Changes in Transmission Use of System Charges 2000 to 2002

ESB National Grid
December 2001

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1 EXECUTIVE SUMMARY

On 8th October 2001 the Commission for Electricity regulation (CER) approved the charges which apply to Generators and Demand Users from 1st October 2001 until 31st December 2002[1]. These tariffs are designed to fully recover the allowed transmission revenue (i.e. costs associated with both the TSO and TAO businesses) for the year 2002, as approved by the CER[2]. The CER directed that the year 2002 tariffs should apply to the final three months of 2001, due to the fact that the year 2000 tariffs were levied to transmission users for the first nine months of 2001 leading to an under-recovery of required revenue for the period.

Compared to year 2000, the allowed revenue for the year 2002 of approximately £147m (in nominal prices), represents an increase of 36%. This has resulted in a significant increase in transmission tariffs. The average unit TUoS tariff, which provides an indication of the impact of the rising costs on transmission users taken as a whole, has increased by approximately 38.4% over the period. The higher rate of increase in the average tariff compared to the percentage increase in revenue requirement, reflects an under-recovery of approximately £10m in revenue in the year 2000[3].

In addition to the costs associated with running the transmission system, the CER also instructed ESBNG to recover 'Capacity Margin' costs amounting to approximately £23.6m in the year 2002, which are paid to generators for the provision of additional capacity for system security reasons above that which is normally required.

The TSO acknowledges that increase in TUoS tariffs is not welcomed by transmission users, and ultimately by end customers. Most of the cost increase is driven by the need to develop the transmission system to meet the needs of a modern industrialised economy, and to facilitate competition in the generation and supply sectors, thus promoting efficiency savings across other sectors of the electricity industry and national economy as a whole. The TSO affirms its commitment to controlling the costs of providing and operating the transmission system where afforded adequate control of such costs, and supports the introduction of appropriate financial incentive regimes in relation to the TSO's costs where appropriate.

[1] TUoS charges approved on October 8th 2001 can be viewed on the CER website at (http://www.cer.ie/)
[2] TSO allowed revenue 2002 may be viewed in August 2001 archive of the CER website (http://www.cer.ie/)
[3] See Section 2 for discussion on this issue.

2 INTRODUCTION

On the 8th of October, 2001, the CER approved the final Transmission Use of System (TUoS) tariffs for the period October 1st 2001 to December 31st 2002[4]. These tariffs were derived in accordance with the year 2000 tariff structure, however, the absolute level of the various tariffs have increased over the period 2000 to 2002[5]. The primary aim of this document is to provide users with a detailed understanding of the reasons behind the tariff increases. Due to the structure of the charging regime the tariff increases are not identical for all customer classes, as tariff specific changes depend ultimately on the allocation of the various cost components of the allowed revenue to each tariff category. This document provides a description of the tariff increases by customer class. It is worth noting that for most customers, tariff increases are very close to the average tariff increase (i.e. 38.4% in nominal terms[6]).

The structure of this paper is as follows. Section 2 outlines the allowed revenue requirement for the year 2002, as approved by the CER and discusses the main reasons for the increase in required revenue compared to corresponding year 2000 figures. The impact of this increase in allowed revenue on the average TUoS tariff, which provides an indication of the impact of the rising costs on transmission users taken as a whole, is discussed in section 3. However, due to the structure of the transmission charging regime tariff increases for individual users may be above or below the average unit increase. Section 4 discusses the tariff increases by customer class.

[4] TUoS charges approved on October 8th 2001 can be viewed on the CER website at (http://www.cer.ie/)
[5] Year 2000 tariffs (unadjusted for inflation) were applied to the first nine months of 2001, as directed by the CER.
[6] This increase does not include the Capacity Margin Charge, which is a new charging component from October 2001.

3 CER ALLOWED REVENUE, 2002

On September 30th, 2001, the CER approved a Transmission Use of System (TUoS) Revenue of £137.06m (in constant year 2000 terms) for the year 2002. Assuming an inflation rate of 3.5%, as instructed by the CER, the allowed revenue in nominal 2002 terms equates to £146.82m. Compared to the year 2000, total allowed revenue has increased by approximately 27% in real terms, or 36% in nominal terms (see table 1).

The main reasons for the necessary increase in transmission revenue is discussed at length in ESBNG's Revenue Submission (December 2000)[7]. A brief summary of these reasons by cost category follows.

