the identification of those transit flows that have a beneficial impact on the utilization of such elements. However, this impact may be affected by the specific definition of transits (Olmos and Pérez-Arriaga, 2007).

[61] Cf. Sintef (2007), "Transit in the European Power Market", SINTEF Energy Research, November 2007.

[62] Cf. FSR (2005).

[63] Note that the exclusion of these costs was already explicit in Regulation 1228/2003. However, they have not been excluded from the ITC mechanism because they are operating costs. Losses costs are also operating costs and they are included in the ITC mechanism. Two possible reasons might explain why system services costs have been excluded: i) system services are considered "local" costs and that they are really not affected by cross-border trades so compensation is not necessary and/or ii) the high complexity in estimating the compensation for system services and the corresponding sensibility to opportunistic behaviors. ETSO comments on draft ERGEG guidelines in 2006 call some operating costs in the compensation mechanism to be included: "*All TSOs, but one, consider that costs related to network assets should also include costs, as allowed by the concerned regulator, related to operation of these assets (costs of control rooms and dispatch operations) at least for voltage levels used in the ITC mechanism, and exclude the net costs of balancing the system and the cost of procuring ancillary services*" (ETSO, 2006. "ETSO Comments on ERGEG draft proposal of Guidelines on Inter-TSO compensation", May 2006). However, the final approved guidelines did not include these costs in the binding ITC mechanism.

Table 2: The problem of the lack of harmonization

Country	Generation tariffs paid in 2009 in 'base case' as efined by ENTSO-E (€/MWh) [A]	Maximum annual average transmission charges paid by producers as required by Regulation (EU) No 838/2010 (€/MWh) [B]
Austria	1.6	0.5
Denmark	0.4	1.2
Finland	0.3	1.2
France	0.2	0.5
Great Britain	1	2.5
Ireland	1.2	2.5
Italy	0.2	0.5
Norway	1	0.5
Poland	0.1	0.5
Romania	1.8	2
Sweden	0.6	1.2

Notes and Sources: [A]: Approximative values - ENTSOE (2010). *ENTSO-E Overview of transmission tariffs in Europe: Synthesis 2009*
[B]: Part B of the regulation (EC) No 838/2010 on laying down guidelines relating to the inter-TSO compensation mechanism and a common regulatory approach to tansmission charging

In conclusion, although the current ITC mechanism and harmonization guidelines are an important step toward a "single system paradigm", they do not solve all the issues of having a system with several TSOs. This unsolved problem could be used as an argument to justify the application of cross-border tariffs to interconnector users. In the following section, we show that applying cross-border tariffs could not be the most efficient way to solve compensation and harmonization issues in general and for the particular case of the BritNed Cable.

2.3. Is Charging BritNed an Efficient and Effective Way to Solve Compensation and Harmonization Issues?

Could UK charges on interconnectors solve compensation problems between TSOs?

The "single system paradigm", which implies that national network charges provide access to the entire EU network, is founded on the existence of a cost compensation mechanism between TSOs.[64] Indeed, different network characteristics or situations (e.g. transit, exporting or importing country) may create differences between the network and operating costs incurred by different TSOs. To be sustainable, the "single system paradigm" should be complemented with a compensation scheme for at least external

[64] FSR 2005

network use and implied infrastructure and operating costs (losses and/or system services).

An ideal compensation scheme would ensure all needed compensations between the TSOs. This mechanism and the corresponding pass-through to each TSO tariff and charges should exactly replicate the payments that network users would realize if there was a unique EU TSO. An ideal compensation scheme should include all the costs and should measure how network users located in particular zones should share the network and operating costs of other zones.

In Europe, the role of compensation is currently ensured by the ITC mechanism. It focuses on "transit" costs compensation and only includes losses and (infrastructure) network costs (i.e., system services costs are excluded from the ITC mechanism). So, it might be argued that TNUoS and BSUoS charges on interconnectors can be justified by the lack of cost compensations between EU countries.

A proper analysis of this argument should be done case by case (border by border) given that compensation needs will depend on each specific interconnector flows pattern and each TSO network situation. However, a preliminary analysis of this argument for the case of BritNed indicates that this might not be economically founded.[65]

The situation of the two systems connected by BritNed cable, British and Dutch networks, is nearer to exporting/importing case than the transit country case.[66] Thus to show that there would be a need of compensation between these two systems, two conditions have to be verified: i) there should be a considerable asymmetrical use of the systems and ii) there should be a difference in costs and this difference should only be due to asymmetrical use of the system. We focus here on TNUoS and BSUoS charges given that, as shown previously, losses "charges" applied to interconnectors are not playing a role of compensation because they are only covering the cost of losses of the interconnector.

The first condition to be verified to demonstrate the need for compensation between NGET and Tennet is whether the use of external networks between the two countries is considerably asymmetrical or not. For instance, an asymmetrical case would be when one country is constantly exporting to the other country, a situation that would consequently increase its network and operating costs during the whole year. This does not seem to be the case of BritNed potential flows. Historical simulations of hourly flow directions indicate that NL to UK cross-border efficient transactions (i.e., those where energy price in NL is higher than energy price in UK) occur 48% of the time and UK to NL cross border efficient transactions occur 42% of the time. During the rest of the time (10%),

[65] Further analysis would need a detailed hour-by-hour study of network and system services costs of both countries and the assessment of the impact of interconnection flows on these costs.

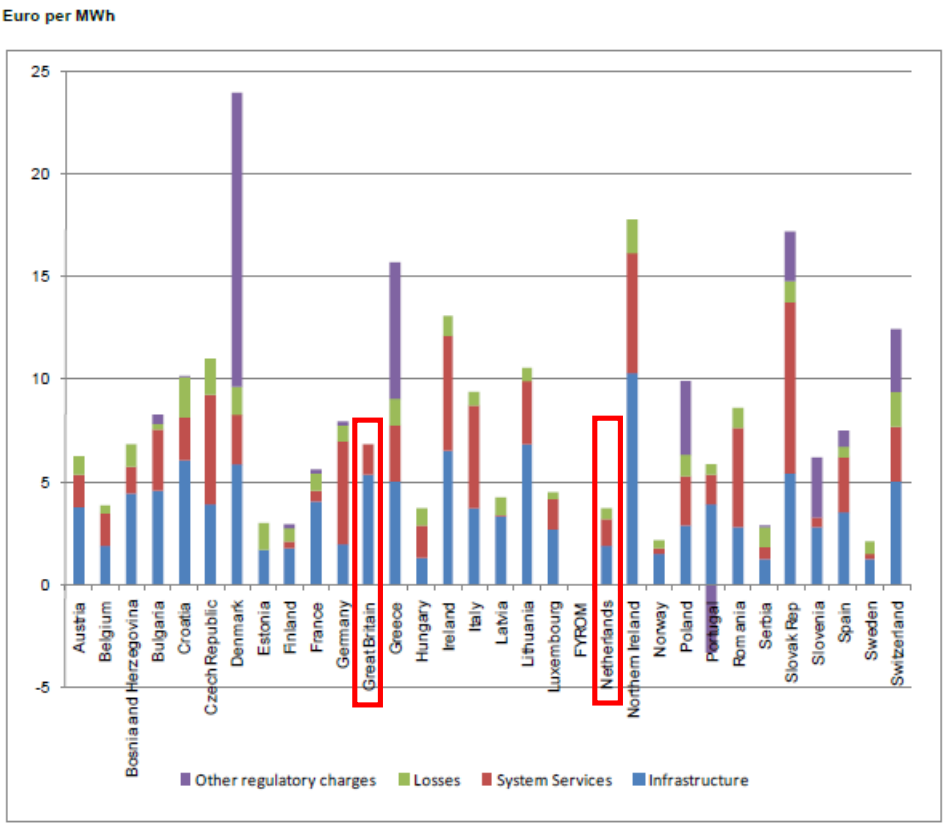
[66] Strictly speaking, there can be also 'transits' flows going through these countries. For instance, the Netherlands can be a transit country if German agents export to UK or the UK can be a transit country if Ireland exports to the Netherlands.

there is no flow between countries[67]. Thus this means that both British and Dutch consumers (load), which are covering an important part of network costs, are benefiting from the cross-border transactions.

The second condition to be verified to demonstrate the need of compensation between NGET and Tennet is that the difference in network and operating costs between countries is exclusively due to the asymmetrical use of the network and that this difference is not due to other issues (e.g., costs related only to national use of the network, inefficient management, investments or other external issues as regulation costs, taxes, etc.). We will verify this condition first for BSUoS charges and then for TNUoS charges.

At first glance, average system services costs in the UK and in the Netherlands are not very different (around 2 €/MWh, see figure 9). This would indicate that no compensation from Dutch users to British users is needed concerning BSUoS charges.

Figure 9: Infrastructure and System Services Charges in EU

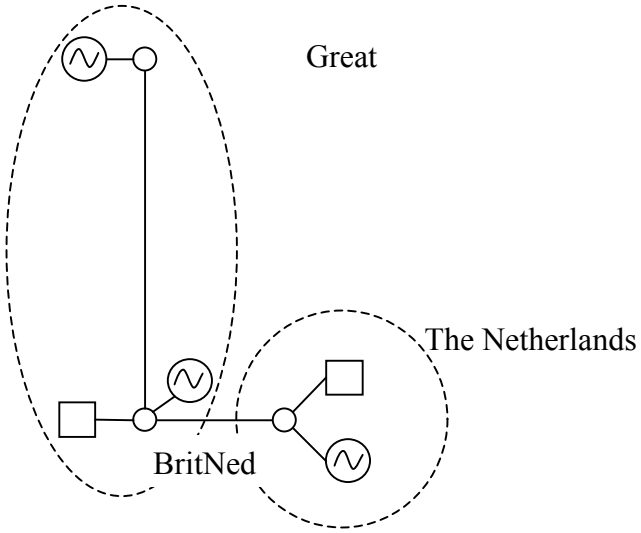


Source: ENTSO (2010)[68]

[67] Cf. Moss Ian, (2009), "APX-ENDEX, Market Coupling & BritNed", BritNed Connect Seminar, 10th December 2009 or von der Fehr and Newberry, (2003), "UK-Netherlands DC Interconnector".

