A Cleaner Future for Power Stations Discussion Paper

Response by the National Generators Forum

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ABN 83 113 331 623 PO Box 4155 Kingston ACT 2604 T 02 6232 7789 F 02 6232 7781 W ngf.com.au

The National Generators Forum

The National Generators Forum (NGF) represents Australia's electricity generators. NGF members account for 95 per cent of the electricity generated in Australia, using the full range of fossil fuel and renewable technologies.

The NGF welcomes the opportunity to comment on the discussion paper *A Cleaner Future for Power Stations*. NGF members face an unprecedented challenge over the next decade. Generators will need to satisfy rising demand for electricity while accelerating a historic shift to lower emissions power.

To meet this challenge, NGF members have a strong preference for efficient, market-based policies. The NGF is alarmed by the proliferation of ad hoc policies, at all levels of government, which distort otherwise efficient electricity markets for what are often ill-defined or marginal environmental aims. These policies are rarely complementary to a future carbon price and are usually token policies announced by governments in order to be seen as 'doing something' to address climate change.

As a bare minimum, the NGF believes that governments have an obligation to develop policies in an open, consultative way with the merits of each policy tested by a rigorous cost-benefit analysis.

1. Emissions intensity standard for coal-fired generation

Introduction

The NGF does not support the proposal for an emissions intensity standard for new coal-fired generation.

With the Government committed to introducing a carbon price by 2013, an emissions intensity standard is redundant. The firm expectation of a carbon price is sufficient to deter investment in new, emissions intensive generation. Power stations are long-lived assets with working lives measured in decades. No business, or project financier, will invest in assets which would be fatally exposed to a carbon price.

The Government has implicitly conceded this point by suggesting that the emissions intensity standard could be phased out after a carbon price is in place. The NGF believes that, if introduced, the standard should be withdrawn immediately after introduction of a carbon price.

The Government has always stressed the merits of market-based measures to capture the externality of greenhouse gas emissions. By comparison, regulatory approaches can be clumsy, unduly prescriptive and have the potential for unforeseen, and undesirable, consequences.

The NGF believes that care needs to be taken when setting emissions intensity standards to avoid the risk of perverse outcomes. In particular, the standard should not prevent generators from upgrading or expanding existing plant. Restricting upgrades and expansions would effectively prevent investments reducing the emissions intensity of generation. Australia should not repeat

the policy mistakes made in the United States where the Clean Air Act and other environmental legislation have entrenched an ageing coal-fired generation fleet.

The NGF would urge the Government to be cautious about the emissions intensity estimates for emerging technologies mentioned in the discussion paper. These estimates have been drawn from overseas research which has not been tested in Australian conditions. The technologies in question have not been demonstrated in Australia on a commercial scale. Close consultation with technical experts in industry will be required to identify appropriate standards for Australia.

Thresholds

The NGF notes that the interdepartmental task group has mooted five options for setting a standard or standards for new coal-fired plant:

- A standard at or below 0.86 tCO2-e/MWh;
- A standard at or below 0.80 tCO2-e/MWh;
- A standard at or below 0.70 tCO2-e/MWh;
- A differentiated threshold by best-in-class existing and emerging systems (i.e. subcritical, supercritical; ultrasupercritical, IGCC, and IDGCC); or
- A standard set with review and possibility of a declining threshold to account for improvements in technology.

Four of these options would apply a single standard to all new generation. The three thresholds mooted are arbitrary, without any obvious environmental or technological rationale. The last option proposes a fluid standard, suggesting a long-term standard which would be adjusted as technology evolves.

The NGF believes a single standard is less likely to promote 'best practice' than a range of tailored standards. Setting different thresholds for different technologies would assure the community that, within a broad menu of technology options, generators were satisfying the highest possible standards.

Adopting a number of tailored standards will require close consultation between government and technical experts in industry. This consultation is essential because of the very limited data available on the operation of emerging technologies in Australian conditions. Differences in fuel quality and operating conditions between Europe and Australia, for example, raise doubts about the emissions intensity levels identified in the discussion paper. It would be risky to treat the estimates as anything more than estimates at this stage.

A flexible approach is also needed to accommodate the special circumstances applying in Western Australia. More than any other State, Western Australia requires the option of coal-fired generation to guarantee energy security.

In Western Australia, natural gas is the fuel source for about two-thirds of the State's generation. However, the main commercial contracts for the supply of natural gas to generators begin to expire in 2015. New long-term supply contracts are already difficult to obtain. After the Varanus Island accident in June 2008, for example, Western Australia was only able to meet essential demand by returning to service old, coal-fired plants.