Table 1: Breakdown of Allowed revenue

All figures in IEP million	**2000 (£m)**	**2002 (£m)**
Depreciation and return on Network assets	43.8	51.14
Depreciation and return on Non-network assets		5.45
TSO Operating costs: Payroll, consultancy and other operating costs	26.2	20.97
Ongoing asset costs: Maintenance, field operations, rates, etc.	11.1	0
TAO Operating costs		17.85
Ancillary services and constraint costs	27.0	36.50
Under recovery from previous years		5.15
Total CER allowed Revenue	**108.1**	**137.06**

* It should be noted that due to the requested reporting structure of the revenue requirement for the year 2002 compared to 2000, in some situations is was not possible to exactly match each cost category. However, the information presented in this table attempts to match each cost category on a like for like basis.

[7] ESBNG's Revenue Submission can be viewed in the August '01 archive of CER website (http://www.cer.ie/) at location (http://www.cer.ie/TSO_Revenue%20Submission.pdf)

Depreciation and return on network assets

The level of depreciation and return on network assets has increased significantly for two reasons:

(1) Due to the revaluation of the transmission assets, as proposed by the CER. The year 2000 allowed revenue for depreciation and return is based on a depreciation policy of 30 years for "old" assets and 40 years for "new" assets. For the year 2002 the CER instructed that all assets should be depreciated over a 40-year period. The main implication of this is that the net asset value of transmission assets increases thereby increasing the total return from these assets. The depreciation profile will also change as assets which were originally fully written off will now have a depreciated value, the impact of this will be offset by a lower depreciation amount on old assets, as all old assets are now depreciated over a longer period. Taken together, this cost category has increased significantly.

The revaluation of the transmission assets has resulted in significant increase in transmission costs for the year 2002.

(2) Due to the level of investment spend in transmission assets that is required over the period. This investment is required for two main reasons.

(a) As a result of the significant increase in Demand over the past several years and expected future demand growth. Demand for transmission services has grown by approximately 5.5% per annum over of the past five years (30% growth in total) and is expected to grow by a further 3.9% per annum during the next five years. This increase in demand, combined with the fact that spare capacity and operating efficiency gains have been fully utilised, has resulted in the need for significant new investment.

(b) Due to extensive upgrading of the transmission network

A significant proportion of the transmission system in Ireland is coming toward to end of its technical life and is in need of either replacement or refurbishment over the coming years, this applies particularly to parts of the 110kV system. Refurbishment of transmission assets is generally recognised as a cost-effective way of maintaining the service capability of ageing assets and, in most situations, offers a more economic alternative to asset replacement.

This high level of capital spend has resulted in a higher annual depreciation and rate of return values.

Depreciation and return on Non-network assets

This cost category includes TSO expenditure on IT systems and platforms. The establishment of a competitive Irish electricity market has considerable cost implications for the TSO. In particular, IT platforms and systems are required to develop and operate the new functions and systems which will be undertaken by the TSO, as part of introducing competition into the generation and supply sectors, and also to replace existing functions that are currently undertaken by ESB. The TSO is by nature an IT-intensive business. For this reason an outlay of investment expenditure is required during the set-up period of the TSO.

A project to replace the existing Energy Management System (NCC), including the Emergency Control Centre (ECC) has also commenced. This is required due to the age of the existing obsolescent systems and the difficulty posed by expansion of the present system in order to take of power system growth.

TSO Operating costs: Payroll, consultancy and other operating costs

Costs that reside with the TSO's own company operations decrease from IEP26.2 million in year 2000, to IEP20.97 million in 2002. There are a number of cost drivers included within this cost category. Cost decreases occur due to the removal of ESB corporate costs, reduced use of consultants by the TSO, and the effect of a one-off allowance for establishment of the interim settlement system in 2000, not included in 2002. Areas of cost increases arise due to the increase in numbers of staff in the TSO required to meet new industry requirements, to take over work currently carried out by consultants on behalf of the TSO, and to replace corporate services which had been provided by ESB.

The total amount allowed by the CER in this cost category is significantly below the revenue requested by ESBNG[11]. The TSO has made known to the CER that it has serious concerns that these cuts will seriously impact on its ability to effectively carry out its functions.