The situation with infrastructure costs is much more asymmetrical. Average infrastructure costs are twice as high in UK than in the Netherlands (around 5 €/MWh for UK against 2.5 €/MWh for the Netherlands). This is mostly due to different national network sizes and topological configurations. In the UK, the main centres of generation and consumption are separated by a large distance while in the Netherlands generation and consumption centres are much closer (see figure 10). To prove that it could be an argument for compensation from Tennet to NGET, one should verify that during UK exporting periods, Dutch consumers benefit, at least partially, from UK north-south network infrastructures. Although quantitative analysis should be carried out to determine how UK infrastructures will be used by Dutch consumers via the BritNed interconnector, it seems unlikely that this accounts for a large part of the cost difference. For instance, it is possible that during UK exporting periods, energy is produced by generators located near British consumption which would imply that Dutch consumers are not using the network.

Figure 10: Infrastructure and System Services Charges in EU



In conclusion, it is not clear whether there is a need for compensation from Tennet to NGET in terms of supplementary costs created by BritNed power flows. Even if this compensation between Tennet and NGET were needed, it would not imply that imposing TNUoS charges on interconnector users would allow recovering the correct amount of money. Thus, to avoid pancaking problems and short-term inefficiencies, more general or regional solutions (e.g., ITC mechanism) would be preferred to border by border corrections.

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[68] ENTSO-E (2010), "Overview of transmission tariffs in Europe: Synthesis 2009", July 2010 (www.entsoe.eu)

Could UK charges on interconnectors solve the harmonization problem?

It is well-known that transmission network tariff regimes are not perfectly harmonized across Europe (cf. appendix 1).[69] It might be argued that network charges on interconnectors can be justified by the lack of harmonization of EU tariff regimes.

Network cost allocation between generators and loads (often called the G and L terms) is one of the main non-harmonized elements of EU tariff regimes.[70] This lack of harmonization of tariff regimes can create some long-term distortions of competition. For instance, in a system composed of two neighbouring countries, if only loads are paying transmission tariffs in one country (i.e. L=100%) and only generators are paying transmission tariffs in the other (i.e. G=100%), there is a clear advantage to increase generation capacity in the first country and to supply load in the second country.

It could be tempting to correct this lack of harmonization problem with network tariffs applied to interconnector users. However, this is not the most appropriate solution from an economic perspective. There are at least three reasons for this. Firstly, allocating network charges to interconnectors creates pancaking problems and short term inefficiencies (see above). Secondly, interconnector tariffs could correct the lack of harmonization only for the case of two countries. Indeed if there are three different countries with different tariff regimes (e.g., country A with G=50% and L=50%, country B with G=0% and L=100% and country C with G=10% and L=90%) the interconnector charging regime would not be able to completely correct lack of harmonization between them. Thirdly, current network charges applied to interconnector users may worsen the problem of harmonization. Consider for instance the case of BSUoS charges applied to the interconnector between the UK and France (IFA cable). BSUoS charges in the UK are shared 50:50 between generators and loads (i.e. G=50% and L=50%) whereas in France these charges (mainly integrated in the network tariff) are recovered exclusively from load (i.e. G=0% and L=100%). Applying UK BSUoS charges to interconnectors only "harmonizes" the situation for generators with respect to UK consumers/load, i.e., British or French generators have to pay the same BSUoS charges to sell in UK. However, this worsens the problem of harmonization for generators with respect to French consumers/loads given that British generators have to pay BSUoS which are twice as high as those paid by French generators.

In conclusion, applying network charges to interconnector users would not be the most efficient and effective way to deal with non-harmonization problems. More general or

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[69] The lack of harmonization is present in the level of tariffs as well as the tariff structure (i.e. G and L terms, capacity and energy terms, etc.). Cf. ENTSO-E (2009), "ETSO Overview of transmission tariffs in Europe: Synthesis 2008", www.entsoe.eu ; Perez-Arriaga (2008), "Transmission issues in cross-border trading of electricity Internal compensation charges in the EU", ENERGY POLICY RESEARCH SEMINAR JFK School of Government Cambridge, December 15, 2008.

[70] There are other non-harmonized elements, for instance, the definition of balancing mechanism (e.g., the size of the settlement period), the allocation of availability payments on imbalance prices, etc.

regional solutions, such as avoiding border by border corrections, will be preferred (e.g., harmonization guidelines) and would be more economically efficient.

2.4. Conclusions of the Compensation and Harmonization Analysis

In the presence of several TSOs, a workable EU internal electricity market can only be ensured in a system working under the "single system paradigm". This implies that compensation and harmonization issues between these TSOs should be completely resolved. Solving these issues is critical to ensuring the sustainability of an integrated market and a fair cross-border competition in the long-run.

Unilateral solutions to tackle compensation or harmonization problems as charging interconnector are far from being efficient and effective. Indeed these types of solutions seem to create/reinforce cross-border problems. In fact compensation and harmonization issues call for regional, multilateral and comprehensive solutions. This has been the way forward chosen in Europe by implementing the EU ITC mechanism and tariff harmonization guidelines. Although the current ITC mechanism and tariff harmonization guidelines are not perfect, they have considerably improved the situation. Unsolved issues should be tackled by improving current instruments and not by charging interconnectors.

Part B. Legal Analysis

This section analyses the compliance of the UK network charges system as applied on interconnectors and interconnector users under the sector specific regulation and general EU law. This issue, besides others, has recently been addressed in a reasoned opinion by the European Commission (June 2010).[71] The Commission identified various violations. One of the key issues was concerns about the UK's provisions on network charges. The Commission considered them to be not in line with the requirements of Regulation (EC) No 1228/2003 on conditions for access to the network for cross-border exchanges in electricity.[72]

Our analysis confirms such result. The existing charging system as applied on interconnectors is not in compliance with the sector specific legislation. By the same token, it does not respect the spirit of EU law, which sees the role of interconnectors as to promote access for any EU operator to a "European" grid.

3. The Legality of the UK Charging System under Sector Specific Legislation

This section examines whether the UK charging system applied to interconnectors and interconnector users run counter to the EU sector specific legislation, namely Regulation (EC) 714/2009 on conditions for access to the network for cross-border exchanges in electricity.[73]

3.1. Provisions Governing the Connection of an Interconnector to the UK Transmission System

In the UK, the connection of an interconnector to the British transmission system is governed by the Connection and Use of System Code (CUSC). A company operating an

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[71] Energy: Commission requests 20 Member States to implement and apply Single Market rules without delay - country fact sheets, Memo 10/725, Brussels 24 June 2010. Besides concerns with regard to the legality of the charges system there were other issues, such as: the information on interconnection capacity is still insufficient; network congestion is managed in a way which is not in line with the requirements of the Regulation; there is still no intraday congestion management mechanism at all interconnections, nor is there a common co-coordinated congestion management method.

[72] Regulation 1228/2003 of 26 June 2003 on conditions for access to the network for cross-border exchanges in electricity, O.J. 15.7.2003, L 176/1.

[73] Regulation 714/2009/EC of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (EC) No 1228/2003, OJ L211/15.

interconnector must enter into a bilateral connection agreement declaring the CUSC binding upon it. The CUSC, being subject to approval by the gas and electricity markets authority Ofgem, foresees the payment of TNUoS, BNUoS and connection charges.[74]

As outlined in the framework of the economic analysis, to date TNUoS charges are applied to three types of transmission users: (i) generators, (ii) consumers and (iii) interconnector owners. In terms of tariffs levied upon them, interconnectors were considered as generators in importing situations (i.e., flows going into UK) and as consumers in exporting situations (i.e., flows leaving UK). However, as mentioned above, in the aftermath of the public consultation by NGET in 2010, Ofgem changed the UK network charges regime: interconnectors will be treated as a separate class of transmission users, distinct from generation or demand, and they will be exempted from TNUoS charges.[75]

BSUoS charges to date are applied separately to production (generation or imports from interconnectors) and consumption (demand or export to interconnectors). Their lawfulness has not been subject to the review undertaken recently. Generally all CUSC Parties including interconnector users are liable for BSUoS charges on the basis of the energy they take from or supply to the NGET system.

3.2. Structure of Regulation 714/2009

It was in the context of the Florence process that rules on cross-border exchanges were finally negotiated between participants. The final compromise was then made legally binding by the European Commission by means of Regulation 1228/2003. Regulation 1228/2003 had a clear harmonization purpose, especially concerning tariffs for cross-border transactions, since the national tariff systems in use diverged too widely, thereby creating trade distortions.[76] The primary objective of Regulation 1228/2003 was to clarify the rules of the game in three core areas: cross-border tariffs and ITC scheme, transparency, methods of cross-border capacity allocation. The first area is of interest to us in the context of this report. We note that the new Regulation 714/2009 leaves the wording of Regulation 1228/2003 unchanged in this area.

A core objective of the Regulation is to outlaw distance-related tariffs and pancaking. It is clear that specific import and export charges, such as BNUoS and TNUoS applied on

[74] See National Grid, Charging and Connections – current arrangements. Available at: http://www.ofgem.gov.uk/Networks/Trans/PT/Documents1/TransmiT_Event_NG.pdf

[75] Cf. Ofgem (2010), Decision letter in relation to Use of System Charging Methodology Proposal GB ECM-26 "Review of interconnector charging arrangements", October 2010 (http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=132&refer=Networks/Trans/ElecTransPolicy/Charging)

[76] Recital 11 of the Regulation 1228/2003.

interconnectors and interconnector users, amount to distance-related charges within the meaning of the Regulation.[77]

In practice physical flows do not match contracted paths and opposite contractual flows may net each other. It thus makes sense to set up a framework where compensation for the use of national networks is not based on individual fees for international trade but on a global compensation mechanism based on physical flows. It has been agreed during the negotiations that costs will be equally split between the importing and the exporting countries. Imposing additional costs on market players who created cross-border flows could be considered more cost-reflective but this solution was not retained. It was indeed considered that all market players benefit from the completion of a truly single market for electricity. Actual physical flows also do not directly result from cross-border trade but from imbalances between surplus and deficit areas. Consequently, it was finally decided to fully socialise transit costs among all network users in each country.[78]

The Regulation on cross-border exchanges addresses the network charging system of Member States through two complementary mechanisms:

Art 13 provides for a compulsory ITC mechanism at EU level. It establishes the right of TSOs to be compensated for the costs they bear as a result of hosting cross-border flows of electricity along their networks. It thus prevents pancaking by ruling out national TSOs to get compensation bilaterally through additional charges. Compensation should be based on real costs incurred. This means that they should also take into account the possible advantages of hosting cross-border flows (e.g. reduction of losses). Art 13 leaves room for the enactment of implementing guidelines under Art 18. Accordingly, the new Regulations 774/2010 (expired on the 2nd of March 2011) and 838/2010[79] (entered into force on the 3rd of March 2011) are meant to implement a binding ITC mechanism, thereby replacing the former voluntary one.

