RED DOT DECISION SUMMARY

The practice of VCAT is to designate cases of interest as 'Red Dot Decisions'. A summary is published and the reasons why the decision is of interest or significance are identified. The full text of the decision follows. This Red Dot Summary does not form part of the decision or reasons for decision.

VICTORIAN CIVIL AND ADMINISTRATIVE TRIBUNAL
ADMINISTRATIVE DIVISION

PLANNING AND ENVIRONMENT LIST

VCAT REFERENCE NOS. P1816/2011, P1818/2011 P1820/2011, P1822/2011, P1829/2011 & P1846/2011

IN THE MATTER OF Dual Gas Pty Ltd & Ors v Environment Protection Authority (includes Summary) (Red Dot) [2012] VCAT 308

NATURE OF CASE	Review of EPA works approval for the Dual Gas Demonstration Project, involving use of coal gasification technology
LOCATION OF PASSAGE OF INTEREST	Parts 2, & 6-9 (Analysis of key issues) Part 4 (Objector Standing)
REASONS WHY DECISION IS OF INTEREST OR SIGNIFICANCE	
LAW – issue of interpretation or application	Consideration of objector standing under s 33B(2) of the *Environment Protection Act 1970*; meaning of "interests affected by the decision" having regard to s 5 of the *Victorian Civil and Administrative Tribunal Act 1998*
LEGISLATION – interpretation or application of statutory provision	Consideration and application of the *Climate Change Act 2011*
POLICY – interpretation or application of policy	Consideration and application of the State Environment Protection Policy (Air Quality Management), including 'best practice' and whether the project is inconsistent with the aims, principles and intent of SEPP
APPLICATION – significant or interesting development.	Public interest in decision

SUMMARY

Dual Gas Pty Ltd seeks to develop a new 600 MWe power station in the Latrobe Valley that will generate base load power whilst demonstrating new power generation technology. The project involves the production of syngas through the integrated drying and gasification of brown coal, which is then used in conjunction with natural gas to fire combined cycle gas turbines for power generation.

The generation of electricity will occur with a lower greenhouse gas emissions intensity (GEI) than the burning of coal in a conventional coal-fired power station – for example, a 39% reduction in GEI compared with an average of the four largest emitting power stations in the Latrobe Valley. If successfully demonstrated at a commercial scale, the new technology has potential worldwide application. Supporters of the Dual Gas project thus see the proposal as 'part of

the solution' to climate change, and as part of the transition to a cleaner energy future with less greenhouse gas emissions. Opponents of the project however see the proposal as 'part of the problem', in still contributing to greenhouse gas emissions through the continued use of brown coal, and with a GEI still above that achievable from some other forms of electricity generation.

The EPA issued a works approval for a 300 MWe power station (i.e. half the capacity Dual Gas had sought). Four objectors, including Environment Victoria Inc., sought to review this decision, claiming that the emissions even from a 300 MWe project would be inconsistent with the State Environment Protection Policy (Air Quality Management). Dual Gas has sought to review some of the conditions on the works approval and seeks to reinstate the generating capacity to 600 MWe.

Despite the wide range of issues, VCAT has a limited discretion in its decision-making role. Section 33B(2) of the *Environment Protection Act 1970* (EP Act) provides only two relatively limited grounds for a person whose interests are affected to seek to review a works approval once it has issued. VCAT's jurisdiction in relation to a proponent's application to review conditions is also generally limited to a consideration only of those conditions related to the review.

The task of considering whether the use of the works will lead to emissions that are inconsistent with the SEPP(AQM) is made harder here because the SEPP contains some provisions that are qualitative rather than quantitative. Some provisions also adopt or apply broader based environmental objectives and policies, at a time when some of those policies are themselves in a dynamic state of change or political uncertainty. Indeed, the Australian and Victorian governments both changed their respective policy positions during the VCAT proceeding. The decision includes a 'postscript' arising from the Victorian government's release of its review of the *Climate Change Act 2010* shortly before publication of the VCAT decision.

Dual Gas initially challenged the standing of all four objectors. The decision includes a detailed examination of the legislative framework and case law in relation to objector standing under s 33B(1) of the *Environment Protection Act 1970*. Given the wide definition to be given to "a person whose interests are affected" under s 5 of the *VCAT Act*, the Tribunal found that three of the four objectors had standing having regard to the context of the EP Act, the nature of the reviewable decision affecting a substantive global issue, and their genuine interest in the subject matter of the decision as opposed to a broader and more general environmental concern. The Tribunal disagreed with and chose not to follow the narrower approach adopted in *Linaker v Greater Geelong CC* [2011] VCAT 1806.

Despite this standing, by reference to the narrower meaning given by the courts to the term "interests" in s 33B(2)(a) of the EP Act, the main ground of one of the objectors with standing (Mr Shield) was struck out.

Within the limited remaining ground of review, the objectors collectively failed to establish that the use of the works that are the subject of the EPA works approval will result in emissions that will be inconsistent with the SEPP(AQM). Amongst other things, VCAT found that

- the Dual Gas project complies with the requirement for 'best practice' having regard to the definition of that term in the SEPP(AQM) and comparable industry activity. 'Best practice' does not require a comparison with all other type of electricity generation, such that the outcome would only ever favour the lowest greenhouse gas emitting form of generation;
- the Dual Gas project is not inconsistent with a holistic assessment of the aims, principles or intent of the SEPP(AQM). In particular:
    - the SEPP(AQM) supports Australian and Victorian measures to address the enhanced greenhouse effect. An objective assessment of relevant government policies and measures indicates a range of complementary measures. Whilst there is an acknowledgment of climate change and the need to transition to a lower emissions energy sector, there are measures designed to maintain energy security as part of that transition, including the potential for the continued use of brown coal through emerging technologies such as that proposed in the Dual Gas project.
    - the Dual Gas project has express support through the award of a conditional $100 million grant under the Australian government's *Low Emissions Technology Demonstration Fund*, and a $50 million grant under the Victorian government's *Energy Technology Innovation Strategy*.
    - the Dual Gas project will not stifle opportunities for renewable energy to play a greater role in future energy supply, given separate government initiatives and funding for such measures, and the priority dispatch of renewable energy within the National Electricity Market.
    - the Dual Gas project is not inconsistent with the principles of environmental protection in the SEP(AQM). On an objective assessment, the benefits of the Dual Gas project, including indirect and longer-term benefits, outweigh the potential disbenefits. The decision discusses the application of the precautionary principle, the principle of intergenerational equity, and the integration of economic, social and environmental considerations (the integration principle). The decision also discusses the application of the decision-making requirements under s 14 of the *Climate Change Act 2010*

VCAT allowed Dual Gas application for review, but only in part, and has endorsed an increase in capacity of the Dual Gas project to 600 MWe subject to conditions. Amongst other things, VCAT found that:

- the EPA has misapplied the principles of environmental protection and best practice under the SEPP(AQM) in seeking to halve the capacity of the Dual Gas project. The EPA approach still leads to the project, if considered

alone, resulting in a material nett increase in greenhouse gas emissions, with no certainty that it will displace or replace higher GEI electricity generators.

- Dual Gas has itself acknowledged that the viability of the project, and the application of the integration principle and precautionary principle, are linked to the ability of the project to displace or replace higher GEI electricity generators. It has emphasised the Australian government's *Contract for Closure* program, through which the government proposes to negotiate the retirement of up to 2,000 MWe of higher greenhouse intensive electricity generation by 2020.
- in allowing a works approval for the project with a capacity of 600 MWe, effect can be given to the principles of environmental protection by imposing an additional condition that effectively prevents the Dual Gas project from commencing until the retirement of an equivalent amount of higher GEI generation capacity in Victoria is secured. Although such a condition was opposed by Dual Gas, the imposition of such a condition on the works approval will more transparently demonstrate a nett reduction in overall greenhouse gas emissions from electricity generation in Victoria, and more clearly facilitate the transition to a lower emissions energy sector.
- whilst the likelihood of the Dual Gas project being used in conjunction with future carbon capture and storage (CCS) is speculative, this is not a reason for not allowing the additional capacity. It remains a potential longer-term benefit of the project. The unique gasification technology lends itself well to CCS, and the works approval contains a condition (not opposed by Dual Gas) requiring that the project be CCS-ready.
- although opposed by Dual Gas, a condition requiring the works to be designed to operate at a greenhouse emissions intensity of 0.8 t CO_2-e/MWh should remain, with the GEI to be measured 'as generated'.
- although opposed by Dual Gas, the conditions for sulphur dioxide capture and noise attenuation are valid responses to an integrated consideration of the SEPP(AQM) and EP Act and should remain, albeit subject to varied wording. The decision contains a detailed examination of the rationale for the sulphur dioxide capture requirement, having regard to maintenance of air quality in the Latrobe Valley Air Quality Control Region, and despite its cost and the relatively minor impact demonstrated through the modelling.

As will be apparent from the nature of the case, there were many additional issues canvassed at the hearing and in the Tribunal's decision. This summary should not be considered a substitute for the more detailed findings and conclusions set out in the decision.