[9] A comprehensive explanation of the methodology used by ESBNG in the derivation of TuoS tariffs can be found on the ESBNG website (http://www.eirgrid.ie/)

[10] Further details on the Demand/Generation split can be found in the tariff explanatory document , "Structure of Transmission Use of System charges" available on the ESBNG website. (http://www.eirgrid.ie/)

[11] ESBNG's Revenue Submission can be viewed in the August '01 archive of CER website (http://www.cer.ie/) at location (http://www.cer.ie/TSO_Revenue%20Submission.pdf)

On-going asset costs (maintenance, field operations, rates, etc)
TAO operating costs

Based on the information in the table above it is not possible to compare the costs in this category for the year 2002 with corresponding 2000 figures. In the year 2000 maintenance, field operations, rates etc amounted to £11.1m. In the year 2002 the CER approved £17.85m for TAO operating costs, maintenance, field operations and rates. Based on the figures provided by the CER it is not possible to directly compare non-TSO operating costs in both years.

Ancillary Services and Constraints

The costs of Ancillary Services and Constraints costs have increased from £27 million in 2000 to £36.5 million in 2002. The main reasons for the increase in these costs are briefly discussed below.

Operating Reserve;
The connection of significantly larger generation units to the system and a reduction in the contribution of reactor switching to operating reserve, due to the more common periods of high system demand at which reactor switch in is not available for system security reasons.

Reactive power;
The connection of more generation units will mean an increase in the reactive capability payments to be made to generators. Also, the increase in demand will result in an increase in both customer reactive demand and reactive power losses on the system, both of which will require, over time, an increased reactive power production from generation sources.

Black start
The key driver in respect of the Black Start payments is the cost of procurement of a new black start facility in the greater Dublin area, which is due to the increase in generation in that area.

Constraint Costs
There is an increase in the costs of transmission constraints from 2000 to 2002, from £7.5 million to £13 million. The increase mainly arises due to the polarisation of new base load generation towards the east coast. This will increase the costs of running generation out of merit in the south and west for system support, and costs of consequential constraining down of plant in the east coast area. Increases in constraint costs will also result from the provision of additional reserve for larger units.

Under-recovery

Due to a shortfall in recovery of Transmission Use of System Revenue in year 2000 of approximately £10m (in real 2000 terms), a total of £5.15 million has been included in the allowed transmission use of system revenue for year 2002[12]. This under-recovery was caused by a number of factors including

(a) Forecasted Value variances
(b) Uncertainty regarding treatment of autoproducers
(c) Over-estimate of the level of capital contributions
(d) An addition of the revenue allowed during 2000.

4 IMPACT ON AVERAGE TRANSMISSION TARIFF

The impact on the average unit TUoS charge, which provides an indication of the impact of the change in CER allowed revenue from year 2000 to year 2002 on transmission customers taken as a whole, is shown in Figure 4. Over the period 2000 to 2002 the average tariff per kWh increases by 0.13p/kWh representing a rise of 29.4% in real terms and 38.4% in nominal terms.

Table 2: Impact on average transmission tariff (pence/kWh)

	2000	**2002**
Total annual revenue requirement Actual recovery As per CER direction (constant 2000 prices)	£97.8m	£137.06m*
Total Energy (GWh)	20866	22605
Per unit Transmission allowed revenue (pence/kWh)	**0.47**	**0.60**
% change Constant 2000 prices Nominal prices (inflation rate = 3.5%, as per CER direction)	29.4 (13.7% pa) 38.4 (17.6% pa)	

*Capacity Margin costs not included.

Table 3 provides the impact of the rising revenue requirement on the average unit tariff by cost category. As shown, a large proportion of the increase in revenue requirement is due to a higher depreciation and rate of return charge on network assets, higher ancillary services and constraints costs, and set-up costs associated with the TSO (for reasons discussed in the previous section).

[12] The remainder of the shortfall will be recovered in 2003
[13] For a more detailed discussion on each of these refer to ESBNG's Revenue Submission.

Table 3 :Impact of Average Tariff by Cost Category (pence/kWh)

	Pence/kWh		Change in price per kWh (pence)
Cost Category	2000	2002	
TSO payroll, consultancy and other operating costs	0.126	0.093	-0.033
Ongoing asset costs: Maintenance, field operations, rates, etc.	0.053		-0.053
TAO Operating costs & maintenance, etc		0.079	+0.079
Ancillary services and constraint costs	0.129	0.161	+0.032
Network assets RoR and depreciation	0.21	0.226	+0.04
Non network assets RoR and depreciation		0.024	
Recovery of shortfall from previous years		0.023	+0.023
TOTAL	**0.518***	**0.606**	**+0.088**
Under recovery from year 2000	(0.048)		
Actual Average Tariff 2000	**0.47**		

***** The average tariff of 0.518 differs to that shown in Table 2 due to an under-recovery of revenue in year 2000 (approximately £10m). The reasons for this under-recovery are discussed in Section 3

It should be noted that due to the requested reporting structure of the revenue requirement for the year 2002 compared to 2000, in some situations is was not possible to exactly match each cost category, for example TAO operating costs contribution to average tariff in 2002 includes maintenance costs.

