



# **PR13: ORR consultation on electricity for traction charges for CP5**

## **Network Rail's response**

May 2013

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# 1. EXECUTIVE SUMMARY

Around 50% of the traffic operated on the GB network is electrically powered. Traction electricity charges recover the cost of electricity supplied by us to train operators for their use of traction electricity, also known as EC4T (Electric Current for Traction). In 2011/12, we recovered £205million through traction electricity charges income<sup>1</sup>.

Throughout the 2013 Periodic Review (PR13) process, we have been working closely with the industry to review the traction electricity charges for CP5<sup>2</sup>.

In September 2012, we consulted with the industry on the way in which EC4T should be charged in CP5. We concluded on that consultation in February 2013, by writing formally to ORR.

On 10 April 2013<sup>3</sup>, ORR issued a consultation of its own on EC4T charges for CP5. This covered some additional policy issues. This document sets out our response to ORR's consultation.

We welcome the opportunity to respond to ORR's consultation. In principle, we support many of ORR's proposals. We also welcome ORR's recognition of the leadership that Network Rail has shown in progressing on-train metering (OTM). However, we have some concerns about the following proposals:

- Disaggregating distribution system loss factors (DSLFF) by electricity supply tariff area (ESTA);
- volume risk sharing; and
- partial fleet metering (PFM).

These are discussed, below, and in more detail in the main body of the document.

We continue to consider that a single national average DSLFF on the AC network is the most appropriate approach for CP5. The main reason for this is that the data is not sufficiently robust to set mark-ups on metered bills at an ESTA level. In addition to the data quality issues at ESTA level, we have concerns about what will happen to DSLFF factors where there are significant changes to the rail electricity distribution network. This is discussed in further detail in [Section 3.1](#).

ORR is proposing to expose Network Rail to some of the risks around transmission loss mark-ups being inaccurate, through the volume wash-up. We have several concerns with this

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<sup>1</sup> Network Rail (August 2012), 'Regulatory Financial Statements for the year ended 31 March 2012', accessible here:

<http://www.networkrail.co.uk/browse%20documents/regulatory%20documents/regulatory%20compliance%20and%20reporting/regulatory%20accounts/regulatory%20financial%20statements%20for%20the%20year%20ended%2031%20march%202012.pdf>

<sup>2</sup> Control Period 5 - this is the regulatory period from 1 April 2014 – 31 March 2019.

<sup>3</sup> ORR, (April 2013), 'Annex A: EC4T consultation', accessible here: <http://www.rail-reg.gov.uk/pr13/consultations/electricity-for-traction.php>

suggestion. Firstly, this proposal appears to discourage Network Rail, financially, from accommodating more OTM. Secondly, we do not consider that it is appropriate to expose Network Rail to the entire metered losses consumption in the year-end volume wash-up but rather a portion of the losses which may be deemed as being 'controllable' by Network Rail. This is discussed further in [Section 3.2](#). We have modelled the impacts of ORR's proposal, using EC4T consumption data from 2011/12. Our analysis is set out in [Annex A](#).

We have serious concerns about ORR's proposals with regards to partial fleet metering (PFM). We are, in particular, concerned about the complexity and costs associated with ORR's proposals. It is unclear whether the benefits from such an approach would outweigh the costs. We are keen that, if PFM is to be adopted, it reduces whole-industry costs and does not simply transfer costs from one party to another. We are not opposed, in principle, to the use of metered data to inform modelled rates. However, we feel strongly that any non-metered consumption should remain, in its entirety, in the annual volume wash-up. We discuss this in further detail in [Section 3.4](#).

We are happy to discuss and/or clarify any part of this response, and for it to be published on ORR's website.

## **2. INTRODUCTION & BACKGROUND**

### **2.1 Purpose of this document**

In April 2013, ORR issued its PR13 consultation on electric current for traction (EC4T) charges for CP5. The purpose of this document is to set out Network Rail's formal response to ORR on the points raised in its consultation document.

### **2.2 ORR's consultation**

In its consultation, ORR proposes changes to the EC4T charging framework, in particular it consults on:

- Charging for transmission losses for CP5;
- proposals for reforming the volume wash-up;
- the basis for charging partially metered services; and
- the basis on which Network Rail is charged for its own consumption.

### **2.3 Background**

Around 50% of the traffic operated on the GB network is electrically powered. Traction electricity charges recover the costs of electricity supplied by us to train operators for their use of traction electricity, also known as EC4T. In 2011/12, we recovered £205million through traction electricity charges income.

In spite of considerable progress with OTM in CP5, around 80% of train operators' electricity consumption is still charged on the basis of modelled consumption rates. This works by multiplying electrified mileage and the relevant electricity price to give the modelled traction electricity charge for each period. At the end of each year, Network Rail carries out two reconciliations. The first is the volume wash-up. This reconciles modelled consumption and actual consumption in each electricity supply tariff area (ESTA) to make sure that all electricity that is supplied through out network is accounted for. The year-end volume wash-up results in either a payment to or from the train operator to Network Rail.

The second year-end reconciliation is the cost wash-up which reconciles the difference in prices charged in each period, and the actual prices we paid for that electricity. Again this results in a payment to or from the train operator to Network Rail.

Metered train operators are currently charged on the basis of their metered consumption (less regenerated energy) multiplied by a mark-up to recover transmission losses (this is currently set at 5% for AC services and 27% for DC services). This kWh consumption is then multiplied by the relevant electricity price, to produce a metered traction electricity charge for each period. Metered train operators participate in the cost wash-up, but they do not participate in the volume wash-up. The exception to this is where more than 90% of an ESTA's consumption is metered, in which case this metered consumption is included in the year-end volume wash-up.

Throughout PR13, we have been working closely with the industry to review the way we charge for traction electricity in CP5. The work undertaken to date can be summarised as follows:

- Each month, there is a cross-industry group which meets to discuss issues around EC4T (the Traction Electricity Steering Group);
- in September 2012, we consulted on traction electricity and electrification asset usage charges in CP5<sup>4</sup>; and
- in February 2013, we issued our conclusions on the above consultation, alongside the draft pricelists<sup>5</sup>.

## 2.4 Network Rail's February 2013 conclusions

In February 2013, we issued the conclusions to our September 2012 consultation on the development and structure of electrification asset usage charges (EAUCs) and the EC4T framework for CP5. In this document, we made the following key conclusions in relation to EC4T:

- To retain the current modelled consumption rates and regenerative braking discounts;
- to continue to charge for losses as a mark-up on consumption, net of regenerated energy (although suggesting an alternative proposal of applying the losses mark-up to gross consumption, for further consideration);
- to levy a single losses mark-up on the AC network, which could be fixed over CP5;
- to levy separate losses mark-ups for the two DC networks, which could be fixed over CP5;
- to charge freight operators on the basis of actual electricity prices (consistent with passenger operators), for both metered and modelled usage; and
- to remove the transitional risk sharing mechanism (TRSM).

We stated in our conclusions document that we considered that these arrangements would provide the industry with certainty and stability for CP5, in a way which is equitable to both metered and non-metered electricity users.

We note that ORR is broadly content with our conclusions, and that it plans to set out its decision in relation to the issues that we raised in our conclusions in its Draft Determination, which we expect to be published on 12 June 2013.