Art 14 aims to limit differences in national tariff systems that would create trade distortions. It only applies to consumers and producers. Additional import/export fees are contrary to Art 14. National charges should be non-discriminatory, cost-reflective and not distance-related (Art 14(1)). Art 14(5) explicitly states that there shall be no specific network charge on individual transactions for declared transits of electricity. Additional costs should indeed be socialized over the whole network users and not solely be placed

[77] See e.g. the Commission's impact assessment accompanying the proposal for an ITC at section 2.1. and 2.2.

[78] This choice however creates problems as market players do not take into account the network costs they create when they take locational decisions, thereby creating increased congestions in cheaper areas. To compensate, Art 4 of the Regulation provided for the opportunity to increase network charges in surplus areas, although it was not an obligation. These locational signals however *de facto* exist in practice where auctions for interconnection capacities are organized to deal with congestions.

[79] Commission Regulation (EU) No 838/2010 of 23 September 2010 on laying down guidelines relating to the inter-transmission system operator compensation mechanism and a common regulatory approach to transmission charging.

on exporters/importers. We note that trade distortions are still possible as Member States retain the right to fix domestic charges (Art 14(2)). However, the new Regulation 838/2010 aims to put a limit to this by setting a range (in EUR/MWh) within which each Member States' annual average transmission charge should stand (Recital 10, Art 2, Part B).

There are clearly two different but complementary mechanisms and one must take into account the results of the other (Art 14(3)(a)). Art 13 and 14 are therefore the relevant norms against which one has to assess the lawfulness of the UK charging system.

3.3. TNUoS and BSUoS Charges under Art 14 of Regulation 714/2009

As already mentioned, Art 14 defines the conditions for setting the charges for access to the network. The provision explicitly foresees that these charges may be born by *consumers* and *producers* (Art 14(2)).

As concerns TNUoS charges, NGET used to consider that interconnector owners were consumers (when withdrawing) or producers (when injecting) for the purpose of network charging. This interpretation does not follow the rationale of the Regulation which sees interconnectors as interfaces between national transmission systems. The Regulation read in conjunction with Directive 2009/72/EC is unambiguous in this regard (see Art 2 of both the Directive and the Regulation). Art 2(13) of the Directive makes clear that interconnectors are only "*equipment used to link electricity systems*" whereas a generator is "*a natural or legal person generating electricity*" (Art 2(2)) and wholesale consumers are "*natural or legal person purchasing electricity for the purpose of resale inside or outside the system where he is established*" (Art (2)(8)). Producers, consumers and interconnectors are thus different concepts clearly delimited from each other. Britned clearly does not generate or purchase electricity itself. We note that the fact that Britned is a DC cable does not change the fact that it cannot be seen as a generator. Actually, flows are controllable, so Britned is close to a power plant in that perspective. However, Britned follows the results of the market (implicit auction) or the schedules of markets participants. So the flows depend on market participants, rather than on Britned's decisions. We note that there is no incentive for traders to voluntarily create an imbalance in real time (i.e. not respecting the day ahead scheduled programs). This could happen only if both NGET and TenneT allowed traders to sell cross-border balancing services. Overall, Art 14 of Regulation 714/2009 does not allow for the imposition of TNUoS on Britned since interconnectors are not the addressee of the norm.

We also note that the European Commission in the context of dispute settlements never considered interconnectors as part of the wholesale supply market. Following its line of reasoning in the *UK-France interconnector* and *Viking Cable* settlements (and

subsequent cases),[80] interconnectors have always been considered explicitly or implicitly part of the market for transmission services between Member States.[81]

The case of BNUoS charges is slightly different, since they are intended to be applied on interconnector users. It would be technically possible for the explicit auction part (it can be introduced in the auction price, and users would be traceable) but not for the market coupling part (where users are not traceable and it is much harder to introduce it in the PX algorithm). As a default solution, Britned would bear the charges.

For the part imposed on Britned, the analysis is the same as for TNUoS charges. Britned is not a producer or user and therefore should not bear any charges. In parallel, additional BNUoS charges on cross-border traders cannot be introduced in the explicit auction price as it would amount to make cross-border traders pay twice for a domestic tariff, which is exactly what the Regulation aims to avoid. The Regulation 714/2009 is clear in its Recital 15: "*It would not be appropriate to apply* […] *a specific tariff to be paid only by exporters or importers in addition to the general charge for access to the national network*".[82] If compensation is indeed legitimate, then it has to be done through the ITC mechanism (Art 13).

Lastly, our economic analysis has clearly shown that the existing charging system complicates the implementation of efficient market coupling solutions. It is true that impairing market coupling is not expressly in breach of the Electricity Regulation as long as non-discriminatory market-based methods such as explicit auctioning are in use (para 2.1 of the congestion management guidelines). However, one of the main tasks of TSOs remains to facilitate market integration (Art 12 of the Directive) and that to this end "*the maximum capacity of the interconnections* […] *shall be made available to market participants*" (Art 16(3) of the Regulation). In addition, TSOs ought to cooperate under the Directive and the Regulation in order to create efficient regional markets. In view of the fast development of price coupling in the north-western European region, impairing market coupling goes counter this objective. In the present context, it is our opinion that only compelling reasons regarding network security or environmental concerns could justify limiting market coupling.

3.4. TNUoS and BSUoS Charges under Art 13 Regulation 714/2009

Compensation for costs incurred from cross-border flows are appropriately regulated under Art 13 which organizes inter-TSO compensation. Only as a result of compensation made under Art 13 NGET will be allowed to adjust TNUoS and BNUoS charges imposed on local producers and consumers (Recital 12, Art 13(3)(a)).

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[80] *Viking Cable*, settlement in COMP/E-3/37.291; *UK/France Interconnector*, informal settlement, IP/01/341 of 12.03.2001.

[81] For more on this, see section 4.

[82] The new Regulation 838/2010 also states: "*Each regulatory authority shall ensure that […] no additional charges for hosting cross-border flows of electricity are included in charges applied by transmission system operators for access to networks*" (2.1. Part A).

We note that the coverage of Art 13 is very wide. It includes all cross-border flows, including export and import flows (Art 13(1)). It is thus not limited to transit flows. It also includes almost all categories of costs covered by TNUoS and BNUoS charges as it generally covers all "*costs incurred as a result of hosting cross-border flows of electricity on their network*" (Art 13(1)).[83] As a consequence, it cannot be argued that costs covered by TNUoS and BSUoS charges fall outside the scope of Art 13 and therefore can be compensated bilaterally.[84] If compensation is legitimate, Art 13 provides a directly applicable and compulsory mechanism.

An objection could be raised on the ground that the new binding ITC mechanism does not foresee compensation for all costs currently covered by the TNUoS and BNUoS charges (essentially balancing and internal congestion) and only addresses transit flows. Does this allow NGET to recover them bilaterally?[85]

Our answer is negative. Art 13 is self-executing, i.e. is directly applicable and binding even in the absence of implementing guidelines and/or a possibly insufficient coverage of the existing compensation scheme. EU Regulations are directly applicable in national legal system and, in the event of any conflict with national laws and regulations the latter should be set aside or interpreted as to comply with EU legislation. The absence of certain implementation rules does not affect the compulsory nature of the provisions of the Regulation. We recall that guidelines are primarily tools for the interpretation of the rules of the Regulation and that they do not create new rules. Due to this self-executive nature, the absence of appropriate guidelines does not lead to the inapplicability of Art 13 or even an application of Art 14 *mutatis mutandis* for the purpose of compensation.

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[83] We note that Art 13 is not always perfectly clear on what "*costs incurred as a result of hosting cross-border flows of electricity on their network*" exactly means. If one of the components of the charges was not covered by Art 13, the legality would have then to be assessed exclusively under general EU law (see next section).

[84] We note that Art 14 also has a very wide definition of network charges, as it can include "*the amount of network losses and congestion caused, and investment costs for infrastructure*" (Art 14(2)). From an economic perspective, BSUoS charges (which include e.g. internal congestion management) do not qualify as access charges but rather as operational charges due to the fact that they are related to the '*operation'* of the system. Whereas access charges refer to infrastructure as such, i.e. sub-stations, lines and cables, operating charges refer to those costs occurring while operating these infrastructures. Since the BSUoS charges at issue compensate for the services that the network operator, here NGET, needs to provide for in order to balance the transmission system (ancillary services; offers and bids made in the balancing mechanism and other services available to the licensee's transmission system) we are not dealing with access charges in the usual sense. Nevertheless, we see that this differentiation is largely irrelevant in practice (most access charges in the different Member States include e.g. balancing services) and from a legal point of view (Art 13 and 14 include losses, internal congestion costs, etc).

[85] We note that we had the same problem with TNUoS, when there were no implementing guidelines.

We note that compensation through the ITC of the currently uncovered costs was foreseen but was finally not implemented. There are two reasons to this. First of all, the effect of cross-border trade on balancing/ancillary costs is generally considered marginal. The second reason is the high complexity[86] of estimating the amount for compensation. In 2006, ETSO tried to include congestion management costs and other balancing costs in the compensation mechanism but finally agreed to leave them out. If NGET deems it necessary to have a wider ITC it cannot act unilaterally but depends on urging for a extension of scope at EU level of the existing ITC through new Art 18 guidelines.

The last question is whether Britned could be considered as a TSO and therefore be liable to compensate NGET through the ITC mechanism. We note that this seems to be, the interpretation of Ofgem and BNetzA. In our view it is not the case. Art 3(2) clearly states that "*the compensation shall be paid by the operators of national transmission systems from which the cross-border flows originate and the system where these flows end*". Flows will neither originate not end in Britned. Only when an interconnector is part of a single control block, and is therefore controlled by a national TSO, it can it be considered as part of a wider TSO (Art 2(2) (last paragraph)). The Directive and Regulation imposes on TSOs plenty of requirements which are not foreseen in the Art 17 procedure.[87] Overall, it is also clear that the new Regulation 838/2010 does not consider interconnectors as TSOs but as interfaces between TSOs.