The increase in the average unit tariff provides an indication of impact of the rising costs on transmission users, taken as a whole. However, in practice tariffs for individual demand users may be above or below the average depending on their load factors[14] and depending on the relative amounts recovered from network and energy based tariffs. In the next section we discuss tariff increases by demand user class. The impact of the increase in revenue on generation tariffs is also discussed.

[14] The load factor is the ratio of the average to peak load (measured using a customers MIC value).
[15] In addition to increased demand from existing functions.
[16] Figures are shown in year 2002 terms.
[17] In real terms

5 INCREASES IN TARIFFS, BY USER CLASS

For pricing purposes the costs of the transmission system, as outlined in Table 1, are separated into "Wires Costs" and "Non-Wires Costs". Wires costs comprise of the cost of depreciation, return on owner's equity, overheads related to the delivery of the service, and operation & maintenance costs. "Non-Wires" costs consist of costs associated with out-of merit generation resulting from constraints in the transmission network, ancillary service costs and system support services. This category also includes the costs associated with the Settlement System Administrator (SSA). Figure 1 below illustrates the allowed revenue for year 2002 and the amount to be recovered from each category of user.

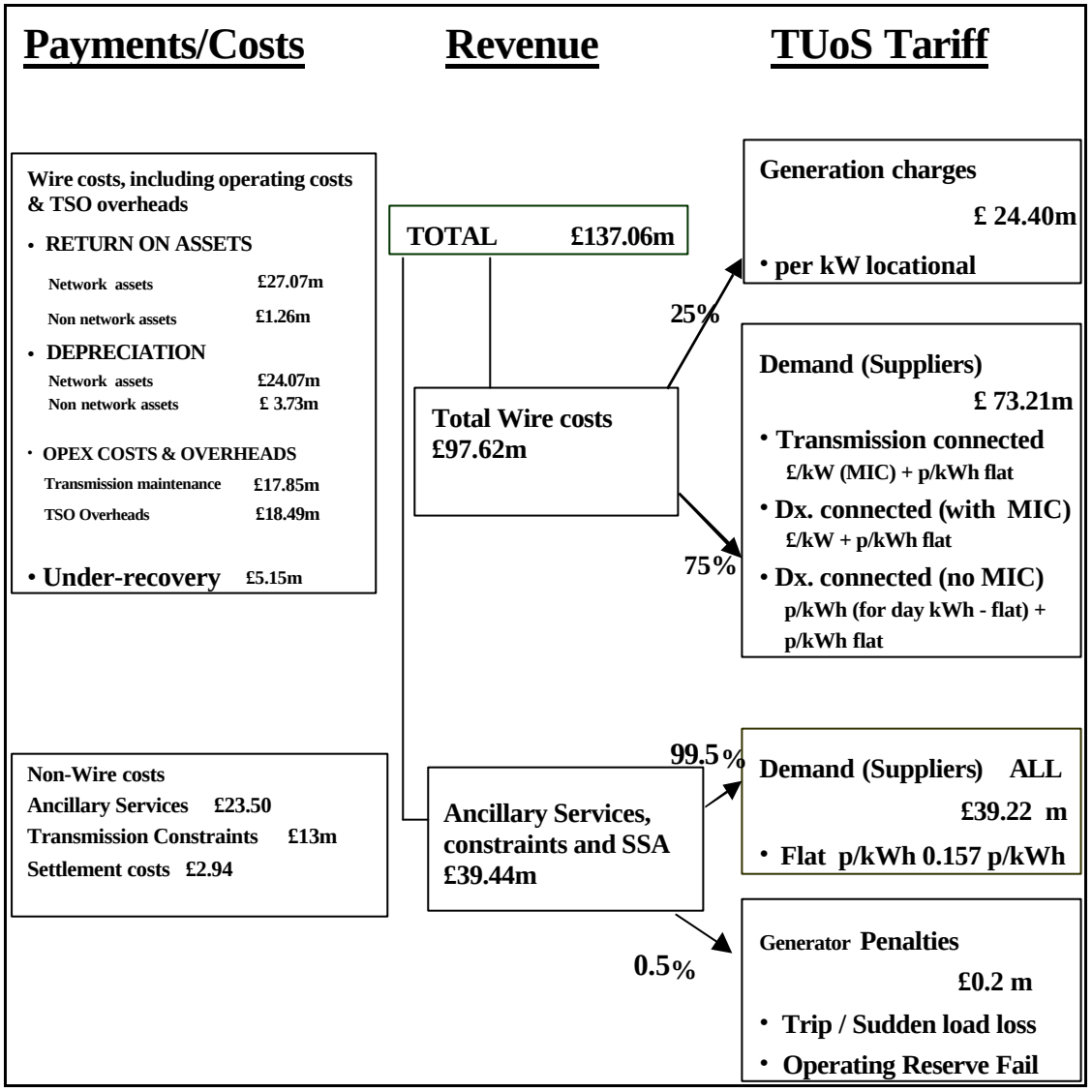
A total of 25% of the wires costs are recovered from Generation, and the remaining 75% of wires costs are recovered from Demand users. Of the allocation to Demand of the allowed transmission revenue associated with the wires costs, 60% is allocated to Demand on a largely fixed basis through a, per MW, Network Capacity Charge. 40% of network related costs is allocated to Demand on an energy basis through a, per MWh, Network Transfer Charge. Wires costs that are allocated to generation users are recovered on a per MW basis, and are locationally based.