It is doubtful whether any of the proposed standards would be feasible in Western Australia. The Western Australian market is too small to readily support new coal-fired generation technologies. A supercritical plant requires a minimum scale of operation (c. 400 MW capacity) while the necessary scale for ultrasupercritical plant is even greater (c. 700 MW). Since 2006, two coal-fired plants (Bluewaters I and II) have been built in Western Australia. The Bluewaters plants use sub-critical technology and have capacities of only 208 MW. The emissions intensity of these plants (0.92 t CO_2-e/MWh) exceeds the 0.86 t CO_2-e/MWh proposed as the 'starting point' for an emission intensity standard.

The NGF prefers a range of 'best practice' standards developed in close consultation with generators. Standards should reflect Australian conditions.

Coverage

The interdepartmental task group proposes three options for defining the coverage of the standard:

- Excluding existing generation units, including future expansion generation units; or
- Excluding existing generation units and expansion units (provided the latter have a lower emissions intensity than existing generation units); or
- Excluding only existing generation units.

The NGF supports the first option as the most practical approach. The first option is also the approach most consistent with the Prime Minister's announcement of 23rd July 2010, in particular the assurance that the standard will not affect existing plants.

The second and third options were not foreshadowed in the Prime Minister's announcement. The second option would mandate lower emissions intensity for expansions to existing plant. This requirement goes considerably beyond the Prime Minister's election commitment. The third option would presumably apply the standard to existing power stations whenever changes are made which add generation capacity.

The Commonwealth often stresses how policy uncertainty is damaging investment in the sector. For this reason, the Commonwealth should avoid creating further, damaging uncertainty. Broadening the scope of the standard, as mooted in the discussion paper, would raise sovereign risk concerns for investors and deter efficiency improvements to existing plants.

The discussion paper also proposes a flawed definition of 'new plant'. The definition of new coal-fired power stations offered on page eight fails to even mention 'new' plant:

> "A generation complex, generation complex project or generation unit that uses coal to generate electricity and may be grid-connected or non-grid connected generation".

This definition must be amended to exclude any possibility of capturing existing plant or projects with environmental approvals. New plants could be defined as a generation unit using coal to generate electricity which, as of 31 December 2011, did not possess an environmental approval from the relevant State authority. This simple test would be consistent with existing approval

processes and would not be open to interpretation or dispute. It would provide certainty to investors and regulators alike.

The Prime Minister's announcement excluded from the standard "planned investments which already have environmental approvals and are determined by the energy market institutions as being sufficiently advanced". As indicated above, the NGF accepts the first point but doubts that there is any valid reason to add a second, subjective test. It is unclear whether the Australian Energy Market Operator or the Australian Energy Market Commission would be responsible for deciding whether a project satisfied the second test. Putting that issue aside, a second test would just add to regulatory uncertainty and the compliance burden.

The discussion paper suggests identifying exempt 'planned investments' using criteria borrowed from the annual Electricity Statement of Opportunities (ESOO). However, the ESOO has a very different purpose to the emissions intensity standard. The ESOO is a planning document. It applies a stringent, multi-factor test to identify 'committed' and 'advanced' projects because the energy market operator requires a reliable forecast of the minimum increase in future generation capacity. The test is weighted to produce a conservative result. The purpose of the exemption for 'planned investments' is different, namely to reduce uncertainty for investors and avoid creating a greater sense of sovereign risk in the Australian energy market. Applying a complex and unpredictable test, as in the ESOO, would have precisely this effect.

The discussion paper suggests that applying the standard to expansion of existing plant would "provide for emissions-intensity improvements in existing generation assets". However, the reverse is more likely to be the case. Owners could be deterred from improving the performance of existing plant if an expansion would trigger new and costly regulatory requirements. Emissions savings which could be achieved from expansion and upgrade of existing plants could be lost.

There is compelling evidence from the United States that applying more rigorous standards to new plant than existing plants can backfire. Tighter US controls on SO_2 and NO_x emissions from new plant has had the perverse effect of deterring the construction of new plants and encouraging greater output from older plants. Since 1990, the net capacity of coal-fired generation has increased by only 2.5 per cent while output has soared by 27 per cent. During this period, only 125 coal-fired units with a capacity of 21,177 MW were built. To put these figures into perspective, the US fleet has 1,466 coal-fired units with a total capacity of 339,509 MW. The new plants amount to about 6 per cent of total capacity. The median age of the US coal fleet is now 44 years.

This experience with the Clean Air Act and related legislation has led environmental groups in the US to question whether tighter emissions controls on new coal-fired plant under the Waxman-Markey Climate Bill will produce a similar, perverse effect. The Commonwealth should consider the lessons of the US experience.

The NGF supports a clear exemption from the standard for all existing coal-fired plants, including future upgrades and expansions. The NGF believes that "planned investments" with a State environmental approval should be exempt from the standard.