VICTORIAN CIVIL AND ADMINISTRATIVE TRIBUNAL

ADMINISTRATIVE DIVISION

PLANNING AND ENVIRONMENT LIST

VCAT REFERENCE NOS. P1816/2011, P1818/2011 P1820/2011, P1822/2011, P1829/2011 & P1846/2011

CATCHWORDS

Environment Protection Act 1970 ss 1B-1L, 19B, 33, 33B, 37, 37A; *Climate Change Act 2010* s 14; review of EPA works approval; Dual Gas; IDGCC power station; greenhouse gas emissions; standing of objectors; meaning of 'interests affected'; *Victorian Civil and Administrative Tribunal Act 1998* s 5; whether works approval or use of works will be inconsistent with *SEPP (Air Quality Management)*; consideration of 'best practice' in relevant 'industry sector or activity'; consideration of aims, principles and intent of SEPP; review of conditions; SO_2 and NO_X emissions; noise.

In P1829/2011 & P1846/2011:

APPLICANT	Dual Gas Pty Ltd
RESPONDENT	Environment Protection Authority

In P1816/2011, P1818/2011, P1820/2011 & P1822/2011:

APPLICANTS	P1816/2011 Martin Shield P1818/2011 Doctors for the Environment Australia Inc. P1820/2011 Environment Victoria Inc. P1822/2011 Locals into Victoria's Environment Inc.
RESPONDENT	Environment Protection Authority
SECOND RESPONDENT	Dual Gas Pty Ltd
SUBJECT LAND	Commercial Road, MORWELL VIC 3840 (Lot 2 on PS 449983 A)
WHERE HELD	55 King Street, Melbourne
BEFORE	Mark Dwyer, Deputy President Ian Potts & Greg Sharpley, Members
HEARING TYPE	Hearing
DATE OF HEARING	24-28 October 2011, 2-4, 7-10 and 14-17 November 2011, and 6-10 and 13-14 February 2012
DATE OF ORDER	29 March 2012
CITATION	Dual Gas Pty Ltd & Ors v Environment Protection Authority (includes Summary) (Red Dot) [2012] VCAT 308

ORDER

In P1822/2011:

1 The application for review by Locals into Victoria's Environment Inc.is dismissed for lack of standing.

In P1816/2011, P1818/2011 & P1820/2011:

2 The applications for review by Martin Shield, Doctors for the Environment Australia Inc., and Environment Victoria Inc. are each dismissed.

In P1846/2011:

3 Pursuant to s 74 of the *Victorian Civil and Administrative Tribunal Act 1998*, leave is granted to Dual Gas Pty Ltd to withdraw its application for review, and the application is withdrawn accordingly.

In P1829/2011:

4 Pursuant to s 60 of the *Victorian Civil and Administrative Tribunal Act 1998*, Environment Victoria Inc. is joined as a party in the proceeding, conditionally upon it not raising additional substantive issues beyond those set out in its grounds of review in P1820/2011.

5 The application for review by Dual Gas Pty Ltd is allowed in part.

6 The decision of the Environment Protection Authority in relation to works approval application WA 67043 is varied.

7 Pursuant to s 37 of the *Environment Protection Act 1970*, the Environment Protection Authority is directed to issue a works approval for the premises at Commercial Road, Morwell (Lot 2 on PS 449983 A). The works approval allows the construction at the premises of works and associated equipment for an integrated drying, gasification combined cycle (IDGCC) power station with a maximum 'sent out' electricity generating capacity of 600 MWe, and where the electricity is generated using a combination of 'syngas' (derived from brown coal) and natural gas, on the terms and subject to the conditions set out in Appendix A.

Mark Dwyer
Deputy President &
Presiding Member

APPEARANCES:

(Note: Not all named advocates appeared on all listed hearing days.)

Environment Protection Authority:	Simon Molesworth QC and David Deller of counsel, instructed by Corrs Chambers Westgarth. Witnesses called by EPA: • Costa Tsesmelis, Protos Consulting • Malcolm McIntosh, mechanical engineer • Dr Jeff Washusen, Marsden Jacob Associates • Dr Graeme Ross, Consultant Air pollution Modelling & Meteorology (CAMM) • Dr Lynette Denison, EPA The EPA also tendered a report by James Nancarrow, EPA, on acoustic issues but (by agreement) he was not called to give evidence.
Dual Gas Pty Ltd	Stuart Morris QC and Barnaby Chessell of counsel, instructed by Maddocks. Witnesses called by Dual Gas: • Alex Blatchford, HRL • David Walton, Dual Gas • Dr Terry Bellair, Environmental Science Assoc. Dual Gas also tendered a report by Dr Norm Broner, SKM, on acoustic issues but (by agreement) he was not called to give evidence.
Environment Victoria and Locals Into Victoria's Environment Inc.	Adrian Finanzio, Rupert Watters and Emma Peppler of counsel, and Felicity Milner, solicitor, instructed by the Environment Defenders Office. Witnesses called by Environment Victoria: • Prof. David Karoly, University of Melbourne • Dr Hugh Outhred, Ipen • Dr Christopher Dey, University of Sydney
Doctors for the Environment Australia Inc.	Matthew Townsend and Jane Treleaven of counsel, instructed by Maurice Blackburn.
Martin Shield	Martin Shield, in person

ACRONYMS & ABBREVIATIONS

AQCR	Air Quality Control Region (established under the SEPP(AQM))
CC Act	*Climate Change Act 2010* (Vic)
CCGT	Combined cycle gas turbine
CCS	Carbon capture and storage
CFC	Contract for Closure – proposed Australian government initiative to close up to 2,000 MW of high GEI generation capacity by 2020
CO_2-e	Carbon dioxide equivalent –used to express all GHG gas emissions as the equivalent amount of concentration of carbon dioxide in terms of its greenhouse effect.
DEA	Doctors for the Environment Australia Inc.
DGDP	Dual Gas Demonstration Project
Dual Gas	Dual Gas Pty Ltd
EPA	Environment Protection Authority (Victoria)
EP Act	*Environment Protection Act 1970* (Vic)
EV	Environment Victoria
GEI	Greenhouse gas emissions intensity, generally expressed as tonnes of CO_2-e per MWh (sometimes also referred to as GGI)
GHG	Greenhouse gas
GT	Gas turbine
HRL	HRL Limited, the parent company of Dual Gas
IDG	Integrated (coal) drying and gasification
IDGCC	Integrated Drying and Gasification Combined Cycle technology
IGCC	Integrated Gasification and Combined Cycle technology used to produce syngas, but without integrated drying within the process
LCoE	Levelised Cost of Electricity – adopted as being equivalent to the long run marginal cost of producing electricity.
LIVE	Locals Into Victoria's Environment Inc.
MW / MWe	Megawatt / Megawatt of 'sent out' electricity
MWh	Megawatt hour. For power generation, a MWh is usually expressed as either 'as sent out' or 'as generated'
NEM	National Electricity Market
NIRV	Noise from Industry in Regional Victoria Guidelines, EPA Publication 1411 (October 2011)
NO_X	Oxides of nitrogen, including nitrogen-dioxide (NO_2)
SEPP(AAQ)	State Environment Protection Policy (Ambient Air Quality)
SEPP(AQM)	State Environment Protection Policy (Air Quality Management)
SO_2	Sulphur dioxide
SRMC	Short run marginal cost of producing electricity.
Syngas	Synthetic gas (or synthesis gas) derived from the gasification of coal.
VCAT Act	*Victorian Civil and Administrative Tribunal Act 1998* (Vic)

REASONS

TABLE OF CONTENTS FOR REASONS

PART 1: INTRODUCTION

What is this proceeding about?

1 Dual Gas Pty Ltd seeks to develop a new 600 MWe power station at Morwell. The proposal is to generate primarily base load power whilst demonstrating new power generation technology at a commercial scale. The proposal is known as the Dual Gas Demonstration Project (DGDP).

2 The new technology is known as the IDGCC process and involves the production of syngas through the integrated drying and gasification of brown coal, which is then used in conjunction with natural gas to fire combined cycle gas turbines for power generation. Steam generated from the hot exhaust gas is used to generate additional power.

3 The production of electricity will thus occur with a lower greenhouse gas emissions intensity (GEI) than the burning of coal in a conventional coal-

fired power station – for example, Dual Gas indicates a 39% reduction in GEI 'as generated' compared with an average of the four largest emitting power stations in the Latrobe Valley[1]. The IDGCC process also lends itself more readily to future carbon capture and storage (CCS) than conventional coal-fired power stations, through which substantial further reductions in GEI may become possible.

4 If successfully demonstrated at a commercial scale, the IDGCC process has potential worldwide application. Supporters of the DGDP thus see the proposal as 'part of the solution' in responding to climate change, and as part of the transition to a cleaner energy future with less GHG emissions. The DGDP has been awarded a conditional $100 million grant under the Australian Government's *Low Emissions Technology Demonstration Fund*, and $50 million under the Victorian Government's *Energy Technology Innovation Strategy*[2].

