Copper Development Centre. Australia Limited
ABN 40 067 486 300
Suite 1, Level 7, Westfield Towers
100 William Street, Sydney NSW 2011
Ph: (+612) 9380 2000 Fax: (+612) 9380 2666

www.copper.com.au

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Proposed Rule change: Distribution Losses

Mr. John Pierce
Chairman
Australian Energy Market Commission
Level 5, 201 Elizabeth Street
Sydney NSW 2000
Email: submissions@aemc.gov.au

Dear Mr. Pierce,

I refer to the Rule change request submitted by the Copper Development Centre (CDC) and the consultation paper subsequently issued by the AEMC[1],[2]. Notwithstanding that the original submission was made by the CDC, after some discussions with a range of industry stakeholders, the CDC would like to make additional points, aimed at clarifying important aspects of the original proposal. In addition, the Attachment to this letter responds to the discussion points raised in the AEMC's consultation paper.

Effectiveness of the proposed Rule change

The regulatory framework that currently applies to DNSPs does not provide for an ex-post review of capital and operating expenditures at the end of each regulatory control period. Rather, efficent capital and operating allowances are approved at the regulatory reset. Throughout the regulatory control period, there are strong incentives provided by this regime for the DNSP to contain expenditures to less than its allowances, as this translates directly into business profitabiity. It is the existence of these incentives, coupled with the deficiency in the current market arrangements that does not require DNSPs to account for the cost of losses, that the CDC's proposed Rule change is aimed at addressing.

Assuming that the distribution losses Rule change is approved, a DNSP would comply with the Rule requirements by taking into account the cost of losses in its forecast expenditures and by demonstrating this to the AER. During the regulatory control period the DNSP could, in theory, then expend those allowances using a different approach. It could maximise its profit by minimising costs,throughswitching to adopt high-loss solutions.

There are two reasons why the CDC believes that such an approach by a DNSP is improbable:

- During its examination of a DNSP's forecast costs at a regulatory reset, the AER closely scrutinises historic capital and operating expenditures. These historic costs in large part form the basis for forward projections. The proposed Rule change would empower the AER to seek information on

1 CDC, Proposed Rule change – Distribution losses, 22 December 2011.
2 AEMC, Consultation Paper - National Electricity Amendment (Distribution Losses in Expenditure Forecasts) Rule 2012, 12 April 2012.

how the cost of losses had been considered by the DNSP. The AER would then have the discretion to take this into account in its consideration of forecast expenditures; and

- At a regulatory reset, the AER also confirms that a DNSP has appropriate governance processes in place, to ensure that its forecast expenditure allowances are spent efficiently. The capital governance processes, in particular, apply to each project from its need-based inception to the post-commissioning review. It is considered very unlikely that a DNSP would establish and document governance processes that included appropriate consideration of the cost of losses and at some later stage modify projects to cut their cost.

In short, whilst the proposed distribution losses Rule change applies directly to DNSP expenditure forecasts at the regulatory reset, its requirements also cover the expenditures made during the subsequent regulatory control period.

Regulatory impact of the proposed Rule change

The proposed Rule change is intended to affect the capital and operating decisions that DNSPs make, by requiring them to consider the cost of losses when they make those decisions. Whilst the impact of this change on the costs to market participants is not particularly difficult to quantify for individual DNSP decisions or projects, the overall effect on the market arising from myriad such individual decisions is.

Each DNSP decision where the cost of losses is considered, and found to be material, is likely to marginally increase the DNSP's capital and operating costs. For example: the purchase of a low-loss transformer; the specification of a heavier conductor size; or a decision to return equipment to service late on the day of an outage after maintenance; are all decisions that will marginally increase the DNSP's costs. However, the overall cost to market participants would be reduced through these measures, albeit in the longer term in the case of capital expenditures.

The impact on DNSPs of a requirement to consider the cost of losses, where they are likely to be material, is not significant. It involves a straightforward calculation of the marginal quantity of lost energy and its incorporation into existing expenditure justification procedures. The value attached to that lost energy would be standardised for each DNSP, based on the AER's guidance[3]. If not already done, this would become a routine process with insignificant impact that would be far outweighed by the potential benefits. The proposed Rule change represents no more than an obligation to use good investment practices by considering the investment from the customers' perspective.

The regulatory burden and cost associated with introducing this provision is also insignificant. The AER employs technical consultants to assist it to review a DNSP's capital and operating expenditure forecasts at each regulatory reset. The AER's consideration of loss costs would simply involve the inclusion of an additional term of reference in the consultant's brief.

