



10 May 2011

Ms Marissa Godinez
Energy and Environment Division
Department of Resources, Energy and Tourism
GPO Box 1564
CANBERRA ACT 2601

Lodged by email to energyefficiencyopportunities@ret.gov.au

Dear Ms Godinez

Draft amendment regulations for extension of the Energy Efficiency Opportunities Act to electricity generators

The National Generators Forum (NGF) welcomes the opportunity to provide a response to the draft amendment regulations.

The NGF has previously provided its position to the Department in relation to removal of the exemption for the generation sector from the *Energy Efficiency Opportunities Act 2006*. In summary, this position is as follows:

- i. The NGF contends that the EEO is not complementary to a carbon pricing scheme;
- ii. The cost benefit justification of removal of the exemption is flawed, the benefits unknown and likely overstated; and
- iii. NGF recommendations to provide choice of baseline and an alternative energy assessment threshold of 98% should be included in the amendment regulations.

The Implementation Regulation Impact Statement (IRIS) concludes that extension of the EEO program is justified on the basis that it will deliver benefits to fossil fuel generators: cost savings, improved efficiencies and emissions reductions, with a positive benefit cost ratio (BCR). The NGF believes that the IRIS's analysis contains erroneous assumptions and errors of fact which undermine the conclusion reached. The NGF's critique of the IRIS is presented below.

While the NGF is pleased to note that the two recommendations made in its submission to the EEO Review remain under consideration, generators are disappointed that they have not been adopted in these amendment regulations.

The NGF recommended that:

- generators be given the option to choose either the 24 month baseline or a longer timeframe (48 months or more) to achieve a baseline that is not unduly influenced by large variations in electricity production caused by internal and external factors; and

- the assessment threshold be set so that generators would be required to assess 98% of their energy use, rather than the existing 0.01PJ threshold.

The justification for these recommendations was provided in the NGF's previous submission.

The Department states that because the two issues identified by the NGF are also relevant to other stakeholders, they will be addressed in regulation amendments for the broader EEO second assessment cycle review, which is at an early stage. While the NGF's recommendations may be relevant to other sectors, the NGF wishes to impress on the Department that the assessment threshold is of preeminent importance to the electricity generation sector because main fuel stream energy consumption accounts for virtually all energy use by electricity generators.

To reiterate the key points made in the original submission, the combustion of coal represents some 99% of a typical coal fired power station's energy use. Energy use from other sources is insignificant in the overall context of electricity production. An assessment of the remaining energy use and potential savings from this area would come at a disproportionately high cost with little gain and will not be cost-effective, as required under the EEO Act.

Moreover, EEO assessment of a multitude of minor systems at a power station — even if they were to result in the potential saving of 50% or even 100% of their respective component energy consumption in aggregate — will *never* amount to a saving which exceeds the uncertainty of measurement of the generator's main fuel stream energy consumption. Consequently, it is the efficiency of energy consumption in the main fuel process stream which ought to be the focus of EEO assessment for generators.

As noted in our previous submission, a more cost effective approach, which would guarantee assessment of virtually all energy use in generation, would be to require generators to assess 98% of their energy use. This would ensure resources and attention are focused on main fuel use where the potential to achieve cost effective efficiency gains is greatest.

The NGF urges the Department to respond to these issues and the two recommendations contained in the original submission for the EEO Review.

The NGF also reiterates that the introduction of a carbon price would make the EEO program redundant. The NGF disagrees with Access Economics's argument that the EEO program would be complementary to an Emissions Trading Scheme. In the event that a carbon price is legislated, the NGF recommends that the EEO program be terminated.

Critique of the Implementation Regulation Impact Statement

As noted above, the IRIS contains several significant inaccuracies which undermine the conclusion that the extension of the program to generators will deliver substantial net benefits (a positive BCR). The areas of concern are outlined as follows.

- i. The costs of program implementation (undertaking energy efficiency assessments and complying with the reporting requirements) are estimated based on the costs reported by existing EEO participants (IRIS, p. 6).

This assumption cannot be justified because the Department is not yet able to identify the amount of effort required at the technical level to achieve compliance with the Energy Mass Balance and Energy Assessment requirements at generation plant sites. This will only become clear once the proposed gas and coal fired generator trials are completed. In addition, the outcome of the .01PJ assessment limit issue will also have a major bearing on generator compliance costs.

- ii. The experiences at the power generation facilities of existing EEO participants (Rio Tinto and Alcoa) cited in the IRIS do not relate to utility generation facilities in any way.

Taking each of these company reports in turn:

a) Rio Tinto

In their 2009 Public Report, Rio Tinto discussed three separate power generation facilities — steam thermal powered plants at Dampier and Cape Lambert and a gas turbine facility at Paraburdoo.

The opportunities reported as implemented/identified included:

- the introduction of a condenser cleaning regime at both Dampier and Cape Lambert, which was expected to improve condenser vacuum and hence turbine efficiency;
- implementation of a vendor Master Services Agreement to maintain the Paraburdoo GT's performance at or close to as-new specifications; and
- implementation of streamlined steam leak detection and repair process.

