

13 Assistance to strongly affected industries

This chapter considers the need for assistance for non-trade-exposed industries that are likely to be strongly affected by the introduction of a carbon constraint, and outlines the Government's decisions on the Electricity Sector Adjustment Scheme to help some coal-fired electricity generators transition to the Carbon Pollution Reduction Scheme.

The Green Paper noted that, in addition to emissions-intensive trade-exposed (EITE) industries, some non-trade-exposed industries could be particularly strongly affected by the Scheme. Where competitive pressures may prevent non-trade-exposed industries from passing on the full cost of the Scheme to consumers or other businesses, the Government would consider the need for measures to reduce the impact of the Scheme on such 'strongly affected industries'.

The Green Paper outlined various preferred positions for the design of an Electricity Sector Adjustment Scheme to assist the coal-fired electricity generation sector, which was the only strongly affected industry identified by the Government at that time. However, the Green Paper also stated that the Government would consider assistance measures for other strongly affected industries in light of stakeholder feedback.

This chapter addresses the following issues:

- Section 13.1 considers whether the characteristics of strongly affected industries identified in the Green Paper remain appropriate for the Government's assessments of whether assistance should be provided to particular industries.
- Section 13.2 and Appendix D assesses particular industries against those characteristics, and finds that only coal-fired electricity generators demonstrate all the characteristics of a strongly affected industry.
- Section 13.3 considers a range of assistance measures that could be incorporated in an Electricity Sector Adjustment Scheme for coal-fired electricity generators.
- Section 13.4 outlines in detail the Government's preferred model for the delivery of limited direct assistance through the Electricity Sector Adjustment Scheme.
- Section 13.5 examines policy considerations relevant to the design of the Electricity Sector Adjustment Scheme, including energy security.

13.1 Characteristics of strongly affected industries

The Green Paper proposed that assistance to strongly affected industries be made available only to non-trade-exposed industries, as trade-exposed industries would be eligible for assistance if they undertake EITE activities. From that starting position, the Green Paper

outlined four other characteristics that the Government proposed to use in identifying strongly affected industries that might warrant assistance.

Green Paper position

The characteristics of strongly affected industries are that they must:

- be non-trade-exposed (as entities in trade-exposed industries may be eligible for assistance as EITE industries)
- be emissions-intensive (exceeding the threshold for eligibility proposed for EITE industries)
- include some entities that are emissions-intensive compared to their competitors, such that they cannot pass on carbon costs and could experience significant losses in asset value
- have significant sunk capital costs
- not have significant economically viable abatement opportunities available to them.

Stakeholders made only limited comment on the appropriateness of the five characteristics (the ‘Green Paper characteristics’). However, some stakeholders:

- argued that an inability to pass on carbon costs should be interpreted to include contractual impediments to carbon cost pass-through
- sought to amend the characteristics to reflect the impact of the Scheme on entities or industries that arise in markets they supply, or in markets that supply them.

13.1.1 Contractual impediments to carbon cost pass-through

Where individual entities’ contractual arrangements prevent them from passing through carbon costs to their customers, the impact of the Scheme on those entities is likely to be higher than if those contracts were not in place.

In response to stakeholder comment, the Government has considered the general issue of removing or legislatively altering the effect of such contractual impediments to carbon cost pass-through. As noted in Chapter 15, which considers this matter in detail, for some contracts the extent of pass-through cannot be determined until the contracting parties have assessed the form of the final Scheme legislation.

Nevertheless, it is likely that, for some entities and under some circumstances, contractual impediments to carbon cost pass-through will remain for some time. Some stakeholders argued for transitional assistance as a method of addressing the economic impact of these contractual impediments on particular entities. Those arguments were often put forward in confidential submissions and so are discussed here in general terms.

The Government would face significant difficulties in accurately determining the economic impact of the Scheme on parties to a given contract before those parties have been able to

determine the nature of pass-through that exists in that contract. Furthermore, in many circumstances it will be in the best interests of both parties to a contract to renegotiate the contract to allow full or partial pass-through of carbon costs. The provision of assistance on the basis of an inability to pass-through carbon costs would weaken the incentives to re-negotiate.

For these reasons, the Government is not able to commit to up-front transitional assistance measures for strongly affected industries on the basis of contractual impediments to carbon cost pass-through.

Furthermore, the Government is generally reluctant to intervene in the contractual arrangements of private parties. As noted in Chapter 15, implementing a statutory override of existing contracts to allow for pass-through of carbon costs raises a range of additional policy issues.

Policy position 13.1

Strongly affected industry assistance is not an appropriate measure to address the effect of contractual impediments to carbon cost pass-through.

13.1.2 Transferred impacts from upstream or downstream markets

Stakeholders in the coal mining industry argued that coal mines that are ‘captured’ by an electricity generator (‘captured coal mines’) should be eligible for strongly affected industry assistance because of the potential impact of the Scheme on the generators that those mines supply.

Stakeholders expressing this view included the Australian Coal Association, the Minerals Council of Australia, the New South Wales Minerals Council, Centennial Coal, Xstrata Coal and Wesfarmers Limited.

The Australian Coal Association argued that this assessment should be made independently of the emissions intensity of the coal mine in question and should simply reflect the expected impact of the Scheme on the coal mine:

[S]ome captured mines will be strongly affected *even if they are not emissions intensive*. These are mines selling to a power station that has its economic life truncated by the advent of a price on carbon. The mine thus is impacted by the roll-on effect of the closure of the power station as well as the inability to pass through the costs of the Scheme. Accordingly, the [Australian Coal Association] proposes that emissions intensity not be a determining factor when deciding on provision of compensation to captured coal mines under the Strongly Affected Industry category. (Australian Coal Association, Submission 530, p. 17, emphasis in original)

Some stakeholders in the tourism industry expressed concern that the Scheme’s impact on the aviation industry would flow through to the tourism industry (a conceptually similar argument).

The Green Paper characteristics reflect the general principle that strongly affected industries will be those that face the largest change in asset value because of the Scheme. In most cases,

that change will be driven by an inability to pass on carbon costs because of competitive pressures within the market in which the entity or industry operates.

However, the Government acknowledges that some entities or industries might face impacts from the effect of the Scheme in the market they supply (a 'downstream market', such as the electricity generation industry in relation to the coal supply industry), or a market that supplies them (an 'upstream market', such as aviation in relation to tourism).

In such a circumstance, the effect of the Scheme depends on not only the emissions intensity and demand characteristics of the entity or industry in question, but also those of the relevant upstream or downstream markets.

The extent of these impacts may well vary from industry to industry and entity to entity. The Government does not consider that entities or industries that might be exposed to losses in asset value because of impacts transferred from upstream or downstream markets can be readily identified on the basis of clear characteristics in addition to the Green Paper characteristics. However, such transferred impacts may be relevant to considering the ability of a entity or industry to pass on carbon costs given its specific circumstances.

The specific circumstances of captured coal mines and the tourism industry in relation to upstream and downstream markets are considered in more detail in Appendix D.

The Government considers that the Green Paper characteristics remain appropriate for assessing the assistance industries might need to transition to the Scheme.

Policy position 13.2

The characteristics of strongly affected industries are that they must:

- be non-trade-exposed, as entities in trade-exposed industries may be eligible for assistance as emissions-intensive trade-exposed (EITE) industries
- be emissions-intensive (exceeding the threshold for eligibility proposed for EITE industries)
- include some entities that are emissions-intensive compared to their competitors, such that they cannot pass on carbon costs, and so could experience significant losses in asset value
- have significant sunk capital costs
- not have significant economically viable abatement opportunities available to them.

13.2 Possible strongly affected industries

Green Paper position

Coal-fired electricity generators are likely to be strongly affected by the scheme, based on the characteristics proposed in Section 10.1 of the Green Paper.

The Green Paper considered carefully whether coal-fired electricity generation demonstrated the characteristics of a strongly affected industry, and concluded that this sector is likely to be strongly affected by the Carbon Pollution Reduction Scheme (the Scheme) due to:

- being non-trade-exposed
- being highly emissions-intensive
- facing significant reductions in asset values due to its inability to pass on the costs of the Scheme to consumers in full
- the sunk capital costs associated with investments in this sector
- the lack of significant economically viable abatement opportunities for coal-fired generators.

Very few submissions argued that coal-fired electricity generators did not satisfy the Green Paper characteristics.

However, a number of submissions from non-government organisations and private citizens reflected concerns about the Government's proposal to provide assistance to coal-fired electricity generation as a strongly affected industry. In particular, many submissions were opposed to the proposal to provide limited direct assistance to entities in this sector. However,

many submissions also supported alternative forms of assistance to the sector, such as assistance to develop low-emissions electricity generation technologies.

The Government maintains the view that coal-fired electricity generators satisfy the Green Paper characteristics, and so should receive some form of assistance.

Sections 13.3, 13.4 and 13.5 consider the appropriate form of assistance to coal-fired electricity generators in further detail.

Policy position 13.3

Coal-fired electricity generation has the characteristics of a strongly affected industry, and the Government will consider appropriate assistance measures for that industry.

The Green Paper also considered the circumstances of the waste, natural gas production and gas supply industries as potential strongly affected industries.

Various stakeholders argued that additional entities or industries fitted the Green Paper characteristics in submissions. Many of those arguments were made in confidential submissions, and have been considered by the Government in its decision making on the final policy positions in this White Paper.

Appendix D considers the arguments made for providing strongly affected industry assistance to:

- gas-fired and diesel-fired electricity generators
- pumped storage hydro-electric generators
- ‘captured’ coal mines
- gas transmission pipelines
- landfill waste and wastewater facilities
- landfill gas electricity generators
- the aviation and tourism industries
- the community services sector
- Government administration
- public transport.

The Government does not consider that these industries satisfy the characteristics of a strongly affected industry but does recognise that, in some cases, other forms of assistance may be appropriate to reflect their particular circumstances.

Policy position 13.4

Industries other than coal-fired electricity generation do not have the characteristics of strongly affected industries.

13.3 The Electricity Sector Adjustment Scheme

The Green Paper identified the coal-fired electricity generation sector as a strongly affected industry. On that basis, the Government proposed that measures be considered to assist the transition of that sector and the workers and communities dependent on it. The Green Paper outlined support through a new fund called the Electricity Sector Adjustment Scheme (ESAS).

The Green Paper identified three potential elements of support under ESAS:

- support for the development and deployment of carbon capture and storage (CCS) technologies, including through existing CCS support programs
- commitments to address particular impacts of the Scheme on workers, communities and regions through various structural adjustment assistance packages, as required
- direct assistance to coal-fired generators.

In light of the Government's policy position 13.3 above, the content and design of these three possible elements are considered below.

13.3.1 Assistance for carbon capture and storage technologies

Green Paper position

The Australian Government has made significant contributions to the commercial deployment of CCS technologies. Those contributions, and any further support, should recognise the technical and institutional hurdles to be overcome, and reflect Australia's significant domestic and international interests in the development of the technologies.

The Government's contributions to the development and deployment of CCS technology reflect the technology's importance in meeting Australia's target of a 60 per cent reduction in emissions from 2000 levels by 2050.

CCS offers the potential to significantly reduce global greenhouse gas emissions, particularly from coal-fired power generation. As a result of its high reliance on coal to generate electricity, and its position as a major coal exporter, Australia has a vital interest in the successful commercialisation of CCS as part of the domestic and global response to climate change.

The Government recognises that ongoing support will be needed to drive the development and deployment of CCS technology internationally. In September 2008, the Government announced the Global Carbon Capture and Storage Initiative and a proposal to contribute up

to \$100 million per year to a new Global CCS Institute. The Government is also supporting a range of CCS-related projects with key international partners, including China, through the Asia–Pacific Partnership on Clean Development and Climate.

The Government has also established the National Low Emissions Coal Initiative (NLECI) to accelerate the development and deployment of low-emissions coal technologies, including CCS, in Australia. The NLECI will provide a range of research programs and some medium-scale demonstration projects, and facilitate the location of carbon dioxide storage sites and the provision of transport infrastructure.

The Australian Government is providing \$500 million over eight years to support the NLECI through the National Low Emissions Coal Fund. In July 2008, the Government announced the formation of the National Low Emissions Coal Council and the Carbon Storage Taskforce to provide expert guidance and advice on the development and implementation of the NLECI.

Furthermore, the Government is enabling offshore CCS projects through the development of a legislative framework. The *Offshore Petroleum Amendment (Greenhouse Gas Storage) Act 2008* was passed through the Australian Parliament in late 2008 and establishes a new range of offshore titles providing for the transport by pipeline of carbon dioxide and potentially other greenhouse gases, and their injection into and storage in geological formations. This legislation makes Australia one of the first countries to establish a comprehensive regulated CCS regime.

The Government recognises that assistance for low-emissions technology, including CCS, will be most effective when delivered through targeted and specific programs to address particular technical or institutional hurdles to the technology. Therefore, assistance to CCS technologies will be best delivered through the NLECI and as part of the Global Carbon Capture and Storage Initiative. Additional assistance delivered separately through ESAS would most likely overlap with these existing programs, potentially reducing their effectiveness. That said, success with CCS would be an important contribution to enhancing the viability of electricity generation and coal-based sectors of the economy.

Policy position 13.5

Australian Government assistance for carbon capture and storage technologies will be delivered through existing programs, such as the National Low Emissions Coal Initiative and the Global Carbon Capture and Storage Initiative.

13.3.2 Assistance to workers, communities and regions

Green Paper position

The Government would address particular impacts of the Scheme on workers, communities and regions. Assistance would:

- take into account the existence of generally applied measures that assist structural adjustment in all sectors (such as social security and employment policies)
- be provided where a clear and sizeable burden has been, or is highly likely to be, imposed on an identifiable segment of the community
- be designed to assist the adjustment of workers, communities and regions to their new circumstances, rather than to prevent or hinder that adjustment
- apply, as necessary, regardless of whether an affected industry has received support as a strongly affected or EITE industry.