Expenditures to which the proposed Rule change would apply

The CDC anticipates that the Distribution Planning and Expansion Rule changes proposed by the Ministerial Council on Energy (MCE) will result in a requirement for DNSPs to consider the cost of losses for capital projects valued at more than $5 million[4]. Whilst this proposal should, when approved, result in the more appropriate consideration of loss costs for major distribution projects, the great majority of DNSP expenditure (and expenditure policy) decisions are made on matters that are not captured by this requirement.Many DNSP decisions do not affect losses. However some can, and the longer term outcomes can be costly for market participants.

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3 CDC, Submission to the Distribution Network Planning and Expansion Framework Rule change proposal, 29 November 2011.

4 MCE, Distribution Network Planning and Expansion Framework Rule Change Request, January 2011.

Clearly the proposed MCE Rule change would apply directly to capital expenditures above the $5 million threshold. However, some DNSP decisions that would not be covered can significantly affect losses and involve expenditures much greater than this threshold, such as:

- Equipment purchase decisions,such as bespoke transformer designs (for larger transformers such as zone substation transformers not covered by MEPS requirement).
- Design and materials specifications, including standardised conductor sizes.

A DNSP's decisions can also affect opex, on matters like determining and restoring the configuration of the network and decisions as to whether to return items of equipment to service on overtime, or defer restoration to the next day. For that reason, and so as not to distort any capex-opex tradeoff, the proposed Rule change was made symmetric, to apply to both capital and operating costs.

The CDC remains firmly convinced that the economic regulatory framework for network businesses needs to more closely align with energy efficiency policy frameworks.CDC is also convinced that the proposed distribution losses Rule change provides a straightforward means of increasing DNSP awareness of the consequences of their decisions and improving energy efficiency.

In closing, I would again convey my appreciation of the AEMC officers' advice in respect of the protocol to be followed in submitting this proposal. Please do not hesitate to contact me, if further explanation of this submission would assist the Commission with its deliberations.

Yours sincerely,

John J Fennell
Chief Executive Officer
Copper Development Centre • Australia Ltd

Attachment – Response to questions put by the AEMC

Question 1	
(a)	Is there evidence that DNSPs do not consider the cost of electrical energy losses when making capital and operating expenditure forecasts?
(b)	Do the rules provide effective incentives for DNSPs to make efficient capital and operating expenditure decisions? If so, what are these incentives?
(c)	To what extent does the EBSS impact on a DNSP's consideration of the cost of losses?
(d)	Do distribution losses significantly contribute to the price of electricity to consumers? If so, how much do they contribute and does this materiality vary between networks?

(a) The CDC considers it would be instructive for the AEMC to further investigate whether, and how, DNSPs consider the cost of electrical losses in their investment decisions. Importantly, the value that they ascribe to electrical losses should reasonably represent the Long Run Marginal Cost of series or shunt losses, as appropriate.

The CDC is aware of anecdotal evidence from a number of industry participants and stakeholders that it is not always the case that losses are duly considered. Moreover, as the long run cost of both generation and networks has increased in recent years and a carbon tax is due to apply from 1 July 2012, the long run value of losses that should be used for investment appraisal has significantly increased.

(b) The present Rules provide no requirement or incentive for DNSPs to consider losses in their capital and operating investment decisions. The CDC outlined the strong incentives that have been placed on DNSPs by the current regulatory framework, in its original submission. These incentives are purely directed at minimising capital and operating costs. The AER's Efficiency Benefits Sharing Scheme (EBSS) simply levellises the incentive on operating costs throughout the regulatory control period.

This cost minimisation incentive faced by DNSPs is not an incentive that will result in efficient investment. The total cost to participants of a DNSP's decision is the sum of the direct costs to the DNSP (recovered through network tariffs) and the market costs, in which the cost of losses is embedded. An efficient regime would require investment decision making by DNSPs to take into account the long run costs to market participants. That is what the Market Objective requires and is exactly what the CDC's proposed Rule change seeks to achieve.

(c) The AER's Efficiency Benefits Sharing Scheme (EBSS) does not currently contain an incentive for DNSPs to reduce their system losses.

The CDC does not consider that an incentive for DNSPs to reduce system losses is appropriate. Nor would it be effective.

Distribution losses are accounted for as the difference between the inputs to the distribution network (at transmission connection points and from embedded generators) and the outputs from the network, using customers' metering. The inputs to the network are all metered using interval meters and thus the consumption for a particular period is readily and accurately determined. However, the metering at most customers' premises is of the accumulation type and read on a two or three monthly cycle. As a consequence, there is a significant accrued volume of energy sales that must be estimated. Regardless of the sophistication of the accruals process, this results in a natural annual

variation in the apparent losses that is exacerbated by changing weather patterns during the winter period.

This natural variation of around 10-15% in annual losses requires a rolling average over about 5 years to be applied to any system losses incentive. The lag thereby introduced means that any incentive properties would be so muted as to be ineffective.