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<sup>4</sup> Network Rail, (September 2012), 'Consultation on traction electricity and electrification asset usage charges in CP5', accessible here: <http://www.networkrail.co.uk/publications/delivery-plans/control-period-5/periodic-review-2013/pr13-closed-consultations/>

<sup>5</sup> Network Rail (February 2013) 'Traction Electricity and Electrification Asset Usage Charges in CP5 – Conclusions of Network Rail's Consultation', accessible here: <http://www.networkrail.co.uk/publications/delivery-plans/control-period-5/periodic-review-2013/pr13-closed-consultations/>

## 3. OUR RESPONSE

### 3.1 Setting transmission losses

#### 3.1.1 ORR's proposals

In relation to setting transmission losses, ORR proposed:

- to fix DSLFs over CP5 (this includes removing the ability for operators or Network Rail to propose and vote on changes to DSLFs through the EC4T Metering Rules, as is currently the case);
- to set DSLFs by ESTA on the basis of the median estimate of losses set out in Network Rail's losses reports published in January 2013<sup>6</sup>;
- not to take account of Network Rail's view that transmission losses will increase over CP5 as a result of the expansion of electrification on the GB rail network;
- that DSLFs are levied on gross consumption rather than consumption net of regenerative energy, as it is currently;
- that Network Rail carries out further work during CP5 to understand the impact of regenerative braking on losses; and
- to approve DSLFs for new ESTAs on the basis of an equivalent methodology used in our losses reports.

We set out our response to each of these issues in the section below.

#### 3.1.2 Our response – fixed DSLFs

Question 1: Should we amend the traction electricity rules so that we take the decision on the DSLF as part of an access charges review (i.e. a periodic review or interim review), and remove the industry's ability to propose and vote on the same?

We support ORR's proposal to fix DSLFs over CP5. We consider that this should provide certainty for operators around charging. In particular it should help operators to construct business cases to move from estimated billing to OTM.

We do, however, have some concerns about the interaction of this proposal with the proposal to disaggregate losses by ESTA. Where ESTA boundaries change during CP5, the appropriateness of keeping DSLFs fixed diminishes. For more details please see [Section 3.1.3](#).

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<sup>6</sup> Network Rail (Jan 2013), 'Updated: Estimate of AC Losses', accessible here: <http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064784497>

Network Rail (Jan 2013), 'Updated: Estimate of DC Losses', accessible here: <http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064784498>

### 3.1.3 Our response – disaggregating DSLFs by ESTA

Question 2: (a) we are minded to set a DSLF by ESTA and establish new ESTAs for new electrified infrastructure, at least for CP5. Do you agree with this policy? Please give reasons for your view. It would be useful if you could cite specific examples why you think this would or would not be appropriate.

As required by ORR, our AC losses report estimated losses by ESTA. This indicative analysis illustrated the relationship between electrical demand (MWh/standard track kilometre) and losses on the basis of the demand and track length in each ESTA to create a national weighted average loss. However, we do not consider that there is sufficient confidence regarding the ‘repeatability’ of this work due to the variability of losses and asset types. This issue was also identified in the review carried out by the independent reporter, AMCL<sup>7</sup>, which was jointly commissioned by ORR and Network Rail. Therefore, we do not consider that the estimates of AC losses by ESTA are sufficiently robust for billing purposes.

For these reasons, in our conclusions document (published in February 2013) we did not propose levying AC losses mark-ups by ESTA, for CP5. We continue to hold this view.

Whilst we recognise the theoretical merits in disaggregating the DSLF by ESTA, we have significant concerns about doing so at this stage. In addition to the ESTA data quality issues, we are concerned about the stability of ESTA boundaries during CP5, especially as a result of new electrification which may lead to boundaries needing to be changed. It is unlikely that ESTAs will be completely new in CP5. Rather, it is more likely that they will be remapped, leading to the requirement to adjust boundaries. The effect of this is likely to be that DSLFs that are set for each ESTA, will soon be ‘out of date’, and would need to be recalculated to ensure the appropriate level of recovery of total losses. The issue of needing to remap ESTA boundaries, and its impact on losses recovery, is less likely to have a material impact if the AC DSLF is set at a nation-wide level.

ORR proposes to establish new ESTAs for newly electrified infrastructure. However, we do not consider that this is practical as the additional parts of electricity distribution network are unlikely to be built in a way that does not alter the boundaries of existing ESTAs.

We are aware that some train operators have concerns about how losses are charged in CP4. London Midland made an application to ORR under the current EC4T Metering Rules change provisions to disaggregate AC losses mark-ups by ESTA in CP4. We have responded to that consultation separately<sup>8</sup>. Our response to London Midland’s proposal sets out our views on the implications of that proposal on ESTA boundary changes which may be necessary between now and the end of CP5.

We consider that there are two reasonable options available, either:

- a fixed national average AC DSLF over CP5; or
- AC DSLFs disaggregated by ESTA with annual reopener provisions to reflect significant changes to the electrified network.

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<sup>7</sup> Asset Management Consulting Ltd, (Dec 2012), ‘EC4T Transmission Losses (AC & DC) Estimate Review’

<sup>8</sup> Network Rail, (Feb 2013) ‘Network Rail response to London Midland EC4T proposed metering Rules Change’, accessible here: <http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064784795>



We strongly urge ORR to consider these alternative approaches.

### 3.1.4 *ESTA boundary change process*

We note that, currently, there is no formal process to contractually accommodate changes to ESTA boundaries. We consider that, regardless of the decision arrived at in relation to charging for losses, a process is required. We plan to be as open and transparent as possible when carrying out any ESTA boundary changes.

In our response to London Midland's consultation to disaggregate AC losses by ESTA, we discuss this issue. We set out a suggested approach to implementing ESTA boundary changes, which should be more open and transparent – this was set out in Annex B to our response to London Midland's consultation<sup>9</sup>.

### 3.1.5 *Our response – levying DSLFs based on gross consumption*

Question 2: (b) we propose to change the basis on which transmission losses for metered consumption are charged so that the DSLF is applied to the gross metered consumption, rather than metered consumption net of metered regenerative braking, as it is currently. Do you agree that this will deliver a more cost-reflective basis of charging for transmission losses? Please give reasons for your view.

We are content with ORR's proposal to change the basis on which DSLFs for metered consumption are charged, so that the DSLF is applied to gross metered consumption, rather than metered consumption net of metered regenerative braking. However, we consider that this proposal has some issues which would require further consideration:

- This change will require a change to the way our track access billing system (TABS) calculates metered bills. Initial estimates suggest that this cost would be in the region of £50 -100k, and would take 3-6 months to complete.
- The transaction costs in relation to the changes required to the drafting of metered charging in Schedule 7 to the Track Access Agreements.

We have carried out considerable work over the last two years to understand the losses incurred on our network. The next stage of this work is to look at the interaction between regenerative braking and its effect on losses. This is a very complex issue for which the engineering science is still emerging. Until we have refined our understanding, we agree that it is appropriate to levy the DSLF as a mark-up on gross consumption, (i.e. not to gross consumption less regenerated energy). We see this being calculated in accordance with the worked example in Table 1, below - the numbers used in this example are illustrative.