The Green Paper noted that the Scheme will affect some industries more than others. Because some regions rely heavily on particular industries, the impact on regions will also vary. In a region where employment is dominated by an industry facing a significant burden from structural change under the Scheme, there may be a need for assistance for workers, communities in that region, or the region as a whole.

In the Green Paper, the Government identified that regions that have coal-fired electricity generation as a major employer might need assistance to adjust to a low-emissions economy. It will take some time to determine the commercial viability of CCS technologies. In the interim, imposing a carbon constraint may affect the sector, with implications for the workers, communities and regions that depend on it.

Regions other than those that depend on the coal-fired electricity generation sector could also face challenges. To assist the transition, the Government proposed to establish the Climate Change Action Fund, and indicated that the Fund would include support on an ‘as needed’ basis for particular workers, regions and communities outside the coal-fired electricity generation sector.

The Government recognises the importance of not duplicating measures to assist structural adjustment within regions and across industries. There is the real risk that structural adjustment assistance delivered through ESAS could overlap with similar assistance provided through the Climate Change Action Fund.

For example, regions such as the Latrobe Valley and the Hunter Valley include both significant coal-fired electricity generation industries and a number of other emissions-intensive industries.

The Government considers that any structural adjustment assistance provided to workers, communities and regions, whether they are dependent on the coal-fired electricity generation industry or on other industries that may be affected by the Scheme, should be delivered in a consistent way.

The Climate Change Action Fund is better tailored to deliver structural adjustment assistance, where required, to workers, communities and regions that face a particular adjustment burden under the Scheme. Therefore, similar assistance measures for regions dependent on the coal-fired electricity generation sector will not be delivered through ESAS, but will be available under the Climate Change Action Fund.

Policy position 13.6

Structural adjustment assistance for regions dependent on the coal-fired electricity generation sector will be provided, if required, through the structural adjustment provision of the Climate Change Action Fund, and so will be consistent with other structural adjustment assistance measures for workers, communities and regions.

While the precise impact of the Scheme on individual regions cannot be easily determined in advance, the Government has considered whether the Scheme would be likely to cause significant structural changes for regions with a high dependence on coal-fired electricity generation.

In particular, the Government has commissioned modelling of Australia's major wholesale electricity markets undertaken by McLennan Magasanik Associates (MMA), ACIL Tasman and ROAM Consulting to assess the potential impact of the Scheme on the electricity generation sector. In turn, this modelling can illustrate potential impact of the Scheme on regions that are dependent on this sector. The results of this modelling exercise are outlined in more detail in Section 13.4.2 below.

The modelling indicates that, while the pattern of impacts on individual coal-fired electricity generators is uncertain, the transition of the sector as a whole is likely to be manageable.

Whilst emissions-intensive generators may lose profitability, only a minority of generators are likely to face marked reductions in generation volume. In addition, coal-fired generators are often well situated in respect to electricity transmission and gas supply infrastructure, making those locations ideal for new generation investments. Consequently, regions that currently have a high level of electricity generation are well placed to enjoy continuing employment in the sector.

In the longer term, the pattern of closures in the coal-fired electricity generation sector is likely to be greatly affected by technological developments, including in CCS. The Government is committed to ensuring that the development of those technologies will contribute to a strong economic future for regions dependent on coal-fired electricity generation.

Although the modelling suggests a manageable transition in this sector, some submissions to the Green Paper raised some concerns. Submissions from the Victorian Government, the Gippsland Local Government Network and Monash University identified Gippsland, and specifically the Latrobe Valley, as a region where impacts from the introduction of the Scheme might be concentrated.

The Gippsland Local Government Network argued for transitional assistance for workers and communities in Gippsland because the effects of economic adjustment in the region may be exacerbated by a lack of alternative markets for brown coal, the relatively lower

socioeconomic status of segments of Gippsland's population, and the relatively older coal-mining and electricity generation workforce. However, it acknowledged the potential for government assistance in the development and deployment of clean coal technologies to allow generators using brown coal to maintain market share (Submission 226).

The Victorian Government noted that economic modelling had indicated that the Latrobe Valley is likely to be the most strongly affected region in Australia. It proposed that transitional assistance be tailored to the adjustment needs of the affected group on the basis of an in-depth analysis into the regional impacts and opportunities of the Scheme. The Victorian Government also argued that assistance should be delivered proactively and be integrated with long-term regional planning (Submission 780).

The Australian Government is aware of stakeholder concerns in relation to particular regions, and stands ready to provide assistance through the Climate Change Action Fund to any region where a clear, identifiable and significant impact arises, or is highly likely to arise, as a direct result of the Scheme. As outlined in Chapter 18, the Government has committed \$200 million of provisional assistance for this purpose.

13.3.3 Limited direct assistance for coal-fired electricity generators

Green Paper position

To ameliorate the risk of adversely affecting the investment environment, the Government proposes to provide a limited amount of direct assistance to existing coal-fired electricity generators.

The assessment that coal-fired electricity generators have the characteristics of a strongly affected industry does not, of itself, justify direct assistance to those generators to partially offset potential losses in asset value.

Other forms of assistance are available and may be appropriate in the sector. As noted above, assistance could be provided in the form of funding for the development and deployment of CCS or other clean coal technologies, or could be directed to workers, communities and regions affected by changes in patterns of activity in the sector.

The Green Paper outlined the Government's preferred position that direct assistance to coal-fired electricity generators was warranted in addition to those other forms of assistance.

In the Green Paper, the Government argued that providing limited direct assistance could reduce the impact of the Scheme on assessments of the risk of investing in the sector. To the extent that the Scheme may cause large and unanticipated losses of asset value for some coal-fired electricity generators, a failure of the Government to partially offset those impacts may cause investors to assess the risk of future regulatory changes more pessimistically. Such assessment of risk can have economic consequences, as new investments would require a return sufficient to cover the increased risk premium required by investors.

The Government concluded that providing direct assistance to the most adversely impacted asset owners reduces the likelihood that the Scheme would increase assessments of the risk of investing in the Australian electricity generation sector. In this way, assistance supports the

ability of the electricity generation industry to deliver lower-emissions technologies while continuing to meet Australia's growing electricity demand.

Stakeholders in the energy industry broadly supported the provision of assistance and the rationale for assistance. For example, the National Generators Forum argued that:

For international power generation investors the loss of profitability, and potential stranding of generation assets, unless adequately compensated via scheme design, will change their assessment of regulatory risk in Australia, with flow on impacts on future investment decisions in Australia ... Perceptions in the investment community about the threat of fundamental change in the key scheme parameters that damages the value of past investments will add to the cost of new projects. (Submission 766, p. 18)

However, outside the electricity generation industry, there was little support for providing direct assistance to address the effect on the investment environment in the Australian electricity generation sector. For example:

Investors that have made long-term investments on the assumption that the future will not bring carbon pricing have simply made a poor subjective risk judgement. (Total Environment Centre, Submission 542, p. 4)

The Government notes a range of stakeholder views on the extent to which the generators should have foreseen the likelihood of the introduction of a carbon constraint over the life of their assets. Whilst the extent to which the introduction of a carbon constraint should have been foreseen by investors cannot be clearly determined, it is relevant to the Government's consideration of the form and extent of assistance provided to address the impact the Scheme will have on perceptions of investment risk.

The Green Paper also considered the merits of providing direct assistance to coal-fired generators on the grounds of improving energy security. While the Government recognised that there are incidental benefits to energy security from limited direct assistance, such as improving the prospects of future investments and mitigating the effects of reduced creditworthiness for generators, it concluded that limited direct assistance is likely to play a small role in maintaining energy security compared to the Government's choice of medium-term target range for emissions reductions.

Some electricity generation stakeholders argued that the Government underestimated the energy security benefits of direct assistance in the Green Paper. For example, Babcock & Brown Power argued that:

there are other strong policy arguments in favour of adjustment assistance [to generators] beyond investment risk. Investment risk necessarily leads to issues with supply reliability or excessive costs to consumers. (Submission 488, p. 7)

The Government remains unconvinced that increasing the quantum of direct assistance above that provided in light of concerns about the risk of the Scheme adversely affecting the investment environment would provide a material or cost-effective benefit to energy security. Section 13.5 considers energy security issues in detail.

On balance, the Government considers that the Green Paper proposal to provide limited direct assistance to coal-fired electricity generators remains appropriate to ameliorate the risk of adversely affecting the investment environment in the Australian electricity generation sector.

Policy position 13.7

The Government will provide limited direct assistance to coal-fired electricity generators through the Electricity Sector Adjustment Scheme (ESAS) to ameliorate the risk of adversely affecting the investment environment in the Australian electricity generation sector.

13.4 Direct assistance to coal-fired electricity generators

13.4.1 Considerations in providing limited direct assistance

Asset value impacts

To ameliorate the impact of the Scheme on the investment environment in the Australian electricity generation sector, the quantum and allocation of assistance should reflect the likely pattern and extent of asset value impacts on coal-fired electricity generators, as it is these impacts that can primarily affect perceptions of investment risk in this sector.

The Government considers that perceptions of the risk of investing in the sector are most likely to be affected by the extent of extreme losses in asset value, rather than by the average level of loss across the sector. In this light, the Green Paper proposed assistance to ‘partially ameliorate the most acute impacts of the Scheme’ on electricity generators.

The Energy Supply Association of Australia, the National Generators Forum of Australia, the Energy Retailers Association of Australia and the Australian Pipeline Industry Association argued, in a similar vein, that:

it will be the scale and sum of individual asset losses, rather than the average loss across the sector, which will affect the risk attached to future investment, especially as individual asset losses reflects ownership and financing structure. (Submission 715, p. 26)

To assess the likely pattern and extent of impacts of the Scheme on coal-fired electricity generators, the Government commissioned three detailed models to examine how Australia’s major wholesale electricity markets, the National Electricity Market (NEM) and Western Australia’s Wholesale Electricity Market (WEM), would respond to the Scheme. This modelling was undertaken by MMA (as part of the Treasury modelling in *Australia’s low pollution future*), ACIL Tasman and ROAM Consulting. Reports outlining the results of these modelling exercises will be made available on the Department of Climate Change website.

The asset value impacts of the Scheme on coal-fired electricity generators suggested by the modelling are outlined in more detail in Section 13.4.2.

Other recipients of assistance

While modelling results provided some guidance for decisions on the final design of ESAS, the Government also kept in mind competing policy priorities, such as the need to provide assistance to low-income households and entities that undertake EITE activities to adapt to the Scheme.

As discussed further below, modelling results are only indicative. The Government's final policy decisions reflect a judgement based on: modelling results; broader analysis of the sector; and consideration of competing Budget priorities across the community.

Chapter 12 and Chapter 17 outline the Government's policy decisions on assistance to EITE entities and industries, and to households, respectively.

Mitigating factors for coal-fired electricity generators

As noted in the Green Paper, investors in the electricity generation sector who have diversified their generation portfolio may offset some of the losses experienced by coal-fired electricity generation assets with gains to other lower emissions generation assets.

More broadly, individual or institutional investors may have portfolios of investments beyond the energy sector that provide revenue streams that are unaffected or increased by the Scheme.

Furthermore, coal-fired electricity generators may be able to increase the effective value of tax benefits for depreciation of capital assets by bringing forward the timing of those benefits in response to a reduction in the value of the assets.

13.4.2 Impacts on generators

Modelling of wholesale electricity markets is very sensitive to assumptions; that is, small changes in key assumptions can lead to significant changes in modelling results. In the Green Paper, the Government stated that it would treat the outputs of modelling as one input among many in determining an appropriate quantum of assistance.

Modelling results are particularly sensitive at the level of analysing potential impacts of the Scheme on individual generators. For this reason, the Government has analysed modelling results with a view to understanding the broad pattern of asset value impacts across the generation sector, rather than attempting to discern a precise estimate of the likely asset value change experienced by generators individually.

Uncertainties surrounding likely changes in the value of individual generation assets increase further over long time periods. Uncertainties about technological developments, fuel prices, demand trends, transmission interconnection and market structure led the Government to primarily consider modelled changes in the value of individual assets over the first decade of the Scheme (that is, the period to 1 July 2020) when discerning broad patterns of impacts across the sector.

Despite these uncertainties, modelling has suggested some broad patterns of impacts on coal-fired electricity generators that can usefully help inform both the quantum and the allocation of limited direct assistance through ESAS.

Sensitivity to modelled carbon prices

The cost of the Scheme faced by an individual generator is a function of its emissions intensity and the carbon price. The general level of carbon prices and the capacity to pass these through, will materially influence asset values in the electricity generation sector.

The indicative national emissions trajectory associated with the Government's choice of medium-term national target range for emissions will be a key input for assessing the likely impact of the Scheme on electricity generators. Chapter 4 outlines the Government's decisions in relation to the indicative national emissions trajectory and the medium-term national target range.

Accordingly, the Government's wholesale electricity market modelling incorporated carbon prices derived from the Treasury modelling for two different policy scenarios:

- 'CPRS -5', involving a 5 per cent reduction in emissions on 2000 levels by 2020
- 'CPRS -15', involving a 15 per cent reduction.

However, in a system with full international linking, the emissions reduction trajectory does not directly determine the domestic carbon price. The Scheme does not require that abatement be achieved in Australia, but allows abatement to occur in other countries where cheaper abatement options are available internationally. Accordingly, policy settings on the extent of international linking (Chapter 11) will also have a material impact on the carbon prices expected under the Scheme.

Similarly, Scheme policy settings on the banking and borrowing of permits and the price cap (Chapter 8) will affect carbon prices, and therefore the impact on asset values in the electricity generation sector.

As expected, modelling results indicate that higher carbon prices drive greater abatement within the Australian electricity generation sector and generally greater asset value impacts on coal-fired electricity generators.

The Government's analysis considers primarily the pattern of results modelled on the basis of the lower carbon price trajectory (the CPRS -5 scenario), but modelled results using a higher carbon price trajectory indicate that asset value impacts are broadly correlated with the carbon price.