Date of Commencement

The NGF does not oppose commencement on 31 December 2011.

Administration

The avowed purpose of the Prime Minister's announcement was to prevent the construction of inefficient/emissions intensive generation, not to add more layers of regulation to the operation of plant or another compliance hurdle for investors.

As far as possible, the application of the standard should be integrated into existing (State) regulatory approval processes rather than duplicating these arrangements with new (Commonwealth) legislation. A Commonwealth-State agreement on appropriate national standards would simplify compliance and prevent different standards being adopted at different levels of government (two State governments have announced their own emissions intensity standards for new plant). The NGF does not accept the claim made in the discussion paper that Commonwealth legislation would be "more expeditious and transparent" than using State legislation. Existing State processes are well understood and there seems no reason to believe that these processes would be any less transparent than a new Commonwealth process.

The NGF is always concerned to minimize the compliance burden for generators. The discussion paper proposes an ongoing monitoring and compliance regime for plants approved under the standard, with the suggestion that operators could face financial penalties. The NGF strongly rejects this proposal as exceeding the terms of the Prime Minister's announcement. The Prime Minister announced that the Government would prohibit the construction of emissions-intensive plant. Once approved, a plant should be left to operate as efficiently as the demands of the market allow. A carbon price will provide daily commercial discipline to ensure the most efficient possible operation of all plants.

Generators already comply with a raft of reporting and other requirements imposed by regulations such as the National Greenhouse and Energy Reporting program, the Energy Efficiency Opportunities Act and the conditions for registration in the National Electricity Market and the Western Australian markets. The emissions intensity standard should not be used to impose further regulatory demands on generators.

The NGF believes the standard should apply only at the approvals stage of a project. There should be no requirement for ongoing monitoring and compliance.

Phase Out

The standard should be withdrawn as soon as a carbon price takes effect. There is no policy rationale to restrict generation choice once the externality of greenhouse gas emissions is priced.

2. CCS-Ready Standards

The NGF is concerned about creating a prescriptive Carbon Capture and Storage (CCS) Ready requirement for new coal-fired generation. A formal standard is premature given the great uncertainties about the application and future availability of this developing technology.

The Government proposes six mandatory requirements for a new CCS-ready requirement for new coal-fired generation:

- Demonstrate sufficient space and access on site and within the facility to accommodate carbon capture and compression facilities for the majority of the plant's CO_2 emissions;
- Identify potential areas for long term geological storage of captured CO_2 (meeting the plant's capture needs);
- Undertake a site specific assessment into the technical and economic feasibility of the CO_2 capture retrofit using one or more technology choices;
- Identify a realistic transport method to identified storage sites;
- Demonstrate measures and approvals that deal with the collection and treatment of pollutants resulting from the capture process and provisions for increased water requirements; and
- Estimate the likely costs of retrofitting capture, transport and storage.

Given that CCS is still an unproven commercial technology at the demonstration stage of development, it is difficult to see how an investor could fulfill all of the proposed conditions. The NGF believes that the proposed standard is unduly prescriptive. While other jurisdictions have ensured that CCS-Ready requirements are addressed on a case-by-case basis through their regulatory approvals, the Commonwealth is proposing a much more formal and onerous approach. In particular, producing a "detailed economic feasibility study of retrofitting CCS" (identified by the Government as "the key requirement") would be challenging given the paucity of commercial data and experience with CCS technology. Such an economic analysis would also be heavily contingent on assumptions about market conditions at an unknown, distant point in the future.

The requirement to identify storage sites is equally problematic. States are only just beginning to undertake assessments of potential storage sites. Generators do not have access to solid pre-competitive information on storage sites. Despite this dearth of information, the discussion paper suggests that project proponents could be required to secure rights to potential storage sites. Requiring an investor to obtain storage rights would add costs to a project which may, in time, prove unnecessary. At most, a project proponent should be required to indicate possible storage sites.

The Government proposes that new generation plant subject to the CCS-ready standard would be required to produce an annual compliance report and "respond to developments in CCS and update feasibility assessments accordingly". Again, as with the emissions intensity standard, the

discussion paper exceeds the scope of the Prime Minister's announcement to impose ongoing regulatory requirements.

The process for determining whether CCS is "commercially available" may allow the Government to reach a general conclusion about the state of CCS technology. However, such a decision does not mean that CCS would be viable for specific assets. The incentive to retrofit CCS in the future will be the opportunity to minimize the carbon liability of the business. If retrofitting is viable at that time, generators will adopt CCS. If retrofitting is not viable, businesses should not be compelled by regulation or Ministerial direction to damage their competitiveness.