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<sup>9</sup> Network Rail, (Feb 2013) 'Network Rail response to London Midland EC4T proposed metering Rules Change', Annex B - accessible here: <http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064784795>

Table 1: DSLF billed on gross consumption – worked example

| Proposed approach   | DSLF (%)                     | Gross energy (kWh) | Regenerated energy (kWh) | KWh billed                                |
|---|------------------------------|--------------------|--------------------------|---|
| (1) DSLF applied to gross consumption                               | 5%                           | 100                | 10                       | 100 * 5% = 105<br>105 – 10 = 95.00        |
|   |                              |                    | 18                       | 100 * 5% = 105<br>105 – 18 = <b>87.00</b> |
|   |                              |                    | 20                       | 100 * 5% = 105<br>105 – 20 = 85.00        |
| (2) DSLF applied to net consumption (assuming average regen of 18%) | $\frac{5\%}{1-18\%}$ = 6.10% | 100                | 10                       | 90 * 6.10%<br>= 95.49 kWh                 |
|   |                              |                    | 18                       | 82 * 6.10%<br>= <b>87.00</b>              |
|   |                              |                    | 20                       | 80 * 6.10%<br>= 85.88                     |

Option (2) in Table 1 illustrates that the final kWh billed would be slightly different in each scenario, this reflects the extent to which actual regenerated energy differs from the 18% average used in the adjusted DSLF.

On balance, we support ORR's proposed approach (see option (1) in Table 1).

### 3.1.6 Our response – taking account of increases in losses in CP5

Question 2: (c) we propose to accept Network Rail's median estimate of the DSLF, subject to it being levied on gross consumption, but we do not accept Network Rail's assertion that losses would necessarily increase over CP5. Do you agree with our assessment? Please give reasons for your view.

We continue to consider that transmission losses will rise over CP5 reflecting the significant changes to our electrified network during this time. However, we recognise that our estimates were somewhat subjective and reflected anticipated changes in traffic only.

### 3.1.7 Our response – further work on regenerative braking and losses

Although these issues were not specifically set out in ORR's consultation questions we support ORR's proposal to require further work to be undertaken to understand regenerative braking during CP5.

## 3.2 Exposing Network Rail to the volume wash-up

### 3.2.1 ORR's proposals

ORR consulted on exposing Network Rail to the volume wash-up in proportion to the amount of metered transmission losses in each ESTA. Its key proposals in relation to this issue are summarised, below.

- Removing '90% rule' (where, if more than 90% of usage in an ESTA is metered, metered consumption is included in the volume wash-up); and
- exposing Network Rail to the volume wash-up (in proportion to the total estimated level of losses in each ESTA).

We set out our response to these issues in the section below.

### 3.2.2 *Our response - removal of '90% rule'*

Question 3: we propose that metered services be exempt from the volume wash-up, even in cases where more than 90% of consumption is metered, this reform would be coupled with Network Rail being exposed to the volume wash-up. We seek your views on this proposal.

We are keen that all train operators move to OTM, therefore we support ORR's proposal to not expose metered operators to the annual volume wash-up, even when more than 90% of consumption in an ESTA is metered. We recognise that this will provide greater certainty to metered operators, with which to prepare business cases for opting in to OTM.

Currently, the annual volume wash-up corrects the following effects:

- the extent to which the modelled consumption rates are incorrect;
- the extent to which the DSLFs are incorrect (which are charged to metered operators) – this is because the error is added to the volume of consumption to be 'washed-up' between modelled operators; and
- the amount of losses associated with regenerative braking (not recovered through the DSLF).

We note that, where c.90% of consumption is metered, the year-end volume wash-up will largely reflect the extent to which the DSLF is 'correct' plus any losses associated with regenerative braking, as opposed to modelling 'errors'. If the volume wash-up is 'money to pay' (i.e. modelled consumption is lower than actual consumption so operators are required to make a payment to Network Rail) it is likely to be due to the DSLF charged to metered operators being too low. In this situation, the remaining modelled operators would be subsidising metered operators (because the DSLF is too low), and vice versa.

We consider that at 100% metering, the difference between actual and metered usage, will merely reflect the 'correctness' of the DSLF and any losses associated with regenerative braking. At this point, the industry will be better placed to reconsider the appropriateness of the DSLF. If it is set too high, Network Rail will gain financially. Conversely if it is too low, Network Rail will be exposed to the difference between the DSLF and the actual level of losses and the losses associated with regenerative braking. We consider that, at this point, the level of the DSLF should be reopened - especially if ORR decides to disaggregate DSLFs by ESTA.

In summary, in considering the 'end game', when 100% of usage is metered one of three outcomes will occur:

- (a) Actual usage > metered usage (suggesting DSLFs are too low);

(b) Actual usage < metered usage (suggesting DSLFs are too high); or

(c) Actual = metered usage (suggesting DSLFs are correct).

Noting that (c) is very unlikely (since the losses associated with regenerative energy will not be reflected in metered usage) - we consider that there would be merit in recalculating the DSLF once 100% of an ESTA's consumption is metered. In practice we accept that this is probably most practical as part of the next periodic review, so as to allow DSLFs to be fixed for each control period.

### 3.2.3 Our response - Network Rail's share of the volume wash-up

Question 4: We would like to know your views on our proposed formulation for Network Rail to share the volume wash-up. We welcome your suggestions for specific alternative formulations.

Question 5: We also seek your comments on our assessment of risks and the incentive properties of the different options.

We have concerns about ORR's proposal to expose Network Rail to a greater share of the annual volume wash-up. We consider that ORR's proposals will be complex to administer, and may cause a number of undesirable outcomes, such as a perverse financial incentive for Network Rail to not be favourable to increased OTM.

The scale of the impact of ORR's proposal would depend on:

- the variation in transmission losses charged to metered operators, from actual transmission losses;
- the amount of losses associated with regenerative braking;
- the extent of metering in each ESTA; and
- the level of electricity prices.

It appears that, currently, Network Rail would stand to receive a financial gain from this approach. Our estimates suggest that this gain would be likely to be c.£2.5million per annum, based on the 2011/12 level of the volume wash-up and extent of metering. This financial gain comes about because, currently, modelled consumption rates are, on average, c.10% higher than they need to be, (i.e. money is paid back to operators through the volume wash-up at the end of the year). ORR notes this in its consultation.

However, we consider that the financial risks that we face would increase if there was more rapid progress towards full metering, this is illustrated in the figures set out in [Annex A](#). Like any business, we are keen to reduce our risk where possible. Although Network Rail is fully focussed on migrating as many trains as possible from estimated to OTM for EC4T, it would be unfortunate if it was disincentivised, financially, from doing so.

We would also like to draw ORR’s attention to Ofgem’s recent decision<sup>10</sup> not to activate a losses incentive mechanism for the GB wide electricity distribution network. Ofgem’s decision was made on the basis that such a mechanism may result in “*potentially unwarranted rewards and penalties of significant value*”. We would urge ORR to consider Ofgem’s analysis when it concludes on its own approach for the rail electricity distribution network.

As mentioned earlier, we have modelled the effects of ORR’s proposal using 2011/12 wash-up data, and run some scenarios to understand our financial risk at different levels of metering. This analysis is set out in [Annex A](#).

**3.2.4 An alternative approach**

We understand that ORR has developed its volume wash-up ‘sharing proposals approach’ to try and reflect Network Rail’s ability to “manage” transmission losses. We have concerns about setting our exposure to be equal to the total share of metered losses. It is our understanding that ORR’s proposal aims to ensure Network Rail takes the risk on:

- the amount of losses that could be avoided through better management of the network; and
- the margin of error in our DSLF estimates.

In principle, we agree that it is appropriate for us to bear the risks of the two things above. However, we consider that ORR’s proposal exposes us to more than these factors.