To the extent that carbon prices vary materially from those assumed in the Government's modelling, assistance in the form of administrative allocations of permits can manage the risk for recipients as the value of those permits, and therefore of the assistance, would vary in line with the price. (Section 13.4.5 outlines the Government's decision that assistance in the form of administrative allocations of permits is preferable to cash transfers.)

It is possible that at significantly higher carbon prices, impacts within the coal-fired electricity generation sector will change such that this correlation breaks down and the provision of assistance in the form of permits would not satisfactorily deal with variations in carbon prices. For example, extreme carbon prices could change the relative cost of different generation technologies such that the technical and economic operation of electricity markets changes dramatically. However, the Government's choice of medium-term target range is moderate,

making extreme price outcomes unlikely. Other Scheme design elements in relation to international linking, banking and borrowing and the price cap further act to moderate carbon prices and smooth them over time.

Impact of the expanded national Renewable Energy Target

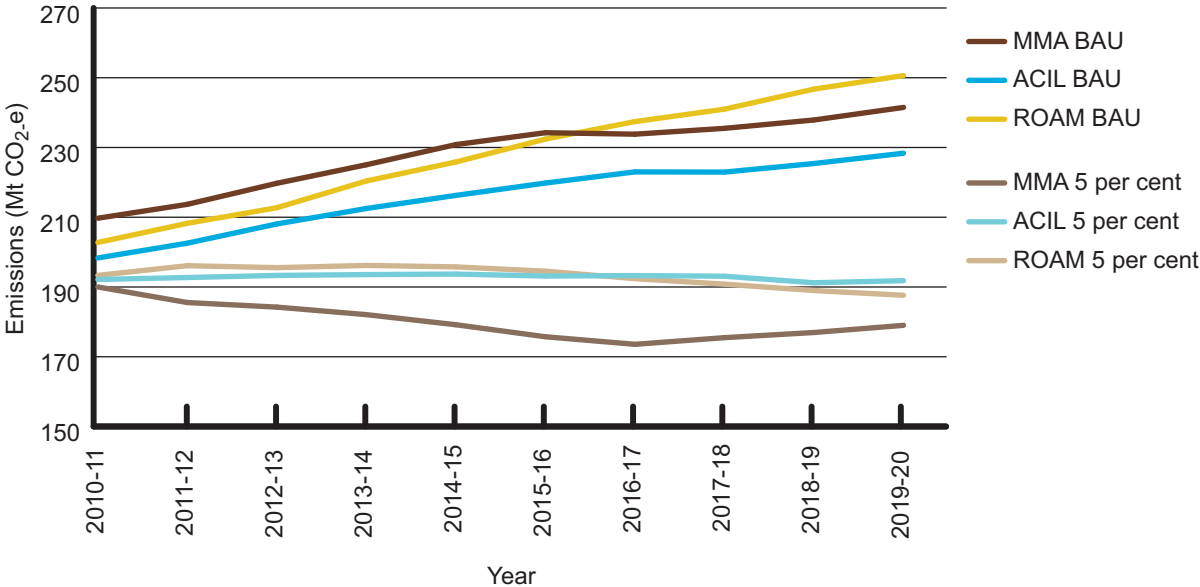
The modelling incorporates the effect of the expanded national Renewable Energy Target, as well as the effect of the Scheme, on the wholesale electricity market by excluding both policies from the modelled ‘business-as-usual’ reference case, and then including both policies in subsequent modelling runs. While the Government is not delivering assistance to recognise the impact of the expanded Renewable Energy Target on coal-fired electricity generators, it is worth noting that the modelling captured the effects of both policy initiatives in combination.

Emissions reductions

In both policy scenarios, the modelling indicates that the abatement required from the Australian electricity generation sector is significant, but achievable.

While modelling indicates that the Scheme will drive significant abatement in this sector compared to the expected growth in emissions under business-as-usual, emissions do not reduce significantly below current levels over the first decade of the Scheme (see Figure 13.1). Modelling suggests that the primary impact of the Scheme is to reduce the emissions intensity of new investment in the sector, rather than to dramatically change the mode of operation of most existing generation assets.

Figure 13.1: Electricity sector emissions



Source: Australian Government analysis of modelling commissioned from MMA, ACIL Tasman and ROAM Consulting.

Generation volume

The modelling indicates that, while some of Australia's 30 major coal-fired electricity generators are exposed to material losses of generation volume over the first decade of the Scheme, the majority maintain their market share.

Table 13.1 outlines the number of coal-fired generators that lose more than 25 per cent of their cumulative generation volume over the first decade of the Scheme when compared to modelled business-as-usual generation.

Table 13.1: Modelled loss of generation volume

Scenario	McLennan Magasanik Associates	ACIL Tasman	ROAM Consulting
CPRS -5	Three brown coal generators	One brown coal generator	One brown coal generator
	Six black coal generators	Two black coal generators	Three black coal generators
CPRS -15	Four brown coal generators	Three brown coal generators	Two brown coal generators
	Six black coal generators	Five black coal generators	Three black coal generators

Source: Australian Government estimates based on modelling commissioned from MMA, ACIL Tasman and ROAM Consulting.

In particular, it is primarily the most emissions-intensive coal-fired electricity generators, that is, brown coal generators and relatively emissions-intensive black coal generators, that are exposed to losses of generation volume.

Modelling also suggests that relatively few generators exit the market in their entirety, although, as noted above, some do reduce their overall generation volume. ROAM Consulting's analysis suggests no generators will exit the market in their entirety prior to 2020, other than those that are already expected to close under business-as-usual.

Whilst MMA and ACIL Tasman analysis do suggest some retirement of power stations or generating units that were not expected to retire under business-as-usual, the extent of this is limited. Under both the CPRS -5 and CPRS -15 scenarios, MMA suggests that only one generator will retire in its entirety due to the Scheme prior to 2020. ACIL Tasman suggests that only two brown coal generators and one black coal generator will retire in their entirety under the CPRS -5 scenario. However, ACIL Tasman modelling suggests that the Scheme will cause three brown coal and four black coal generators to retire in their entirety under the CPRS -15 scenario.

While these conclusions are sensitive to assumptions about the level of growth in demand for electricity, the rate of growth in electricity demand assumed in the policy scenarios used in the modelling is at the lower end of market predictions of demand growth, and so may overestimate the extent of likely losses of generation volume. For example, the National Electricity Market Management Company's 2008 'Statement of Opportunities' considers the impact of the Scheme on the NEM but projects that the total amount of electricity that must be generated to meet demand will continue to grow between 1.0 per cent and 3.4 per cent per year over the period to 2017–18¹.

Electricity prices

The Government's wholesale electricity market modelling shows significant variability in the extent to which carbon costs incurred by electricity generators under the Scheme translate into general increases in the level of electricity prices (the rate of 'carbon cost pass-through'). The

rate of carbon cost pass-through varies both between models and within models between states.

For example, ACIL Tasman shows a low rate of carbon cost pass-through in the NEM region of Queensland under the CPRS -5 scenario, while MMA and ROAM Consulting suggests a strong rate of pass-through in that region. MMA modelling suggests a very strong rate of carbon cost pass-through in the NEM regions of New South Wales and South Australia, while ROAM Consulting and ACIL Tasman show significantly lower rates in those regions. Conversely, MMA modelling suggests a lower rate of pass-through in the Western Australian WEM than ACIL Tasman and ROAM Consulting. Rates of carbon cost pass-through are broadly similar in the Victorian region in all three models.

Table 12.2 (Chapter 12) outlines the rate of carbon cost pass-through resulting from different models in different NEM regions and the WEM over the first decade of the Scheme.

Asset value impacts

Given that less emissions-intensive coal-fired electricity generators generally retain significant quantities of generation volume under the Scheme, the extent of carbon cost pass-through that occurs in the wholesale electricity market will have a large bearing on the impact of the Scheme on those generators' asset values. The impact is a function of the difference between a generator's individual emissions intensity (which determines the increase in costs it faces under the Scheme) and the rate of carbon cost pass-through it experiences in the market.

In combination, the difference between a generator's cost increase and the general price increase due to carbon cost pass-through determines how much asset value it loses due to 'margin compression', that is, due to earning a reduced margin on each unit of electricity it produces. Where generators lose generation volume they may face reductions in asset value beyond those due to margin compression.

Modelling results indicate the potential for significant variation in carbon cost pass-through, both between the three models employed and between different locations in any given model. Accordingly, the extent of expected changes in asset value varies significantly across the three models. Within any given model, the variation in the rate of carbon cost pass-through in different locations and in the emissions intensity of different generators creates significant variation in the impact of the Scheme on different generators.

Table 13.2 illustrates the variability in changes in asset value by outlining the absolute changes in asset value suggested by the three models over the first decade of the Scheme under the CPRS -5 scenario. Changes in asset value are discounted back to present values and are presented in millions of real 2008-09 dollars. Results are broken down into broad 'brown coal' and 'black coal' categorisations, with assets in the brown coal sector being located in Victoria and South Australia, and assets in the black coal sector being located in New South Wales, Queensland and Western Australia.

The Government notes that these results are driven by the assumptions in each model, and that actual asset losses would need to be determined by taking into account the individual circumstances of each generator. Changes in asset value can vary significantly due to uncertainty in both modelled business-as-usual asset values and asset values under the policy

scenarios, and so should be regarded as indicative only. Accordingly, individual assets are not named, but are separated to distinguish brown coal and black coal generators and ranked broadly in each asset class in order of decreasing asset value loss. Gains in asset value are expressed as positive numbers.

Table 13.2: Modelled changes in asset value

Generator	MMA (\$m)	ACIL Tasman (\$m)	ROAM Consulting (\$m)
Brown Coal 1	-901	-1185	-1168
Brown Coal 2	-620	-949	-989
Brown Coal 3	-321	-1183	-939
Brown Coal 4	-137	-643	-403
Brown Coal 5	-127	-305	-407
Brown Coal 6	-61	-127	-103
Brown Coal 7	-47	-93	-86
Brown Coal 8	-130	-67	-5
Brown Coal sub-total*	-2,344	-4,552	-4,100
Black Coal 1	-250	-466	-773
Black Coal 2	155	-662	-265
Black Coal 3	-15	-657	-88
Black Coal 4	183	-746	-175
Black Coal 5	-12	-376	-106
Black Coal 6	-63	-346	-77
Black Coal 7	-206	-144	-129
Black Coal 8	794	-338	-907
Black Coal 9	15	-390	-50
Black Coal 10	65	-146	-342
Black Coal 11	923	-414	-915
Black Coal 12	-37	-286	-46
Black Coal 13	-181	-108	-50
Black Coal 14	-62	-154	-108
Black Coal 15	-36	-146	-89
Black Coal 16	306	-163	-393
Black Coal 17	-2	37	-209
Black Coal 18	20	-87	-50
Black Coal 19	4	-162	49
Black Coal 20	26	-57	-76
Black Coal 21	15	0	-67
Black Coal 22	553	-144	-389
Black Coal sub-total*	2,197	-5,954	-5,258

Source: Australian Government estimates based on modelling commissioned from MMA, ACIL Tasman and ROAM Consulting.
* Sub-totals may not equal the sum of individual asset value changes due to rounding.

The table above shows that, while all brown coal generators lose asset value across all models, only nine of 22 black coal generators do so.

Of those black coal assets that are expected to lose more than \$300 million in asset values under the ACIL Tasman modelling (Black Coal 1, 2, 3, 4, 5, 6, 8, 9 and 11), only three also lose more than \$300 million in either of the two other models (Black Coal 1, 8 and 11). Whilst asset value impacts for these assets are large in absolute terms due to the absolute size of these assets, these same assets may also enjoy significant increases in asset value in circumstances of strong carbon cost pass-through (such as for Black Coal 8 and 11).

There is significant uncertainty as to the asset value impacts of the Scheme on black coal assets in absolute terms. Relative asset value losses, that is, the percentage change in asset value from an asset's business-as-usual value, also shows significant variation, particularly for small generators.

Conversely, the modelling consistently suggests losses of asset value for brown coal assets, reflecting their relative emissions intensity.

13.4.3 Quantum of assistance

The Government has considered the broad pattern of modelling results when deciding the quantum of assistance to be delivered through ESAS and the allocation of that assistance.

However, the significant variability in modelled asset value impacts between states, and particularly at the level of individual assets, means that the Government has proceeded cautiously in calibrating an assistance package. In particular, the Government is mindful that attempting to calibrate assistance to individual generators in a way that closely matches upper estimates of modelled loss estimates brings a significant risk of delivering windfall gains to those generators and is inconsistent with its commitment to a limited amount of direct assistance.

It should also be noted that the estimates in all the models is implicitly based on the assumption that the introduction of a carbon constraint was not foreseen by investors. The models calculate the difference in economic returns between a market without a carbon constraint and with the Scheme. If the introduction of a carbon constraint was, or should have been, foreseen at the time of making a particular investment, then the price paid for the asset should reflect this possibility. In that event, the modelled loss estimates represent an over-estimate of the real economic loss experienced by the investor.

If coal-fired electricity generators achieve a high rate of carbon cost pass-through, much of the loss suggested by some models will not eventuate. Significant uncertainty in the rate of pass-through between models and states indicates that a large portion of the upper estimates of modelled losses is also uncertain.

Alternatively, if the rate of pass-through in particular states or throughout Australia's wholesale electricity markets is low, asset value losses for those generators will be correspondingly larger in aggregate and more widely spread, with a greater number of assets experiencing some loss in value. However, in this circumstance, whilst the overall level of loss is significantly larger in absolute terms, the losses experienced by the majority of generators are not necessarily large in percentage terms. Addressing such diffuse and

uncertain losses through direct assistance is unlikely to be effective in achieving the Government's policy objectives.