Any regulatory arrangements which have the potential to deter investment in new generation need to be considered carefully. A major concern with the CCS-Ready Standard is that the cost and timing of the regulatory obligations cannot be quantified by a potential investor. An investor could face a significant, unpredictable cost. This would obviously stifle investment in new plant, leaving older, less efficient plant in operation.

There would be no policy rationale to retain a CCS-Ready standard once a carbon price is in place.

The NGF believes a prescriptive CCS-Ready standard is premature, given the state of CCS technology. If a standard is adopted, experience with State requirements suggests that a standard should be general and flexible to allow projects to be treated on a case-by-case basis.

3. Energy Efficiency Opportunities Act

Generators believe that the EEO program should allow businesses to concentrate their efforts on energy efficiency activities which are most likely to yield meaningful returns. Requiring businesses to assess all energy use is obviously inefficient. The EEO program recognizes this point by exempting minor activities from assessment. Under the current program, activities using less than 0.01PJ/year are not required to be included in a site assessment.

The threshold for this exemption may be appropriate for businesses participating in the current EEO program. These businesses typically use much less energy than major generators. Applying the same 0.01PJ/year threshold in the generation sector could capture minor activities. While 0.01PJ/year would be equivalent to 2 per cent of energy use on many sites assessed under the current program, the same threshold could capture more marginal activities at a large power station.

There are many minor components in any energy system using relatively trivial quantities of energy. In a power station, these sub-system components are typically part of auxiliary systems and have such minor energy use that separate metering and reporting is not practical. These components could include transformer cooling fans, seal oil pumps, fan and feed pump lube oil pumps, stator water pumps and fabric filter pulse compressors. Measuring the energy consumption of these minor components would be complicated and have little prospect of uncovering potential energy savings. In any event, given the relatively minor energy used by these systems, savings would not be significant. A higher threshold than the current 0.01 PJ would relieve businesses of the necessity to introduce new, costly systems to allow energy assessments of minor sub-systems.

A higher threshold for exemption could be considered for the generation sector. The threshold could be expressed as a percentage of total energy use at a site or as a higher energy value. A positive requirement to assess a minimum proportion of energy use could be appropriate, given that energy use is concentrated in a relatively small number of industrial processes in the generation sector. The NGF will discuss this issue further with the Commonwealth.

There are also implementation issues associated with the program. NGF members have raised with the EEO program managers the risk of double counting of energy used in the production of electricity. This issue, and others, could be addressed through the development of specific program guidelines for the generation sector, similar to the guidelines in place for the mining sector. Separate guidelines for the sector would be appropriate given that the energy used in the sector is equivalent to all the energy used by current participants in the EEO program. Guidelines would need to be developed in concert with the industry.

The NGF would support additional flexibility in the development of baselines for reporting. The current requirement for 24 months of data is appropriate for many sites. But, in other cases, it may be more accurate for businesses to provide data over a longer period. The performance of assets is affected by a host of internal and external factors, such as maintenance schedules, fuel quality and availability of water. The combination of these factors in the two years preceding adoption of the EEO program could produce a misleading baseline. The NGF suggests that generators should have the option of providing data for three or four years as well as the current two years.

The NGF suggests raising the threshold for exemption of marginal activities from assessment from 0.01PJ/year. Industry guidelines for the generation sector would assist in implementing the EEO program. Generators should have the option of using data over a longer period than two years.

4. National Energy and Greenhouse Reporting

Generators already report energy use, energy production, direct (scope 1) emissions and indirect (scope 2) emissions at the facility level. This data is then aggregated at the corporation level. Under the National Greenhouse and Energy Reporting Act, the Greenhouse and Energy Data Officer must report, at the corporation level, scope 1 and scope 2 emissions and energy consumption. Energy production is not reported. Energy production has been excluded to prevent the disclosure of commercially sensitive information from all energy businesses.

The discussion paper proposes that this restriction on reporting energy production be removed but only for electricity generators.

The NGF does not support the proposal to require only generators to publish annual facility-level data on greenhouse gas emissions and electricity production. The proposal is discriminatory. It would produce a misleading impression of the efforts being made by corporations by focusing attention on individual facilities. It would disclose commercially sensitive information on the operation of assets in competitive wholesale markets. Businesses in no other sector would be required to have their energy production data published at the corporate level, let alone at the facility level.

AEMO provides more than adequate data for electricity production at the NEM metering point. There is no need to duplicate or augment this data by yet another authority.

The NGF does not accept limiting coverage to facilities under the ANZSIC code 261 as it omits other significant energy producers and users, with substantial emissions.

The NGF does not support electricity generators being singled out to report commercially sensitive production data at the facility level. The NGF believes that generators should be subject to the same requirements as other large energy producers and users.