We propose an alternative approach which may be closer to accounting for these two effects, while recognising that Network Rail cannot control 100% of these two effects. This is set out in a worked example in Table 2, below.

*Table 2: Alternative proposal for volume risk sharing (ESTA A)*

|                                | <b>ORR proposal</b>                                | <b>NR suggestion</b>                               |
|--------------------------------|--|--|
| % modelled                     | 80%  | 80%  |
| % controllable losses          | 100% (assumed)                                     | 10%  |
| % margin of error              |  | 25%  |
| Proposed value of ‘x’          | 100% x 4.06% = 4.06%                               | (10% + 25%) x 4.06% = 1.42%                        |
| NR share of volume wash-up (%) | $\frac{4.06\%}{(80\% + 4.06\%)} = \mathbf{4.83\%}$ | $\frac{1.42\%}{(80\% + 1.42\%)} = \mathbf{1.75\%}$ |

The worked example in Table 2, above, assumes the following:

- 20% of consumption in ESTA A is metered;
- that **10% of losses** could be avoided through better management of the network; and
- that there is a potential **25% margin of error** in the DSLF estimate.

<sup>10</sup> Ofgem, (November 2012), ‘Decision not to activate the losses incentive mechanism in the fifth distribution price control’, accessible here: <http://www.ofgem.gov.uk/Networks/ElecDist/Policy/losses-incentive-mechanism/Pages/index.aspx>

**The figures used, above, are illustrative.**

We accept that it is difficult to determine suitable numbers for the controllable losses and margin of error. However, the work that the industry did in 2011<sup>11</sup> to better understand the degree to which Network Rail can actively carry things out to reduce transmission losses suggested that there were, in fact, very few actions that we could take. This informs our suggestion of applying a 10% factor to losses. This may need further verification and to be differentiated by AC and DC systems.

The 25% margin of error figure for DSLF estimates is informed by judgement based on the AC and DC losses studies that Network Rail recently completed.

We consider that this would be a more reasonable approach that recognises that we should bear some of the risks on the level of transmission losses, but that it is inappropriate to expose us to all risks. Furthermore, this approach would lower the level of money paid back to Network Rail through the year-end volume wash-up if metering was not to increase significantly during CP5.

### *3.2.5 Transitional risk sharing mechanism*

For the billing period 2010/11, we introduced the transitional risk sharing mechanism (TRSM) which was designed to cap modelled operators' post volume wash-up consumption rate so that it increased by no more than 7.5%. This was to mitigate the risk to modelled operators of large increases in their EC4T bills as a result of operators moving to OTM and hence away from the volume wash-up. The TRSM was always designed to be time-limited such that it expired at the end of CP4, to provide the industry with more experience in the issues associated with OTM, while protecting modelled operators. This 'proving' period is now complete and, therefore, TRSM is no longer appropriate.

We note that ORR does not make reference to the TRSM in its consultation letter - however, we would like to reiterate that we continue to support its removal at the end of CP4. We consider that this is appropriate in light of the maturity of OTM now that it has been in operation for 3 years. It is also worth noting that the payments made from Network Rail through the TRSM over the last few years have largely reflected changes in freight operators' traffic mix as opposed to large changes resulting from metering itself.

## **3.3 Applying an uplift on modelled consumption**

### *3.3.1 ORR's proposal*

In May 2012<sup>12</sup>, ORR concluded that modelled EC4T consumption rates should be subject to an uplift to incentivise operators to move to OTM. ORR has now decided not to implement this policy, and will not apply an uplift to modelled EC4T consumption rates.

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<sup>11</sup> Network rail, (December 2011), 'Review of DC traction energy efficiency proposals'; and Network Rail, (May 2012), 'Review of AC traction energy efficiency proposals'

<sup>12</sup> Setting the financial and incentive framework for Network Rail in CP5. Available at: <http://www.rail-reg.gov.uk/upload/pdf/financial-incentive-framework-cp5.pdf>

### 3.3.2 *Our response*

While we are keen for operators to be incentivised to move to OTM, we understand the drawbacks of this particular approach. In particular, we had concerns around the administrative burden of such an approach, and how the proceeds from the uplift would be used. For these reasons, we support ORR's updated proposal.

## 3.4 **Partial fleet metering**

### 3.4.1 *ORR's proposal*

Some operators (particularly those operating on the DC parts of the electrified network) consider that the costs of metering are prohibitively high. These stakeholders have been considering the feasibility and appropriateness of partial fleet metering (PFM), whereby a fleet is partially fitted with meters, with the data from this sample extrapolated to the rest of the fleet – essentially fully opting in to OTM, but with only a proportion of trains actually having meters installed. ORR addresses this in its consultation. The key points of ORR's proposal are:

- The industry should devise the contractual framework for PFM;
- operators using PFM should treat all vehicles the same, this should be subject to audit;
- that not all of the non-metered PFM consumption is excluded from the volume wash-up (to incentivise partial fleet metering, but also retain an incentive for the full use of OTM); and
- that Network Rail manages the changes required to its billing to accommodate PFM until such time that it had confidence that PFM would be sufficiently widespread that it would be proportionate to do so.

We set out our response to these issues in the section, below.

### 3.4.2 *Our response – principles of PFM*

|   |
|---|
| Question 6: (a) do you agree with our views on PFM and the basis on which it should be charged? |
|---|

We support the principle that there should be stronger incentives for operators to install meters. We welcome the approach taken by the industry to better understand the potential issues surrounding PFM. However, we have significant concerns about its introduction.

In paragraph 46 of its consultation document, ORR states that it does not consider that the estimates of EC4T consumption for the services not metered through PFM need to be the same standard as that for OTM. We would like to better understand why ORR considers that this is appropriate.

As we have previously stated in industry fora, we consider that all estimated data should remain in the volume wash-up - this includes data extrapolated from metered data through PFM. We consider that this approach is a fair one, in that it would not transfer the risks

associated with these estimated values being wrong to modelled operators in the same ESTA. Furthermore, we understand from the statistical analysis, carried out to date, that the risk of inaccuracy is greater than that associated with industry agreed meter tolerances themselves. Whilst we understand that operators are keen to move away from the volume wash-up, we continue to believe that the fairest way to do this is via 'real' on-train metering as opposed to improving estimated billing.

It is worth noting that if PFM data was included in the volume wash-up, and it were genuinely more accurate than the modelled consumption rates, one would expect the volume wash-up itself to be much smaller than currently is the case. This would, thus, retain the incentive to move to OTM.

We also believe that it is unfortunate that no practical demonstration or testing of PFM has been carried out. We note that, to date, all of the work that has been carried out in considering PFM has been 'desk based'. We consider that it would have been better if a practical test of this approach had been trialled before serious consideration is given to rolling it out across the GB network. Absent such practical trials we are very concerned that significant industry expense and time could be expended trying to make PFM work from a contractual and billing perspective.

Network Rail considers that having three different approaches (modelled, metered and PFM) to billing for EC4T would represent an unduly complex and expensive approach. We also consider that PFM could distract from the goal of moving to a fully metered GB fleet of electrically powered trains.

We would also like to reiterate that the current OTM billing approach does support partial fleet metering. Network Rail continues to support operators' rights to partially meter their fleets. We do not, however, support the idea that PFM is appropriate to inform the bills for an operator's full fleet of trains.

