

Proposed changes to the Statement of the Use of System Charging Methodology as a result of Charging Conditions 2 and 4.

This paper contains the changes that National Grid is proposing to make to the Statement of the Use of System Charging Methodology (the “methodology statement”) following reviews and consultations on Condition 2: Incremental Cost of Capacity; and Condition 4: Long Term Fixed Access Products.

The report associated with each of these conditions can be found on the National Grid industry information website¹. The responses to the Condition 2 report are also on this website. Any response received to the draft Condition 4 report will also be placed on the website.

The proposed changes, attached as Appendices A and B, are presented separately to reflect that separate processes were followed in developing each.

Condition 2 - Incremental Cost of Capacity

The Condition 2 progress report summarised the process followed by National Grid up to April 2006. The report allows interested parties to better understand how the incremental cost of capacity is calculated and also gave those users who would not normally attend industry meetings the opportunity to contribute to the review prior to National Grid concluding and taking forward any changes to the methodology and / or statements.

The review covered many diverse and detailed areas of the methodology; the principles applied in the transport and tariff models, along with the detailed calculation process for the incremental cost of capacity and associated expansion factors. National Grid engaged the industry through the Transmission Charging Methodologies Forum (TCMF) and its sub-group the Charging Issues Standing Group (CISG). Much of the detailed technical discussion took place at the CISG, with the January 2006 CISG essentially being used as a Condition 2 workshop².

On the central issue of the cost reflectivity of the incremental cost of capacity and how it is used within the methodology, the analysis carried out in conjunction with industry discussion at a number of forums and response to the report, leads National Grid to conclude the current process is reasonably cost reflective in the context of the methodology as a whole. This takes account of all the factors that facilitate meeting the relevant objectives, such as transparency, simplicity and the need to reflect future rather than historic costs, as far as reasonably practicable, in the locational signal to encourage efficient decisions.

National Grid has reviewed the assumption that the cost of 400kV overhead line new build can be considered as a proxy for the all the techniques for providing additional

¹ Draft Condition 4 Report: http://www.nationalgrid.com/NR/rdonlyres/32E01F9C-C925-4415-A21C-E1F5810D82CB/9274/Condition4Report_vFINAL.pdf
Condition 2 report: <http://www.nationalgrid.com/NR/rdonlyres/DA355E39-9E52-4676-B777-85BE425EE67C/7014/Condition2progressreportApril2006.pdf>

² Slide available at: <http://www.nationalgrid.com/NR/rdonlyres/0E7946AD-3784-435B-AD68-577A62C5B43E/6252/Condition2.pdf>

capacity. National Grid continues to believe this a reasonable assumption in the context of the methodology and models used to implement the methodology, the DC load flow (DCLF) and tariff models, the report expands on the issues and analysis to support this.

However, through discussion with the industry, it was clear that there was a general misunderstanding amongst users of the processes used and the assumptions made in the calculation of incremental cost of capacity. In order to address this National Grid has already carried out a number of tutorials on the methodology and the calculation of incremental cost of capacity, and will consider facilitating similar tutorials in the future should significant changes in the representation at industry meetings occur.

In the report National Grid indicated that as a result of the Condition 2 review National Grid's intention was to update the Statement of the Use of System Charging Methodology with more information to improve the general transparency and understanding of the concept of incremental cost of capacity: what it represents; how it is calculated; the assumptions made in the calculation; how it is used within the methodology.

National Grid received 4 responses to the Condition 2 report. Having considered the responses, three of which supported National Grid's main conclusions, National Grid now intends to proceed with updating the methodology statement as discussed above.

Appendix A to this paper provides the proposed changes to the methodology statement for Condition 2. National Grid does not consider that these proposed changes represent a change to the existing methodology, but offer further explanation of the methodology.

Condition 4 – Long Term fixed Access Products

The draft Condition 4 report concluded on National Grid's consultation and discussion with users on the issue of long-term fixed tariffs. National Grid has sought views through a workshop, an industry questionnaire, and several industry charging meetings over a 14 month period.

National Grid concluded that the development of multiple-year, fixed-price tariffs should not be progressed at this stage on the grounds that:

- remaining users on variable tariffs would be unwilling to be exposed to the financial consequences arising from differences between fixed and variable tariffs;
- that the trade-off between the risks and duration covered by a hedging contract and the associated premium is such that only very limited risks and short durations could be hedged against, which is likely to limit the attractiveness and uptake of such arrangements;
- users were concerned that it was inappropriate for National Grid to set tariffs and simultaneously offer a hedge for changes to tariffs; and
- the provision of cost-reflective locational signals could be restricted and that may be expected to result in less efficient outcomes.