4. The UK Charging System under the EU Competition and Free Movement Rules

This section examines whether the imposition of TNUoS and BSUoS charges on interconnectors and interconnector users by NGET complies with those provisions in EU law ensuring access to the Single Market: the competition and free movement rules.[88]

While aiming at compensation, hence solving an internal problem, the UK charging system has a detrimental effect on the completion of the IEM. From an EU law perspective, it raises a typical 'free movement' problem. Nevertheless, we will primarily focus on compliance with the EU competition rules (Art 102 TFEU prohibiting abuses of dominance) for the following reasons:

- In view of the recent *Svenska Kraftnät* (SvK) jurisprudence (2010), the Commission seems increasingly willing to use competition law to tackle the abusive behaviours that create obstacles to the free movement of goods, peoples and capital. We note

[86] The same seems to be true also for the exclusion of import/export flows.

[87] We note that ETSO in its response to the EC Consultation Document on the Inter-TSO compensation mechanism (17 March 2009) clearly stated that merchant interconnectors should be excluded from the ITC (p.4).

[88] State aids, public procurement or taxation provisions could also be considered in this category but are irrelevant in our case.

that the jurisprudence of the European Courts has shown that competition rules are perfectly able to address these situations.[89]

- While the Commission has extensively used the rules on free movement in the early days of energy liberalization,[90] the use of competition law is now preferred, presumably for reasons of procedural economy. In fact, the Commission has powers under competition law (Art 9 of Regulation 1/2003) to negotiate commitments directly with dominant undertakings to rapidly address competition problems. In view of the recent ruling of the European Court of Justice in *Alrosa*[91] (2010), which broadly supported the policy of the Commission on commitments, it can be assumed that the Commission will not change its strategy.[92]
- The Treaty provisions governing free movement refer to measures the State must take. The interpretation of state is very broad and entails measures taken by national authorities. Ofgem, as an independent body which has been granted regulatory powers by national legislation fall within the scope of the provisions.[93] From the Commission's point of view, an infringement procedure against the British state for non-compliance with EU law is procedurally less efficient and politically probably more costly.[94]

Therefore we will ask whether, in the light of the SvK (Svenska Kräftnet) jurisprudence, the imposition of the UK charging system on interconnectors could be considered as an

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[89] e.g. Case 27/76 *United Brands* and related cases. Arguably the French initiative to take Article 3 EC out of the Lisbon Treaty, and thus eliminate competition as a core Treaty objective to put it instead in a protocol which relates to the internal market makes the case for using competition rules to achieve market integration even stronger.

[90] See e.g. C-159/94 *Commission v. France*, C-158/94 *Commission v. Italy*, C-157/94 *Commission v. Netherlands*. For comments see Blanchard, "French Electricity Sector: ECJ Decision on Monopolies for the Import and Export of Electricity", 17(3) *Journal of Energy and Natural Resources Law* (1999), 265-280; Cameron, *Competition in Energy Markets* (2007), Oxford University Press; Gunst, "Energy Trade in the European Common Market – Free Movement, Exceptions and Regulatory Inaction", 21 *Journal of Energy and Natural Resources Law* (2003), 447-469; O'Loughlin, "EC Competition Rules and Free Movement rules: An Examination of the Parallels and their Furtherance by the ECJ Wouters Decision", 24(2) *European Competition Law Review* (2003), 62-69; Talus, "Role of the European Court of Justice in the Opening of Energy Markets", 8 *ERA Forum* (2007), 1-14.

[91] C-441/07 P *Alrosa*.

[92] For more on the Commission practice regarding commitments and an assessment, see Hancher and Hauteclocque, "Manufacturing the EU Energy Markets: the Current Dynamics of Regulatory Practice", 11(3) *Competition and Regulation in Network Industries* (2010), 307-334.

[93] Following e.g. C-129/00 *Commission v. Italy*. See generally on this Craig, "Legal Control of Regulatory Bodies: Principle, Policy and Teleology", in Birkinshaw and Varney (eds.), *The European Legal Order After Lisbon* (2010), Kluwer Law International, 93-116.

[94] We note that NGET could also be considered as an emanation of the British State (following Case C-188/89 *Foster v. British* Gas, Case C-103/88 *Fratelli Constanzo SpA v. Commune di Milano*) and thus be liable for damages in British Courts.

abuse of a dominant position by NGET under EU competition law. SvK was a very peculiar case but full of more general insights. As competition and free movement case law are increasingly converging,[95] we will use both to support our analysis.

We note that the reasoning in the SvK case was entirely based on EU competition law whereas the case could have also been addressed under EC Regulation 1228/2003 and the congestion management guidelines. Such approach indicates that the Commission may also be willing to use competition rules to solve problems related to non-compliance with the sector-specific legislation.

In the SvK case, the industrial association of Danish energy companies Dansk Energi submitted to the Commission in June 2006 a complaint regarding an alleged abuse of dominant position by SvK on the Öresund interconnector linking Southern Sweden and Eastern Denmark. Later on, the Commission broadened the scope of the inquiry and included all interconnectors linked to the Swedish high voltage transmission grid. The argument was that SvK was curtailing transmission capacity on the Öresund interconnector to decrease costs linked to counter-trade and lower Swedish spot market prices. Dansk Energi argued that the curtailment led to the limitation of cross-border trade, hence to the creation of a barrier to internal market integration to the detriment of Eastern Danish consumers.

The Commissions inquiry led to the following commitments by SvK: from 1 November 2011, and for a period of 10 years SvK will subdivide the Swedish transmission system into two or more bidding zones. By 30 November 2011 the network will also be reinforced by building and operating a new 400kv line in the West-Coast-Corridor.

This section follows step by step the analysis of the Commission decision of 14 April 2010 in SvK and draws the parallel with the UK situation and NGET. It therefore analyzes the following:

- Is NGET responsible, under the EU competition law, for the distorting effect of the UK charging system?
- What is the relevant product and geographic market?
- Is the UK charging system raising competition problems under the EU competition law?

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[95] See e.g. Gyselen, "The Emerging Interface Between Competition Policy and Environmental Policy in the EC" in Cameron and May (eds.), *Trade and Environment* (1994), London; Mortelmans, "Towards Convergence in the Application of the Rules on Free Movement and on Competition?", 38 *Common Market Law Review* (2001), 613-649; Schmidt, "Diagonal Competence Conflicts Between European Competition Law and National Regulation – a Conflict of Laws Reconstruction of the Dispute on Book Price Fixing", *European Review of Private Law* (2000), 155. O'Keefe and Bavasso, "Four Freedoms, One Market and National Competence: In search of a Dividing Line", in *Liber Amicorum in Honour of Lord Slynn of Hadley* (2000), The Hague.

- Are there acceptable 'objective justifications' for the UK charging system under EU competition law?

4.1 Responsibility of SvK and NGET under the EU Competition Rules

The first question is whether NGET can be held responsible under competition law. Looking at the SvK case, the fact that SvK is a state-owned central administrative authority that does not have legal personality did not hinder its qualification as an undertaking (and thus its responsibility) under EU competition rules. With reference to the Court's case law the Commission stated that an entity engaged in economic activities is considered to be an undertaking in the meaning of Art 102 TFEU regardless of its legal status and the way it is financed.[96] To support his argument, the Commission noted that SvK has the capacity to be an independent party to legal proceedings where a matter falls within its area of competence. It also enjoys considerable autonomy in practice. Given this extensive definition, NGET can be considered as an undertaking under EU competition law.

The second question is to establish whether NGET bears responsibility for the specific practice under review. In the SvK case, the Commission established the responsibility of SvK in curtailing the interconnector capacity. Establishing responsibility was very easy to do as soon as it was established that SvK was independent from the Swedish state when taking operational decisions like interconnection management.

NGET is much more independent from the British state than SvK was from the Swedish state. An objection could however be raised in view of the fact that Ofgem regulates the charges imposed by NGET. In short, does the fact that Ofgem intervened shield NGET from antitrust liability when it collects network charges?

In the *Deutsche Telekom* case, the Commission confirmed that EU competition rules could be enforced towards a dominant undertaking applying a previous decision of a national regulator if it left room for an abuse of dominant position. This was confirmed by the General Court and lately by the Court of Justice on 14 October 2010.[97] The Court made clear that a decision of the national regulator cannot shelter the dominant undertaking from its responsibility on the basis of the principle of legitimate expectation, and that an undertaking as Deutsche Telekom (or NGET for that matter) would be considered responsible for the abusive charges *as it is its responsibility to solicit a change of tariff to the regulator* (something NGET has actually done for TNUoS charges). Lastly, The Court held in his judgment that the fact that the Commission could have started an infringement procedure against the German state (and thus the British state) under Art 260 TFEU[98] does not limit the responsibility of Deutsche Telekom (and thus NGET) under competition rules. The responsibility of NGET is thus well established as regards the UK charging system.

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[96] Case C-41 *Höfner and Elser*, Case C-280/06 *ETI and Others*, Case C-350/07 *Kattner Stahlbau*.
[97] Case-280/08 *Deutsche Telekom AG v Commission*.
[98] See also C-6-9/90 *Francovich*.

4.2. Relevant Product and Geographic Market

The Commission decision on the relevant market in SvK followed its usual practice, which reinforces our conclusion that an interconnector cannot be considered as a generator or consumer.

In SvK, the relevant *product* market was defined as the (220-400kv) transmission grid including the interconnectors connected to it. This indeed follows the Commission's jurisprudence where the electricity transmission market broadly includes transport of electricity between points of the high voltage grid.[99] The fact that Britned is a merchant cable does not change that definition.

The definition of the relevant *geographic* market has however been less straightforward. It includes two options: the geographic market is either the interconnector itself[100] or the whole national TSO's network including interconnectors, i.e. either only the cross-border transmission market (e.g. UK-Netherlands) or the whole transmission grid located on the national territory and borders.[101] *In both cases, the jurisprudence of the Commission shows that an interconnector cannot be considered as a producer or consumer*. In SvK, the geographic market was considered as being the whole Swedish transmission grid including interconnectors.

On this basis, the relevant market in a competition case investigating the charging system of NGET is likely to be the UK grid including all exempted interconnectors. In this case we would have several suppliers, NGET and the interconnectors, providing UK transmission services. It could be argued that each interconnector linked to the UK is a specific relevant market in its own right but this would not (directly) prevent NGET's charging behaviour from having an impact on merchant interconnection investment incentives or on market prices in the UK and foreign wholesale and retail markets. The case where the Commission considered the interconnector as the relevant market in itself covered situations where it investigated whether long-term access rights on already amortized interconnectors were acceptable or whether the two parent companies of a joint venture could actually market the (exempted) interconnector capacity without colluding. This market definition would thus be used e.g. to investigate whether Britned markets its own capacities in full compliance with competition law. We note here that obtaining an exemption under Art 17 of Regulation 714/2009 (replacing Art 7 of Regulation 1228/2003) does not shelter the investors from EU competition scrutiny *ex post*. [102]

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[99] Following Case M.5154 *CASC JV*, Case M.4922 *EMCC*, Case M.3696 *E.ON/MOL,* Case M.3440 *EDP/ENI/GDP*.