### *3.4.3 Our response - allocating the volume wash-up to services with PFM*

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| Question 6: (b) what is your view of our suggested method for allocating the volume wash-up? (c) do you have an alternative formulation that you wish to propose? |
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As mentioned in [Section 3.4.2](#), we consider that any non-metered data associated with PFM should be included in the volume wash-up. Therefore, we do not support the formula proposed in ORR's consultation.

Reflecting on the formula itself, it appears to reflect the complexity of the entire approach. In addition, introducing a formula which raises the non-metered consumption percentage to the power of 4 seems arbitrary. We think it would be helpful if ORR could explain its rationale for suggesting this formula. Furthermore, ORR's proposal also appears to suggest carrying out the year-end volume wash-up by service code – we consider this to be unduly complex. We would welcome ORR explaining why it has proposed such an approach. We consider that ORR should be mindful of the transaction costs associated with significant changes such as these, particularly so late in the periodic review process.

We set out some more detailed concerns about the potential introduction of PFM in [Annex B](#).



### **3.5 Network Rail's own consumption of EC4T**

#### *3.5.1 ORR's proposal*

In relation to Network Rail's own consumption of EC4T, ORR proposed the following:

- To contractualise the treatment of Network Rail's consumption and the consumption by third parties in the traction electricity rules.
- That it would support Network Rail if it wanted its metered consumption to be excluded from the volume wash-up.

#### *3.5.2 Our response*

Question 7: do you agree that Network Rail's metered consumption should be treated on an equivalent basis to other metered consumption? What conditions do you think should apply to this? Please give reasons for your views.

We support contractualising the treatment of Network Rail's usage of traction electricity in the EC4T Metering Rules. We are content to work with ORR to develop the set of rules for CP5.

ORR states that it would support our proposal to remove Network Rail's metered consumption from the wash-up. However, we would like to clarify that we already do this. The reason for this is that, on average, the modelled rates are too high, and therefore in most ESTAs, money is paid back to operators through the wash-up. We did not consider it appropriate to include known metered consumption in a wash-up which mostly pays 'money back'. Therefore, we have taken a conservative view to exclude both our modelled and metered consumption such that we do not stand to gain financially from such an arrangement. As discussed above, we are content to formalise this approach. Further, we support the view that this should be subject to audit in a similar way to on-train meters.

## **4. SUMMARY & NEXT STEPS**

### **4.1 Summary**

In summary, we support many of ORR's proposals. However, we have concerns about the following proposals:

- DSLFs by ESTA;
- volume risk sharing; and
- partial fleet metering.

These are discussed in more detail in the previous sections.

We look forward to receiving ORR's Draft Determination on the issues raised in its consultation.

We are happy to discuss any part of this response, and for it to be published on ORR's website.

### **4.2 Next steps**

We believe that the next steps with regards to these issues will be for ORR to conclude on the issues as part of its Draft Determination, which is due to be published on 12 June 2013.

To the extent that any of ORR's decisions lead to the need for changes to Network Rail's billing system, we will be seeking input from industry colleagues to make sure that the industry remains able to generate accurate EC4T bills.

# ANNEX A: IMPACT OF VOLUME RISK SHARING PROPOSAL

## Purpose of analysis

To help us better understand the implications of ORR's volume risk sharing proposal, we have modelled it using 2011/12 actual data. The modelling shows, for each ESTA, how Network Rail's (NR) financial exposure to the volume wash-up changes with the proportion of metered consumption.

The modelling is based on:

- 2011/12 billed kWh consumption data by ESTA;
- 2011/12 actual kWh consumption by ESTA;
- the % proportion of metered consumption in each ESTA; and
- ORR's proposed values for DSLF for each ESTA (as set out in its consultation document).

In addition, we have made the following assumptions:

- electricity price is £0.08 per kWh;
- Network Rail's consumption is zero; and

DSLFs are correct i.e. no margin of error.

We have made these assumptions for simplicity, they are illustrative for the purposes of this modelling exercise only. This analysis reflects ORR's proposal, set out in its consultation. It does not model Network Rail's alternative proposal.

In 2011/12, 17 of the 19 ESTAs were in a scenario where operators received 'money back' from the year-end volume wash-up as a result of modelled consumption rates being on average c.10% too high. In the remaining two ESTAs the opposite was true, i.e. operators were required to pay money to us as a result of modelled consumption rates being too low, 'money to pay'.

The effect of the situation described, above, demonstrates that, through sharing the volume wash-up, Network Rail stands to financially gain, overall. This is because, on average across the network, modelled rates are on average too high, and money is generally paid back to operators through the volume wash-up.

## Explanation of diagrams

Figures 1 and 2 illustrate Network Rail's financial risk profile in a 'money back' scenario, for ESTA A (AC) and ESTA U (DC), respectively. They show that, as the proportion of metered consumption increases in an ESTA where modelled consumption rates are too high, the amount of financial gain which Network Rail would receive decreases, and hence Network Rail would be financially disincentivised to accommodate additional on-train metering. At around 90% there is a 'step change', where the financial gain quickly reduces to zero.

Conversely, Figure 3 shows an AC ESTA (ESTA B) in which the modelled consumption rates are too low, hence operators make a payment to Network Rail through the volume wash-up. In this situation, Network Rail's risk of exposure to the volume wash-up decreases as more on-train metering is accommodated. Similarly, at 90% of metering this quickly reduces to zero. However, in 2011/12 this situation only applied in 2 of the 19 ESTAs.

At 100% metering, any financial exposure on Network Rail will be as a result of inaccuracies in the level of the DSLF compared with the actual level of transmission losses. It is unlikely that at 100% metering the financial exposure would be zero. For example, under ORR's proposal:

- if DSLFs were too low Network Rail would be financially exposed to a portion of that error in the volume wash-up (alongside other modelled operators), and at 100% metering, we would be fully exposed to it; or
- if the DSLFs are set too high, Network Rail would financially gain through the volume wash-up (alongside other modelled operators in the wash-up), and at 100% we would benefit from the difference in the DSLF uplift applied to metered consumption and actual levels of transmission losses.

The specific effects of this would also depend on whether the ESTA is in a 'money back' or 'money to pay' scenario. We have modelled these effects (set out in figures 4 – 9) this is explained below. This analysis is also based on the consumption data from 2011/12.

Network Rail will also be exposed to any transmission losses that are experienced by regenerative energy that is carried through the EC4T network.

Figures 4, 5 and 6 illustrate the situation, in each of the example ESTAs, if the DSLFs were set 25% too high, resulting in Network Rail over-recovering the cost of transmission losses. The effect that ORR's volume risk sharing proposal has on our financial exposure in this scenario depends on whether the ESTA is a 'money back' or 'money to pay' ESTA. If money is paid back to operators through the year-end volume wash-up, the financial gain that we make increases at around 90% metering e.g. in ESTA A we would stand to gain by c.£60k at 100% metering (c.£4million in the DC ESTA, U). If it is a 'money to pay' ESTA, then our financial exposure diminishes and we begin to make a gain at around 90% metering e.g. in ESTA B our financial gain increases to c.£50k at 100% metering.