5 Opponents of the DGDP however see the proposal as 'part of the problem', in still contributing to substantial GHG emissions through the use of coal, and with a GEI well above that achievable from some other forms of electricity production such as renewable energy or CCGT using natural gas. The DGDP is a major power station that will generate up to 4.2 million tonnes of GHG per annum over a 30 year projected life cycle[3] and increase Victoria's GHG emissions profile by 2.5% over 2009 levels[4].

6 In September 2010, Dual Gas sought a works approval for the 600 MWe DGDP from the Environment Protection Authority, under s 19B of the *Environment Protection Act 1970*.

7 In May 2011, the EPA issued a conditional works approval (WA 67043) for a 300 MWe power station operating a single- train IDGCC process, rather than the 600 MWe two-train power station Dual Gas had sought. The EPA considers that a 300 MWe power station is sufficient to demonstrate the IDGCC technology at a commercial level, and that the proposed use of an 'E class' gas turbine in the second train would be inconsistent with 'best practice'.

8 There are six applications for review before the Tribunal. Four of these are by objectors that cover the following matters:

- Environment Victoria (EV) and Locals into Victoria's Environment Inc (LIVE) are objectors who both contend that if the DGDP proceeds, the use of the works will result in a discharge or emission of GHG that is inconsistent with the *State Environment Protection Policy (Air Quality Management)*. In their view, the DGDP is neither 'best

[1] Dual Gas Closing Submissions at [139].
[2] Blatchford evidence, Tribunal Book at DGA.200.072
[3] EPA Opening Submissions at [5]. This is at a modelled *maximum* capacity of 600 MW power station. Under the modelled scenarios appearing in Part 3 of these reasons, the evidence is that the GHG emissions will more likely be 3 to 3.2 million tonnes CO_2-e per annum.
[4] EPA Opening Submissions at [17].

practice', nor consistent with the aims, principles or intent of the SEPP(AQM). EV and LIVE want the works approval application refused completely.

- Doctors for the Environment Australia (DEA) is an objector that essentially supports the EV/LIVE objection, and also contends that if the DGDP proceeds, the use of the works will result in the discharge or emission of SO_2, NO_X, particulates or other air quality indicators that is inconsistent with the SEPP(AQM).
- Martin Shield is an individual objector who essentially supports the EV/LIVE objection, and also contends that if the DGDP proceeds, the use of the works will unreasonably and adversely affect his interests.

9 Two of the applications for review are by Dual Gas. In particular:

- Dual Gas seeks to review the decision of the EPA to reduce the capacity of the DGDP to 300 MWe. It wants to have its original 600 MWe proposal approved.
- Dual Gas also seeks to delete or modify conditions on the EPA's works approval relating to SO_2 capture and noise emissions.

10 In relation to the objector applications, Dual Gas challenges the legal standing of each objector to bring its application for review, and it also challenges some of the objectors' grounds of review.

Limits on the scope of Tribunal review

11 Despite the wide range of issues before the Tribunal, it should be emphasised at the outset that we[5] do not have an open-ended discretion in our decision-making role.

12 Section 19B of the EP Act provides for public notice of a works approval application to be given, and allows any person or body an opportunity to comment broadly on the application in response to that notice. The EPA considers these comments when deciding whether to issue a works approval. By contrast, s 33B(2) of the EP Act provides only two relatively limited grounds for an objector application to the Tribunal to review a works approval once it has issued.

13 Secondly, in relation to a proponent's application under s 33(3) of the EP Act to review conditions on a works approval, the Tribunal's jurisdiction is generally limited to a consideration only of those conditions under review. The Tribunal can obviously also consider the related or consequential impact of any change to these conditions on the works approval or other conditions[6]. Given Dual Gas is seeking to challenge the condition limiting the capacity of the DGDP (and to 'extend' it from the 300 MWe allowed to

[5] For convenience and consistency, the plural term is used throughout these reasons, although any questions of law have been decided by Dwyer DP alone. Having said that, there is no disagreement between the three Tribunal members on any determinative issue, including questions of law.
[6] Following the principle in cases such as *Domus Design Pty Ltd v Cardinia SC* [2009] VCAT 283

the 600 MWe initially proposed), the related or consequential impact that we can consider in this proceeding – particularly in relation to GHG emissions - is therefore broader than may ordinarily be the case.

14 Section 51 of the VCAT Act gives the Tribunal all of the functions of the original decision-maker. This does not however increase the available grounds of review or our review jurisdiction.

15 The effect of this is that we are not undertaking a general review of the entire works approval application for the DGDP. This proceeding is not in the nature of an EES or environmental impact assessment for the whole DGDP. More particularly, although the issues of climate change and GHG emissions form an important backdrop to the issues canvassed in this proceeding, the case before us is not a referendum on climate change generally or the adequacy of government response to climate change. Nor is it a referendum on the future use of brown coal for electricity generation in Victoria. The proceeding, at its core, is simply about whether the use of the works proposed for the DGDP will be inconsistent with the SEPP(AQM) or can be made consistent through the imposition of appropriate works approval conditions.

16 The task is made harder here because the SEPP(AQM) contains some provisions that are qualitative rather than quantitative. Some provisions of the SEPP(AQM) adopt or apply broader based environmental objectives and policies, at a time when some of those policies are themselves in a dynamic state of change or political uncertainty. This does not however present the parties (or us) with an unfettered opportunity to adopt particular philosophical or intellectual climate change positions. Inconsistency with the SEPP(AQM) must still be objectively assessed within the known regulatory and policy framework.

17 Having said that, the Tribunal notes the existence in Victoria of the *Climate Change Act 2010* (CC Act). The CC Act contains a legislative recognition in Victoria of "the overwhelming scientific consensus that human activity is causing climate change", and that "responding to climate change is a responsibility shared by all levels of government, industry, communities and the people of Victoria". The preamble to the CC Act further notes that: "Early action to reduce greenhouse gas emissions will ease the task of long-term transition to an environmentally sustainable economy." To the extent the CC Act is relevant in this proceeding, the EPA, Dual Gas and the objectors all acknowledged this legislated position on climate change (albeit leading to different views on the outcome for this proceeding), as does the Tribunal.

Issues for our consideration

18 The combined grounds of review, considered in conjunction within the limits of our jurisdiction, have led us to a number of key issues for our consideration. We have first set out the framework for our decision (Part 2

of these reasons) and further background material about the DGDP proposal (Part 3). For convenience, in the balance of these reasons we have then grouped the issues together under the following topics:

- do the objectors (or any of them) have legal standing to bring their respective applications for review? (Part 4)
- does Mr Shield have any interest, for the purpose of s 33B(2)(a) of the EP Act, that will be unreasonably and adversely affected by the use of the DGDP works? (Part 5)
- will the use of the DGDP works result in GHG emissions that are not managed through 'best practice' under the SEPP(AQM)? (Part 6)
- will the use of the DGDP works result in GHG emissions that are inconsistent with the aims, principles and intent of the SEPP(AQM)? (Part 7)
- should the works approval be for a 300 MWe or 600 MWe power station? In particular, is the use of an 'E class' turbine in the second train inconsistent with 'best practice' under the SEPP(AQM) and/or does a 600 MWe power station properly give effect to the principles of environmental protection under the SEPP(AQM) and other relevant factors? Can any relevant concerns be resolved through appropriate conditions on the works approval? (Part 8)
- are SO_2, emissions from the DGDP inconsistent with the SEPP(AQM)? Is a condition for SO_2 capture required as part of the works approval? (Part 9)
- are other emissions from the DGDP (NO_X, particulates, and other air quality indicators) inconsistent with the SEPP(AQM)? (Part 10)
- are the conditions on noise targets and noise attenuation measures appropriate? (Part 11)
- are there are any town planning issues that we must have regard to? (Part 12)

Consideration of evidence

19 The parties provided us collectively with several thousand pages of background material, policy documents, expert evidence, and submissions on these matters. Whilst we have considered all of this material in reaching our decision, it is not possible to refer to it all in these reasons.

20 For the record, we note that there are a number of matters that fall outside the scope of our review. In issuing a works approval, the EPA has assessed a number of other matters, including, for example, the impacts of the transportation of coal, wastewater discharges, land contamination, stormwater discharge, solid waste management, water usage, and visual impact. No-one has sought to review these matters. At the hearing, in response to a direct enquiry by us, the EPA confirmed that it was satisfied

with its assessment on all other issues, and we rely on that assessment without further inquiry.

Summary of Conclusions

21 We have come to a decision that the objectors' applications for review fail. In particular, within the limited grounds of review available to them:

- the objectors have failed to establish that the use of the works for the DGDP that are the subject of the EPA works approval will result in emissions that will be inconsistent with the SEPP(AQM). The DGDP complies with the requirement for 'best practice', and is not inconsistent with the aims, principles or intent of the SEPP(AQM);
- by reference to the narrow interpretation of 'interests' in relevant case law, Mr Shield's additional ground under s 33B(2)(a) is struck out.