Conversely, even where carbon cost pass-through is estimated to be high, it appears that particular emissions-intensive assets are still exposed to significant losses of value.

Given these uncertainties, the Government has designed an assistance package that seeks to partially offset the most extreme losses in asset value, rather than attempting to precisely offset all modelled losses in value. The Government is targeting a quantum of assistance that is sufficient to offset a large portion of the most extreme losses in asset value suggested by the modelling for the CPRS -5 scenario.

The quantum of assistance when delivered through an administrative allocation of permits will vary in line with actual permit prices (see Section 13.4.5). Actual permit prices may vary for a number of reasons, including due to Government decisions on the level of Scheme caps consistent with the medium-term target range.

The Government has determined that ESAS will deliver limited direct assistance through the administrative allocation of a fixed quantity of permits (see Section 13.4.6). This fixed quantity of permits would deliver assistance valued at around \$3.9 billion in nominal terms or \$3.5 billion in 2008–09 dollars, based on carbon prices estimated under the CPRS -5 scenario. The assistance, when delivered as outlined below, should be sufficient to achieve the Government's policy objectives by significantly offsetting the most probable and most extreme asset value impacts of the Scheme.

Policy position 13.8

The Government will deliver limited direct assistance through the administrative allocation of a fixed quantity of permits valued at around \$3.9 billion in nominal terms, or \$3.5 billion in 2008–09 dollars.

13.4.4 Allocation of assistance

Green Paper position

Direct assistance for coal-fired electricity generators would be allocated to individual recipients using a simple asset-by-asset method that involves:

- the available assistance being split into separate pools, with one pool being made available to brown coal-fired assets and the other to black coal-fired assets
- assistance in each pool being allocated to individual assets in direct proportion to the capacity of each asset.

The allocation of assistance should reflect the likely pattern and extent of asset value impacts on coal-fired electricity generators, as it is mainly those impacts that can affect perceptions of investment risk in the sector. Such an approach will also minimise the risk of delivering windfall gains to coal-fired electricity generators.

While stakeholders generally recognised that the allocation methodology outlined in the Green Paper was intended to deliver a simple and transparent allocation method that reasonably reflects potential impacts on the value of individual assets, several submissions argued that alternative allocation methodologies might target assistance more effectively.

The National Generators Forum commented:

A more accurate allocation of assistance could be achieved by using an alternative measure based, for example, on sent out energy, emissions or capacity weighted by emissions intensity. Given the relatively small number of generators, this could also be expected to meet the simplicity and transparency criteria. (Submission 766, p. 30)

The Government has assessed the benefits of several alternative assistance allocation approaches in the light of its modelling.

In essence, all allocation methodologies must be weighted using the ‘size’ of generators in some way. All other things being equal, larger assets produce more electricity and hence have higher asset values under business-as-usual. It follows that larger generators also have more asset value to lose because of changes in the market in which they operate.

All allocation methodologies must also take into account the variability in emissions intensity between coal-fired electricity generators in order to reflect the varying cost and asset value impacts of the Scheme on similar sized assets.

Calibration of assistance to reflect asset size

The allocation methodology set out in the Green Paper attempted to reflect the relevance of asset size to asset loss by weighting assistance to individual assets according to their generation capacity.

Several stakeholders raised concerns about the use of generation capacity as a method for weighting the assistance provided to individual assets. For example, the proposed Green Paper allocation methodology does not reflect variability in the capacity factor of different generators, that is, the proportion of their theoretical maximum output that they produce over a period of time.

Given the concerns raised, the Government considers that weighting assistance by the historical energy output of an asset, rather by its generation capacity, offers appropriate calibration, while also offering transparency and simplicity.

In implementing this approach, the Government must also:

- choose between using ‘electricity generated’ (that is, all electricity produced by the generator) and ‘electricity sent out’ (that is, the electricity produced by the generator less the electricity used in the generation process) as its output measure
- choose an appropriate timeframe over which to calibrate this baseline
- consider how to fairly determine energy baselines for assets that only entered service relatively recently.

Using electricity sent out as an energy output baseline risks creating arbitrary distortions between generators. For example, an electricity sent out baseline would advantage a generator that exports all of its electricity to the grid and then purchases electricity from the grid for use internally relative to a generator that exports its electricity net of internal consumption. It would also disadvantage generators that use electricity for on-site coal mining compared to generators that purchase coal mined at a different location, or that use other fuels to operate mining equipment. Furthermore, electricity sent out figures are generally more commercially sensitive than electricity generated data, so using sent out data as a basis of allocations would be less transparent.

Accordingly, the Government considers that electricity generated is an appropriate basis for determining an energy output baseline.

Electricity generated can vary significantly over time due to changing market conditions, periods of planned or unplanned maintenance, and other events beyond the control of generators, such as restricted access to cooling water during drought. All these considerations support the use of an energy output baseline over a number of years to smooth out observed fluctuations. However, using a longer period to determine an output baseline potentially introduces distortions between assets that have entered service or been refurbished more recently.

The Government considers that three years is an appropriate period to use in determining an energy output baseline for an individual asset. The three-year period should cover the period up to the date on which bipartisan support was declared for an emissions trading scheme in Australia; that is, 3 June 2007. Therefore, the appropriate baseline period is from 1 July 2004 to 30 June 2007.

Generators that were not in service prior to 1 July 2004 might be unfairly disadvantaged by this choice of period, so special provision will need to be made for them. One approach would be to assume a particular capacity factor to derive a proxy for the generator's energy output by applying that factor to the capacity of the asset. If that approach were adopted, draft Scheme legislation would outline the Government's final decision on an appropriate assumed capacity factor for coal-fired electricity generators. Coal-fired electricity generators generally operate at quite high capacity factors (between 65 and 90 per cent). An assumed capacity factor at the higher end of this range, such as 80 per cent, may be appropriate to reflect the likely mode of operation and reliability of a new coal-fired generator.

Calibration of assistance to reflect emissions intensity

The Green Paper allocation methodology attempted to reflect variation in the emissions intensity of individual coal-fired electricity generators simply and transparently through the creation of two 'pools' of assistance (one for assets using brown coal and the other for those using black coal, to reflect their different emissions intensities).

In addition to the Green Paper approach, the Government has also considered assistance allocation methodologies that reflect the emissions intensity of the generator by incorporating:

- the historical emissions intensity of that generator
- the variation between the historic emissions intensity of a generator and a 'threshold' level of emissions intensity.

The modelling commissioned by the Government demonstrated a pattern of impacts that reflected the emissions intensity of individual assets to an extent that could not be adequately captured by using two pools of assistance as a proxy for the different emissions intensities of brown-coal and black-coal assets, as proposed in the Green Paper.

While the overall extent of loss varied significantly between models and scenarios according to the rate of carbon cost pass-through, losses were clearly concentrated among the most emissions-intensive generators.

This pattern emerged for two main reasons:

- for any given level of carbon cost in the market, margin compression is greater for more emissions-intensive generators
- assets that lost generation volume under the Scheme were typically the most emissions-intensive assets in the market.

Weighting assistance by a generator's emissions intensity alone does not take into account the ability of all generators to pass-through a significant portion of their carbon costs to the market through increased electricity prices.

Generators will attempt to pass on as much of their carbon costs as competition within the market will allow. An individual generator is constrained by being under-priced in the market by their competitors. Generators with particularly high emissions intensity, and hence carbon costs, will not be able to pass on their full costs because their competitors face lower costs.

Whilst all generators will be able to pass on some portion of their carbon costs as allowed by the emissions intensity of their competitors, any given generator will face exposure to losses of asset value when the carbon cost it faces exceeds the average level of carbon cost pass-through reflected in electricity prices.

Furthermore, while all coal-fired electricity generators are emissions intensive, modelling indicates that only some of them—largely the most emissions intensive—face a significant risk of losses of generation volume during the first 10 years of the Scheme. This supports the use of a threshold level of emissions intensity to weight assistance in line with the extent to which an asset's emissions intensity exceeds the threshold.

Estimating emissions intensity

All estimates of the emissions intensity of an individual generator involve some uncertainty. Its fuel efficiency will vary over time depending on how it is operated and how well it has been maintained, among other things. The quality of fuel used may also vary over time, potentially creating variation in the quantity of emissions released per unit of fuel consumed in the generation process. Using a three-year baseline period will smooth out fluctuations in the emissions intensity of an asset, allowing a more reliable estimate of its true performance.

As for the energy output baseline, the Government recognises that it will need to make special provision for assets that did not enter service prior to 1 July 2004. The emissions intensity of those assets could be estimated on the basis of fuel quality and engineering design documents; in many cases, those estimates will be able to be confirmed against the performance of the asset since it entered service.

Additional complexity emerges from the use of different measures of emissions intensity. One measure considers only the generator's direct emissions (that is, the emissions released in the process of combusting fuel to generate electricity). An alternative measure would consider the generator's 'full fuel cycle' emissions, including emissions from the production and transport of the fuel (such as fugitive emissions from coal mining).

Uncertainty in estimates of an individual generator's full fuel cycle emissions can be quite significant, due to the variation in the emissions released in the production and transport of different fuels and the variation in those emissions over time (for example, because of changing operational patterns at a coal mine). Furthermore, taking such emissions into account would result in the calibration of assistance for an individual generator in a way that reflects operational decisions taken by a variety of other parties, particularly fuel suppliers.

For this reason, the Government considers that estimates of emissions intensity used for the allocation of assistance should consider only direct emissions.

Furthermore, some coal-fired generators might also be part of 'cogeneration' facilities, which produce both electricity (for sale or internal use) and steam (for use in a co-located industrial process for example). In such circumstances, some emissions created by the combustion of fuel by the generator are not attributable to the generation of electricity, but to the production of steam.

Because assistance is targeted to address the competitive pressures facing generators in the wholesale electricity market, the emissions intensity estimates used in the allocation of assistance will only consider emissions directly attributable to the generation of electricity.

To retain consistency between the emissions intensity baseline and the energy output baseline, emissions intensity will be estimated on an 'electricity generated' basis, rather than on an 'electricity sent out' basis.

Threshold level of emissions intensity

The National Greenhouse Accounts Factors (November 2008)² include a series of aggregated factors for both the direct and full fuel cycle emissions intensity of electricity consumption in each state. The Government has used those factors to estimate the direct emissions intensity of electricity generated in Australia at approximately 0.78 tonnes of CO₂-e per megawatt-hour.

However, the Government considers that the average emissions intensity of all generation in Australia is not the threshold at which risks of more extreme asset value impacts might emerge. That threshold is more closely represented by the relative emissions intensity of an asset when compared to other fossil fuel-fired generators. This is because a large portion of renewable generation, including most wind generation, is dispatched into the market preferentially and so does not directly compete with fossil fuel-fired generation. Furthermore, most hydro-electric generators are constrained by access to water, and so are likely to change their competitive behaviour to reflect the increase in cost of their fossil fuel-fired competitors, rather than in a way that reflects the emissions intensity of hydro-electric generation.

The Government's estimate of the average emissions intensity of fossil fuel-fired generation in Australia is 0.86 tonnes of CO₂-e per megawatt-hour.

This threshold emissions intensity calculated on an ‘as-generated’ basis is approximately equal to the Government’s preferred electricity allocation factor for EITE assistance of 1 permit (representing 1 tonne of CO₂-e) per megawatt-hour, which is calculated on an ‘as-consumed’ basis. The difference between the emissions intensity of electricity generation on an as-consumed basis and an as-generated basis is primarily due to electrical losses in the generation process and through the transmission network. The Government’s estimate of Australia’s as-generated emissions intensity of 0.78 tonnes of CO₂-e per megawatt-hour translates to an as-consumed emissions intensity of approximately 0.93 tonnes of CO₂-e per megawatt-hour.

Calibration to reflect asset age

Several stakeholders argued that the allocation methodology proposed in the Green Paper failed to recognise that the impact of the Scheme may vary between assets according to their remaining useful lives. For example, the Griffin Group argued that ‘the useful remaining asset life of coal fired generators should be taken into account’, but acknowledged the practical difficulties in such an approach (Submission 600, p. 4). The Griffin Group suggested that this approach could use the date an asset first entered service as a proxy for its remaining asset life.

An electricity generation asset requires significant ongoing maintenance and expenditure over its period of operation. Furthermore, the useful remaining life of an asset can only be estimated imprecisely because it will vary under different maintenance regimes.

As a result, adjusting assistance on the basis of the date a generator first entered service does not recognise the significant ongoing expenditure incurred by owners of assets that first entered service many years ago. Such assets can include many components that are at the beginning of their working lives.

Furthermore, it is unclear whether coal-fired electricity generation assets that have been constructed more recently are entitled to more, rather than less, assistance. While the Government’s choice of eligibility cut-off date is intended to capture the date at which the risk of the imposition of a carbon price became certain, in reality there was some risk before that date. It could be argued that more recent investors had the advantage of greater clarity on this matter, and are thus entitled to less assistance.

Given this ambiguity, and the potential that a simple proxy for asset age will not reflect the timing of actual investments in generation plant, the Government does not consider that asset age should be included as a factor in the allocation of assistance under ESAS.

Policy position 13.9

The Government will allocate assistance through ESAS to coal-fired electricity generators according to a methodology that weights assistance by:

- the historical energy output of the generator, measured as the electricity generated by the asset between 1 July 2004 and 30 June 2007
- the extent by which the Scheme regulator's estimate of the emissions intensity of the generator (over the period 1 July 2004 to 30 June 2007) exceeds the Government's threshold level of emissions intensity (0.86 tonnes of CO₂-e per megawatt-hour of electricity generated).

The Scheme regulator's estimate of emissions intensity will be on an 'electricity generated' basis, and will consider emissions only from the combustion of fuel that are directly attributable to the generation of electricity.

The Government will clarify how this methodology will apply to assets that did not enter service until after 1 July 2004.

13.4.5 Allocations of cash or permits

In the Green Paper, the Government sought stakeholder feedback on the relative merits of providing direct assistance to coal-fired electricity generators through administrative allocations of permits or through cash payments.