Revenue associated with the costs of Ancillary Services, Congestion, Constraints, and Market Administration and Settlement are recovered largely from Demand, with the exception of the allocation of charges to generation for use of Operating Reserves when a generating unit trips off-line.

Further details on ESBNG's transmission tariff structure can be found in the explanatory document, "Structure of TUoS Charges: October 1st 2001 to December 31st 2002 " available on ESBNG's website. (http://www.eirgrid.ie/)

In this section we outline the tariff increases by cost category. We begin by explaining the price increases for demand users. Next we discuss generation tariffs.

Figure 1 Above: Transmission Revenue Requirement for year 2002 (constant 2000 prices)



5.1 Demand tariffs

There are three classes of Demand Transmission Service provided by ESBNG.

1. **Tariff Schedule DTS-T**: which provides service to suppliers serving customers connected directly to the transmission system.
2. **Tariff Schedule DTS-D1**: which provides service to suppliers serving customers connected to the distribution system who are above a 0.5MW threshold (before adjusting for distribution losses).

3. **Tariff Schedule DTS-D2**: which provides service to suppliers serving all other customers connected to the distribution system, summed in aggregate, who are not served under the other tariff schedules noted above.

Each of these demand tariff categories in discussed below.

5.1.1 Tariff Schedule DTS-T

This tariff schedule is applicable to suppliers serving customers connected directly to the transmission system. This tariff schedule consists of:

1. Network Capacity Charge
2. Network Transfer Charge
3. System Services Charge
4. Network Unauthorised usage charge (see section 4.1.5)

DTS-T users must pay a Capacity Margin Charge as determined by the CER (see section 4.14).

Based on the tariff structure as outlined in Figure 1, the tables below show each of the charges payable by a user on DTS-T user. As shown, in nominal terms the Network Capacity Charge (NCC) increase by approximately 51%, the Network Transfer Charge (NTC) increases by approximately 56% and the System Services Charge (SSC) increases by 18.4% over the period 2000 to 2002. The significant rate of increase in the NCC and NTC charge reflects the large increase in wires-related costs (see table 3).

Network Capacity Charge

Year	Tariff rate
2000	£616.48/MW/Month
2002	£931.0766/MW/Month
Increase	51 %

Network Transfer Charge

Year	Tariff rate
2000	£0.89/MWh
2002	£1.3878/MWh
Increase	55.9 %

[18] The Network Capacity Charge under Tariff Schedule DTS-D2 is based on a per MWh during Day Hours basis as a proxy for per MW charging.

[19] All tables are in nominal terms

System Services Charge

Year	Tariff rate
2000	£1.57MWh
2002	£1.8594MWh
Increase	18.4 %

The tables above provide an indication of impact of the rising costs on DTS-T users, taken as a whole. However, in practice tariffs for individual transmission connected users may be above or below the average depending on their load factors. Appendix A provides a summary of tariff increases for several typical DTS-T users. It is worth noting that although the average increase differs by load factor (i.e. as the load factor increases the tariff increase falls), the tariff increase in all the examples provided is close to the average increase in unit TUoS tariff (i.e. 38.4%). It is also worth pointing out that the percentage increases are the same for all sizes of DTS-T user, but obviously the absolute levels differs.