22 We have also come to a decision that the Dual Gas application for review succeeds, but only in part. In particular:

- the EPA has misapplied the principles of environmental protection and best practice under the SEPP(AQM) in seeking to halve the capacity of the DGDP. Although not leading to an inconsistency with the SEPP(AQM), a halving of capacity still leads to a material increase in GHG emissions;
- in allowing a works approval for the DGDP with a capacity of 600 MWe, effect can be given to the principles of environmental protection under the SEPP(AQM) by imposing an additional condition that effectively prevents the DGDP from commencing until the retirement of an equivalent amount of higher GEI generation capacity in Victoria is secured. Although such a condition was opposed by Dual Gas, through the condition the DGDP will more demonstrably lead to a nett reduction in overall GHG emissions from electricity generation in Victoria, and more clearly facilitate the transition to a lower emissions energy sector.
- although opposed by Dual Gas, a condition requiring the works to be designed to operate at a GEI of 0.8 t CO_2-e/MWh should remain, with the GEI to be measured 'as generated';
- although opposed by Dual Gas, the conditions for SO_2 capture and noise attenuation should remain, subject to varied wording.

23 Although not determinative, the additional condition linking the DGDP approval to the retirement of an equivalent amount of higher GEI electricity generation also addresses many of the underlying concerns of objectors, save for those based on a philosophical opposition to the continued use of brown coal. Even if, contrary to our actual finding, we had found that the DGDP was inconsistent with the SEPP(AQM), we consider that inconsistency could have been resolved by still allowing the DGDP with a 600 MWe capacity with this condition.

24 This summary of conclusions should not be considered a substitute for the more detailed findings and conclusions set out in these reasons.

PART 2: FRAMEWORK FOR DECISION

Relevant provisions in the EP Act

25 Given the process and statutory framework for the works approval application is not in issue, we do not propose to set it out in detail here. It is sufficient to note the following:

- the EPA is responsible for the issue of a works approval (EP Act, s13(d)).
- an occupier of scheduled premises cannot conduct an activity that will result in the discharge of certain waste or emissions, except with a works approval and/or a licence (s 19A).
- a power station which generates more than 5 MW is a prescribed premises[7].
- to proceed with the DGDP, Dual Gas has initially sought a works approval. The approval has been sought under the ordinary provisions applying to a works approval (s 19B), rather than as a research, development and demonstration approval (s 19D).
- in considering an application for the issue of a works approval, the EPA must have regard to policy so that the authorisation and any condition in it is consistent with all applicable policies (s 20C).
- the SEPP(AQM) is an applicable policy, declared under s 16 of the EP Act.
- if the DGDP is approved, Dual Gas will also require a licence to discharge waste or emissions (s 20).

26 The issue of a works approval under s 19B of the EP Act also triggers the application of s 14 of the CC Act[8].

Dual Gas grounds of review

27 Under s 33(3) of the EP Act, an applicant for a works approval can apply to the Tribunal for a review of any condition to which the works approval has been made subject. Dual Gas has sought to review:

- the condition(s) limiting the capacity of the DGDP from 600 MWe to 300 MWe;
- condition 3.1(a) of the works approval relating to SO_2 emissions reduction levels, and.

[7] Schedule 1 of the *Environment Protection (Schedule Premises and Exemptions) Regulations* 2007.
[8] Schedule 1 of the *Climate Change Act 2010*

- conditions 2.6, 2.7 and 3.1(b) of the works approval relating to noise targets and noise mitigation measures.

28 The Dual Gas review of the capacity of the DGDP calls into question the reasons for which the EPA has purported to reduce the capacity from 600 MWe to 300 MWe. As we understand it, these are primarily that:

- the EPA considers the use of an 'E class' turbine in the second train of the DGDP is inconsistent with 'best practice';
- the EPA considers a 300 MWe power station to be sufficient to demonstrate the IDGCC technology at a commercial level and, given this, believes it would be contrary to the advancement of principles of environmental protection to allow a greater capacity at this stage.

29 Dual Gas had initially brought two applications for review. In its application to review conditions, there was at least a potential argument that the EPA's decision to halve the capacity of the power station was not a valid decision, in that it amounted to the approval of something quite different (i.e. a transformation, rather than a modification) to what had been applied for. The capacity limitation to 300 MWe had also been included in the 'Works Description' in the works approval, rather than as a numbered condition, which created a potential argument that it could not be the subject of any review of conditions. To protect itself against these arguments, Dual Gas had made a second application to the Tribunal (P1846/2011) to review the purported failure of the EPA to properly decide its works approval application.

30 By the time of the second phase of the hearing in February 2012, the parties to the Dual Gas applications had all agreed that, in the circumstances of this works approval application:

- the EPA had power to reduce the capacity of the power station;
- the halving of capacity was a modification rather than a transformation of the DGDP proposal[9]; and
- this modification was in the nature of a reviewable condition on the works approval.

31 On this basis, Dual Gas sought to withdraw the 'failure' application (P1846/2011) and, in the absence of any objection, leave was granted to Dual Gas to withdraw this application.

Objector grounds of review

32 Section 33B(1)(a) of the EP Act allows a person whose interests are affected by a decision of the EPA to issue a works approval to seek a review of the decision. The relevant parts of s 33B(2) then provide:

[9] See, for example, the EPA Closing Submissions at [11]-[29] and the discussion therein.

(2) An application for review under subsection 1(a) is to be based on either or both of the following grounds —

(a) that if the works are completed in accordance with the works approval, the use of the works will result in—

(i) a discharge, emission or deposit of waste to the environment;

…

— which will unreasonably and adversely affect the interests, whether wholly or partly of that person.

(b) that if the works are completed in accordance with the works approval, the use of the works will result in—

(i) a discharge, emission or deposit of waste to the environment;

…

— in the area which will be inconsistent with any relevant Order declared under section 16, 16A or 17 for the area …

33 The grounds for review are clearly limited.

34 Only Mr Shield relies on the first available ground under s 33B(2)(a). As will be seen, we have determined that this ground should be struck out.

35 All of the objectors have relied to varying degrees on the second available ground under s 33B(2)(b), and seek to contend that the level of emissions from the DGDP will be inconsistent with the SEPP(AQM), essentially by reason of the following:

- the level of emissions will not comprise 'best practice' by reference to cl 18, 19 and 33 of the SEPP(AQM). This arises primarily in relation to GHG emissions, but is also raised by DEA in relation to SO_2, NO_X, particulates, and other Class 3 indicators;
- the level of emissions will be inconsistent with the aims, principles and intent of the SEPP(AQM), by reference to cl 18 and 33 of the SEPP(AQM) and the aims, principles and intent expressly set out in cl 6, 7 and 8.

36 It is common ground that the SEPP(AQM) is a relevant order declared under s 16 of the EP Act, for the purpose of s 33B(2)(b).

37 The initial grounds submitted by each objector were relatively sparse, but the objectors lodged either amended statements of grounds[10] and/or further and better particulars[11] through which the substance of the objections was better articulated.

38 Dual Gas had sought to have the objectors grounds alleging inconsistency with the SEPP(AQM) struck out on the basis that there was no prima facie

[10] e.g. EV at Tribunal Book EVL.360.040
[11] e.g. DEA at Tribunal Book DEA 460.014, Shield at Tribunal Book MSH.560.021

case of inconsistency having regard to the simple and objectively ascertainable standards under the SEPP(AQM).

39 We have however chosen not to summarily strike out any of the objector's grounds under s 33B(2)(b). There is no simple, objective and ascertainable standard that Dual Gas can point to in the SEPP(AQM) on GHG emissions that it simply and demonstrably meets. As we have said, the SEPP(AQM) contains qualitative standards, in addition to some quantitative standards, particularly in relation to GHG emissions, best practice, and consistency with the aims, principles and intent of the SEPP(AQM).

40 We have greater sympathy with Dual Gas' concerns with the DEA grounds in relation to SO_2, NO_X, particulates and other air quality indicators, given that:

- the modelled level of particulate matter and NO_X comply with the relevant design criteria under Schedule A of the SEPP(AQM); and
- the modelling of SO_2 and NO_X was undertaken in accordance with the relevant Schedule C modelling protocols under the SEPP(AQM).

41 Part of the DEA grounds of review imply a concern with the adequacy of the SEPP(AQM). We agree with Dual Gas, following the decision in *Thirteenth Beach Coastwatch Inc v EPA & Anor*[12], that:

> … Parliament did not intend that those standards could be replaced or raised or otherwise modified by the environmental standards of any person or entity who or which might choose to become an applicant for review.

42 That said, we consider that the 'offending parts' of DEA's grounds (and the evidence supporting them) can be read down, rather than summarily striking out all of the DEA grounds generally. We note that the DEA grounds also raise qualitative issues of 'best practice'. In any event, Dual Gas has placed SO_2 capture squarely in issue in the proceeding by contesting the SO_2 reduction condition.

'Use' of the works

43 We note that s 33B(2)(b) allows an objector a right of review on the ground that, if the works are completed in accordance with the works approval, the *use of the works* will result in a discharge or emission that will be inconsistent with the SEPP(AQM).