Rather than applying such an incentive on outcomes, the CDC believes it is more efficient to apply the economically efficient inputs to the DNSP investment processes. The optimisation of distribution losses would follow as a natural consequence.

(d) Distribution losses do represent a significant cost to electricity consumers. The system losses are a broad average that is dependent upon the configuration and loading on a DNSP's network. Average losses vary from around 5% for compact metropolitan distribution systems to 15% or more for rural networks. The distribution loss factors of small customers are slightly greater than this average. Losses thus account for around 2.5 – 7% of the bill of a small customer (which has network and retail components of similar magnitude). This proportion will increase with the imposition of the carbon tax in July 1012.

Question 2

(a) How might the extension of the EEO program to distribution networksaddress the concerns raised in the rule change request by CDC?

(b) To what extent do the requirements on distribution transformers under theMEPS program encourage DNSPs to minimise distribution losses?

(c) Do the requirements on distribution transformers under the MEPS programinfluence the broader network equipment decisions of DNSPs?

(a) The extension of the Energy Efficiency Opportunities program would potentially provide financial incentives for DNSPs to carry out some works aimed at reducing losses in elements of their networks. However, the CDC believes there are likely to be significant limitations to the application of this scheme:

- The long run cost of losses in networks varies markedly with the load profile, the configuration of the particular distribution network and the voltage level within the network. It would not be possible for the EEO incentives to be structured to reflect an appropriate long run cost for losses, tolead to their optimisation;
- The EEO scheme specifies a payback period of four years, which is not compatible with distribution investmentshaving much longer usefullives;and
- It is unlikely that the EEO scheme could be structured to apply to the broad range of investments that DNSPs make.

The CDC considers that the most efficient way to optimise the cost of losses in DNSP investment decisions is to ensure that appropriate cost inputs are used in the investment analysis.

(b) The MEPS program applies to a specific type of distribution equipment, namely distribution transformers. Whilst these are a significant contributor to distribution system losses (15-25%), other items of equipment also contribute to losses and these are not covered by MEPS.

The CDC supports the use of MEPS to provide a basic minimum level of energy efficiency for distribution transformers. However, this does not guarantee theoptimal or economically efficient

level of losses (which is not achieved through minimising losses). Each DNSPs' network configuration is different and that, plus the loading pattern over the life of the transformer, means that an optimal transformer design must permit some trade-off between the transformer's no-load losses, load losses and capital costs.

CDC has responded to the current review of distribution transformer MEPS by the Department of Climate Change and Energy Efficiency, to propose the adoption of a European-style system[5],which would provide DNSPs with flexibility to further optimise distribution transformer losses by creating a range of energy efficient transformers for different applications.

(c) The distribution transformer MEPS is a blunt regulation that influences the component of distribution system losses taking place within distribution transformers. It has no influence whatsoever on the decisions that DNSPs make concerning the loss characteristics of their other investment decisions. Nor, in its current form, does it permit a DNSP that so wished to optimise the transformer losses for its individual situation, so as to minimise overall supply costs.

Question 3

(a) Will the proposed rule result in DNSPs considering the cost of networklosses in preparing their capital and operating expenditure forecasts?

(b) Are there any alternatives to the proposed rule that may better address theissues raised in the rule change request?

(c) Should a similar requirement to the proposed rule be considered fortransmission networks?

(a) The CDC is of the view that the distribution loss Rule change proposal represents a simple and straightforward way of addressing a deficiency in the current market arrangements. When approved, a DNSP would comply with the Rule requirements by taking into account the cost of losses in its forecast expenditures and by demonstrating this to the AER.

During the ensuing regulatory control period, the DNSP could theoretically expend those allowances using a different approach. It could maximise its profit by minimising costs, by adopting high-loss solutions. However, there are two reasons why the CDC believes that this is unlikely:

- During its examination of a DNSP's forecast costs at a regulatory reset, the AER closely scrutinises historic network capital and operating expenditures. These historic costs are the foundation for the DNSP's forecasts. The proposed Rule change would require the AER to seek information on how the cost of losses had been considered by the DNSP. The AER would then have the discretion to take this into account in its consideration of forecast expenditures; and
- At a regulatory reset, the AER also confirms that a DNSP has appropriate governance processes in place, to ensure that its forecast expenditure allowances are spent efficiently. The capital governance processes apply to each project from its inception to the post-commissioning review. It is considered improbable that a DNSP would establish and document governance processes that included appropriate consideration of the cost of losses and at some later stage modify projects to cut their cost.