5.1.2 Tariff Schedule DTS-D1

This tariff schedule is applicable to suppliers serving customers connected indirectly to the transmission system via the distribution system. The tariff is derived in a similar way as to DTS-T. However, the capacity component has been modified to reflect the fact that distribution connected customers, through diversity of their demands, do not have the same effect on the transmission system as a directly connected customers. This tariff schedule consists of:

1. Network Capacity Charge
2. Network Transfer Charge
3. System Services Charge
4. Unauthorised Capacity Charge (see section 4.1.5)

DTS-D1 must also pay a Capacity Margin Charge as directed by the CER (see section 4.1.4).

Based on the tariff structure as outlined in Figure 3, the tables below show each of the charges payable by a user on DTS-D1 tariff schedule. As shown, in nominal terms the NCC increase by approximately, 50.6%, the NTC increases by approximately 56% and the SSC increases by 18.4% o ver the period 2000 to 2002. The significant rate of increase in the NCC and NTC charge reflect the increase in wires-related costs (see table 3).

Network Capacity Charge

Year	Tariff rate
2000	£551.13/MW/Month
2002	£830.4243/MW/Month
Increase	50.6 %

Network Transfer Charge

Year	Tariff rate
2000	£0.89/MWh
2002	£1.3878/MWh
Increase	55.9 %

System Services Charge

Year	Tariff rate
2000	£1.57MWh
2002	£1.8594MWh
Increase	18.4 %

The tables above provide an indication of impact of the rising costs on DTS-D1 users, taken as a whole. However, in practice tariffs for individual DTS-D1 users may be above or below the average depending on their load factors. Appendix B provides a summary of tariff increases for several typical DTS-D1 users. It is worth noting that although the average increase differs by load factor (i.e. as the load factor increases the tariff increase falls), the tariff increases in all the examples provided is close to the average increase in unit TUoS tariff (i.e. 38.4%). It is also worth pointing out that the tariff increases in percentage terms are the same for all sizes of DTS-D1 user, but obviously the absolute levels are different.

5.1.3 Tariff Schedule DTS-D2

This tariff schedule is applicable to suppliers serving customers connected indirectly to the transmission system via the distribution system. Under Tariff Schedule DTS-D2 the Network Capacity Charge is levied based on day hour consumption,[21]. Day Hour

[20] All tables are in nominal terms

[21] Day Hours being 08:00 to 23:00 inclusive all days.

recovery is considered an effective proxy to having MIC values for all distribution customers. This tariff schedule consists of:

1. Network Capacity Charge
2. Network Transfer Charge
3. System Services Charge

DTS-D2 must also pay a Capacity Margin Charge as directed by the CER (see section 4.1.4). The tables below show each of the charges payable by a user on DTS-D2 tariff schedule.

Network Capacity Charge

Year	**Tariff rate**
2000	£1.94/MWh
2002	£3.08/MWh
Increase	58.7 %

Network Transfer Charge

Year	Tariff rate
2000	£0.89/MWh
2002	£1.3878/MWh
Increase	55.9 %

System Services Charge

Year	Tariff rate
2000	£1.57MWh
2002	£1.8594MWh
Increase	18.4 %

Based on the tariff structure as outlined in Figure 3, the tables below show each of the charges payable by a user on DTS-D2 users[23]. As shown, in nominal terms the Network Capacity Charge (NCC) increase by approximately, 58.7%, the Network Transfer Charge (NTC) increases by approximately 55.9% and the System Services Charge (SSC) increases by 18.4% over the period 2000 to 2002. The significant rate of increase in the NCC and NTC charge reflect the increase in wires-related costs.

[22] All tables are in nominal terms

[23] All Charges are shown in Irish pounds (nominal terms)

5.1.4 Capacity Margin Charge

From 1st October 2001 all 3 classes of demand users are eligible to pay the Capacity Margin Charge (CMC), which is charged at a rate of €2.0996/MWh for daytime energy (this is a new charge which was not applicable in the year 2000). The CMC is designed to recover the costs that ESBNG must pay generators for the provision of additional capacity for system security reasons above that which is normally required. This charge has been included in the Transmission Use of System 'Statement of charges' as directed by the CER.