44 Dual Gas had sought to argue that the actual discharges or emissions of GHG and other substances was ultimately a matter for a licence to be issued under s 20 of the EP Act, and that the works approval simply dealt with broader design standards for the works to ensure that future licence conditions could be met. It suggested our review of the works approval ought to be similarly limited.

[12] [2009] VSC 53 at [13] per Cavanough J. This case is discussed in more detail later in these reasons.

45 We consider that the reference to "use of the works" in s 33B(2)(b) requires us to look beyond the design standards for the works, and to consider the consequences of the works in terms of the future discharges and emissions to the environment, and the manner in which they can or should be regulated or controlled within the works approval. This is further supported by the fact that the EPA can only issue a licence that is "not inconsistent with any conditions specified in the works approval"[13], and perhaps also by the fact that the issue of a licence is not open to third party review where a works approval has first issued.

Tribunal role on review

46 The powers of the Tribunal on review include the following:

> **37 Powers of Tribunal**
>
> On a review under this Part the Tribunal, by order, may—
>
> (a) direct that a works approval shall or shall not be issued or transferred or be subject to a specified condition;
>
> …

47 Section 37A of the EP Act then provides as follows:

> **37A Matters Tribunal must take into account**
>
> In determining an application for review or a declaration under this Part the Tribunal must—
>
> (a) take into account any relevant planning scheme; and
>
> (b) where appropriate, have regard to any planning scheme or amendment adopted by a planning authority under the *Planning and Environment Act 1987* but not, as at the date the application is determined, approved by the Minister or the planning authority; and
>
> (c) take account of, and give effect to, any relevant State environment protection policy or waste management policy; and
>
> (d) where appropriate, have regard to any agreement made under section 173 of the *Planning and Environment Act 1987* affecting land the subject of the application.

48 Three of these mandatory considerations relate to town planning matters, which we will consider separately later in these reasons. The fourth, in s 37A(c), clearly requires us to consider the SEPP(AQM), although this policy is in any event at the core of most of the grounds of review before us.

49 The combination of ss 20C and 37A(c) of the EP Act is such that the Tribunal, on review, must do more than simply have regard to the SEPP(AQM). We must give effect to it and ensure the works approval and its conditions are consistent with the SEPP(AQM). As set out above, we

[13] EP Act s 20(7C)

agree with Dual Gas that, at least in relation to the objector applications under s 33B(2)(b) of the EP Act, our role is confined to the limited ground of review available under the Act[14]. However, in relation to the Dual Gas application to review the condition limiting the capacity of the power station, a broader responsibility to give effect to the SEPP(AQM) applies.

50 In our introduction to these reasons, we have also made further comment on the limits of our review jurisdiction. Although s 37A of the EP Act has set out four matters that we *must* consider, this does not prevent us from taking into account other relevant considerations within our jurisdiction and having regard to the nature of the particular review before us[15].

Comment on Dual Gas witnesses

51 Evidence in relation to the DGDP was given primarily by two Dual Gas representatives; namely HRL's Principal Process Engineer, Alex Blatchford[16], and Dual Gas' Chief Financial Officer, David Walton[17].

52 The other parties criticised some of this evidence, in part on the basis that Mr Blatchford and Mr Walton were 'company men' and that their evidence was not independent or expert. Whilst we might have preferred to have Dual Gas present greater independent evidence, we note that, on many core technical issues, its position was supported by the independent experts called by the EPA and points of difference were dealt with through cross-examination of those experts. Much of the proceeding also turned on the interpretation and weighting to be given to policy in the SEPP(AQM). In many instances, this was a matter for submission rather than evidence. We are satisfied that we have sufficient tested evidence to have reached the necessary findings to decide this case.

53 Insofar as the evidence of Mr Blatchford and Mr Walton provides a general factual description of the DGDP, we have treated it as non-expert. We note that much of this evidence (including projected emissions) was largely uncontested in any event. To the extent some of Mr Blatchford's evidence was opinion evidence, based on his undoubted technical knowledge, we have treated it as expert evidence, but not *independent* expert evidence, and we have weighted it accordingly. Mr Walton did not claim to appear as an independent or expert witness.

Confidentiality

54 Prior to the main hearing, Dual Gas had sought to maintain confidentiality in certain documents forming part of its works approval application, in order to protect the valuable intellectual property in the IDGCC process. Separate interlocutory orders were made limiting access to certain

[14] see also *Thirteenth Beach* at [41]
[15] see for example *Minister for Aboriginal Affairs v Peko Wallsend Ltd* (1985) 162 CLR 24
[16] HRL is the parent company of Dual Gas
[17] Mr Walton indicated he was employed on a contract basis by Dual Gas, and had a broader consulting role with Dual Gas beyond his 'title' role as CFO. See Transcript at p 1212.

documents to certain parties' legal representatives or witnesses and/or allowing other documents to be provided more widely in a redacted form[18].

55 The issues before us that are relevant to the various grounds of review are primarily about the impact of the *outputs* of the DGDP (e.g. the projected emissions of GHG or SO_2) rather than the complex and confidential components of the IDGCC process that lead to these outputs. The amount of projected emissions levels were not contested.

56 We are satisfied that the limited access and/or redaction of some documents has not prevented sufficient relevant information on determinative matters from being made available to the parties and to the Tribunal. Whilst we were provided with a sealed set of all documents, we have not had recourse to the confidential or unredacted documents. We are satisfied that our decision can be (and has been) made having regard only to those documents in redacted form and in the public domain.

Joinder of parties

57 By earlier order, and without objection, Dual Gas had been joined as a party in each of the four objector applications for review.

58 EV and LIVE both sought to be joined as a party in the two Dual Gas applications for review. Dual Gas opposed this. For reasons given orally in the first week of the hearing, EV was conditionally joined as a party (but LIVE was not), and this is now confirmed in our orders. With the subsequent withdrawal of the second Dual Gas application, EV's formal joinder is now only in relation to the remaining Dual Gas 'conditions' application (P1826/2011).

59 Pursuant to s 60(1) of the VCAT Act, the Tribunal may join a person as a party to a proceeding if the Tribunal considers that the person's interests are affected by the proceeding, or "for any other reason it is desirable that the person be joined …". Although we noted in our oral reasons that both circumstances for joinder arise here, the primary basis for joinder is the latter. We consider it desirable that EV be joined given:

- the nature of the organisation (referred to further in the section on standing),
- the representative capacity in which it appears,
- the fact that it is an applicant for review in a related proceeding before us (P1820/2011) with many common issues and evidence, and a common hearing, and
- the desirability of having an appropriate 'contradictor' in a significant proceeding before the Tribunal where there is a high level of community interest in the outcome.

[18] reported at [2011] VCAT 2432, per Judge Ginnane VP and Member Martin, and at [2011] VCAT 1920 per Judge Bowman VP and Member Code.

60 We considered that the joinder of EV would (and indeed has) enabled all the issues in dispute to be more effectively debated and determined.

61 EV indicated that it would accept a proposal by Dual Gas that its joinder be conditional upon it not raising additional substantive issues beyond those set out in its grounds of review in P1820/2011 – i.e. limiting its involvement in the 'conditions' review to the issues of GHG emissions and consistency with the SEPP(AQM). EV has therefore not involved itself in the Dual Gas challenge to conditions relating to SO_2 capture or noise.

62 The Tribunal did not join LIVE as a party to the 'conditions' review. As we explain later in these reasons, we do not consider LIVE has standing in its own application for review. Moreover, unlike EV, it has a small private membership and there is a lesser public interest or desirability in its joinder. We consider that the joinder of EV provides a sufficient and suitable contradictor to the Dual Gas proceeding.

PART 3: THE DUAL GAS PROPOSAL

Background

63 Before turning to the key issues raised in the proceedings, we consider it appropriate to set out some further information about the DGDP as a basis for understanding the context in which our decision is made. We do so, however, without reciting all of the technical evidence and submissions.

64 It is fair to reflect that the Latrobe Valley has been, and remains, the main centre for power generation in Victoria. This is based on its extensive brown coal resources – the largest single deposit of brown coal in the world[19], with an estimated 500 years supply - that provide a relatively low-cost and readily accessible fuel source. Although the combustion of coal in a coal-fired power station is a relatively inefficient mechanism for power generation, these vast coal resources allow for the generation of a relatively cheap form of electricity that, in turn, provides significant economic benefits to Victoria.

65 Indeed, 80% of electricity generation in Victoria occurs through the combustion of brown coal in the Latrobe Valley, and the generation of electricity from brown coal forms an important role in Victoria's overall energy security. The Latrobe Valley generators make a substantial contribution to the supply of electricity into the National Electricity Market (NEM).

66 A consequence of this is that the power generation industry in the Latrobe Valley has the unenviable reputation as a major contributor of GHG emissions. Overall, Victoria's electricity generation sector contributes some

[19] Washusen evidence, Transcript at p 1492

32% of Victoria's total GHG emissions annually, and 12 % nationally.[20] Whilst the Latrobe Valley generators contribute substantially to these GHG emissions in absolute terms (as a function of the overall electricity generated), they also do so with a high GEI so there is a greater GHG impact per unit of electricity produced. For example, Hazelwood Power Station has a GEI of 1.4 t CO_2-e per MWh 'as generated' and Yallourn Power Station 1.31 t CO_2-e per MWh 'as generated'[21].