However, National Grid has proposed a number of steps to be progressed that will enhance the stability and predictability of TNUoS tariffs in the longer term. National Grid anticipate that the majority of these will be implemented for 1 April 2007.

In terms of the use of system methodology, National Grid has identified several areas where greater transparency of the process associated with changing the charging methodology and the use of informal charging consultations would benefit users. To achieve this National Grid has developed proposed changes to the Statement of Use of System Charging Methodology, which are provided in Appendix B to this paper. As with the proposed Condition 2 changes, these changes are not considered to change the methodology itself, but serve to improve transparency and understanding of the methodology.

In addition, National Grid believes that reforms to the access arrangements, which are beyond the scope of the charging condition will contribute to the aims of the charging condition, for instance, enhanced commitment by generators would be expected to improve the predictability and possibly the stability of future tariffs. National Grid has also proposed amendments to the data included within the Seven Year Statement, which will better enable users to model future possible tariff changes. National Grid intends to progress these changes by proposing amendments to the CUSC.

Next Steps

Following consideration of comments on the attached text and further consideration of any response to the draft Condition 4 report, National Grid intends to write to the Authority summarising the responses to the respective reports and indicating the final conclusions to the reviews.

The proposed changes to the Statement of the Use of System Charging Methodology are not considered to represent a change to the methodology, but rather serve to improve the transparency of the existing methodology. As such, National Grid intends to include these, having considered comments in response to this paper, in the annual update to the statement by April 2007. Nevertheless, National Grid does believe that the proposed improvements to transparency, predictability, and stability for users, will lead to a greater understanding and less uncertainty and so improve the overall functioning and efficiency of the market.

Responses

National Grid welcomes comments on the attached draft text for the Statement of Use of System Charging Methodology. Any comments should be sent by 30 September 2006, preferably by e-mail, to:

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or alternatively by post to:

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If you have any queries contact Patrick Hynes on 01926 656319 or Adam Brown on 01926 625839.

Appendix A - Proposed changes to the Statement of the Use of System Charging Methodology for Condition 2

Additional and amended text for Chapter 2 of The Use of System Charging Methodology.

To be inserted starting at 2.22 and replacing existing text 2.22 to 2.24, subsequent paragraphs to be renumbered appropriately. References in square brackets refer to existing paragraph, to be updated only in the final text.

The Expansion Constant

- 2.22 The expansion constant, expressed in £/MWkm, represents the annuitised value of the transmission infrastructure capital investment required to transport 1 MW over 1 km. Its magnitude is derived from the projected cost of 400kV overhead line, including an estimate of the cost of capital, to provide for future system expansion.
- 2.23 In the methodology the expansion constant is used to convert the marginal km figure derived from the transport model into a £/MW signal. The tariff model performs this calculation, in accordance with [2.34], and also then calculates the residual element of the overall tariff (to ensure correct revenue recovery in accordance with the price control), in accordance with [2.39].
- 2.24 The transmission infrastructure capital costs used in the calculation of the expansion constant are provided via an externally audited process. They also include information provided from all Transmission Owners. They are based on historic costs and tender valuations adjusted by a number of indices (e.g. global price of steel, labour, inflation, etc.). The objective of these adjustments is to make the costs reflect current prices, making the tariffs as forward looking as possible. This cost data represents National Grid's best view; however it is considered as commercially sensitive and is therefore treated as confidential. The calculation of the expansion constant also relies on a significant amount of transmission asset information, much of which is provided in the Seven Year Statement.
- 2.25 For each circuit type and voltage an individual calculation is carried out to establish a £/MWkm figure, normalised against the 400KV overhead line (OHL) figure, these provide the basis of the circuit expansion factors discussed in [2.25]. In order to simplify the calculation a unity power factor is assumed, converting £/MVAkm to £/MWkm. This reflects that tariff and charges are based on real power.
- 2.26 The table below shows the first stage in calculating the expansion constant. A range of overhead line types is used and the types are weighted by recent usage on the transmission system. This is a simplified calculation for 400kV OHL using example data:

400kV OHL expansion constant calculation					
MW	Type	£(000)/km	circuit km*	£/MWkm	Weight
A	B	C	D	E = C/A	F=E*D
6500	La	700	500	107.69	53846
6500	Lb	780	0	120.00	0
3500	La/b	600	200	171.43	34286
3600	Lc	400	300	111.11	33333
4000	Lc/a	450	1100	112.50	123750
5000	Ld	500	300	100.00	30000
5400	Ld/a	550	100	101.85	10185
<i>sum</i>			2500 (G)		285400 (H)
Weighted Average (J= H/G):					114.160 (J)

***These are circuit km of types that have been provided in the previous 10 years. If no information is available for a particular category the best forecast will be used.**

- 2.27 The weighted average £/MWkm (J in the example above) is then converted in to an annual figure by multiplying it by an annuity factor. The formula used to calculate of the annuity factor is shown below:

$$Annuityfactor = \frac{1}{\left[\frac{(1 - (1 + WACC)^{-AssetLife})}{WACC} \right]}$$

- 2.28 The Weighted Average Cost of Capital (WACC) and asset life are established at the start of a price control and remain constant throughout a price control period. The WACC used in the calculation of the annuity factor is the National Grid regulated rate of return, this assumes that it will be reasonably representative of all licensees. The asset life used in the calculation is 50 years; the appropriateness of this is reviewed when the annuity factor is recalculated at the start of a price control period. These assumptions provide a current annuity factor of 0.066.
- 2.29 The final step in calculating the expansion constant is to add a share of the annual transmission overheads (maintenance, rates etc). This is done by multiplying the average weighted cost (J) by an 'overhead factor'. The 'overhead factor' represents the total business overhead in any year divided by the total Gross Asset Value (GAV) of the transmission system. This is recalculated at the start of each price control period. The overhead factor used in the calculation of the expansion constant for 2006/07 is 1.8%. The overhead and annuitised costs are then added to give the expansion constant.

2.30 Using the previous example the final steps in establishing the expansion constant are demonstrated below:

400kV OHL expansion constant calculation	
	Ave £/MWkm
OHL	114.160
Annuitised	7.535
Overhead	2.055
Final	9.589

2.31 This process is carried out for each voltage, along with other adjustments to take account of upgrade options, see [2.27]and [2.28], and normalised against the 400KV overhead line cost (the expansion constant) the resulting ratios provide the basis of the expansion factors.

2.32 This process of calculating the incremental cost of capacity for a 400kV OHL, along with calculating the expansion factors is carried out for the first year of the price control and is increased by inflation, RPI, (May–October average increase, as defined in National Grid’s Transmission Licence) each subsequent year of the price control period.

End of proposed changes for Condition 2

Appendix B - Proposed changes to the Statement of the Use of System Charging Methodology for Condition 4

Update index as required.

In General Introduction replace para 6 with the following text, re-number subsequent paragraphs as required.

Modification Process

- 6 Before making modifications, unless it has been agreed otherwise with the Authority, National Grid will consult with CUSC parties for a period of at least 28 days on the proposed change to the Use of System Charging Methodology. The consultation will seek views on:
 - details of the proposed modification;
 - the timetable for implementation;
 - the justification of the proposal against the Relevant Objectives; and
 - the impact on other industry documents.
- 7 The consultation will, where appropriate, indicate how the proposed changes will impact existing tariffs or where a new charge is created an indication what tariffs might be.
- 8 The timetable for implementing methodology changes will seek to avoid introducing changes to tariffs within a charging year where this would affect the charges paid by existing users. However, there may be circumstances where this will not be possible, and in these circumstances National Grid will seek views from users on the issues that might arise. Against this background, methodology changes to existing tariffs will generally be implemented from the following 1 April, although later dates may be considered where this could be expected to better facilitate competition in generation or supply of electricity.
- 9 There may also be instances where additional industry consultation may be beneficial. For example:
 - where a proposal is likely to have a significant impact on a large number of transmission users and an additional consultation will enable these users to better prepare for a formal modification and / or highlight specific implementation issues that should be taken into account.
 - where a methodology change is consequential to other framework changes and an early additional consultation will expedite the formal charging process, the framework change, or reduce uncertainty for users.
 - where there are several options for change that could each better facilitate the Relevant Objectives and an additional consultation will expedite the formal charging process.

- 10 In these instance and where time permits, an “Initial Thoughts” consultation will be prepared to consult users in advance of commencing the formal process for modifying the Use of System Charging Methodology. It is anticipated that an additional 28 day consultation would be allowed for.
- 11 Following consultation with Users, a report will be issued to the Authority by National Grid setting out the terms of the modification, the representations made, any changes to the terms of the modification, how the modification better meets the relevant objectives and a timetable and date for implementation of the modification.