Capacity Margin Charge

Year	Tariff rate
2000	N/A
2002	£1.6536/MWh

5.1.5 Unauthorised capacity charge

ESBNG's tariffs are designed to charge an unauthorised capacity charge to demand users that exceed their MIC requirements. This charge will be applicable to DTS-T and DTS-D1 customers from 1st July 2002. It will be charged at the rate of **€ 600/MWh** for Metered Energy transferred in excess of the Customer's Maximum Import Capacity in the Charging period[24].

[24] Further detail are available in 'TUoS charging principles' available on ESBNG's website (http://www.eirgrid.com/)

5.2 Generation Transmission Service

As discussed previously, of the allocation of total network related costs 25% is currently recovered from generation users. This cost is recovered from generation on a locational basis[25]. The Transmission Use of system revenue to be recovered from Generators for year 2002 is shown in figure 7 below, figures are shown in real 2000 terms. Year 2000 revenue is also shown for comparative purposes. The increase in revenue to be recovered from generators over the period is 53% in real terms and 64% in nominal terms.

Revenue to be recovered from Generator Capacity Charges

Year	IEP (Million £)
2000	15.98
2002	24.41
Increase	53 %

5.2.1 Average Generation Unit Charge

Figure 8 below shows average unit generation use of system capacity charge for year 2000 and 2002 [26]. The increase in the average generation tariff reflects the fact the wires related costs have increased significantly (see figure 3).

Average unit generation charge

Year	£/kW/year
2000	3.69
2002	5.27
Increase	43 %

It should be noted that the average tariff is only indicative of the impact of the revenue increases on generation as a whole. An individual generator's charge will of course be determined by its location[4].

5.2.2 Generator Price Volatility

A potential drawback of locational use of system charges from a generators's viewpoint is the presence of price volatility. ESBNG has carried out a number of studies assessing the possible magnitude of the price volatility under a range of network development scenarios. Based on our analysis, generation TUoS charges have the potential to be

[25] More details of how Generation Locational charges are derived is discussed in 'Structure of TUoS charges'available on ESBNG webite (http://www.eirgrid.com/)
[26] Shown in year 2000 terms.

relatively volatile, especially in a situation where large amounts of generation connect to a given location. ESBNG believes that suitable mechanism should be introduced to reduce potential volatility. ESBNG will issue a consultation document on this issue in the near future.

6 APPENDIX A: TARIFF INCREASES FOR TYPICAL DTS-T USERS

DTS-T is the Demand Transmission Service provided to suppliers serving customers connected directly to the Transmission System. For the purposes of demonstration this appendix derives tariff increases for a 15MW user, for a range of different Load Factors. As discussed in section 4 of this paper the average increase in the per unit TUoS tariff over the period 2000 to 2002 is 38.4 %, in nominal terms. The following examples show that the increase in an individual DTD-T user's tariff depends on the load factor (i.e. as the load factor increased the increase in the tariff level falls). Nevertheless, the tariffs increases for all examples provided are close to the average per unit increase. It is also worth noting that for given load factor the percentage increase will be the same for all sizes of DTS-T user.

[27] All of the following calculations are carried out in **Nominal terms** henceforth.

EXAMPLE CHARGES: TARIFF SCHEDULE DTS – T

Tariff Schedule DTS-T

	2000 Tariff	2001/2002 Tariff
Network Capacity Charge	€ 781.7700/MW/month	€ 1,182.2235/MW/month
Network Transfer Charge	€ 1.1300/MW/month	€ 1.7621/MWh
System Services Charge	€ 2.0000/MW/month	€ 2.3610/MWh

2000 vs. 2001/2002 Tariff Schedule Comparison

Metered Demand	15 MW				
Load Factor	50%	55%	60%	65%	70%
2000 Tariff Charge	€ 346,360	€ 366,924	€ 387,488	€ 408,052	€ 428,616
Unit Rate (per kWh)	0.53 ¢	0.51 ¢	0.49 ¢	0.48 ¢	0.47 ¢
2001/2002 Tariff Charge	€ 483,688	€ 510,777	€ 537,865	€ 564,954	€ 592,043
Unit Rate (per kWh)	0.74 ¢	0.71 ¢	0.68 ¢	0.66 ¢	0.64 ¢
Increase	**39.65%**	**39.21%**	**38.81%**	**38.45%**	**38.13%**

*Capacity Margin costs not included.