The Dual Gas Demonstration Project

67 The DGDP proposal is for a power station that will generate electricity using brown coal as its primary fuel source, but with a substantially lower GEI of between 0.73 and 0.78 t CO_2-e per MWh 'as generated' when operating with syngas[22].

68 Mr Blatchford summarised the nature of the DGDP as follows:

> Dual Gas Pty Ltd proposes to develop a new 600 MWe power station to generate base load power whilst demonstrating the IDGCC technology at commercial scale at a site in Morwell, Victoria.
>
> The power station is proposed to be comprised of:
>
> - 2 integrated drying and gasification (IDG) plants;
> - 2 gas turbines (GTs);
> - 2 heat recovery steam generators (HRSGs);
> - 1 steam turbine and generator (ST);
> - 1 air cooled condenser (ACC);
> - 2 char burners.
>
> The design of the plant is such that the steam generated from the two HRSG's and the two char burners are supplied to a single steam turbine.[23]

69 In addition to these key components, the development will include:

- exhaust stacks, each with a minimum height of 80 metres These will have maximum diameters of 5.05 metres (CCGT), 1.37 metres (char burners), 0.43 metres (air pre-heater stacks) and 1.31 metres (pre-dryer stacks).
- flare burners for excess syngas;
- the IDG units contained within large structures;
- associated offices and buildings.

[20] Based on State and Territories Greenhouse Gas Inventories 2009, Department of Climate Change and Energy Efficiency, Commonwealth of Australia, 2011, Tribunal Book EPA.050.731
[21] Blatchford evidence, Tribunal Book DGA.200.067 at p 24
[22] ibid at p 24
[23] ibid at section 2.2.1

70 Dual Gas provided us with a broad base layout plan[24] and an indicative photo-representation of what the power station *might* look like (albeit based on an earlier design iteration)[25]. Ordinarily, we would have preferred a more detailed plan of the works we were being asked to approve. However, the DGDP is proposed to be located on land that currently encompasses the Energy Brix operations outside of Morwell, including briquette manufacturing and the Morwell power station. The EPA had expressed no concern with any inadequacy in the plans, and the proceeding before us was essentially concerned with the use of the works (and the impact of emissions and whether inconsistent with the SEPP(AQM)) rather than where they were physically located and what they looked like. We are satisfied that detailed design can be adequately dealt with in conditions or (if relevant) as a town planning matter.

The nature of the gasification process and power generation

71 All the engineering experts agree that the novel aspect of the DGDP is the IDGCC technology for the integrated drying and gasification of the brown coal – i.e. the way in which brown coal is used as a fuel source through gasification rather than combustion. The remaining components of DGDP (e.g. electricity generation by gas and steam turbines) will use proven technologies.

72 In general terms[26], the IDGCC process consists of:

- drying brown coal and converting it to synthetic gas under high pressure and temperature;
- using the generated hot syngas in the coal drying process;
- cooling and cleaning the syngas to remove particulates and ammonia generated in the gasification process;
- using the syngas as a fuel in a GT to generate electricity, relying on natural gas for start up and periodic combination with syngas to lower carbon emissions intensities;
- directing the hot turbine exhaust gas into a heat recovery boiler to generate steam;
- combining the heat recovery boiler steam with steam generated from the burning of char and ash produced from the gasifier and syngas cleaning to power a steam generator for further electricity production;
- using natural gas to boost the steam generator output on an as needed basis.
- using an air cooled condenser to cool exhaust gases.

[24] Exhibit D21
[25] Exhibit D22
[26] The IDGCC process is set out in more detail in diagrammatic form in Figure 1 in Blatchford's evidence, Tribunal Book DGA.200.067 at p 3.

73 The proposal to generate 600 MW of sent out electricity is based on having two integrated drying and gasification units feeding two GTs and the single steam turbine unit. Such a configuration is termed a '2 x 1 train'. Dual Gas contends that such a configuration is commonplace in the power generation industry, providing benefits in terms of capital costs as well as efficiency from the operation of one larger steam turbine. Dual Gas also stated that a demonstration of this more conventional configuration would assist in future marketing of the IDGCC process to potential clients.

74 The proposed development of the 600 MWe DGDP power station would be in two stages:

- Stage 1 would comprise construction and operation of one IDG and a 'Class E' GT linked to a HRSG and steam turbine (Train 1), with a second 'Class E' GT in place also linked to a HRSG and steam turbine but without an IDG (Train 2).
- Stage 2 would commence once the IDGCC process has been successfully demonstrated by Train 1 in Stage 1, by adding a second IDG to Train 2, thereby completing the overall development. This is expected to occur around two years after commencement of the project.

The DGDP is then expected to operate as a full commercial power station with a program life of some 30 years, but may operate longer.

75 What this means is that, in Stage 1, Train 1 would operate on a combination of syngas with some natural gas and demonstrate the commercial viability of the IDGCC process. The primary fuel source would be the syngas from the IDG, with natural gas used in start up phases and as a supplemental fuel to achieve appropriate heating values within the GT and to maintain an appropriate GEI. Natural gas would also be used in supplemental firing of the HRSG to boost power output from the steam generator if required. During the testing or demonstration phase of Train 1, Train 2 would be fired solely on natural gas. Train 2 would be used to boost the base load supplied by Train 1 or as a peak supply operation. Through its use as a conventional GT in Stage 1, Train 2 would also provide a more stable income source to Dual Gas to cross-subsidise the IDGCC demonstration.

76 If the IDG component fails its demonstration, Dual Gas proposes to convert Train 1 to run fully on natural gas in a CCGT operation over the projected program life – i.e. remove the IDG component. The effect of this is that the DGDP would then operate as a relatively conventional 2 x 1 train[27], natural gas fired CCGT power station.

77 On the evidence, the prospects of the technical viability of the IDGCC process being successfully demonstrated through the DGDP are high. Such prospects are based on trials of the technology at a much smaller capacity.

[27] i.e. two gas turbines linked to one steam turbine.

78 We consider that we should assess the works approval for the DGDP as a power station generally, rather than solely as a demonstration project. The demonstration of the IDGCC process remains a relevant factor and a major 'plus' for the proposal, but not one that by itself justifies the works approval. In the context of our decision, the novelty of the IDGCC process in the use of brown coal does not overshadow a proper consideration of other factors, particularly given the anticipated operating life of the DGDP for 30 or more years beyond its demonstration phase. The proposed power station, considered as a whole, must still comply with the SEPP(AQM).

The nature of emissions

79 Given the nature of the DGDP and its main base fuel through brown coal/syngas, its operation will generate gaseous emissions, noise and wastewater. These emissions are the focus of the works approval, and some more particularly the focus of this proceeding by way of review.

80 The gaseous or air emissions comprise of:

- carbon dioxide and other greenhouse gases, expressed as carbon dioxide equivalents (CO_2-e);
- sulphur dioxide (SO_2);
- oxides of nitrogen (NOx);
- other air quality indicators under the SEPP(AQM); and
- particulate matter of 10 microns or smaller.

81 The focus of the hearing and evidence from parties has been on GHG, SO_2, and to a lesser extent on NO_X and fine particulates.

82 Wastewater is generated from the condensation of steam, condensate from the turbine exhaust. The estimated water use and generation of wastewater in this proposal is minimised due to the use of air cooled systems. Higher ambient air temperature levels (e.g. over summer) will require the use of some water cooling systems. A positive aspect of the DGDP, acknowledged by all parties, is the large reduction in water use, and hence a reduction in wastewater. A saving of some 75% to 80% in water use is envisaged, compared with a conventional brown coal-fired, boiler-based, power station.

The sources of coal

83 The source of the coal fed to the IDG process is relevant in so far as the type of coal will influence the potential emissions from the power station.

84 Brown coal is termed a low rank, high moisture content coal that has a low heating value. A substantial amount of coal must be burnt to generate steam for power generation. As a result the GEI for a conventional brown coal-fired power station is relatively high. We have previously noted the GEI for Hazelwood Power Station is 1.4 t CO_2-e per MWh 'as generated'. By

comparison, black coal generators (primarily in NSW and Queensland) operate with a GEI of around 0.8 to 1.0 t CO_2-e per MWh 'as generated', and open-cycle natural gas generators at around 0.6 to 0.8 t CO_2-e per MWh 'as generated'. The modelled DGDP GEI of between 0.73 and 0.78 t CO_2-e per MWh 'as generated' (when using syngas sourced from brown coal) is more in the range of these other fossil-fuel based generators than the conventional brown coal-fired boiler generators.

85 The DGDP proposes to source brown coal from two specific coal fields in the Latrobe Valley. The Morwell open-cut coal field would be used initially, as it is the closest. The existing coal feed system to the Morwell/Energy Brix power station can be adapted to supply the DGDP. A second source of coal is expected to be from the Yallourn North Extension field which will likely require transport by road.