In sum, these opportunities were assessed as 2.7% of the aggregate energy consumption and not 3.5% as stated in the IRIS. The other 0.8% related to an unspecified opportunity reported as under investigation.

When the actual savings are examined, a figure was only quoted for the condenser cleaning opportunities while for the others the actual saving would only be confirmed as a consequence of later analysis and experience following implementation. This is likely to appear in the 2010 Rio Tinto report.

Even if the full 2.7% is achieved, these or similar opportunities are unlikely to arise at utility plants because all utility generators would:

- in all probability already be using condenser cleaning on a regular basis;
- already have a manufacturers' GT inspection and maintenance regime in place; and
- do not operate with significant steam leaks.

b) Alcoa

The IRIS states that Alcoa has identified significant opportunities for cost and emissions savings at those generation facilities covered by the EEO program. The reported achievements are based on data quoted from Alcoa's 2007 Public Report and also presumably the associated Alcoa Pinjarra Industry Leader Case Study (DRET report).

The opportunities highlighted by Alcoa include:

- condensate heat recovery from the co-generation plant by the installation of feedwater heaters instead of discharging hot condensate straight to waste (0.2GJ/t alumina or 4.4% of energy used); and
- introduction of larger CRD heaters in digestion (0.1GJ/t alumina).

The first opportunity will not exist at utility power plants because all useful heat from steam streams is already recovered. At most power generation sites spent steam feed water heating already occurs in a series of probably four or more LP and HP heaters, prior to the economiser section of the boiler which uses low temperature flue gas to preheat feedwater.

Updating of shell and tube heaters is also most unlikely to yield an efficiency improvement at power generation facilities. It is understood that corrosion of the digester heaters when new is a recognised phenomenon, usually solved by plugging tubes and presumably reducing energy recovery. Hence the installation of over capacity heaters is likely to be beneficial in the longer term.

Due to sophisticated feedwater treatment in high pressure power station boilers, tube scale, cleaning and corrosion control are not issues likely to yield energy efficiency gains. Power generation original equipment would have been designed and selected to support optimum plant energy efficiency and is unlikely to warrant change out.

- iii. The cost of electricity to generators (see for example IRIS Tables iv and 2.3) is assumed to be the opportunity cost of selling to the wholesale market.

To say that the value of electricity to a generator is its market opportunity price is only true if the generator is fully dispatched. While this will be true for some plant, many (if not most) are very rarely fully dispatched so there is no opportunity cost. Given that the electricity market must have access to undischarged plant at all time, it is inherent that some/many/most generators are in this state. The value of electricity to generators is therefore the cost of fuel required to generate that electricity. A value does not seem to appear in the IRIS analysis but we strongly suspect that it is significantly larger than the incremental fuel cost of generation.

- iv. IRIS overall conclusions

In reaching its BCR conclusions, the IRIS assumes central case assumptions of:

- \$200,000 per annum compliance costs for the larger generator stations;
- thermal efficiency improvement of 1%, guided by the fictitious 3.5% reported from the Rio Tinto site factored downwards; and
- 2% auxiliary efficiency improvement, guided by the metals manufacturing sector EEO improvement of 3.9% also factored down. This sector was selected for comparison as it was said to represent the closest proxy to power generation.

The factoring down is based on Access Economics's expectation that generators already have in place more advanced electricity consumption, maintenance and monitoring programs than other companies. Whether these anticipated EEO percentage savings are realistic for the generation sector is unknown.

The IRIS concludes that, based on the central case assumptions, for the EEO extension to be cost neutral for generators requires thermal efficiency improvement of 0.18%, coupled with auxiliary improvements of 2%. An auxiliary improvement of this magnitude may be both measurable and possible but a thermal efficiency improvement of 0.18% in response to specific opportunities certainly isn't measurable with any degree of confidence.

Other possible improvement options for generators listed by Access Economics include:

- installation of plant to reduce the water content of coal;
- changes to boiler design and maintenance schedules to maximise energy extracted per unit of fuel;
- improvements to lagging to reduce thermal losses; and
- refinement of policies balancing energy efficiency against other operational concerns such as maintenance and redundancy.

The potential for these options to deliver efficiency savings could be investigated in the planned generator trial program to confirm or demonstrate otherwise the statements offered up in the IRIS.

General remarks

The NGF would also like to take this opportunity to advise the Government of the following:

- The country's major capacity power stations operate at their most efficient when operating at their full design capacity. With the substantial penetration of renewable power generation into the nation's electricity markets, continued full capacity operation is unlikely to continue resulting in a significant reduction in generation efficiency, thus offsetting any gains which might otherwise be achieved.
- In relation to energy efficiency trends in power generation, the NGF also believes the Government should be aware that it has been reported in some overseas studies that beyond a certain point, the increased penetration of renewables provides no greenhouse reduction benefits and only increases the local cost of power supplies in proportion to the extent of the enabling subsidy/tax offset. There is strong potential for the current regulatory context and industry structure to have this unintended outcome here.

Finally, the NGF notes the inconsistency of having the EEO exemption removed from power generation while it is maintained for energy distribution and transmission entities, contrary to the proposals of the Report of the Prime Minister's Task Group on Energy Efficiency.

Yours sincerely



Malcolm Roberts
Executive Director