Electricity generation stakeholders almost uniformly preferred allocations of permits, often citing the risk management or 'natural hedge' benefits of permits—that is, the benefit that the value of assistance delivered in the form of permits increases or decreases in line with the carbon price, and therefore in line with the broad impact of the Scheme on emissions-intensive generators. However:

- Origin Energy argued that assistance in the form of cash 'would prevent hoarding ... allow for a more efficient operation of the auction and secondary market and provide a more transparent means of assistance' (Submission 815, p. 93).
- Despite broadly supporting assistance in the form of permits, the joint submission of the Energy Supply Association of Australia, the National Generators Forum, the Energy Retailers Association and the Australian Pipeline Industry Association observed that 'cash may be more applicable for assets with projected short lives' (Submission 715, p. 26).
- The National Generators Forum's submission supported the provision of assistance in the form of permits but argued that 'other approaches may need to be considered when the national targets are announced' (Submission 766, p. 31).

The natural hedge qualities of assistance through the administrative allocation of permits offer a significant advantage for recipients of assistance. Administratively allocating permits would support the Government's policy objective by ensuring that the value of assistance delivered will adjust over time in a way that is correlated with the need for assistance.

While the Green Paper noted the transparency benefits for Government in providing assistance in the form of cash, on balance the Government considers that the natural hedge qualities of assistance as permits outweighs the benefits of delivering assistance in the form of cash.

Policy position 13.10

The Government will provide assistance through ESAS in the form of administratively allocated permits.

13.4.6 Delivery of assistance

Capping the overall permit allocation

The value of assistance delivered in the form of permits will vary depending on the carbon price. Similarly, the value of the permit revenue the Government foregoes through administratively allocating permits is related to the prevailing market price.

To reduce the scope of uncertainty surrounding the value of assistance to be delivered to coal-fired electricity generators, the Government will cap the total number of permits to be allocated under ESAS.

Capping the overall quantum of permits that may be provided under ESAS requires the Government to allocate assistance on a 'pro rata' basis, such that assistance decisions in relation to each individual generator are inter-related. An increase in the amount of assistance provided to any one generator, for example due to revision of an estimate of its emissions intensity, necessarily reduces the quantum of assistance available to other generators to ensure that the cap is not breached.

Allocating assistance pro rata under a cap in accordance with the methodology set out in Section 13.4.4 means that the assistance for an individual asset can be determined according to the following formula (considering only those generators that satisfy the eligibility criteria in Section 13.4.7):

$$AF_i = \frac{(EI_i - EI_{average}) \times EO_i}{\sum [(EI_i - EI_{average}) \times EO_i]}$$

for all eligible generators where $(EI_i - EI_{average}) > 0$

where

AF_i = the assistance factor for generator i

EI_i = the emissions intensity of generator i (in kilotonnes CO₂e/GWh)

$EI_{average}$ = the average emissions intensity of all fossil fuel fired generators, 0.86

EO_i = the historic electricity output of generator i over the period 1 July 2004 to 30 June 2007
(in GWh)

then

Assistance to generator i = $Q \times AF_i$

where

Q = the quantum of assistance (in permits)

The assistance factor in the formula multiplies the emissions intensity (above the average) for a particular generator, by its electricity output, and divides this by the same calculation summed across all generators with emissions intensity greater than the average.

Where a generator receiving assistance under ESAS breaches the conditions attached to assistance, or has assistance withheld on the basis that it is likely to receive a windfall gain, the Government will ensure that the pro rata allocation to all other generators is not adjusted. Such an adjustment would not support the Government's policy objectives, as decisions made in relation to one eligible generator would arbitrarily reward all other eligible generators.

Indicative allocations

Despite the inter-relationship of allocations to individual generators, indicative allocations for any given generator can be estimated by considering its emissions intensity and energy output, provided that reasonable estimates of these same variables can be made for all other eligible generators.

The Government has used a variety of industry data to estimate emissions intensities and electricity output baselines for coal-fired electricity generators that may meet the eligibility criteria set out in Section 13.4.7. Based on this data, the Government estimates that the denominator in the formula provided above is approximately 69,100. Given that the total number of permits available for allocation under ESAS is 130.7 million (as set out in Policy position 13.12), the number of permits that would be provided to a generator through ESAS can be estimated using the formula below, where its emissions intensity and energy output baselines are known:

$$\text{Assistance to generator } i = Q \times AF_i$$

where

$$Q = 130.7 \text{ (million permits)}$$

$$AF_i \approx \frac{(EI_i - 0.86) \times EO_i}{69,100}$$

EI_i = the emissions intensity of generator i (in kilotonnes CO₂e/GWh)

EO_i = the historic electricity output of generator i over the period 1 July 2004 to 30 June 2007
(in GWh)

The value of an indicative allocation of permits estimated in this way will vary in accordance with the carbon price. Noting this, Table 13.3 sets out the indicative value of assistance that may be provided to several hypothetical generators, assuming that actual carbon prices under the Scheme result in the total quantity of permits available under ESAS being valued at \$3.9 billion in nominal terms (see Policy position 13.12).

Table 13.3: Indicative allocations

Hypothetical generator	Emissions Intensity (ktCO ₂ -e/GWh)	Capacity (MW)	Capacity factor	Estimate of energy generated (GWh) over three years	Indicative assistance calculation	Indicative assistance over five years (\$m nominal)
Calculation	[A]	[B]	[C]	[D] = (3 years x 365 days x 24 hours x [B] x [C])/1000	[E] = ([A] - 0.86) x [D]	[F] = ([E]/69100) x 3880
Brown coal	1.3	1000	90%	23652	10407	584
Emissions intensive black	0.95	1000	80%	21024	1892	106
Efficient black	0.85	1000	85%	22338	< 0	0

Source: Australian Government analysis based on industry data.

Implementing the allocation approach

The allocation of assistance under ESAS must be implemented in a transparent and fair manner. Given the policy settings established in Policy position 13.9, the quantum of assistance that will be provided to individual generators will be sensitive to accurate determinations of that generator's emissions intensity and energy output.

Further, given the inter-related nature of decisions on the quantum of assistance provided to individual generators, the quantum of assistance provided to any individual generator will vary depending on equivalent decisions made in respect of all other eligible generators.

To provide certainty and transparency to this process, the Government will require the Scheme regulator to make determinations as to the eligibility, emissions intensity and historic energy output of generators that apply for assistance under ESAS.

Within 90 days of the commencement of Scheme legislation, potential recipients of assistance will be required to apply to the Scheme regulator to prove their eligibility, and to have their emissions intensity and historic energy output determined.

The Scheme regulator will assess each application. Once all applications have been assessed and finalised, the Scheme regulator will be able to determine the number of permits that form the allocation of assistance to each generator. However, the delivery of this quantity of permits to any individual generator will be subject to complying with conditions attached to the assistance (see Section 13.5.4), and subject to the outcomes of a windfall gains review (see Section 13.4.9).

Policy position 13.11

Potential recipients of assistance under ESAS will:

- be required to apply to the Scheme regulator within 90 days of the commencement of Scheme legislation to prove their eligibility and provide other information relevant to determining the amount of assistance they should receive
- have these applications assessed by the Scheme regulator to determine eligibility and the quantity of permits that may be provided to each eligible generator.

Timing of delivery of assistance

Given the need to consider a range of factors, including the quantum of limited direct assistance, the emissions reduction trajectory, the timing of auctions, and the amount of permits available at each auction, the Government did not set out a preferred position on the timing of the delivery of assistance in the Green Paper.

Green Paper position

The proposed direct assistance for coal-fired electricity generators would be provided on a ‘once and for all’ basis—that is, further allocations would not be provided after the scheme begins.

A decision on the timing of the delivery of the proposed direct assistance for coal-fired electricity generators would be made at the time the quantum of assistance is determined.

The Government considers that assistance through ESAS should be delivered relatively promptly after the Scheme begins, to reinforce the ‘once and for all’ nature of the decision on the quantum of assistance.

However, the timing of the delivery of assistance must also support the Government’s objectives in relation to conditionality of assistance (see Section 13.5.4) and the windfall gains review (see Section 13.4.9).

Conditional assistance will only be effective where a significant portion of the assistance available can be withdrawn in response to a breach of the relevant condition. The Government considers that the risk of perverse outcomes in wholesale electricity markets will have

dissipated within five years of the commencement of the Scheme. Accordingly, delivering assistance over the first five years of the Scheme ensures that generators are provided with an incentive to comply with the Government’s preferred conditionality model through this period.

Similarly, an effective midway assessment approach for the windfall gains review requires that a significant portion of the available assistance be subject to the review. Delivering the assistance over five years allows the regulator to benefit from information from more than two years of the operation of the Scheme, while retaining the ability to reduce the prospect of windfall gains through withholding the final two years of assistance.

Limited direct assistance through ESAS will be delivered in the form of administrative allocations of permits. The permits can be of different ‘vintages’, and can be delivered over a number of years to ensure that the Government retains enough permits to auction in any given year.

The Government has determined that ESAS will deliver limited direct assistance through the administrative allocation of a fixed quantity of permits valued at around \$3.9 billion in nominal terms or \$3.5 billion in real terms in 2008–09 dollars. The Government has calibrated the total quantum of permits available through ESAS by converting the (nominal) carbon prices set out in Table 13.4 to real 2008-09 dollars, using an inflation rate of 2.5 per cent. The total number of permits that deliver assistance valued at around \$3.5 billion in 2008-09 dollars is 26.14 million permits each year, or 130.7 million permits in total.

Assistance of \$3.5 billion in real 2008-09 dollars is approximately equal to assistance of \$3.9 billion in nominal dollars when that assistance takes the form of five equal allocations of permits over five years, as set out in Table 13.4.

Table 13.4: Modelled number and value of permits

	2010–11	2011–12	2012–13	2013–14	2014–15	Total
No. of permits ('000s)	26,140	26,140	26,140	26,140	26,140	130,700
Permit price (\$ nominal)	25.00	26.43	29.26	32.32	35.37	-
Value (\$m nominal)	654	691	765	845	925	3,880

Source: Australian Government estimates.

The Government considers that this schedule for the delivery of assistance does not compromise its auction policies (see Chapter 9), and ensures that sufficient permits are available to allocate to entities that undertake EITE activities.

Policy position 13.12

The Government will issue up to 130.7 million permits over the first five years of the Scheme through ESAS which delivers assistance of around \$3.9 billion in nominal terms based on carbon prices estimated under the CPRS -5 scenario. The permits will be distributed in equal amounts in each of the five years, subject to eligible entities satisfying the conditions for assistance, and subject to the outcome of the windfall gains review.

13.4.7 Eligibility for assistance

Green Paper position

Eligibility for the proposed direct assistance for coal-fired electricity generators would be limited to those assets that were ‘in existence’ on 3 June 2007; that is, assets that were in operation or satisfied the National Electricity Rules criteria for a ‘committed project’ on that date.

In the Green Paper, the Government recognised that the risk of the imposition of a carbon price on emitting industries has emerged over time, rather than materialising at a single moment. Nevertheless, the Government proposed a single point in time as a cut-off for eligibility for limited direct assistance under ESAS. That point was the date on which bipartisan support for an emissions trading scheme was confirmed.

Assets ‘in existence’

Energy sector stakeholders such as the National Generators Forum (Submissions 715 and 766) and the Energy Supply Association of Australia et al (Submission 715) supported the use of 3 June 2007 as the eligibility cut-off date for direct assistance through ESAS and the criteria for determining that an asset was ‘in existence’ on that date.

The Government considers that whether an asset is ‘in operation’ is more easily determined by assessing its behaviour over a month rather than a single day. For example, market conditions or maintenance practices may mean that an asset did not generate electricity on 3 June 2007 but should still be considered to be in operation at that time. The Government considers that an asset that generated electricity at any time during June 2007 can be regarded as having been ‘in operation’ on 3 June 2007.

The Government also recognises that a generation asset that was essentially ‘in operation’ might nevertheless have been out of service for all of June 2007, for example, due to routine maintenance. Therefore, assets in operation should include assets that were out of service in June 2007 but which had a plan to return to service before the end of 2007.

Finally, the Government recognises that drought restricted access to cooling water for some generators during 2007, and so considers that an asset that was out of service temporarily for that reason should also be regarded as being in operation in June 2007.

The Green Paper also recognised that investors may have been committed to constructing a new generator as of 3 June 2007 such that their investment decisions could not have been easily altered in response to the emergence of full knowledge that the Government would implement the Scheme, but that such an asset would not satisfy the criteria of being ‘in operation’. Accordingly, the Government proposed extending eligibility for assistance under ESAS to assets that could be considered to be a ‘committed project’ according to the National Electricity Rules criteria on that date.

The Government considers that the National Electricity Rules criteria remain relevant for determining whether an asset was ‘in existence’ if the asset had not entered service before

June 2007. The rules define a ‘committed’ project as one that has been fully committed by the project proponent, taking into account:

- the proponent’s rights to land for the construction of the project
- whether contracts for the supply and construction of the project’s major plant or equipment, including contract provisions for project cancellation payments, have been executed
- the status of all planning and construction approvals and licences necessary for the commencement of construction of the project, including completed and approved environmental impact statements
- the level of commitment to financing arrangements for the project
- whether project construction has commenced or a firm date has been set for it to commence.³

Connection to a major electricity grid

In addition to the Green Paper criteria for eligibility for assistance, the Government considers that coal-fired electricity generators that are not connected to a major electricity grid are unlikely to be exposed to the same competitive pressures as those that are connected to large grids where alternative sources of electricity are available.

For this reason, the Government has added the criterion that a coal-fired electricity generator must have been connected to a major electricity grid, or been intending to connect to a major grid, in June 2007 to be eligible for direct assistance under ESAS.