86 Whilst other sources of brown coal are available within the Latrobe Valley, we understand that the moisture content and heating values of the coal are such that they may not be suitable for use in the IDG process developed to date. Further development and testing of other brown coal sources would be required before use.

The four modelled DGDP scenarios

87 To cover the range of possible operational scenarios over the life of the project, Dual Gas modelled four different case scenarios as a basis for considering GHG emissions. These were:

- *Case 1* – Two gasifiers in operation, Morwell coal used for the first 4 years, then Yallourn coal for 11 years, and Morwell coal for 15 years. Using a relatively large amount of natural gas (11,425 TJ/year).
- *Case 2* – Two gasifiers in operation. Same coal use as in Case 1, but using a moderate amount of natural gas (8,715 TJ/year).
- *Case 3* – Two gasifier operation, Morwell coal used throughout, using a moderate amount of natural gas (9,518 TJ/year)
- *Case 4* – 'failure scenario'. One gasifier, ceasing after 4 years, Morwell coal used for these 4 years, Natural gas used thereafter (14,108 TJ/year).

88 Because of the broader level at which the objections to the DGDP are pitched, the particular modelled scenarios were not analysed in detail, nor were the outputs of the model challenged.

89 The outputs of the GHG modelling were as follows:

Operating Scenario	Ave. projected annual GHG emissions (million t CO_2-e /yr)	GEI 'as generated' (t CO_2-e/MWh)	GEI 'as sent out' (t CO_2-e/MWh)
Case 1	3.024	0.73	0.78
Case 2	3.201	0.77	0.83
Case 3	3.238	0.78	0.84
Case 4	0.762	0.45	0.46

90 We note in passing that none of these scenarios purport to represent the 'most likely' case scenario. The reference to *two* gasifiers in each of cases 1, 2 and 3 appears from the description in the works approval application[28] to model GHG emissions as if two gasifiers were operating from Day 1 (rather than the second gasifier being later installed after two or three years, after a successful demonstration of the first). This will therefore likely lead to GHG emissions being over-stated in the model in the early period. This aside, we understand that Case 3 is perhaps a more likely preferred scenario than the others, using Morwell coal as much as possible and a lesser amount of natural gas[29]. For comparative purposes with other power stations, Dual Gas has used an average derived from Cases 1, 2 and 3.

91 An obvious initial conclusion to be drawn from the modelling is that the 'failure' scenario in Case 4 (i.e. if the demonstration of the IDGCC technology fails) is not a 'worst case' scenario in terms of GHG emissions from the DGDP. The GEI will be significantly less if the DGDP operates on natural gas alone.

Comparisons with other power stations, fuel sources & technology

92 Based on the Dual Gas modelling, the following comparisons can be drawn[30]:

- the four largest emitting power stations in the Latrobe Valley (Hazelwood, Yallourn, Loy Yang B, and Loy Yang A) operate with a GEI 'as generated' of between 1.13 and 1.4 t CO_2-e/MWh. (The GEI 'as generated' of Hazelwood Power Station is 1.4 t CO_2-e/MWh).
- the most efficient brown coal-fired power station in the world (Niederasussem in Europe) is estimated to operate at a GEI 'as generated' of 0.93 t CO_2-e/MWh (modelled with use of Latrobe Valley coal).

[28] 'SKM Greenhouse Gas Assessment', Appendix D to works approval Application, at pp 55-61.
[29] Blatchford evidence when recalled, see for example Transcript at p 1739
[30] These comparisons are taken primarily from the Part 2 of the Dual Gas Closing Submissions. Those submissions, in turn, reference the primary source documents.

93 As a consequence, the DGDP would achieve a 46% reduction in GEI 'as generated' with Hazelwood, and a 39% reduction compared with the average of the four largest emitting Latrobe Valley power stations. The DGDP would have a lower GEI than any brown coal-fired power station worldwide.

94 Because it is relevant to the discussion that follows, we note that the GEI from the DGDP would fall to 0.26 t CO_2-e/MWh if used in the future in conjunction with carbon capture and storage (CCS)[31].

95 Existing black coal-fired power stations in Australia operate with a GEI 'as generated' of between 0.8 and 1.0 t CO_2-e/MWh. The DGDP compares favourably with these. Moreover, these black coal-fired power stations exist primarily in NSW and Queensland. If significant power for Victoria were generated from these distant sources, there would be transmission losses that would mean that the effective or 'real' GEI would be higher per MW of electricity consumed. Mr Blatchford estimated power transmission losses would be in the order of 10% from the Hunter Valley in NSW, and between 15% and 30% from Queensland, compared with transmission losses of 2% to 3% from the Latrobe Valley to Melbourne.

96 Despite these favourable comparisons, the DGDP would have a GEI 'as generated' that is higher than the average of gas-fired power stations in Victoria (where currently most are open-cycle GTs operating with a GEI between 0.52 and 0.78 t CO_2-e/MWh)[32]. Dual Gas contended that the GEI figures for gas-fired power stations were low because GHG emissions from the production of the natural gas were not accounted for. However, we understand that the understating of the GEI for natural gas is in the order of 8%[33], and the GEI for a gas-fired power station will therefore still be lower than the DGDP even allowing for this. The new plant standard for a CCGT operating an 'F class' GT is for a GEI 'as generated' of 0.35 t CO_2-e/MWh , and the best currently operating is the Tallawarra power station in NSW at 0.34 t CO_2-e/MWh[34]. If operating on natural gas alone, in the 'failure' scenario, the GEI of the DGDP would be higher than this, at 0.45 t CO_2-e/MWh, because it would be using 'E class' GTs.

97 The DGDP obviously compares unfavourably with renewable energy, which has a very low GHG impact[35], and a marginal GEI (if any) derived from external power consumption associated with its use or transmission.

98 Whilst GEI is important, so too are the GHG emissions in absolute terms. As we have indicated, the DGDP is proposed as a major power station that will generate between 3.0 and 3.2 million tonnes of GHG per annum over a 30 year projected life cycle (based on the Cases 1, 2 and 3 modelling) and

[31] Blatchford evidence at Transcript p 727.
[32] Blatchford evidence, Tribunal book DGA.200.067 at p 26
[33] Dual Gas Closing Submissions at [94]. We were told this figure did not include fugitive emissions from coal-seam gas.
[34] ibid at p 28-29
[35] created through the production and construction of infrastructure (e.g. wind turbines or solar cells)

up to 4.2 million tonnes of GHG per annum if it were to operate at full capacity. The EPA indicates that a 600 MWe DGDP would increase Victoria's GHG emissions profile by 2.5% over 2009 levels, at a time when Victoria has a target of reducing its GHG emissions by 20% over 2000 levels by 2020[36]. The Australian government has also committed to a national target of reducing GHG emissions to 5% below 2000 levels by 2020, and 80% by 2050[37].

99 The competing comparative benefits and disbenefits of the DGDP in relation to GHG emissions and GEI thus give rise to a complex debate about the application of the SEPP(AQM) to our consideration of the DGDP. This is particularly the case for those parts of the policy framework within the SEPP(AQM) that themselves contain competing or qualitative elements.

The GEI debate – 'as generated' vs. 'as sent out'

100 GEI can be published on an 'as generated' or 'as sent out' basis. The Table above shows both, although most data provided by Dual Gas was on an 'as generated' basis, and so too therefore are most references to GEI in these reasons.

101 As the name implies, 'generated' power is the power actually generated by a power station, as measured at the generator. The 'sent out' power is the power actually sent out from the power station, after allowance for the internal (or auxiliary) power consumption within the power station – i.e. the power used to run the generators, pumps and other equipment. Because of this, the power 'sent out' from a power station will always be lower than the 'generated' power. Given that the GHG emissions from the power station will be the same either way, the GEI (derived from GHG emissions and the power output) will therefore be higher when published on an 'as sent out' basis.

102 The debate between the two ways of presenting GEI achieved some notoriety during the hearing before us, although we agree with Dual Gas that it was somewhat of a 'red herring'. From the evidence, it seems that GEI had been commonly reported within the electricity generation industry, until relatively recently, on an 'as sent out' basis[38]. The first version of the works approval application for the DGDP was also prepared and submitted with references to GEI 'as sent out'.

103 However, at almost exactly the same time, the Australian government indicated a move towards a formal GEI standard for coal-based power stations on an 'as generated' basis of 0.86 t CO_2-e/MWh[39]. The Victorian

[36] s 5 of the *Climate Change Act 2010* . We discuss this later in these reasons.
[37] *Securing a Clean Energy Future – the Australian Government's Climate Change Plan*, Commonwealth of Australia 2011, Tribunal book EPA.050.1126 at pp 14-15
[38] E.g. in reporting to the former Australian Greenhouse Office
[39] e.g. *ALP Media Release: Tough new emissions standards for new coal fired power stations,* 23 July 2010 (Exhibit O-3). See also *ALP Release: A Cleaner Future for Power Stations* (undated) (Exhibit D1);

government also indicated a move towards a GEI standard of 0.8 t CO_2-e/MWh[40], without indicating clearly whether this was on an 'as generated' or 'as sent out' basis. We agree with Dual Gas that these government indications were perhaps more in the nature of 'aspirational policy pronouncements', to be implemented in the future, rather than fixed standards then taking effect. For example, the then Victorian Government indicated its GEI standard would be implemented as a 'target' through the then *Climate Change Bill*, but this did not occur and there is no GEI standard or target in the *Climate Change Act 2010*.