[100] *UK-France interconnector* - IP/01/341 of 12.3.2001, Case E-3/37.921 *Viking Cable*, Case M.5154 *CASC JV*, Case M.4922 *EMCC*.

[101] Case M.3440 *EDP/ENI/GDP*, Case M.3696 *E.ON/MOL,* Case M.3696 *E.ON/MOL,* Case M.3440 *EDP/ENI/GDP*.

[102] For more on this see Hauteclocque and Rious, "Regulatory Uncertainty and Inefficiency for the Development of Merchant Lines in Europe: A Legal and Policy Discussion", in

However, the precise definition of the relevant market is not so consequential, insofar as it is well-established Court case law that a business conduct on one market having an anticompetitive effect on another market can also be considered as an abuse of a dominant position.[103] As was highlighted in the preliminary assessment of the Commission in SvK (p.6):

> "*the competitive analysis which concerns the transmission of electricity within Sweden and for exports to other Member States and Contracting Parties to the EEA Agreement does not depend on whether only one specific interconnector line or the national transmission grid is considered to be the relevant geographic market. Even when the interconnector is not owned or co-owned by the Swedish state or SvK, SvK can, in any event, control and thereby reduce the available capacity for this interconnector as the owner of the transmission grid in Sweden*."

We believe it to be the same in the case of NGET. Being dominant (actually a *quasi*-monopoly)[104] on the UK transmission grid, the behaviour of NGET (its charging system on interconnectors) can have an influence on cross-border flows and on Britned's profitability.

We finally note that the relevant market would constitute a so-called 'substantial part' of the internal market, as the business practice under review has the potential to appreciably affect trade between Member States, which is a necessary condition for the case to fall under the jurisdiction of EU competition rules. From the case law, we indeed see that the impact of an abuse of dominant position on EU trade may be direct or indirect, actual or potential.[105] Hence, the definition is very wide, and always includes cases involving interconnectors.[106]

Delvaux, Hunt and Talus (eds.), *EU Energy Law and Policy Issues* (2010), 2nd edition, Brussels: Euroconfidential, 163-182.

[103] See generally Case C-62/86 *Akzo*, Case T-83/91 *Tetra Pak*. See also all cases where an "essential" input on one market is needed for competition to develop on a related market (so-called vertical dominance cases).

[104] We note that the dominant position of SvK and NGET in the respective relevant markets is self-evident. As the Swedish state granted an exclusive concession to SvK to operate the electricity transmission network, SvK is a monopoly and therefore holds a dominant position on the electricity transmission network in Sweden. NGET also owns and operates the electricity transmission network in England and Wales (except a dozen of off-shore transmission grids managed by independent operators) and thus holds the same dominant position than SvK. It will entail the same related *special* responsibility not to impair competition.

[105] Case C-42/84 *Remia BV and Others v. Commission*; Case C-359/01P *British Sugar v Commission*.

[106] It is clear from the case law that no *de minimis* threshold exists in relation to the articles concerning free movement of goods. It means that a state measure can constitute a prohibited measure even if it is of relatively minor economic significance or if it is only

4.3 Practices Raising Concerns: Insights from the SvK Case for the Situation under Review in this Report

The Svk case is all the more interesting in that it applies to a completely unbundled TSO with no interest in supply activities, like NGET and more and more European TSOs in the future. It shows that even ownership-unbundled TSOs can infringe competition rules. This situation represents, therefore, an entirely different scenario from the traditional one, that saw transmission networks as 'essential facilities' in the energy sector where abuses were linked to the existence of a vertically-integrated company favouring its affiliated supply arm in related markets.[107]

The competition concern in SvK was that the Swedish TSO had curtailed capacity on the Swedish interconnectors when internal congestion problems on the national transmission system might arise. This behaviour would imply an abuse of dominant position, as curtailing interconnectors in these conditions would amount to:

1. Discriminating between different network users: SvK treated (i) internal demand for transmission for the purpose of consumption and (ii) external demand for transmission for the purpose of export in a different way. For the Commission, internal demand was satisfied whenever capacity was available whereas external demand was refused despite availability during a substantial number of hours during the year. The Commission actually recalled: the prohibition of discrimination on grounds of nationality is a fundamental principle of EU law (Art 18 TFEU). This principle in fact underlies the whole proceeding.[108]

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applicable on a very limited geographical part of the national territory, see Case C-67/97 *Bluhme* [1998] ECR I-8033. Conversely, in case of competition rules a *de minimis* threshold does apply (see the Notice on agreements of minor importance which do not appreciably restrict competition under Article 81(1) of the Treaty (*de minimis*), O.J. 22.12.2001, C 368/13), but generally not to a practice so inherently linked to cross-border trade. However we saw in (Case M.2947) *Verbund/Energie Allianz* in 2003, concerning Austria, that little weight was given to the cross-border tariff, of 0.5 euros/MWh, to be paid for transmission of electricity between Germany and Austria. Because of the specific features of the Austrian market, the Commission held that this tariff acted as a barrier to entry "*only to a limited extent*", which shows that the magnitude of the restraint should be taken into account, at least under competition rules.

[107] On the case law on "essential facilities" in energy, see Kotlowski, "Access Rights to European Energy Networks – A Construction Site Revisited", in Delvaux, Hunt and Talus (eds.), *EU Energy Law and Policy Issues* (2010), 2nd edition, Brussels: Euroconfidential, 87-118; Hauteclocque, Marty and Pillot, "The Essential Facilities Doctrine in European Competition Policy: The Case of the Energy Markets", in Glachant, Finon and Hauteclocque (eds.), *Competition, Contracts and Electricity Markets: A New Perspective* (*forthcoming* 2011), Cheltenham: Edward Elgar.

[108] See generally on the case law regarding discrimination: Bernard "Discrimination and Free Movement in EC Law", 45 *International and Comparative Law Quarterly* (1996), 82-108.

The Court used the criterion of discrimination to back Art 102 TFEU proceedings in many instances. Since market integration is one of the core objectives of the EU Treaty, every State or firm behaviour that has as its object or effect the fragmentation of markets is likely to be caught by Art 102 TFEU. As summarized by the Commission in its SvK decision, the Court has used such reasoning in two categories of competition cases: (a) straightforward discrimination on ground of nationality by a dominant undertaking,[109] (b) discrimination taking the form of applying dissimilar conditions to equivalent transactions.[110] In the second case, the measure has a discriminatory effect, but not necessarily on grounds of nationality. Discrimination can thus also arise when a measure results in a disadvantage for a portion of domestic market players compared to other domestic or foreign market players.[111] Of course, an 'internal market' dimension still needs to be established.

Looking at the free movement of goods case law, it appears unclear whether discrimination on grounds of nationality (reinforced by a protectionist intent or effect[112]) is necessary for a prohibition, or if inequality between market players creating trade restraints is sufficient. We believe that the second interpretation should be favoured as tackling 'apparently' non-discriminatory measures, which nevertheless restrict cross-border trade, is necessary to achieve the Treaty goals of free movement.[113] This difference between discrimination and inequality as the definite test for prohibition under the free movement rules is however, irrelevant under EU competition law.[114]

2. Solving an internal problem to the detriment of the completion of the internal market: SvK has artificially segmented the internal market and hence prevented foreign industrial and other users to benefit from the single market. Indeed, SvK artificially maintained low prices in Sweden and high prices in Denmark. The fact that a conduct on one market (transmission in Sweden) creates anti-competitive trade restriction on another market (wholesale in neighbouring countries or wholesale in Sweden) is a typical abuse of dominance covered by EU competition law.

To sum up: in the first line of reasoning discrimination/inequality between market players is emphasized. As a complement, the second line addresses the choice of the dominant

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[109] Case T-139/98 *AAMS,* Case 7/82 *GVL.*

[110] Case C-18/93 *Corsica Ferries*, Case C-163/99 *Portuguese Republic v Co*mmission, Case C-82/01 *Aéroports de Paris.*

[111] Davies, "Understanding Market Access: Exploring the Economic Rationality of Different Conceptions of Free Movement Law", 11 *German Law Journal* (2010), 671.

[112] This is the interpretation of the Court e.g. in Joined Cases C-267-8/91 *Keck & Mithouard.*

[113] Supporting this interpretation, see Case C-110/05 *Commission v. Italy* and the opinion of the Advocate General in Case C-412/93 *Leclerc* and Case C-110/05 *Commission v. Italy*. We note that with the other freedoms (establishment, services),[113] the principle of equality among all market participants replaced discrimination on grounds of nationality (See e.g. Case C-55/94 *Gebhard*, Case C-369-76/96 *Arblade*, Case C-415 *Bosman*).

[114] More on this below.

company to favour its own interests to the detriment of the single market. How could this be applied to the situation of NGET?

1. Discriminating between different network users:[115] At first glance, the NGET situation does not fit easily in this first line of reasoning. NGET indeed imposes the same charges on all UK network users (assuming interconnectors are users). It is thus more a case of inequality than discrimination.

   The essence of the discrimination prohibition under Art 102 TFEU is that dominant firms have a special responsibility to ensure a fair competitive process among customers on downstream markets.[116] The prohibition of discrimination therefore requires that comparable situations are not treated differently unless such difference in treatment is objectively justified.[117] Conversely, different situations must be treated differently, in particular if a similarity of treatment damages these customers on the markets in which they operate. Indeed, it is the very fact that a measure affects some market participants more negatively than others, and therefore changes their relative competitive positions, which makes market access harder for disadvantaged parties and creates indirect discrimination.[118] The question then is to demonstrate whether (i) the UK charging system ensures a fair competitive process on downstream markets (wholesale markets in UK and the Netherlands) and (ii) some customers (here importers/exporters) of UK transmission services suffer from competitive harm.