For consistency with the *Renewable Energy (Electricity) Act 2000* and associated regulations, one option for defining a ‘major electricity grid’ is that it is a grid on which the installed capacity of generation is more than 100 megawatts (excluding minor sources of generation).

Generators that use other fuels in addition to coal

Coal-fired electricity generators can use fuels other than coal under certain circumstances. While some generators routinely use other fuels as a major energy input for generation, almost all coal-fired electricity generators use some alternative fuel, such as fuel oil or natural gas, to start combustion in their boilers. The Government’s definition of a ‘coal-fired generator’ must allow for this.

However, a generator designed or modified to allow the combustion of significant quantities of an alternative fuel as a major energy input, and that has demonstrated this capability through historical use of the alternative fuel, does not face the same risk of asset value loss as a generator that relies exclusively on coal as its major energy input.

For example, a generator that can use natural gas as an alternative fuel in place of coal has available to it an immediate and significant abatement opportunity that is not available to a generator reliant on coal.

The Government considers that an asset must have used coal to supply over 95 per cent of its energy used in electricity generation over the period from 1 July 2004 to 30 June 2007 to be eligible for assistance as a ‘coal-fired’ electricity generator.

Where an asset had not entered service before 1 July 2007, the asset must have intended to use coal to supply over 95 per cent of its energy for electricity generation once the generator entered service.

Policy position 13.13

The Government will limit eligibility for assistance under ESAS to electricity generators that:

- generated electricity in June 2007, or were planned to return to service before the end of 2007 (or following the end of restrictions on their access to cooling water), or are considered to have been ‘committed’ projects at 3 June 2007 when assessed against the relevant National Electricity Rules criteria
 - were, or were planned to be, connected to a major electricity grid
- and
- used coal for over 95 per cent of their energy supply in the period from 1 July 2004 to 30 June 2007, or, if the generator was not in operation before 1 July 2007, intended to use coal for over 95 per cent of their energy supply.

13.4.8 Recipient of assistance

The Government must make the identity of the legal entity that will receive assistance clear enough to give parties to an asset transaction certainty about how the right to assistance will be treated in that transaction. Clarity on this matter will also help to improve investor confidence, which is an overall objective of providing assistance.

The Green Paper sought stakeholder views on the approach of providing assistance to registered generators in the NEM or the Western Australian WEM for particular generation assets, as of the day on which the proposed allocation is delivered.

While this approach had general, if cautious, support, several submissions (including those of Babcock & Brown Power and the State Electricity Commission of Victoria) argued that the recipient of assistance should be defined as the liable entity under the Scheme.

That approach has intuitive appeal, but runs into some practical difficulties. For example, where an asset ceases production, it will not have a liability under the Scheme and so the liable entity will not be identified as part of the routine operation of the Scheme.

Nevertheless, linking the recipient of assistance with liability under the Scheme has significant policy advantages, particularly because it ensures that assistance is not provided to entities that do not face a direct cost under the Scheme.

Therefore, the Government has adopted an approach that allows the recipient of assistance to be identified as the liable entity in relation to an asset. Where the asset does not create

sufficient emissions to incur a liability under the Scheme, the recipient is identified as the entity that would have incurred a liability had the asset been operated so as to incur one.

Because multiple entities could incur a liability under the Scheme across a financial year in relation to a single asset, the Government must identify only one of them as the recipient of assistance. If multiple recipients were identified, the appropriate division of assistance could create significant uncertainty.

The clearest arrangement for all parties is to identify the liable entity, or the entity that would have been the liable entity had a liability been incurred, at the close of the previous financial year. As assistance will be delivered across five years, with one allocation of assistance each year (Section 13.4.6 refers), that assessment will be made in relation to each yearly allocation of assistance. Multiple entities may receive assistance in relation to a given generation asset over the course of the delivery of ESAS, but only one will receive the assistance provided in respect of an asset in any given year.

This ‘point in time’ assessment allows asset transactions to be clear about whether the value of assistance is transferred to the buyer (for transactions before the end of a financial year) or retained by the seller (for transactions effected after the end of the financial year). Where parties are concerned about residual uncertainty in the date of effect of a transaction, additional private contractual arrangements can be used to ensure that the rights to assistance are clearly assigned in the transaction.

Policy position 13.14

The Government will provide assistance that is available through ESAS in respect of a given asset in any given year to:

- the entity that was the liable entity for an eligible asset’s emissions at the end of the preceding financial year, or
- if no liability is incurred in relation to an eligible asset, the entity that would have been liable for that asset’s emissions at the end of the preceding financial year had a liability been incurred.

13.4.9 Windfall gains review

Green Paper position

The quantum of proposed direct assistance for coal-fired electricity generators would be determined ‘up front’ (that is, before the scheme begins). However, potential recipients would need to submit to a review process to minimise any prospect of windfall gains.

Because of the inherent uncertainty of the impact of the Scheme on specific electricity generators, any quantum of assistance delivered by the Government carries some risk of delivering a windfall gain to some generators.

A windfall gain can be regarded as arising when the generator’s discounted net revenue stream (where ‘net revenue’ is the revenue earned from selling electricity, less the costs of

generating that electricity) under the Scheme, plus the value of the assistance delivered through ESAS, exceeds the discounted net revenue stream of the generator in the absence of the Scheme.

The submission of the Energy Supply Association of Australia et al supported such a review ‘to provide assurance to the Government that there have not been any windfall gains’ (Submission 715, pp. 26–27).

Despite targeting the available ESAS assistance using the allocation methodology outlined in Section 13.4.4, the Government considers that a review is necessary to minimise the risk of delivering windfall gains to coal-fired electricity generators that receive ESAS assistance.

Structure of the review

The Government has considered three mechanisms for windfall gain reviews:

- ‘*ex ante*’ reviews, which assess of the appropriateness of proposed assistance quanta before the assistance is delivered
- ‘*ex post*’ reviews, which assess whether there have been windfall gains in the light of observed outcomes for individual generators under the Scheme, and allows assistance to be reclaimed by the Government
- ‘midway assessment’ reviews, which are held after a portion of assistance is delivered without review, but which subject the remaining portion of assistance to review and allows this portion to be withheld if windfall gains are in prospect.

An *ex ante* review would minimise uncertainty for potential recipients of assistance following the completion of the review. However, before the review, potential recipients would face significant uncertainty about the value of assistance to be delivered to them under ESAS.

Some stakeholders indicated that some auditors and creditors might seek to revalue generation assets well in advance of the commencement of the Scheme. Given this, the Government considers that giving stakeholders certainty about the likely value of assistance they will receive is important to prevent full losses in asset value from being realised on an entity’s balance sheet before the Government’s commitment to a level of assistance becomes clear. An *ex ante* review does not offer enough certainty in this regard.

Furthermore, an *ex ante* review does not have the benefit of allowing the review body to observe actual behaviour in the electricity market following Scheme commencement.

An *ex post* review would give potential recipients significant certainty that a given level of assistance may be delivered to them, but would subject that assistance to the persistent risk that it could be reclaimed by the Government at a later time. The impact of a potential ‘clawback’ on the valuation of assistance on balance sheets is not clear, but there is a material risk that this approach would devalue the assistance enough to undermine the policy rationale for assistance.

An *ex post* review may still require some element of projection about future outcomes, as asset value impacts of the Scheme could occur beyond the period over which assistance will

be delivered. An *ex post* review does not remove the inherent uncertainty in assessing the impact of the Scheme on asset values over an extended period.

A midway assessment review overcomes some of the difficulties of both approaches by giving potential recipients a high degree of certainty that some assistance will be delivered and cannot be reclaimed by the Government. Furthermore, once the midway assessment has occurred, recipients will also have a high degree of certainty that the remaining portion of assistance will be delivered.

Midway assessment reviews will benefit from observing how electricity markets have responded to the Scheme. While the body undertaking the windfall gains review will still need to make projections to assess asset value impacts of the Scheme over a long period, it will be informed by observed outcomes within the electricity market.

A midway assessment approach to the windfall gains review balances the need to minimise the prospect of windfall gains, while giving potential recipients of assistance enough certainty about the value of that assistance to avoid undermining its value. Therefore, the Government will adopt a midway assessment approach to the windfall gains review.

Timing of the review

The Government considers that approximately three-fifths of the proposed assistance should be delivered before the midway assessment. This will give recipients of assistance certainty that a significant portion of the assistance available to them will be delivered without review.

The remaining two-fifths will be subject to the assessment, ensuring that the portion of assistance that can be withheld is sufficiently large to make the review effective in mitigating the risk of windfall gains.

This approach involves a review in the 2012–13 financial year, after the delivery of assistance in 2010–11, 2011–12 and 2012–13. Assistance due in 2013–14 and 2014–15 will be delivered subject to the outcomes of the windfall gains review.

Decision-making structure

Assessing windfall gains is inherently complex and uncertain for reasons including:

- the requirement to project asset value impacts over a long period to reflect the longevity of electricity generation assets
- the complex and strategic nature of behaviour in the wholesale electricity market
- the interaction of the Scheme with other policy measures, including the expanded national Renewable Energy Target
- variability in key economic parameters in the electricity market, including demand, fuel costs and capital costs.

The windfall gain review cannot provide an absolute answer that a windfall gain will or will not occur. Instead, it must make a probabilistic assessment of the likelihood of such a gain. This assessment must factor in the uncertainty inherent in a number of key variables.

No individual organisation or government agency has an ideal skill set to administer the review. The Government considers that the Scheme regulator will be best placed to draw on relevant expertise to administer the review and so is the appropriate body to undertake the windfall gains review.

Given the uncertainty of the assessment, withholding assistance should be implemented through a ministerial determination rather than an action of the Scheme regulator. This allows the responsible minister to assess whether the withholding of assistance because of a ‘likely’ windfall gain is appropriate to minimise the risk of the gain, without undermining the original purpose of the assistance.

If the Scheme regulator does not find that a windfall gain is likely, the minister will not be empowered to withhold assistance. Furthermore, if the Scheme regulator finds that a windfall gain is likely, that finding will be subject to merits review in the Administrative Appeals Tribunal.

Where the minister and Scheme regulator consider that a windfall gain is likely, this assessment would indicate the net impact of the Scheme on the generator in question has been largely offset through the provision of the initial portion of assistance not subject to the windfall gains review. Providing further assistance would not be necessary to offset extreme asset value losses, and so would not further the Government’s policy objective of ameliorating the impact of the Scheme on perceptions of risk in the electricity generation sector. Accordingly, the windfall gains review will not provide the minister with discretion to partially withhold assistance.

To provide certainty to recipients of assistance that the windfall gains review will occur in a manner that reflects the policy intention of the review mechanism, while protecting the policy intention of delivering assistance, the Scheme regulator will be required to publish a legislative instrument outlining key assumptions and methodologies that it will employ in the review.

Assessing the impact of the expanded national Renewable Energy Target

To minimise the complexity in the review arising from the need to differentiate the impact of the Scheme on recipients of assistance from the impact of the expanded national Renewable Energy Target, the Scheme regulator will assess the net revenue of the generator in the absence of both the Scheme and the expanded target, and the net revenue of the generator under both those policy measures in combination.

The period assessed in the review

The Government must also establish a period of time over which the windfall gains review will assess the impact of the Scheme and the Renewable Energy Target on generators. While the assessments used in the initial calibration of ESAS focused on impacts arising in the first decade of the Scheme, the longevity of generation assets warrants an assessment of windfall gains over a slightly longer period.

Uncertainty in any wholesale electricity market modelling exercise increases with the period over which projections are made. Because almost four years will have passed between final policy decisions on ESAS and the windfall gains review, the Scheme regulator will be able to

observe actual impacts of the Scheme and project beyond the Scheme's first decade with reduced uncertainty. Furthermore, it is likely that, at the time of the windfall gains review, there will be additional certainty for all participants in the market as to the likely rate of emissions reductions that will be required in the Australian electricity generation sector beyond 2020 given international and domestic policy settings.

Therefore, it is appropriate to extend the period of assessment of the windfall gains review beyond the period primarily assessed in the Government's modelling, such that it encompasses the first 15 years of the Scheme.

The effect of upgrading generation assets

Some coal-fired electricity generators will be able to upgrade their assets in some way over the period of the windfall gains review to reduce their emissions intensity. If the review were to take account of actual or potential modifications, the generator in question would face disincentives to announcing or undertaking plant modifications before the completion of the review.

This would distort abatement incentives for the parties subject to the review. Therefore, it is appropriate for the Scheme regulator to assume that generation assets are not upgraded over the period of the windfall gains review.

Policy position 13.15

The Government will require each recipient of assistance through ESAS to submit to a windfall gains review, which will involve the following:

- The Scheme regulator will assess whether the delivery of assistance to an individual generator would be likely to deliver that generator a windfall gain.
- The likelihood of windfall gains will be assessed by comparing the generator's actual and predicted revenues under the Scheme with those predicted to have occurred in the absence of the Scheme and the expanded national Renewable Energy Target over a 15-year period.
- The Scheme regulator's assessment of the likelihood of a windfall gain will not take into account actual or predicted upgrades to generation plant.
- If the Scheme regulator finds that a windfall gain is likely, the responsible minister will have discretion to withhold the last two years of assistance from that asset.
- A regulator finding that windfall gains are likely may be challenged by the generator in the Administrative Appeals Tribunal.

13.4.10 Adjustment of assistance for contractual arrangements

The Government recognises that the impact of the Scheme on individual coal-fired electricity generators may vary depending on the terms of their contractual arrangements relating to the supply and price of electricity.

Contractual arrangements are not an appropriate basis for identifying strongly affected industries (see Policy position 13.1). However, providing assistance to a generator that holds a contract that allows for significant pass-through of carbon costs might not be effective in promoting the Government's policy objective, which is to ameliorate the risk of the Scheme affecting the investment environment in the Australian electricity generation sector.