Thus the proposed distribution losses Rule change applies directly to DNSP expenditure forecasts at the regulatory reset, and covers the expenditures made during the subsequent regulatory control period.There is a very significant incentive on DNSPs to follow the requirements of the Rules in preparing their capital and operating expenditure forecasts. These forecasts are critically reviewed by

5 CDC, Submission to the Consultation RIS for the Review of MEPS for Distribution Transformers, 16 July 2011.

the AER, with consultant assistance. The forecasts are rarely, if ever, accepted by the AER as reasonably reflecting a realistic expectation of forecast costs.

(b) Two alternatives are often mooted as ways in which DNSPs may be provided with an incentive to optimise the cost of distribution losses and thereby minimise overall supply costs:

- ***Financial incentive based on the DNSP's distribution system losses*** – For the reasons advanced in response to Question 1 (c), an incentive based on a DNSP's system losses would be ineffective.
- ***Loss purchases*** -DNSPs would be required to purchase the losses in their system,by trading in the market. This proposal would introduce a substantial element of risk to each distribution business, as the energy volumes are substantial. For a DNSP with system losses of 10%, the cost of losses would be circa 5% of the distribution revenue derived through network prices. This would require the fundamental rearrangement of the current regulatory framework, as DNSPs have been established as relative low risk regulated entities, without market exposure.

(c) For transmission network businesses, the RIT-T requires the consideration of market costs and benefits, and thus the cost of losses. This requirement currently applies to capital investments in excess of $5 million. The nature of transmission businesses is such that their investments are generally bespoke and commonly exceed that threshold. TNSPs are not faced with a great number of small investment decisions, as are DNSPs.

In addition, the AER's Service Target Performance Indicator Scheme (STPIS) imposes significant incentives on TNSPs to maintain high levels of network availability, particularly where the market may be impacted. As transmission losses are influenced by the availability of all network elements for service, there is a direct incentive for TNSPs to develop operating practices that minimise the losses in their networks.

Question 4

(a) What are the likely implementation and ongoing costs associated with theproposed rule for DNSPs and the AER?

(b) Is the proposed rule likely to result in more efficient expenditure whichcould lead to lower electricity prices for consumers over the long term?

(a) The proposed Rule change represents an incremental change to the existing requirements on DNSPs and the AER for forecast

(b) The long-run cost of losses is much greater than the regional reference prices from recent market trading. It is in the same order as the retail tariff for the type of customer concerned and will increase with those retail tariffs to reflect the carbon tax on 1 July 2012.

A significant proportion of the expenditure by DNSPs does influence network losses. The CDC considers that its proposed Rule change will result in more efficient expenditure by DNSPs by creating a requirement for them to consider the cost of losses in their capital and operating investments. This will flow through to consumers as lower electricity prices in the short term, in the case of operating decisions, and in the longer term, in the case of capital decisions.

Question 5

(a) How material is the cost of losses to the expenditure by DNSPs that wouldnot be captured under the requirements of the proposed RIT-D?

(b)	To what extent would the guidance and worked examples proposed to beprovided by the AER in the RIT-D application guidelines help determine thevalue ascribed by DNSPs under this proposed rule if implemented?

(a) The proposed RIT-D would impose a requirement on DNSPs to consider the cost of losses in their major capital investment decisions. A threshold of $5 million has been proposed for the application of this test.

The nature of DNSP businesses is that the RIT-D requirement will only capture a small proportion of DNSP expenditures. There are a very great number of capital and operating decisions that a DNSP makes, which influence the level of system losses. There are also policies and standards that DNSPs develop and apply to investment programs. These frequently influence program expenditures that are orders magnitude greater than the RIT-D threshold.

The proposed Rule change would apply directly to capital expenditures below the $5 million threshold. However, some DNSP decisions that would not be covered can significantly affect losses and involve expenditures much greater than this threshold, such as:

- Equipment purchase decisions,such as bespoke transformer designs (for larger transformers not covered by MEPS requirement).
- Design and materials specifications, including standardised conductor sizes.

A DNSP's decisions can also affect opex, on matters like determining and restoring the configuration of the network and decisions as to whether to return items of equipment to service on overtime, or defer return to the next day. For that reason, and so as not to distort any capex-opex trade-off, the proposed Rule change was made symmetric, to apply to both capital and operating costs.

(b) DNSPs are already well equipped to determine the incremental loss effects (in kWh) of alternative investment options, where losses are material. The tools they currently use for network planning enablethem to readily carry out this type of calculation.

The value that is attributed to the long run cost of losses is most important aspect in calculating their cost for a particular investment. It is in this area that a range of plausible assumptions can be made concerning future long run generation costs and a broad range of outcomes would ensue. The CDC envisages that the AER would provide guidance to DNSPs on the long run cost of losses, and would engage expert assistance to do so. This is exactly the same approachcurrently used to provide guidance to TNSPs on loss costs. This would significantly reduce the diversity of outcomes.