   In the case of the UK charging system, TNUoS and BSUoS charges are apparently equally applied. However it is the actual effect which matters. Our economic analysis has shown that by creating pancaking situations, both TNUoS and BNUoS charges disadvantage market players involved in cross-border flows (essentially UK to Netherlands). The system thus (i) distorts competitive conditions on related downstream markets and (ii) creates competitive harm and loss of welfare, in particular to customers in the Netherlands.

   We also recall that the Union since the beginning of liberalization has put the emphasis on increasing cross-border trade, not only by tackling exclusive

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[115] In order to use the discrimination argument against NGET, the relevant market would have to be defined as the UK grid including interconnectors. If it is defined otherwise, abuse would have to be grounded as in point 2 and 3 of the analysis below.

[116] Case 85/76 *Hoffmann-La Roche,* Case C-322/81 *NV Nederlandsche Banden Industrie Michelin*. See also Behrens, "Controlling Dominance or Protecting Competition: From Individual Abuses to Responsibility for Competition" in Ullrich (ed.), *The Evolution of European Competition Law: Whose Regulation, Which Competition?* (Edward Elgar, 2006), 224-232 and M. van der Woude, "Article 82 EC – Abuse of a dominant position", in Jones (ed.), *EU Energy Law (Volume II): EU Competition Law and Energy Markets* (2007), 2nd ed., Claeys & Casteels, Brussels.

[117] Case C-280/93 *Germany v Council.*

[118] We note that the Court still uses a presumption of *equal burden* for these "apparently" non-discriminatory measures. It is thus upon the claimant to prove the restricting effect on market access.

import/export monopolies[119] and long-term priority access rights signed before liberalization,[120] but also by outlawing distance-related tariffs[121] and providing for the creation of an inter-TSO mechanism.[122] By hindering the continuous effort of the Union to create a right to any customer or producer of the Union to access a truly *European* grid, NGET does not fulfil its responsibility vis-à-vis the competitive process and undermines the effectiveness of the Union system for access to networks.[123] The fact that TNUoS and BNUoS charges complicate the implementation of market integration trade platforms would fit generally in this line of reasoning. We also note that in several competition cases, the Commission already had the opportunity to say that flat transfer charges for cross-border flows were generally arbitrary, discriminatory, anti-competitive and not cost-reflective.[124] In this perspective, it is fairly straightforward to argue that NGET creates discrimination or inequality and thus abuses its dominant position when it imposes TNUoS charges on interconnectors.

2. Solving an internal problem to the detriment of the completion of the internal market: The NGET case fits more easily in this second line of reasoning where discrimination does not have to be established. The SvK case served to establish three basic criteria to be fulfilled to ground a competition offence in cases where domestic goals conflict with market integration: (i) the company under scrutiny must be dominant, (ii) the dominant company must engage in the practice under review with a view to achieve domestic goals, be they for its own benefit or for the benefit of its own nationals; (iii) the practice under review must have an impact on the creation of a true single market in energy.

   SvK is the dominant undertaking on the relevant market and therefore has a special responsibility for not impairing the completion of the single market. The practice under review has a clear internal purpose, alleviating internal congestions and thus reducing costs, and this is clearly to the detriment of foreign customers and free trade

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119 E.g. Case IV/32.732 *Ijsselcentrale* and cases cited supra note 91.

120 See European Commission, *Role of interconnectors in the electricity market. A competition perspective:* MEMO/01/76 of 13.3.2001, and the cases cited supra note 101.

121 See Regulation 1228/2003.

122 For a full analysis of the developments in this field, see Hauteclocque and Talus, "Capacity to Compete: Recent Trends in Access Regimes in Electricity and Natural Gas Networks", in Delvaux, Hunt and Talus (eds.), EU *Energy Law and Policy Issues III* (*forthcoming* 2011), Euroconfidential, Brussels.

123 It is interesting to recall that in the *Bussone* case (Case 31/78 *Francesco Bussone v. Italian Ministry of Agriculture*), the Court held that the adoption of the national rule under review was illegal only because it could hinder directly or indirectly, actually or potentially the effectiveness of the Union system.

124 See the Case M.1673 *VEBA/VIAG* and Case *Verbandevereinbarung*, Report on Competition Policy (1998), 156-159; see also the analysis of the latter case in Albert, "Energy Liberalization and EC Competition Law", 25 *Fordham International Law Journal* (2001), 909-945.

within the internal market. The competition offence was thus well grounded in this case.

The application of the SvK jurisprudence on the UK charging system for backing a possible offence is fairly straightforward. NGET, the dominant company on the relevant market, is imposing charges on interconnector users for cost recovery – an internal purpose – to the detriment of free trade within the internal market (pancaking).[125] As shown in the economic section, charges imposed by NGET indeed do reduce cross-border trade by lowering the range of efficient cross-border transactions and increasing the cost of market coupling implementation. As a result, the behaviour of NGET on the UK transmission market has an anti-competitive impact on the UK (and foreign) wholesale and retail markets.[126] A competition concern acceptable under EU competition law thus also exists in this case.

3. Other possible competition offences: other competition offences not strictly related to the SvK case could probably be investigated by a competition authority. In particular, the effect on other market players' incentives to invest in interconnectors is interesting to our analysis. If the relevant market is the UK transmission grid including all interconnectors, it could indeed be argued that NGET by imposing charges on interconnectors and interconnector users creates barriers to new entry in the supply of UK transmission services.[127] As we have seen in our economic analysis, the UK charging system creates disincentives to invest in interconnectors by hindering the business case of new (merchant) interconnectors, i.e. complicating entry in a part of the relevant market. Raising barriers to entry is a competition offence, in particular for a "*super-dominant*"[128] undertaking. In addition, as NGET also invests in merchant interconnectors (and thus gets part of its money back through the charging system), it might also be considered as an exploitative behaviour.[129]

   We note that this type of analysis is not unfamiliar to the SvK case. In this case, it is also interesting to see how the Commission justifies the adequacy of the

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[125] This of course also applies to TNUoS charges.

[126] We note that cross-border charges had also been analyzed by the Commission as a barrier to entry in a gas case (Case M.931 *NESTE/IVO)*.

[127] By extension, in case all possible cross-border transmission markets were separate relevant markets (e.g. UK-Netherlands, UK-Ireland, UK-Norway, etc.) it could also be argued that the NGET charging system has an exclusionary or pre-emptive (NGET keeps the option to invest later) effect.

[128] As defined by Advocate General Fennelly in Case C-395/96P and C-396/96P *Compagnie Maritime Belge Transports SA and Others*; see also Case C-1/36.915 *Deutsche Post AG – Interception of cross border mail.*

[129] We note generally that allowing regulated TSOs to invest in merchant interconnectors leads to potentially severe anti-competitive effects and inefficiencies. On this, see Hauteclocque and Rious, "Reconsidering the Regulation of Merchant Transmission Investment in the Light of the Third Energy Package: The Role of Dominant Generators", EUI Working Papers, RSCAS 2009/59.

commitments it accepts (the creation of bidding zones) as it spells out clearly all competition concerns the commitments must address. Bidding zones are generally intended to prevent a distortion of price signals and to reflect market conditions. In particular, they are intended to give important investment signals for both new grid investments and new generation capacity that will lead to price convergence between the zones in the long run. In the SvK case, the Commission makes clear that a dominant undertaking distorting investment signals for grid investment (including interconnectors) and thereby hindering price convergence might be responsible of a competition offence. This line of reasoning could work also in the UK case.

4. 4. 'Objective Justifications'

Here we discuss whether the UK charging system might be considered objectively justified under EU competition law despite its negative effect on single market integration. Objective justifications can be *economic* or *non-economic* in nature.

4.4.1. Economic Justifications

Objective justifications are generally of an economic nature in competition cases, even though reasons of wider public interest are also considered from time to time.[130] Under Art 101 TFEU, the EU primary provision addressing cartels, the balancing of anti-competitive effects and objective justifications (generally referred to as 'efficiencies') is current practice. This is, however, not very often the rule in practice under Art 102 TFEU due to the special responsibility of dominant companies vis-à-vis the competitive process and the internal market. If in theory a dominant company can submit objective justifications, this is only rarely accepted by the Court.[131] Accordingly, the analysis of objective justifications is the shortest part in the competition analysis of the Commission in the SvK case.

The existence of a real balancing assessment between anti-competitive effects and efficiencies in more traditional abuse of dominant position cases with a "purer" antitrust rationale is largely theoretical. We can therefore hardly foresee that it will be carried out in a competition case where the competition offence is a breach of one of the most fundamental principle of the European Union, i.e. single market integration.[132] The Court

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[130] See generally e.g. Monti, "Article 81 EC and Public Policy", 39 *Common Market Law Review* (2002), 1057-1099.

[131] See the argument by Temple Lang and O'Donogue in "The Concept of a Exclusionary Abuse under Art 82", Working Paper (2005), Global Competition Law Center on "objective justification": "*This issue deserves serious consideration, since a defense that is recognised in theory, but not in practice, is the same as no defence.*" See generally Loewenthal, "The Defense of "Objective Justification" in the Application of Article 82 EC", 28(4) *World Competition* (2005), 461-463.

[132] To the opposite we note that, since Case 120/78 *Cassis de Dijon*, the Court is trying to reach a balance between prohibition and exceptions (the so-called "rule of reason"

has indeed clearly stated that quantitative restraints to exports (i.e. *any* measures having equivalent effects to state taxes on imports/exports[133] – Art 30 TFUE) by a dominant undertaking amounts to a restriction *by object* under the competition rules.[134] This means that there is no need to quantify *the effect* on market integration to state that there is indeed an abuse. It is also well established under Art 101 TFEU that practices hindering the fundamental objective of market integration such as market partitioning clauses in supply/transport contracts are almost never accepted, which also amounts to a *quasi per se* prohibition.[135]

If we assume that the Commission or the Court would truly carry out a balancing exercise between the internal (economic) benefits for the dominant firm and the magnitude of the damage to market integration under competition rules than the four criteria of Art 101(3) TFEU should *at least* be fulfilled as conditions are likely to be substantially more restrictive for a dominant company. These criteria[136] state that the behaviour under review should (i) substantially improve economic efficiency, (ii) give a fair share of benefits to final consumers, (iii) be indispensable or at least proportional to the achievement of the efficiency gains and (iv) not afford contracting parties the possibility of eliminating competition in respect of a substantial part of the products in question. Objective factors out of the control of the company such as public service obligations may also be taken into account and will be analyzed later.