Figures 7, 8 and 9 illustrate the situation, in each of the example ESTAs, where the DSLF is set 25% too low, resulting in Network Rail under-recovering the cost of transmission losses. The effect that ORR's volume risk sharing proposal has on our financial exposure in this scenario also depends on whether the ESTA is a 'money back' or 'money to pay' ESTA. If money is paid back to operators through the year-end volume wash-up, the financial gain we make diminishes at around 90%, and we begin to be financially exposed e.g. in ESTA A we would be financially exposed to around c.£60k at 100% metering (c.£4million in the DC ESTA, U). If it is a 'money to pay' ESTA our financial exposure will increase e.g. in ESTA B our exposure increases to c.£50k at 100% metering.

As this analysis shows, this is a complex issue, and we consider it is important to be fully aware of the different issues implicit in ORR's proposal.

## Diagrams modelling potential financial impact of ORR's proposal

Figure 1 - NR exposure to wash-up in ESTA A (an AC 'money back' ESTA)

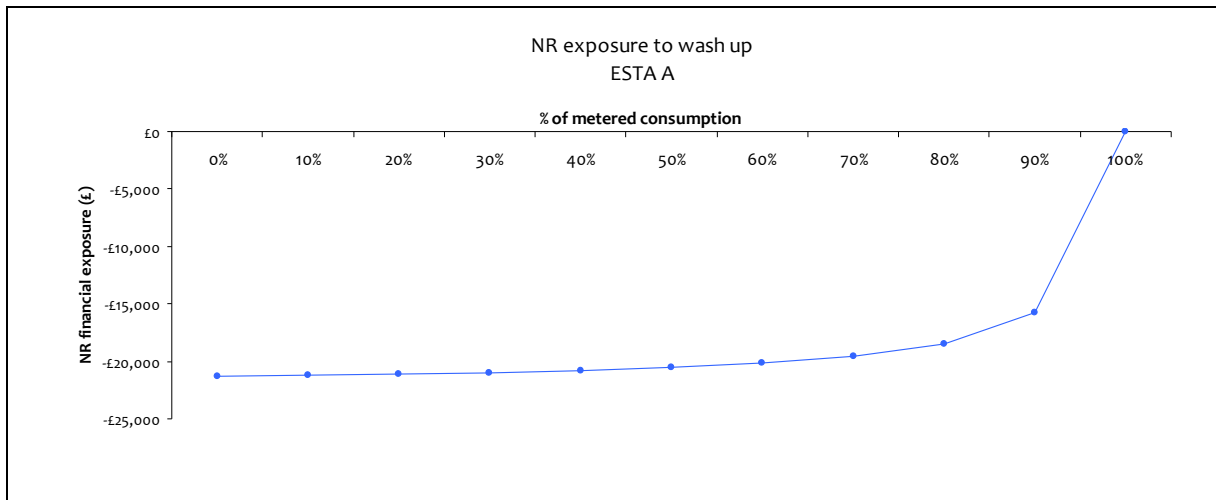


Figure 2 - NR exposure to wash-up in ESTA U (a DC 'money back' ESTA)

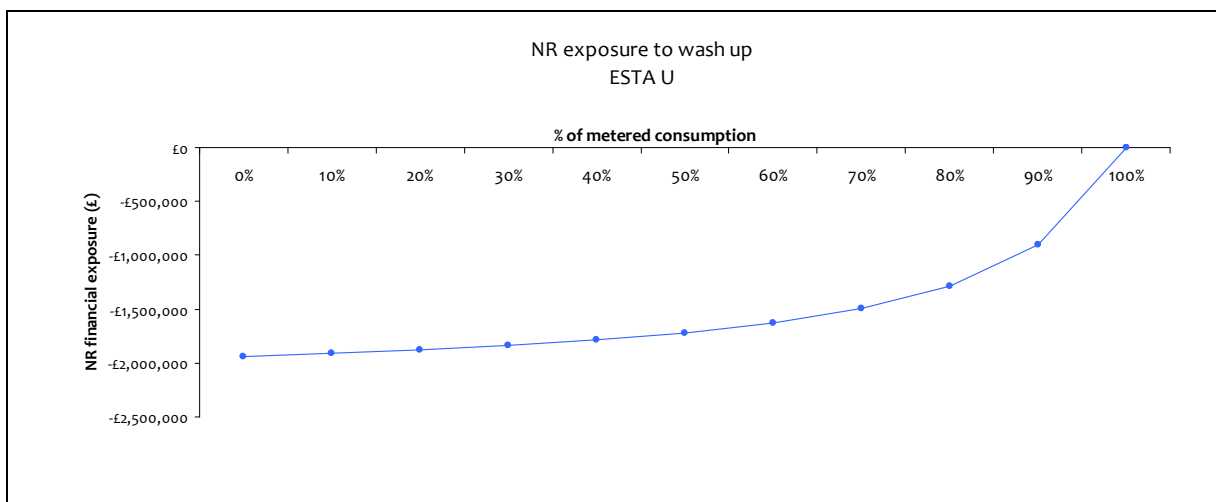


Figure 3 - NR exposure to wash-up in ESTA B (an AC 'money to pay' ESTA)

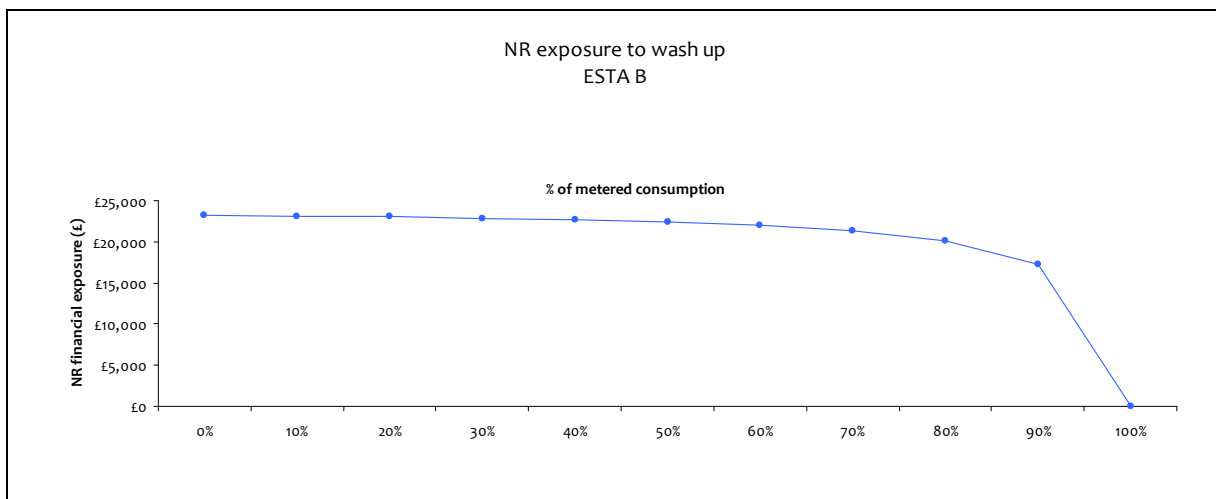


Figure 4 - NR exposure to wash-up in ESTA A (an AC 'money back' ESTA) - DSLF is 25% too high