Methods of considering contractual arrangements

The Government could:

- adjust the initial allocation of assistance provided to individual generators in the light of an *ex ante* assessment of the effect of favourable contractual arrangements to which they are party
- reserve the right to reclaim assistance provided to individual generators in the light of an *ex post* assessment of the effect of contractual arrangements to which they are party
- explicitly consider the effect of contracts in the windfall gains review.

Where a generator has consciously allocated the risk of an exposure to a carbon cost to another party to the contract, adjusting the initial allocation of assistance might unfairly penalise a generator for establishing favourable contractual arrangements.

Furthermore, the extent of adjustment that this approach requires is not evident. Withdrawing all assistance on the basis of a contract might not be appropriate—it could disadvantage the generator more than the absence of the contract. Conversely, the appropriate extent of a partial withdrawal of assistance is not clear and depends on a range of assessments.

Allowing the Government to reclaim assistance *ex post* creates significant risks that the initial provision of assistance will be significantly devalued by the generator because of the risk that the assistance will be reclaimed. Such devaluation would undermine the Government's objective in delivering assistance.

On balance, addressing the impact of contractual positions through the windfall gains review best supports the objective of delivering assistance through ESAS, while protecting against the possibility that excessive and unwarranted assistance will be provided to individual generators.

This view also recognises that the Government's determination of an appropriate quantum and allocation of assistance to generators reflects a broad judgement rather than a precise calculation arising out of certain information. Accordingly, a mechanical assessment of the impact of a given contractual position on the level of loss likely to be experienced by an individual asset is not appropriate.

Contracts that will be considered

Where a generator and purchaser of electricity enter into a contract in full knowledge of the impending introduction of a carbon price, the economic incentives faced by both parties reflect the cost increase faced by the generator relative to its competitors in the market. In such a circumstance, the underlying economic impact of the Scheme would generally be reflected in the terms of the contract struck between the parties.

However, where a contract has been entered into before the emergence of full knowledge of the introduction of the Scheme, the contractual arrangements might distort who bears economic costs under the Scheme.

Under those circumstances, a generator could either be penalised by facing a lower carbon cost pass-through than it could achieve in the market, or benefit by achieving a higher level of pass-through than the market suggests.

The Government is concerned about the delivery of windfall gains to generators that enjoy favourable contractual arrangements. However, it does not want to penalise generators that have obtained a favourable contractual position in a circumstance where both parties to the contract negotiated that position with full knowledge of the introduction of the Scheme.

Therefore, the Government will only require the Scheme regulator to consider contracts that were entered into before 3 June 2007 in the windfall gains review. The effect of the contract should only be considered up until the point that it is subject to revision or renegotiation.

Policy position 13.16

The Government will not adjust the assistance allocation methodology in the light of the contractual positions of individual generators. However, the Scheme regulator will be required to take into account the effect of contracts entered into before 3 June 2007 (for the period that they are not subject to revision or renegotiation) as part of the windfall gains review.

13.5 Energy security and the Scheme

Australia enjoys a high level of energy security, with adequate and reliable supply at internationally competitive prices. The Government recognises that supporting energy security is crucial to the successful introduction of the Scheme.

In the Green Paper, the Government outlined three elements to energy security: adequacy, reliability of supply, and affordability. Submissions by stakeholders generally supported that approach to defining energy security. Therefore, the Government's consideration of the relationship between energy security and the introduction of the Scheme has centred on those three elements.

The affordability element has been addressed through comprehensive Scheme measures, such as household income support (with full assistance provided to low-income households and partial assistance to middle income households) and assistance for entities that undertake EITE activities. This section deals with the other two elements: the reliability and adequacy of energy supply. It describes risks that have been suggested by the energy industry and other stakeholders, and how the medium-term target range and other Scheme design elements will help to ameliorate potentially material risks.

13.5.1 Risks identified in the Green Paper

The Green Paper noted a range of industry arguments about the potential impacts of the Scheme on energy security. These included the risks of reducing the profitability of electricity generators, leading to the early retirement of significant generation capacity, thereby reducing the adequacy, reliability and affordability of energy supply. Industry considered that there was a risk that the Scheme could reduce participants' ability to fund basic operational maintenance, resulting in more frequent generator malfunctions and reduced reliability of supply. More generally, industry was concerned that the Scheme could reduce its creditworthiness in financial dealings with other parties, exposing those parties to increased financial risk.

Green Paper position

The Government considers that the medium-term national target range, and the pace of expected emissions reductions, will have the greatest bearing on energy security. When setting the medium-term national target range, the Government will be mindful of the speed with which the economy generally, including the electricity generation industry, can adjust.

Submissions to the Green Paper by industry stakeholders emphasised the risks of imposing an overly ambitious emissions reduction requirement on the sector in the short-term. Stakeholders focused on the risk of asset devaluation and reduced creditworthiness causing the retirement of plant before replacement plant could be installed:

Large impacts on asset values could trigger debt facility review events which in turn could lead to repayments or a credit rating downgrade, which could cascade to the suspension or withholding of payments under electricity hedge/bilateral contracts. (Energy Supply Association of Australia et al, Submission 715, p. 24)

Existing generators experiencing cash flow and funding difficulties and holding assets with reduced lifespans will be less inclined to maintain these assets effectively, leading to a loss in reliability and resultant increase in price volatility. (The Griffin Group, Submission 600, p. 3)

As a reflection of the geographical separation of the [Western Electricity Market] from the [National Electricity Market], reliability of supply in [Western Australia] will only be maintained if the existing Market Participants (retailers and generators), are insulated by the transitional arrangements for [the scheme]. Failure to do so may result in market failure. (Synergy, Submission 865, p. 2)

Conversely, other submissions argued that energy security would not be enhanced through the provision of limited direct assistance to existing coal fired generators (Origin Energy, Submission 815, p. 89). Others also argued that the current market structures are appropriate to ensure that energy security is maintained, noting the importance of the trajectory. However, stakeholders have also raised concerns about the energy security implications of state-based retail price regulation. The retail price regulation issue is discussed further in Chapter 15.

13.5.2 Energy security and the carbon constraint

In its consideration of options for the medium-term national emissions target range, the Government carefully considered the speed with which the economy, including the electricity generation industry, can adjust.

Noting the importance of the carbon constraint trajectory, the submission from the Energy Supply Association of Australia et al, stated that:

To ensure a smooth transition to a low emission energy supply system, a modest interim target should be set for 2020. This would mitigate some of the immediate negative impacts on coal-fired generators and improve the prospects for security of supply until there is sufficient new investment in lower emission generation. (Submission 715, p. 6)

In the Green Paper, the Government outlined an approach to setting the trajectory that ensured a gradual industry transition, avoiding the need for sudden, large-scale retirements of capacity before enough replacement capacity could be installed. By spreading the burden across almost all sectors of the economy, drawing on international sources of abatement and providing additional flexibility within the Scheme, undue pressure on any particular sector could be reduced, giving all sectors time to begin the necessary adjustment.

As the overall carbon constraint will have the greatest impact on energy security, the Government has received advice from three national energy market agencies on the impact of the medium term target range, as described in detail below. In addition, the Government has considered the impact on the generation sector as modelled by MMA, ACIL Tasman and ROAM Consulting.

As described in Section 13.4.2, the Government's wholesale electricity market modelling shows that demand continues to be met, although some emissions-intensive plant lose volume. However, as electricity prices increase in line with carbon prices, most existing power plants continue to operate. In addition, the assumed convergence of east coast gas prices to export parity also helps coal-fired electricity maintain its competitiveness for baseload generation.⁴ This mitigates the risk that large-scale generators retire prematurely from the market, ahead of new capacity being installed.

13.5.3 Energy market characteristics that support energy security

Both of Australia's main wholesale electricity markets, the NEM and the WEM, are underpinned by financial contracts between generators and retailers. In the NEM, risk management and the potential for exposure to the \$10,000 pool price cap provide a strong incentive for parties to enter hedge contracts that fix the price of electricity between them. Alternatively, parties may manage the risk of purchasing electricity from the spot market through 'vertical integration', that is, by purchasing or constructing generation to supply their customer base. In the WEM, the market design is predicated on parties entering bilateral contracts.

Since the energy market reforms of the late 1990s, there has been significant investment in the energy sector and the security and reliability of supply has been maintained. There is significant evidence that energy markets are maturing and are well equipped to deal with the introduction of the Scheme.

Some stakeholders have noted that there is already a tight supply situation emerging in some energy markets. Stakeholders have suggested that this is partly due to uncertainty caused by a lack of climate change policy clarity for many years. Indeed, a major finding of the Task Group on Emissions Trading⁵ was that policy uncertainty was a key factor inhibiting investment decisions. This White Paper is a major step in addressing that uncertainty and should provide a strong policy foundation for the necessary investment in the Australian energy industry.

In this context, an important consideration for the maintenance of energy security is the possibility of premature closure of the existing generators. Any tightening of supply in the wholesale electricity market will have the effect of increasing prevailing prices. This price signal means that it would not make commercial sense for a generator to withdraw its capacity at peak times and create a supply shortfall. Generally, wholesale electricity markets are designed to provide large incentives for generators to be available at peak demand times, as that is when their capacity is most valued by the market.

The Government recognises that there are practical constraints on the speed at which new generation capacity can be constructed. Long lead-times in the construction of generation plant, sourcing upstream gas supplies or accessing gas pipelines can all delay new investment in lower emissions generation. However, when new capacity is required, tightness of supply and associated high prices are likely to create sufficient incentive for incumbent generators to stay in the market until replacement capacity can be provided.

A range of other characteristics of the energy market that have developed over time will further curtail the speed at which existing emissions-intensive generators are retired. Recent trends toward vertical integration in electricity markets mitigate the risk of premature retirement of generation capacity that is owned to supply an existing customer base. It is unlikely that a vertically integrated entity would withdraw its generation capacity from the market if that would leave it exposed to high and volatile prices when supplying its customer base.

As a final guard against supply shortfalls, the market operator has the power to direct the behaviour of participants to ensure system security. A participant can refuse to follow a direction only where there is a risk to life or to plant and equipment.

For the directions power to be functional, the participant must be registered with the market operator. While the Government considers the medium-term target range and other Scheme design elements, particularly the flexibility provided through international linking, have the biggest impact on energy security, it has considered how the ESAS package could be used to further secure energy security by providing an additional incentive for participants to remain registered (see Section 13.5.4).

Energy security advice from energy market institutions

Given the importance of continued energy security to Australia, the Government approached the Australian Energy Regulator (AER), the National Electricity Market Management Company (NEMMCO) and the Australian Energy Market Commission (AEMC) to seek their assessment of the risks of electricity reserve shortfalls due to plant shutdown due to the introduction of the Scheme. To facilitate their assessment, the agencies were provided with the high level parameters of the Scheme design and the ESAS package.

The three agencies' responses indicate that the risk to energy security is significantly mitigated by the choice of trajectory and other parameters, such as international linking, unlimited banking and limited borrowing. All agencies noted that the initial modelled carbon prices are not likely to significantly alter the merit order of the existing generators, or the role they currently play in the electricity market. The AER concluded that these parameters 'all suggest a measured implementation of the CPRS. This reduces the risk of disruptive plant closure.'

However, it was noted that there is already a tight supply and demand balance in South Australia, Victoria and Tasmania. NEMMCO indicated that given this pre-existing tight supply situation, which is independent of the Scheme, it is not possible for the policy package to completely remove the existing risks to energy security. The AER noted that these conditions are likely to put upward pressure on spot and contract market prices, meaning that it would be unlikely that generators would retire plant, mitigating any additional risks to energy security arising from the implementation of the Scheme. In addition, the impact of the global financial crisis was noted by the AEMC and NEMMCO. NEMMCO noted that it is difficult to predict precisely what position financiers might take in a tight global market.

In relation to the allocation of assistance under ESAS, all agencies noted that it appeared to target the most strongly affected participants. For example, whilst NEMMCO noted that 'even at a carbon price of \$20 per tonne however, the absolute and relative financial positions of generation businesses are likely to be impacted', it went on to conclude that '[t]he proposed ESAS payments to the most affected generation businesses represent an important mitigating factor. It is recognised that ESAS payments are primarily intended to address the issue of sovereign risk to investors, but they inevitably also serve to mitigate the financial risks to businesses'. Similarly, the AEMC noted that '[t]he risk of acute and rapid financial distress is significantly reduced by an exogenous contribution to capital of \$3.9 billion, targeting on the most carbon-intensive plant'.

However, the AEMC and NEMMCO agreed that the risk of technical failure remained, irrespective of the broader Scheme design or the quantum and design of the ESAS package. Both agencies noted that there is a risk that if a significant plant failure was to occur, this may lead to the early shutdown of some generating plant as undertaking the repairs may not be economic. Whilst NEMMCO notes these risks are elevated by the Scheme, particularly when the current supply situation and the effects of the global financial crisis are considered, it notes that these 'relatively extreme outcomes, might also have been plausible in the market to date, and no evidence has come to light of their emergence.' Further, the AEMC note that the risk of technical failure 'is reduced if plant can continue to operate base-load.' As noted earlier, the modelled carbon prices do not indicate a significant shift in the merit order, implying that the mode of operation of existing plant will not change significantly.

Box 13.1: Energy security—advice from energy market institutions

Having considered the broader Scheme design and the ESAS package, the three agencies conclude that the risks to energy security have been significantly mitigated. The AEMC noted that ‘measures to provide additional financial assistance to generators of the form and quantum contemplated...would reduce significantly the risk of immediate, acute financial distress—and, therefore, any consequential operational impacts such as the withdrawal of capacity.’

The AER concluded that, given the broader Scheme design and ESAS package, ‘the risks of CPRS-related plant shutdown are low and further measures are unnecessary.’ Similarly, NEMMCO concluded that the ‘mitigation factors included in this policy package clearly reduce the energy security risks arising from the CPRS,’ whilst noting that some risks are independent of the Scheme.

Energy security impacts of capital funding and financial contracts

Some stakeholders have indicated that the Government should consider the likely reactions of hedge counterparties and financiers to possible revaluations of generation assets, as both the NEM and the WEM are underpinned by financial contracts.