Retain existing paras 8 through 10 and insert after new para 11.

Note: existing paragraph 8 may need to be altered to reflect any change the Authority makes to the veto period where it believes an Impact Assessment is required.

In Chapter 2 (“Derivation of the Transmission Network Use of System Tariff”) insert after para 2.50 the following text.

Stability & Predictability of TNUoS tariffs

A number of provisions are included within the methodology to promote the stability and predictability of TNUoS tariffs. These are described in Appendix TN-8.

Insert new appendix and add the following text after Appendix TN-7

Appendix TN-8: Stability & Predictability of TNUoS tariffs

Stability of tariffs

The Transmission Network Use of System Charging Methodology has a number of elements to enhance the stability of the tariffs, which is an important aspect of facilitating competition in the generation and supply of electricity. This Appendix seeks to highlight those elements.

Each node of the transmission network is assigned to a zone. The result of this is to dampen fluctuations that would otherwise be observed at a given node caused by changes in generation, demand, and network parameters. The criteria used to establish generation zones are part of the methodology and are described in Paragraph [2.17].

These zones are themselves fixed for the duration of the price control period. The methodology does, however, allow these to be revisited in exceptional circumstances to ensure that the charges remain reasonably cost reflective or to accommodate changes to the network. In circumstances where such a re-zoning exercise is required, this will be undertaken in such a way that minimises the adverse impact on users. This is described in Paragraph [2.20].

In addition to fixing zones, other key parameters within the methodology are also fixed for the duration of the price control period or annual changes restricted in some way. Specifically:

- the expansion constant, which reflects the annuitised value of capital investment required to transport 1MW over 1km by a 400kV over-head line, changes annually according to RPI. The other elements used to derive the

expansion constant are only reviewed at the beginning of a price control period to ensure that it remains cost-reflective. This review will consider those components outlined in Paragraph [2.22].

- ❑ the expansion factors, which are set on the same basis of the expansion constant and used to reflect the relative investment costs in each TO region of circuits at different transmission voltages and types, are fixed for the duration price control. These factors are reviewed at the beginning of a price control period and will take account of the same factors considered in the review of the expansion constant.
- ❑ the locational security factor, which reflects the transmission security provided under the GB Security and Quality of Supply Standard, is fixed for the duration of the price control period and reviewed at the beginning of a price control period.

Predictability of tariffs

National Grid revises TNUoS tariffs each year to ensure that these remain cost-reflective and take into account changes to allowable income under the price control and RPI. There are a number of provisions within National Grid's Transmission Licence and the CUSC designed to promote the predictability of annually varying charges. Specifically, National Grid is required to give the Authority 150 days notice of its intention to change use of system charges together with a reasonable assessment of the proposals on those charges; and to give users 2 months written notice of any revised charges. National Grid typically provides an additional months notice of revised charges through the publication of "indicative" tariffs. Shorter notice periods are permitted by the framework but only following consent from the Authority.

These features require formal proposals to change the Transmission Use of System Charging Methodology to be initiated in October to provide sufficient time for a formal consultation and the Authority's veto period before charges are indicated to users.

More fundamentally, National Grid also provides users with the transport and tariff model used by National Grid to calculate tariffs. This allows users to make their own predictions on how future changes in the generation and supply sectors will influence tariffs. Along with the price control information, the data from the Seven Year Statement, and users own prediction of market activity, users are able to make a reasonable estimate of future tariffs and perform sensitivity analysis.

To supplement this, National Grid also prepares an annual information paper that provides an indication of the future path of the locational element of tariffs over the next five years. This analysis is based on data included within the Seven Year Statement. This report typically includes:

- ❑ an explanation of the events that have caused tariffs to change;
- ❑ sensitivity analysis to indicate how generation and demand tariffs would change as a result of changes in generation and demand at certain points on the network that are not included within the SYS;
- ❑ an assessment of the compliance with the zoning criteria throughout the five year period to indicate how generation zones might need to change in the future, with a view to minimising such changes and giving as much notice of the need, or potential need, to change generation zones; and

- a complete dataset for the DCLF Transport Model developed for each future year, to allow users to undertake their own sensitivity analysis for specific scenarios that they may wish to model.

In addition, National Grid will, when revising generation charging zones prior to a new price control period, undertake a zoning consultation that uses data from the latest information paper. The purpose of this consultation will be to ensure tariff zones are robust to contracted changes in generation and supply, which could be expected to reduce the need for re-zoning exercises within a price control period.

End of proposed changes for Condition 4