The first criterion indicates that the UK charging system must create significant efficiency gains and that a causal link between the achievement of the claimed efficiency and the restrictive practice must be clearly established. As we saw, the UK charging system cannot be directly linked to all costs incurred (e.g. internal congestion costs): it is

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exceptions) in the free movement of goods case law (see below). It is also true for the freedoms of establishment (Case C-55/94 *Gebhard*) and services (Case C-3/95 *Broede*).

[133] In Case C-120/78 *Cassis de Dijon*, the Court stated that "*all trading rules enacted by Member States which are capable of hindering directly or indirectly, actually or potentially, intra-Community trade are to be considered as measures having an equivalent effect to quantitative restrictions*". See also e.g. C-2-3/62 *Commission v. Belgium and Luxembourg*, Case 8/74 *Dassonville*, Case T-115/94 *Opel Austria v. Council*. Measures of equivalent effects to an export/import tax do not have to be collected by the state or redirected to it. They do not even have to create discrimination or concern a good that would be in direct competition to a local good. It just has to be a sum of money, however small, imposed by the very fact that a good crosses a frontier within the internal market. It therefore seems likely that TNUoS and BNUoS charges imposed on interconnections and interconnector users will be considered as measures having equivalent effect to cross-border quantitative restraints. We however note that the *Cassis de Dijon* decision has been widely criticized for going too far and that the subsequent cases have not always been consistent.

[134] Case 58-64 *Consten and Grundig*.

[135] The Court therefore seems less willing to consider justifications under competition rules than under free movement rules, probably because state measures generally have a stronger "public interest" component.

[136] We note that the four criteria should all be fulfilled, they are thus not mutually exclusive.

not clear whether import/export flows increase fixed and variable costs of NGET. Compensation, as it is now organized, does not "*contribute to improving the production or distribution of goods or to promoting technical or economic progress*".[137] In the past, the two main efficiency gains recognized so far by the Commission in energy have been investment and entry.[138] Internal benefits of UK charges seem to be very weak[139]. Moreover, as we saw, UK charges distort interconnector investment incentives and hinder cross-border trade, thereby limiting entry. Criterion (i) is therefore far from being fulfilled.

We can also wonder whether protecting the competitiveness of UK generators in their home country could be considered as an efficiency. It has indeed been argued during the NGET consultation on TNUoS charges that the removal of charges from interconnectors would be detrimental to the competitiveness of UK generators vis-à-vis foreign generators on the domestic market, and that it could even lead to the relocation abroad of certain UK generators. Similar concerns had been expressed by respondents to the market test of the SvK case. It had been argued that the introduction of bidding zones will raise industrial prices in the south of Sweden and will affect their ability to compete on their own markets. The Commission made clear that this was not an acceptable justification to the behaviour of SvK as European industrial consumers also face unfair competition from Swedish industrial consumers benefiting from electricity prices which do not reflect market prices. As a result, restoring fair competition across the single market here means creating a level playing field for industrial customers in the whole Union. In the light of the SvK case, protecting the UK market from the risk of relocation abroad cannot be considered an objective justification.

As regards the second criterion, we note that even under Art 102 TFEU objective justifications had generally to be justified in terms of efficiencies *and* consumer interests.[140] As concerns customer interest, we fail to see a clear benefit of the UK charging system, except as concerns cheaper prices for UK consumers to the detriment of Dutch customers.

The third criterion addresses the problem of the *proportionality* and of the *necessity* of these charges.[141] As regards proportionality, cost-reflectivity is the key factor. We note that Regulation 714/2009 clearly states that as a general principle mutual compensation is acceptable but should be cost-reflective to avoid creating artificial barriers to entry.

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[137] Commission Guidelines on the application of Article 81(3) of the Treaty, O.J. 27.4.2004, C 101/97. The Commission guidelines also note that "cost savings that arise from the mere exercise of market power by the parties cannot be taken into account".

[138] E.g. *Synergen*: Report on Competition Policy 2002, IP/02/792 of 31.5.2002; Case C-37.966 *Distrigaz*.

[139] Cf. note 25.

[140] Case C-95/04P – *British Airways*.

[141] We also find in the free movement case law these criteria of proportionality and so-called "alternative means", i.e that where there is another measure which is less restrictive of trade, the first measure would be neglected .

Our economic analysis has shown that there is no evidence that the existing charges compensate NGET for the right amount or that additional export/import flows actually do create any additional fixed and variable costs to NGET depending on the circumstances. In theory, a justification of the distorting measure could be that it in fact corrects a market failure or an externality. In our case, the externality could be the additional congestions created. However, our economic analysis has shown that UK charges are not clearly implemented for this purpose and do not give efficient signal to cross-border transactions. In a nutshell, there is no reason to believe that TNUoS and BSUoS charges would pass the proportionality test.

As regards necessity, the objective is to demonstrate that these charges are the most efficient way, amongst other alternatives, to solve the problem of the dominant incumbent. In the SvK case for instance, it is likely that if curtailment had clearly been the most efficient solution and it had been *transparently* reported and discussed with the national regulatory authority, it would have been acceptable under the competition rules, at least in the short term. This interpretation is reinforced by the fact that the new draft ERGEG framework guidelines for capacity allocation and congestion management in electricity[142] explicitly acknowledge it. Even if we can assume that the transparency requirement is fulfilled for NGET, as Ofgem reviews and approves the charging system, we are not aware of any comparative assessment carried out in partnership with Ofgem showing that TNUoS and BNUoS charges are the best way to obtain compensation. It therefore appears that these charges would also fail the necessity test.

As regards the fourth factor, it is hard to quantify the percentage of competition that would be eliminated. Our economic analysis has however shown that the restraint is potentially very significant. We roughly calculated that the loss of welfare only due to inefficient trade could be of 60 M€/year, and that it could be considerably higher if we consider the competition effect of cross-border trade (see box 1).

Overall, we cannot see how the UK charging system on interconnectors could be objectively justified, at least on economic grounds.

4.4.2 Non-Economic Justifications

The question remains whether there are acceptable non-economic justifications (e.g. social policy, environment, security of supply). In our case security of energy supply, meaning network reliability (for BSUoS) and network investment (for TNUoS) could provide for justification. NGET could argue that there is the need to recover its total costs in order to suitably ensure short-term security of supply. The case for invoking a 'security of supply' argument seems however very weak in the case of UK charges on interconnectors. Moreover, non-economic benefits are generally seldom taken into account in competition cases. Even long-term gas import contracts are not sure to be

[142] ERGEG, *Draft Framework Guidelines on Capacity Allocation and Congestion Management for Electricity*, E10-ENM-20-03, September 2010.

accepted on the basis of a 'security of supply' argument.[143] Remarkably, even when the public interest (e.g. strategic use of domestic natural resources[144]) was much more clearly at stake, the Court in recent cases[145] gave more prominence to free movement/competition arguments.[146]

Yet, non-economic justifications also play a key role in the area of free movement, albeit in a different guise:[147] the so-called "mandatory requirements of general interest" exemption may be invoked in respect of measures which apply without distinction to national products and products from other Member States.[148] As seen, this is the case for the UK charging system. However, demonstrating that the conditions for this exemption are fulfilled is difficult. It must be demonstrated that 'in the absence of the measure under review, there would be a serious and foreseeable risk that the non-economic benefit pursued would not be achieved'.[149] It can hardly be argued that the absence of UK charges on interconnectors would "*seriously undermine*" security of supply in the UK.

Lastly, NGET, if considered 'an undertaking entrusted with a public service obligation regarding security of supply' could obtain an exemption under Art 106(2) TFEU[150] from the competition and free movement rules. As certified TSO, NGET is indeed entrusted with the operation of many services of general economic interest (see Art 3, 12 and 15 of Directive 2009/72/EC), to which security of supply belongs.[151] There are four requirements to be exempted under Art 106(2) TFEU: (i) the undertaking must have been given a specific task, (ii) the task must have been granted by the state pursuant to a measure of the public authorities, i.e. a public act, (iii) the task in question can only be

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143 Even though the series of cases involving dominant exporters (Gazprom, etc.) evidenced the influence of non-economic elements in the analysis, see for instance Talus, "Long-term Gas Agreements and Security of Supply – Between Law and Politics", 32(4) *European Law Review* (2007), 535-548.

144 Case 72/83 *Campus Oil Ltd.*

145 E.g. Case C-196/07 *CNE*, Case C-207/07 *Endesa*, Case C-206/06 *Essent*, Case C-439/06 *Citiworks*.

146 E.g. Case 72/83 *Campus Oil Ltd*; Case C-347/88 *Commission v. Hellenic Republic.*

147 Purely economic benefits are not acceptable as justification and non-economic benefits are the norm, see for instance Case C-158/96 *Kohll*: "*aims of "purely" economic nature cannot justify a barrier to the fundamental principle of freedom to provide services*".

148 Keck

149 In *Kohll*, the Court stated that "*the risk of seriously undermining the financial balance of the social security system constitute an overriding reason in the general interest capable of justifying a barrier of this kind*". See note above.

150 As a "privileged undertaking", NGET shall "be subject to the rules contained in the Treaty in so far as the application of those rules does not obstruct the performance in law or in fact, of the particular tasks assigned to them. The development of trade must not be affected contrary to the public interest".

151 This argument was made in Case 91/50 *Ijsselcentrale*, Case C-158/94 *Commission v. Italy*, Case C-393/94 *Almelo*.

performed under acceptable economic conditions[152] if the relevant Treaty Articles are not applied and (iv) the Union interest must not be adversely affected.[153] Conditions (i) and (ii) are easily fulfilled: the British state entrusts NGET with security of supply obligations and Ofgem publicly grants an exclusive right to impose charges. Condition (iii) is the competition law version of the proportionality test analyzed above,[154] and we saw that the existing charging system does not fulfil it. Condition (iv) interestingly imposes that the Union interest is not negatively affected by the measure. Here again the charging system clearly fails the test as it creates pancaking, discrimination and it does not tackle the compensation and harmonization problems in the interest of the Union.

To conclude: The case law is somehow ambiguous on whether or not *per se* prohibitions exist under Art 102 TFEU for business practices hindering single market integration. However, in all likelihood 'objective justifications' with a weak economic or non-economic rationale, as it is the case for the UK charging system, could not shield NGET from antitrust liability. The analysis pursued under alternative EU legal basis yields the same result.

General Conclusions

The UK charging system as applied on interconnectors is both detrimental to the integration of the single market in electricity and not in compliance with EU law. We summarize our findings against the relevant objectives specified in SLC C5(5) of NGET's electricity transmission license and its statutory duties.