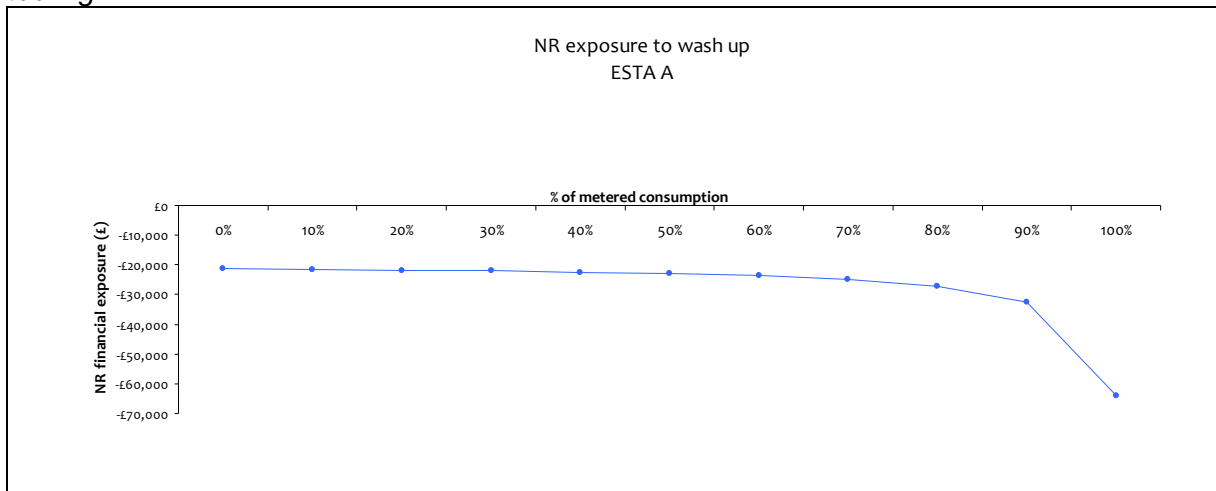


Figure 5 - NR exposure to wash-up in ESTA U (a DC 'money back' ESTA) - DSLF is 25% too high

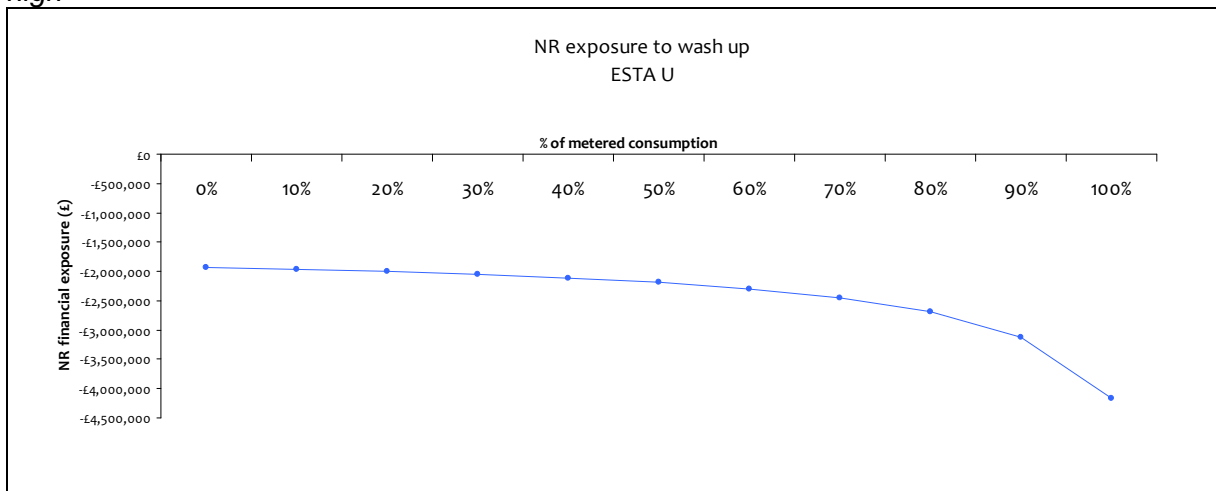


Figure 6 - NR exposure to wash-up in ESTA B (an AC 'money to pay' ESTA) - DSLF is 25% too high

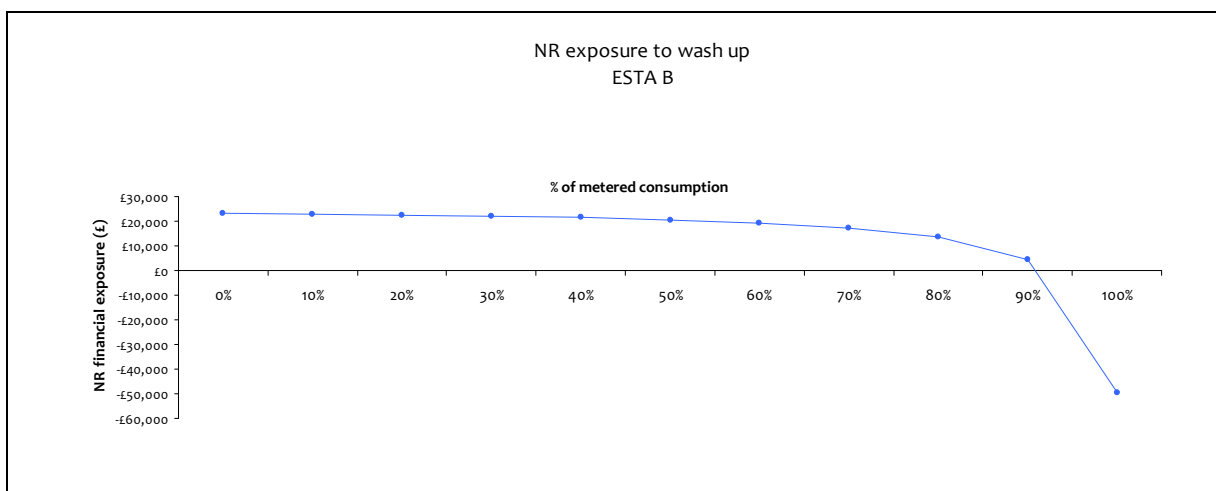


Figure 7 - NR exposure to wash-up in ESTA A (an AC 'money back' ESTA) - DSLF is 25% too low

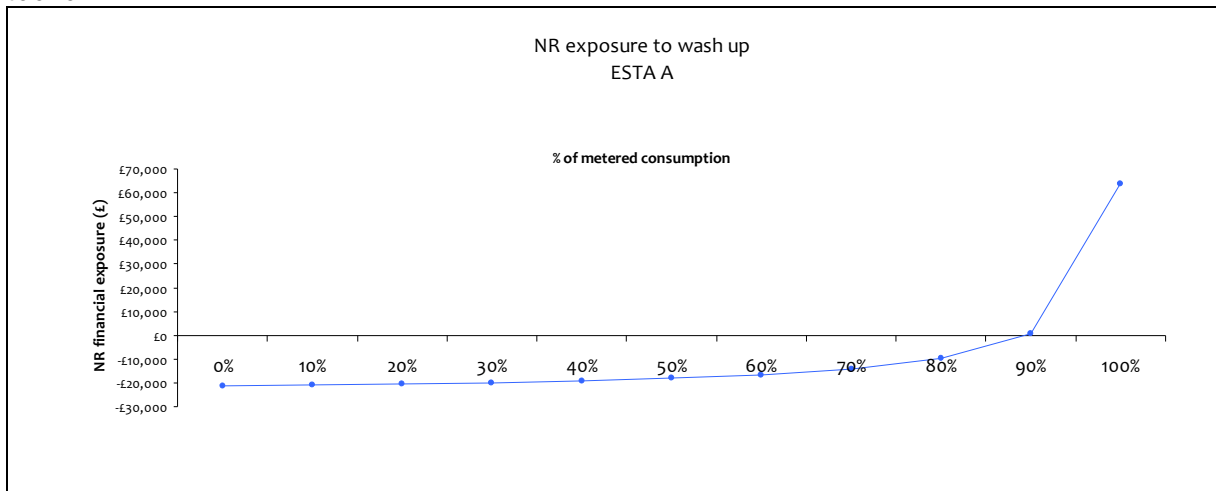


Figure 8 - NR exposure to wash-up in ESTA U (a DC 'money back' ESTA) - DSLF is 25% too low