The Government understands that, while differences exist, generation assets are usually funded with a mix of debt and equity, with the debt sized according to the expected cash flows from the asset. Debt covenants are established when the loan is agreed and provide bounds on how far financial ratios can move before the debt provider can take action. For example, as noted in the submission from Access Capital Advisers, the debt service coverage ratio (DSCR) is commonly used to calculate the number of times debt servicing costs could be paid from the forecast free cash flows. Access Capital Advisers suggested that a typical loan agreement might have a trigger point set at a DSCR of 1.2–1.5 times, at which point no payments would be made to equity, which is known as ‘lock up’. At a DSCR of between 1.05–1.20, equity holders risk the asset being placed in default and creditors taking financial control of the asset. (Submission 712). However, even in this scenario, so long as the generator is able to cover its marginal cost, it will likely continue to operate. Importantly, the likelihood of a generator being able to cover its marginal cost is greatest at times of tight supply conditions.

The Government considers that lenders have significant incentives to negotiate outcomes with financially distressed borrowers rather than taking precipitous enforcement action. Creditors are likely to recognise that there is a risk of making a deteriorating financial situation terminal if they enforce their security on an asset and appoint an administrator. In addition, any action on behalf of creditors to force a sale of the asset risks depressing the sale price, which (depending on the debt levels) may risk leaving the creditor exposed.

The Government considers that, given the advice of the energy market institutions regarding the likely impact on the energy market, and the provision of assistance to the most affected generators through ESAS, it is very unlikely that the actions of creditors will pose a risk to energy security, as it will not be in their interests to take aggressive enforcement action, or to withdraw an asset from the market when prices would justify continued generation.

AEMC review of the energy market framework

In July 2005, the Council of Australian Governments established the AER and the AEMC to regulate and monitor the energy market and undertake rule making and market development functions for the national electricity and gas markets. Under the National Electricity Law, the administrator of the rules (the AEMC) and the AER are bound to promote markets that safeguard the short- and long-term interests of electricity and gas consumers in the efficiency, security and reliability of supplies.

These new market institutions provide flexibility in the market framework and enable it to adjust to changing conditions as required to ensure that the long-term interests of energy consumers continue to be met. However, these arrangements also have benefits for the introduction of the Scheme, as the market rules can be adjusted if necessary to ensure the Scheme's smooth implementation.

The Ministerial Council on Energy has directed the AEMC to review the current energy market frameworks to identify any amendments that may be necessary because of the implementation of the Scheme and the expanded Renewable Energy Target. In identifying options for implementation, the AEMC has been asked to take into account the need for actions to be proportionate, and the value of stability and predictability in the energy markets regulatory regime. In September 2009, the review will report to the Ministerial Council on Energy with a detailed implementation plan for any changes required to the market rules.

The AEMC published a scoping paper for the review on 10 October 2008. The paper raised a number of areas for stakeholders' consideration, including the convergence of the electricity and gas markets, time lags in the delivery of electricity generation capacity, and the interplay with increased renewable generation. The paper also examined how to share the cost of network augmentation, the efficient location of new generation, signalling to the market and the risks associated with the maintenance of retail price caps.

The question of retail price caps has long been an issue across Australia. The AEMC scoping paper highlights the risks of maintaining price caps below cost-reflective levels. The Government considers it very important that, if retail price caps are to be maintained, they be set at levels that allow for full cost recovery. As noted in the AEMC paper, failure to do so risks the viability of retailers and mutes the potential for retail competition.

Policy position 13.17

Energy security can be maintained through the setting of a target range for emissions cuts that allows for a smooth transition to lower-emissions technology. Any minor amendments that are required to the energy market frameworks can be accommodated within the current rules amendment processes.

13.5.4 Conditionality of assistance

In the Green Paper, the Government indicated that it is open to exploring conditions that could be attached to the limited direct assistance to be provided through ESAS.

Green Paper position

Direct assistance to coal-fired electricity generators that is designed to address changes in asset values should generally be provided unconditionally. However, options for conditional support could be considered, provided that they would be consistent with the economic and environmental objectives of the scheme.

Submissions generally did not support conditionality, as it would have the potential to distort market behaviour and frustrate the Scheme objective of meeting emissions reduction targets in the most flexible and cost-effective way:

Conditions will distort market behaviour and frustrate the scheme objective of meeting emission reductions targets in the most flexible and cost-effective way. (Energy Supply Association of Australia et al, Submission 715, p. 26)

Placing conditions on direct assistance to coal-fired electricity generators runs the risk of compromising the environmental and economic objectives of [the Scheme]. It is also completely unnecessary from a policy perspective. (TRUenergy, Submission 813, p. 13)

Assistance and energy security are not related. Origin also strongly argues against assistance which is conditional on investment in new low emission technology—this could ‘squeeze out’ other firms who are not eligible for assistance from investing in new technologies. (Origin Energy, Submission 815, p. 94)

In contrast, some non-government organisations and unions believed that assistance should be conditional on the recipient making a commitment to significantly reducing emissions through investments in low-emissions technology.

In support of some limited form of conditionality, Babcock & Brown Power noted that:

Conditionality of some component of assistance might provide some confidence to the Government that the allocations will assist with the structural adjustment task, and are not purely compensation related ... Making a component of structural adjustment assistance as conditional could be acceptable if it does not disrupt the economic operations of the business.

Principles for considering conditionality options

The Government recognises that the objective of the ESAS package is important when considering options for conditionality. Given that the purpose of the package is to ameliorate the impact of the Scheme on the investment environment in Australia’s electricity generation sector, the ability of the assistance to affect the balance sheets of recipient generators is paramount.

Whilst the Government noted in the Green Paper that the provision of direct assistance is not primarily designed to deliver energy security benefits, ESAS may be capable of providing incidental benefits for energy security through mitigating impacts that could arise in the unlikely event of financial distress of generators. To further mitigate the risk of supply shortfalls, the Government has also considered various models for attaching conditionality to assistance to deliver additional energy security benefits without undermining the original intent of the assistance.

When considering options for conditionality, the Government has taken some key principles into account. First, any mechanism must not undermine the Government's objective of achieving significant carbon pollution cuts. For example, conditionality based on output of electricity (rather than availability) would have the potential to distort the operation of the Scheme. Furthermore, a conditionality mechanism should not artificially lower the short-run marginal cost of a recipient generator, as that would have the potential to artificially increase output from emissions-intensive generators.

Second, conditionality should reinforce and not distort the current energy market design and work within the existing well-functioning and efficient market frameworks.

Third, across Australia, energy systems are experiencing a tightening of the supply and demand balance (in both generation and network capacity). In this context, it is very important that any conditionality mechanism provides incentives for the recipient generator to be available at times when it is most valued by the market. This ties into the second principle: the current NEM energy-only design provides very strong incentives for generation to be available in times of tight supply–demand balance because the market employs a high price cap, currently set at \$10,000 per megawatt-hour and due to increase to \$12,500 per megawatt-hour from 1 July 2010.

Finally, conditionality proposals should seek to address residual reliability issues that might occur only in the transitional period. The measures should not delay the entry of new lower-emissions generation facilities and should take into account the lead time for commissioning new plant.

The Government has considered the cost of implementation of different conditionality models. Heavily intrusive models of conditionality that require, for example, approval of operational, maintenance or financial plans are inherently more costly to administer.

Assessment of options

One option that has been suggested is to make assistance conditional on the recipient investing in low-emissions technology in some form. The Government has carefully considered this option and has decided against it for a number of reasons. First, the recipients of the assistance are a limited set of entities that are defined as strongly affected. However, there is no reason to conclude that those entities are the ones that are best placed to make the most efficient investment in low-emissions technology. The Government shares the concern of Origin Energy that a conditionality model along those lines risks crowding out potentially more efficient investment.

In addition, in using this model it is very difficult to determine whether investment was over and above what would have occurred in any event. This makes monitoring and enforcement

of this conditionality model complex, uncertain and open to a high degree of interpretation. Those characteristics would devalue the package in the eyes of the recipients and undermine the Government's intent in providing the assistance package.

The Government has also examined conditionality options that seek to provide further reassurance of continued reliable electricity supply. However, among the range of conditionality models relating to energy security that have been proposed, some have been ruled out because they tend to conflict with the operation of the overall Scheme. For example, any model that requires that a generator maintain a specific output distorts the operation of both the carbon and energy markets. Rather than rely on the pricing signals that flow from those markets, a participant would be forced, by virtue of the conditions for assistance, to produce electricity and, necessarily, emissions. This runs the risk of creating inefficient or perverse outcomes and forcing a higher cost of abatement than would otherwise be the case.

The Government has, therefore, focused on models of conditionality that require generators to be available to meet demand but do not compel a given level of production. A well-designed conditionality model will allow the energy market to function with minimal distortion. The market ensures that incentives remain for generators to be available when their energy is most valued. For example, in the NEM, a generator that fails to produce energy when the market is priced at the ceiling faces a cost approaching \$10 000 per megawatt-hour, either as the opportunity cost of not generating or as the actual cost of contract for difference payments to retailers. This provides a great level of surety that the necessary incentives will work so that generators ensure that peak demand is met.

An alternative model might be to make limited direct assistance conditional on recipients producing electricity when called on by the market operator. This would provide a further insurance policy in addition to price signals. Under this model, recipients would lose future assistance if they failed to produce electricity on request. The Government does not consider this to be the optimal model, as it does not appear to add to the price incentive or to the existing requirement for generators to follow a direction of the market operator, subject to caveats on risks to safety and to plant and equipment. If the Government applied conditionality along these lines, with similar caveats, the Scheme regulator would be cast in the role of making technical assessments about why a plant did not produce when asked to. The Government considers that these matters are best left to the current energy market institutions.

However, for the powers of direction to apply, a recipient must be registered with the relevant market operator. Being registered also requires the generator to meet a range of maintenance, reporting and other requirements specified in the market rules. Therefore, there may be benefit in making the limited direct assistance package conditional on the recipient remaining registered with the relevant market operator. This would enable the benefits to energy security of keeping recipients registered, but would leave the market operator in control of making directions and determining whether a participant has complied with those directions and the broader market rules.

However, the Government recognises that simply requiring a recipient to remain registered could force the recipient to keep an asset in operation when they would ordinarily decide to reduce capacity. Where adequacy of supply is not in question, this condition could impose additional costs on the industry and therefore on consumers. Therefore, the Government has

considered models of conditionality that include a mechanism to allow the withdrawal of capacity, where there are likely to be sufficient energy reserves.

Energy market agencies assessment

As part of seeking advice on the risks and energy security implications from the implementation of the Scheme, the Government asked the AER, NEMMCO and the AEMC for their views on the need to attach conditionality to the ESAS package. The agencies were presented with the Government's high level principles for assessing conditionality options, along with a possible model that requires recipients to remain registered unless the relevant market operator assesses that the withdrawal of generation capacity is not likely to result in a breach of the power system reliability standards in that market at any time within the next two years.

In general all agencies agreed that if conditionality were to be applied it should be designed in a way that does not distort the energy market. It was also noted that, depending on the model contemplated, there is a risk that the imposition of conditionality could detract from the stated purpose of the ESAS package.

However, NEMMCO noted that a form of conditionality which requires that a recipient remain registered with the market operator does not impose material additional costs on generation businesses or have a significant distortion to the market. The AEMC further indicated that this form of conditionality does not appear to 'detract from the ability of generators to count any assistance as a contribution to capital.' This is important as it maintains the integrity of the ESAS package.

In summary, neither the AEMC nor the AER considered that conditionality provided material additional benefits for energy security. Conversely, NEMMCO indicated that this form of conditionality would 'provide a degree of increased mitigation against the energy security risks.' In addition, NEMMCO noted that this would ensure 'that the business remains open to NEM intervention mechanisms such as 'directions' which can be issued at times of forecast supply shortfall by the market operator.' NEMMCO concluded by indicating that conditionality would have some value in mitigating the risks to energy security.

Conditionality model

Given the analysis of options and the advice from the energy market agencies, the Government has developed a conditionality model that meets all of the high level principles outlined above, but also provides additional protection for the ongoing adequacy of supply in markets with tight supply and demand balances.

The Government will make limited direct assistance conditional on the recipient generator remaining registered with the relevant market operator, with the same planned or actual capacity as at the eligibility cut off date of 3 June 2007. However, given concerns that this may lead to the imposition of unnecessary costs, in situations where there are sufficient energy reserves, a recipient will be allowed to reduce registered capacity without any loss of assistance. If a recipient of assistance wishes to reduce its registered capacity, it will need to ask for an assessment by the relevant market operator that there are likely to be adequate energy reserves in the system to allow the reduction in capacity without breaching the power

system reliability standards applicable to the energy market concerned at any time within two years.

Whilst this model requires that a participant remain registered if a reserve shortfall is forecast, it does not distort the operation of the Scheme or the energy market as it still relies on the price signals inherent in the energy market to ensure that generators produce at times of high demand.

Policy position 13.18

The provision of limited direct assistance will be conditional on the recipient remaining registered with the relevant market operator, with the same actual or planned capacity as at 3 June 2007, unless the relevant the market operator assesses that there are likely to be adequate energy reserves in the system to allow the reduction in capacity without breaching the power system reliability standards.

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- 1 National Electricity Market Management Company, *Statement of Opportunities*, 2008, p. 3-39.
 - 2 Australian Government, *National Greenhouse Accounts Factors*, 2008.
 - 3 National Electricity Rules, version 21, 1 July 2008, Clause 11.10A.1, published by the Australian Energy Market Commission.
 - 4 Australian Government, *Australia's low pollution future*, p. 177, 2008.
 - 5 Prime Ministerial Task Group on Emissions Trading, *Report of the Prime Ministerial Task Group on Emissions Trading, Commonwealth of Australia*, 2007, p. 86.