SLC C5(5)(a) – Facilitates effective competition in the generation and supply of electricity and facilitates competition in the sale, distribution and purchase of electricity

UK network charges as unilaterally implemented by NGET create pancaking problems and cross-border inefficiencies. Their imposition leads to a limitation of competition in the internal market, restrict efficient cross-border transactions and increases implementation costs on market integration.

Compensation and harmonization issues naturally call for comprehensive and EU-wide solutions. From an economic point of view, unsolved issues should be tackled by improving current EU instruments and not by charging cross-border transactions.

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[152] Case C-C-320/91 *Corbe*au.

[153] Hancher, "Article 86: Special and Exclusive Rights", in Jones (ed.), *EU Energy Law (Volume II): EU Competition Law and Energy Markets* (2007), 2nd ed., Claeys & Casteels, Brussels.

[154] As noted by Hancher (ibid), the Art 106(2) TFEU test is wider than the pure free movement test as it accommodates economic justification.

SLC C5(5)(b) – Costs reflectivity – charges which reflect, as far as reasonably practicable, the costs incurred

UK network charges on interconnectors are, in general, not cost reflective with respect to cross-border interconnector users and create several inefficiencies. The reason for this is threefold.

Firstly, UK network charges create pancaking problems which is making certain cross-border network users pay twice for the same service. This is the case for instance of Dutch consumers who should have to pay for the network twice if they import energy from the UK.

Secondly, UK network charges are not cost reflective because they are not properly implemented. Indeed the charges applied to interconnector users do not correspond directly to the real costs created by the cross-border flow. This is the case for instance of BSUoS charges which are not reflective of internal congestion costs created by interconnector flows.

Thirdly, the existing charging system implemented unilaterally by NGET is not cost reflective with respect of compensation and harmonization problems. It creates automatic compensation even when compensation is not needed. When compensation is needed, charges are usually not cost-reflective.

SLC C5(5)(c) – Properly taking account of developments in the transmission system

Finally UK network charges on interconnectors do not properly take into account the development in the transmission system. These charges create distortion of interconnection investment incentives. Indeed, UK charges lower the economic interest that investors and, more broadly, the EU community have in the interconnector, possibly to a point where the project would no longer be profitable.

Appendix

Appendix 1 – EU ITC History

The 2002 voluntary ITC scheme was one of the early agreements reached within the Florence Forum in 2000. It however was not followed by prompt implementation. It was meant to be a transitory solution to replace transaction-based cross-border tariffs and to overcome tariff pancaking.

The first compensation scheme, called at that time cross-border transfer (CBT) mechanism, included nine participating countries (87 TWh and involved a fund of 200 M€). It allowed suppression of several cross-border transaction tariffs and pancaking problems. In fact, a year before, in 2001, every country had enforced its own cross-border transmission tariff and imports, exports or transits of energy though a power system which used to be charged for the use of every national network.

Between 2004 and 2006, difficulties with obtaining and evaluating real network flow data delayed the development of an agreed methodology to measure and compensate cross-border flow costs in a manner consistent with the Regulation's requirement that costs are based on Long Run Average Incremental Costs ("LRAIC"). By the end of 2006, ITC Guidelines had not been submitted to the EC's Comitology process. ERGEG did not submit formal advice to the EC. This delay prevented the EC to proceed with a mandatory ITC scheme.

In the absence of agreement, ERGEG advised that until an agreed methodology was established it should be the responsibility of ETSO to reach an agreement on the choice of method to be adopted in any interim period. ERGEG advised that ETSO should indicate its formal position on its preferred choice with respect to the methodology it intends to pursue with respect to both the interim period and for the longer terms, subject to the approval of the national regulators.

In light of ERGEG's advice, ETSO developed a proposal to apply for the years 2008 and 2009 that was again based on a voluntary approach. (To tackle the participation issue, ETSO's public position on the continuation of a voluntary arrangement was that the voluntary mechanism could only proceed with the inclusion of all its members. The terms of the circulated agreement contained a clause requiring all signatories to confirm the support of their national regulators for the inclusions of the costs within the scheme within their national tariff mechanisms. The effect of this clause was that if one or more TSO did not receive the support of their national regulators for their participation in the scheme, then the scheme would become null and void for all signatories. The implication was that only with full participation could ETSO, ERGEG and the EC be confident of progressing mandatory ITC Guidelines for implementation from 2010.)

This agreement for the years 2008 and 2009 ended on 31 December 2009. In December 2009, TSOs reached a new agreement for an interim solution to be enforced until the

official EC guidelines for ITC compensation were adopted during the year 2010. In the same month, a draft regulation was published.

Appendix 2 – Details of ITC Mechanism

The ITC mechanism proceeds in three steps. First, the total "fund" available to ITC parties, is calculated, both for losses compensation and for compensation for provision of infrastructure. Second, the compensation (cost claims) for each TSO whose system is used to host transit flows. Third, the mechanism establishes the contribution (cost payments) to be paid by ITC entities to reflect their responsibility in inducing transit flows in other grids by participating ITC parties. Finally, based on agreed principles for compensation and contribution, an ex-ante net financial result is calculated for each party to determine the level of payment to (or receipt from) the ITC fund based on the net flow across a country's network.

The Size of Compensation Fund

The first step is to calculate the total amount of the compensation fund. Regulation (EC) No 713/2009 established the Agency for the Co-operation of Energy Regulators. According to Regulation (EC) No 838/2010, this agency is required to make a proposal on the total amount required for the fund for infrastructure provision compensation, which we subsequently refer to as CF. This amount should be based on a EU assessment of the infrastructure of electricity transmission associated with facilitating cross-border flows of electricity.

The Individual Claiming of the Compensation Fund

The total amount is then split between TSOs proportionally, depending on: the TSO's transit and load factors.

The TSO's transit factor, which is defined as the transit in the national transmission system as a proportion of total transit in all transmission systems. Transit is defined by the formula min(export, import), on an hourly basis and aggregated on an annual basis, i.e. the hourly transit is the minimum between the total hourly flow in the import direction and the total hourly flow in the export direction. The transit factor is the ratio of a TSO's transit relative to the aggregated transit of all participating TSOs and is given by the following formula: $TF = \left[\frac{T_i}{\sum T_i}\right]$.

The TSO's load factors, which is the square of transits of electricity, in proportion to load and transits in that national transmission system relative to the square of transits of electricity in proportion to the load and transit for all national transmission systems. The transit load factor is given by the following formula:

$$LF = \frac{\left[\frac{T_i}{T_i + L_i}\right] \times \left[\frac{T_i}{\sum T_i}\right]}{\sum_i \left[\frac{T_i}{T_i + L_i}\right] \times \left[\frac{T_i}{\sum T_i}\right]}$$

Cost claimed: $C = (0{,}75 \times TF + 0{,}25 \times LF) \times CF$

The Individual Contribution to the Compensation Fund

The contribution to the ITC fund by each TSO is calculated in proportion to the absolute value of the net flows into and from their national transmission as a share of the absolute vale of the net flows into and from all national transmission systems. For each Member State, the cumulated absolute net flow (CANF) should be calculated for the relevant period according to the formula:

$$CANF_i = \sum_{t=1}^{N} |X_i(t) - M_i(t)|$$

$X_i(t), M_i(t)$ being the measured flows on interconnections respectively in export direction and import direction, during hour t.

Each Member State is supposed to contribute to the compensation fund on the basis of its CANF. The compensation to be paid by Member State is therefore given by the formula:

$$K_i = \frac{CANF_i}{\sum_j CANF_j} \times CF$$

Appendix 3 – Harmonization in the EU

	Sharing of network operator charges		Price signal		Are losses included in the tariffs charged by TSO?	Are system services included in the tariffs charged by TSO?
	Generation	Load	Seasonal / time-of-day (1)	Location		
Austria	15%	85%	-	-	Yes	Through a specific component to generators
Belgium	0%	100%	xxx	-	Not included for grid >=150 kV	Tariff for ancillary services
Bosnia and Herzegovina	0%	100%	-	-	No	No
Bulgaria	0%	100%	-	-	Yes	Yes
Croatia	0%	100%	x	-	Yes	Yes
Czech Republic	0%	100%	-	-	Yes	Yes
Denmark	2-5%	95-98%	-	-	Yes	Yes
Estonia	0%	100%	x	-	Yes	Yes
Finland	11%	89%	x	-	Yes	Yes
France	2%	98%	-	-	Yes	Yes
Germany	0%	100%	-	-	Yes	Yes
Great Britain	27% TNUoS Tariff (2) 50% BSUoS Tariff (2)	73% TNUoS Tariff 50% BSUoS Tariff	xx	TNUoS - locational; BSUoS - non-locational	No, recovered in the energy market	Included in BSUoS Tariff
Greece	0 % Use of system 0 % Uplift charges	100 % Use of system 100 % Uplift charges	x	-	No, recovered in the energy market	Included in Uplift charges
Hungary	0%	100%	-	-	Yes	Yes
Ireland	20%	80%	-	Generation only	No, recovered in the energy market	Yes
Italy	3%	97%	-	-	No	Yes
Latvia	0%	100%			Yes	Yes
Lithuania	0%	100%	-	-	Yes	Yes
Luxembourg	0%	100%	-	-	Yes	Yes
FYROM	0%	100%	-	-	Yes	Yes
Netherlands	0%	100%	-	-	Yes	Tariff for ancillary services
Northern Ireland	25%	75%	xxx	-	No	Tariff for ancillary services
Norway	44%	56%	xxx (via losses)	Location	Yes	Yes
Poland	0,60%	99.4%	-	-	Yes	Yes
Portugal	0%	100%	xx	-	No, included in energy price	No, included in energy price
Romania	20,45% use of system	79,55% use of system	-	6 G zones =6 G tariffs values 8 L zones =8 L	Yes	Tariff for ancillary services
	0% system services	100% systems services				
Serbia	0%	100%	x	-	Yes	Yes
Slovak Rep.	0%	100%	-	-	Through a specific fee	Through a specific fee
Slovenia	0%	100%	xx	-	Yes	Tariff for ancillary services
Spain	0%	100%	xxx	-	No, included in energy price	No, included in energy price
Sweden	25%	75%	xx (via losses)	Location	Yes	Yes
Switzerland	0%	100%	-	-	By a separate tariff for losses	By separate tariffs for ancillary services

Source: ENTSO (2010)