7 APPENDIX B TARIFF INCREASES FOR TYPICAL DTS-D1 USERS

The following examples deal with sample charges from Tariff Schedule DTS-D1, which applies to all distribution connected customers above 0.5MW (before adjusting for the distribution loss factor). For the purposes of demonstration this appendix derives tariff increases for a 5MW user, for a range of different load factors.
As discussed in section 4 of this paper the average increase in the per unit TUoS tariff over the period 2000 to 2002 is 38.4 %, in nominal terms. The following examples show that the increase in an individual DTD-D1 user's tariff depends on the load factor (i.e. as the load factor increased the increase in the tariff level falls). Nevertheless, the tariffs increases for all examples provided are close to the average per unit increase. It is also worth noting that for given load factor the percentage increase will be the same for all sizes of user.

EXAMPLE CHARGES: TARIFF SCHEDULE DTS – D1

Tariff Schedule DTS-D1 - 38 kV

	2000 Tariff	2001/2002 Tariff
Network Capacity Charge	€ 699.7900/MW/month	€ 1,054.4214/MW/month
Network Transfer Charge	€ 1.1300/MW/month	€ 1.7621/MWh
System Services Charge	€ 2.0000/MW/month	€ 2.3610/MWh

2000 vs. 2001/2002 Tariff Schedule Comparison

Metered Demand	5 MW				
Distribution Loss Factor	1.0165	average of Day and Night Values			
Load Factor	50%	55%	60%	65%	70%
2000 Tariff Charge	€ 112,358	€ 119,326	€ 126,294	€ 133,262	€ 140,229
Unit Rate (per kWh)	0.51 ¢	0.50 ¢	0.48 ¢	0.47 ¢	0.46 ¢
2001/2002 Tariff Charge	€ 156,095	€ 165,274	€ 174,452	€ 183,631	€ 192,809
Unit Rate (per kWh)	0.71 ¢	0.69 ¢	0.66 ¢	0.64 ¢	0.63 ¢
Increase	**38.93%**	**38.51%**	**38.13%**	**37.80%**	**37.50%**

Tariff Schedule DTS-D1 - MV kV

	2000 Tariff	2001/2002 Tariff	Increase
Network Capacity Charge	€ 699.7900/MW/month	€ 1,054.4214/MW/month	50.68%
Network Transfer Charge	€ 1.1300/MW/month	€ 1.7621/MWh	55.94%
System Services Charge	€ 2.0000/MW/month	€ 2.3610/MWh	18.05%

2000 vs. 2001/2002 Tariff Schedule Comparison

Metered Demand	1 MW				
Distribution Loss Factor	1.0455	average of Day and Night Values			
Load Factor	50%	55%	60%	65%	70%
2000 Tariff Charge	€ 23,113	€ 24,546	€ 25,979	€ 27,413	€ 28,846
Unit Rate (per kWh)	0.53 ¢	0.51 ¢	0.49 ¢	0.48 ¢	0.47 ¢
2001/2002 Tariff Charge	€ 32,110	€ 33,998	€ 35,886	€ 37,774	€ 39,662
Unit Rate (per kWh)	0.73 ¢	0.71 ¢	0.68 ¢	0.66 ¢	0.65 ¢
Increase	**38.93%**	**38.51%**	**38.13%**	**37.80%**	**37.50%**

Tariff Schedule DTS-D1 - LV kV

	2000 Tariff	2001/2002 Tariff	Increase
Network Capacity Charge	€ 699.7900/MW/month	€ 1,054.4214/MW/month	50.68%
Network Transfer Charge	€ 1.1300/MW/month	€ 1.7621/MWh	55.94%
System Services Charge	€ 2.0000/MW/month	€ 2.3610/MWh	18.05%

2000 vs. 2001/2002 Tariff Schedule Comparison

Metered Demand	1 MW				
Distribution Loss Factor	1.0970	average of Day and Night Values			
Load Factor	50%	55%	60%	65%	70%
2000 Tariff Charge	€ 24,251	€ 25,755	€ 27,259	€ 28,763	€ 30,267
Unit Rate (per kWh)	0.55 ¢	0.53 ¢	0.52 ¢	0.51 ¢	0.49 ¢
2001/2002 Tariff Charge	€ 33,691	€ 35,672	€ 37,654	€ 39,635	€ 41,616
Unit Rate (per kWh)	0.77 ¢	0.74 ¢	0.72 ¢	0.70 ¢	0.68 ¢
Increase	**38.93%**	**38.51%**	**38.13%**	**37.80%**	**37.50%**

*Capacity Margin costs not included.