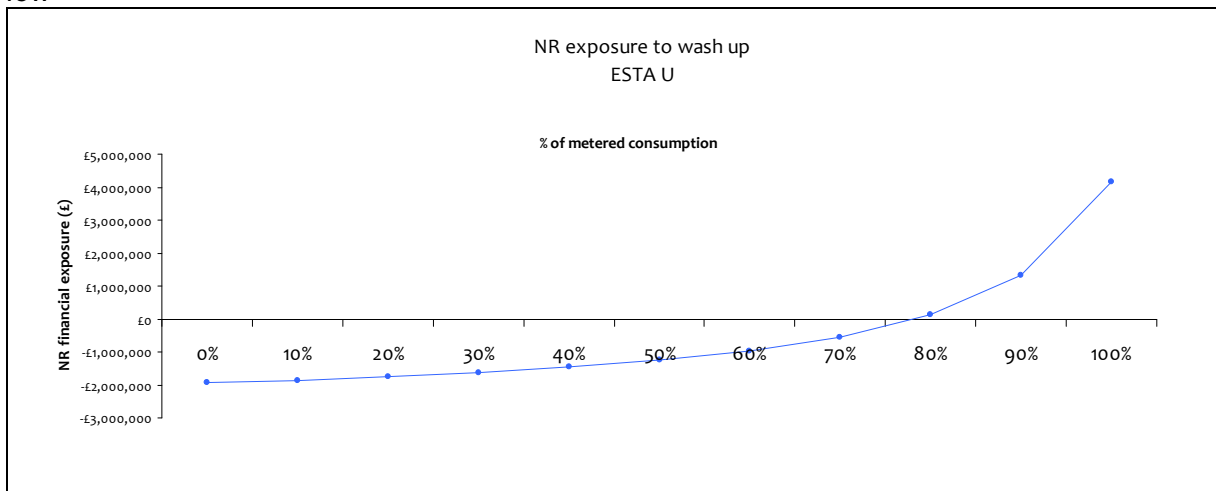
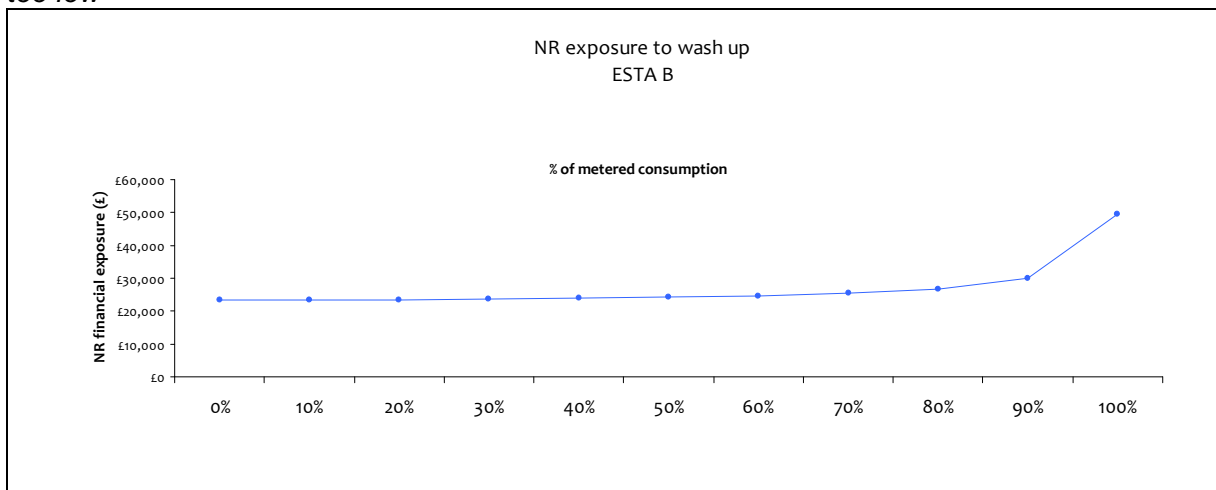


Figure 9 - NR exposure to wash-up in ESTA B (an AC 'money to pay' ESTA) - DSLF is 25% too low



## **ANNEX B: IMPACT OF PARTIAL FLEET METERING**

### **Potential impact on our billing system**

Network Rail is very concerned about the ability to bill operators on the basis of PFM. As we have previously stated, creating a billing system to accommodate PFM would not be an insignificant challenge. Our initial estimates suggest that such a system would cost in the region of £200k – 500k, and would take around 6 – 12 months to build and test. In addition, there would be considerable ongoing annual costs from maintaining and supporting the billing system for OTM. These costs are difficult to estimate.

While it may be considered that PFM will save money for train operators, it will introduce considerable costs for Network Rail billing and ongoing support. We consider that it is important that an approach such as PFM reduces whole-industry costs, and does not simply transfer costs within the industry from one party to another. Furthermore, we consider that ORR's proposal would require the volume wash-up to be carried out by service code, which we consider to be disproportionately complex and risky.

In its consultation, ORR suggests using a 'less automated solution' for an interim period for PFM similar to that used for OTM during its first year of billing. We would like to clarify that the interim solution developed for OTM for Virgin trains for 2010/11 was complex, costly and was not manual. The total cost of that solution was c.£1million for a single year's operation. We would like to avoid creating an interim solution like this again.

### **Points of concern**

We have significant concerns around the process for introducing a charging system such as PFM. Our experience from the OTM project and indeed other charging projects leave us with the following observations:

- We should seek to avoid accommodating each concern specific to each operator. History has shown us that working up proposals to suit each operator may be time consuming when theoretical issues fail to materialise. The work done on suspension factors<sup>13</sup> reflects this, where we have ended up with a very complex solution indeed.
- We note that DC operator Southeastern has recently notified us that it plans to opt-in all trains in its DC fleet. This begs the question of whether full fleet fitment on DC really is uneconomical.
- We are concerned about the likelihood of PFM distracting from the objective to achieve full metering.
- There have been discussions within the industry about the costly exercise of handling large volumes of data. PFM is likely to generate even larger volumes of data which will need to be processed regularly.

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<sup>13</sup> Network Rail, (August 2012), 'Suspension Factors – final proposal', accessible here: <http://www.networkrail.co.uk/WorkArea/DownloadAsset.aspx?id=30064784063>



- Accommodating PFM in the contractual arrangements for EC4T is likely to be time-consuming and complex. This cost would be primarily borne by Network Rail and not operators.

Network Rail is, however, open to working with operators to run practical PFM trials to understand the impact of this approach. We consider that this is essential before ORR concludes on whether to support a full roll-out of PFM. We believe that it is a shame that no practical trials have taken place during the nearly 3 years that PFM has been discussed. If practical trials had taken place which demonstrated that PFM was straightforward and does not pass on undue levels of risk to modelled operators, Network Rail may have been able to support its national roll out.