104 Nonetheless, the works approval application for the DGDP was withdrawn, modified and re-submitted to show GEI on an 'as generated' basis that could comply with these proposed standards. EV contended that this withdrawal and resubmitting of the works approval application by Dual Gas only followed media reporting of a likely non-compliance of the initially submitted DGDP with these proposed standards[41]. However, we see nothing sinister in this change of approach by Dual Gas in response to a changing policy environment within which its works approval application would likely be assessed.

105 In any event, the Australian government has since indicated a shift away from the implementation of a strict GEI standard, now preferring a more market-based approach to the regulation of new power stations through its carbon pricing mechanism. Although the current Victorian government had adopted the previous government's proposed target figure for GEI within its policy for the 2010 election[42], it has not implemented a GEI standard, and its approach to GHG emissions is now under review (as part of a review of the *Climate Change Act 2010*) following the change in the Australian government's position.

106 The issue remains relevant to us, because there is a condition on the works approval issued by the EPA that requires the DGDP to comply with a GEI of 0.8 t CO_2-e/MWh without indicating whether this is on an 'as generated' or 'as sent out' basis. We deal with this issue later in these reasons.

PART 4: CHALLENGE TO OBJECTOR STANDING

Introduction to standing

107 Dual Gas challenged the legal standing of all four objectors to bring their respective applications for review, and the parties approached the matter as somewhat of a test case on standing, with extensive argument on this issue

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and *Working Together for a Clean Energy Future*, Dept of Resources, Energy and Tourism, Australian Government, July 2011 (part of Exhibit O-7)

[40] *Taking Action for Victoria's Future : Victoria's Climate Change White Paper - The Action Plan*, Victorian Government, July 2010 [Tribunal Book EPA.050.340] at p 13.

[41] statutory declaration of Adam Morton dated 16 January 2012 (Exhibit O-16)

[42] *The Victorian Liberal National Coalition Plan for Energy and Resources* (Exhibit E-5) at p15

over two days of the hearing. The issue of standing in EPA works approval matters has been a matter of continuing debate for many years, and we consider that legislative clarification or a court ruling may be necessary to provide greater future certainty. We have simply approached the matter by applying the legal framework, as we understand it, to the particular circumstances of this proceeding.

Relevant legislation

108 The relevant part of s 33B(1) of the EP Act provides as follows:

> (1) If the Authority or a delegated agency—
>
> (a) issues a works approval;
>
> …
>
> a person whose interests are affected by the decision (other than the applicant or licence holder) may apply to the Tribunal, within 21 days after the decision is made, for review of the decision.

109 The standing of an objector to review an EPA decision to issue a works approval is thus founded upon whether the objector is "a person whose interests are affected by the decision".

110 Section 5 of the VCAT Act provides:

> **5 When are a person's interests affected by a decision?**
> If an enabling enactment provides that a person whose interests are affected by a decision may apply to the Tribunal for review of the decision—
> (a) *interests* means interests of any kind and is not limited to proprietary, economic or financial interests;
> (b) the person may apply to the Tribunal whether the person's interests are directly or indirectly affected by the decision and whether or not any other person's interests are also affected by the decision.

111 It is not surprising that s 33B(1) of the EP Act and s 5 of the VCAT Act use an identical phrase. The *Tribunals and Licensing Authorities (Miscellaneous Amendments) Act 1998* was passed to coincide with the commencement of the VCAT Act in 1998, and amended many enabling Acts conferring jurisdiction on this Tribunal to include the phrase "a person whose interests are affected", including the EP Act. Prior to 1998, s 33B(1) of the EP Act had referred to "a person who feels aggrieved by the decision", a phrase which had been interpreted differently in other cases[43].

112 There is therefore a clear legislative intent that s 5 of the VCAT Act applies to applications for review under s 33B(1) of the EPAct. It follows that the applicant's 'interests' under s 33B(1) must be considered in the context of

[43] See for example *Murragong Nominees Pty Ltd v MMBW* (1985) 60 LGRA 210, referred to in *Brambles Australia Ltd v Power Marketing Pty Ltd* (1999) 16 VAR 143 at [24]

this definition in the VCAT Act. It provides a very wide meaning to a person's interests that may be affected by a decision.

113 Section 5 of the VCAT Act is based largely on a very similar provision that had existed in s 27(2) of the former *Administrative Appeals Tribunal Act 1984*, which applied to VCAT's predecessor. The second reading speech for that provision had indicated:

> Clause 27 deals with persons who may make application to this tribunal. It sets out the standing provisions. The intention is to provide access to as broad a range of persons who wish to participate in the proceeding as is compatible with the requirements of the jurisdiction and the interests of justice. The question of standing before courts or tribunals is one that has been the subject of much debate and, in many people's eyes, the current law regarding standing is quite restrictive. The intention of this clause is to provide access to persons who not only have the traditional kinds of association with the decision involved – whether proprietorial or economic – but also have a concern that places them beyond the category of a member of the general public or in the words of the cases, a "mere busybody". That concern does not need to result from interference with a specific legal right but may arise, for example, from a genuinely held and articulated intellectual or aesthetic concern in the subject-matter of the decision[44].

Although this second reading speech was made some time ago, it is still a relevant extrinsic aid to the interpretation of Parliament's intent for tribunal standing, in terms of the relatively wide meaning that may be given to a person's 'interests' that may be affected by a reviewable decision. It nonetheless falls short of giving open standing to any person. There is seemingly the need for a genuine connection with the subject matter of the decision to be demonstrated, in a manner compatible with the context of the Tribunal's relevant jurisdiction under an enabling enactment.

114 Because it is relevant to the debate, we note that s 33B of the EP Act also refers to a person's 'interests' on one other occasion, in s 33B(2)(a). One of the two grounds of review available to an objector is where the use of works will result in a discharge or emission to the environment "which will unreasonably and adversely affect the *interests*, whether wholly or partly of that person".

115 This reference to a person's 'interests' had existed in the EPA Act well prior to 1998 (at a time when s 33B(1) still referred to a person 'aggrieved') and it cannot necessarily be claimed that the drafter therefore had a similar intent in the use of the word. This is particularly the case with the *special* meaning given to use of the phrase "a person whose interests are affected by the decision" in s 33B(1), and the effective definition of 'interests' (for that purpose) in s 5(a) of the VCAT Act. The context is also different. Section 33B(1) deals with standing, and s 33B(2)(a) deals with a limited ground of review.

[44] Hansard, Legislative Assembly, 20 September 1984 at pp 665-6

Relevant case law

116 The common law position on standing in environmental matters has evolved over many years, with a 'special interest' test developed, refined and applied in cases such as *Australian Conservation Foundation v Commonwealth*[45], *Onus v Alcoa of Australia Ltd*[46], *North Coast Environmental Council Inc v Minister for Resources*[47] and more recently in Victoria in *Environment East Gippsland Inc. v VicForests*[48]. At common law, the interest necessary to establish standing needs to be more than an intellectual or emotional concern in the protection of the environment, and needs to involve more than genuinely held convictions. Moreover, an allegation of non-compliance with a statutory provision or administrative procedure does not of itself confer standing, nor does the opportunity to comment on a proposal as part of an environment impact assessment process of itself confer standing to challenge a decision resulting from that process. For an organisation (as opposed to an individual), a 'special' interest is not demonstrated merely by formulating objects that support environmental protection. Nonetheless, more formal representation in a consultative process, government recognition and/or funding of the organisation, or a nexus with protection of a particular segment of the environment, may each be sufficient to establish an organisation's special interest.

117 None of these cases on standing arise from an objector application under the EP Act with its clearly articulated grounds of review, nor in relation to a review by a tribunal with a special provision on 'interests' and standing such as arises under s 5 of the VCAT Act. Indeed, the 'special interest' test in cases such as *ACF v Commonwealth* and *Onus* was formulated before s 27(2) of the former *Administrative Appeals Tribunal Act 1984* existed (or s 5 of the VCAT Act). It may well have been one of the 'restrictive' approaches in the then 'current law' that was referred to in the second reading speech above, and which the wider operation of standing at the then Administrative Appeals Tribunal (and now at VCAT) was intended to address.

118 We consider that the express wording of s 5 of the VCAT Act, when read in conjunction with s 33B(1) of the EP Act, clearly evinces an intention to have a wider and more liberal test for standing for the purpose of Tribunal review proceedings, when compared to the 'special interest' test for standing in environmental matters that applies at common law and for cases of judicial review and similar proceedings. By reference to s 5 of the VCAT Act, the 'interests' in s 33B(1) are interests of any kind, and may be direct or indirect, and may arise whether or not any other person's interests are

[45] (1980) 146 CLR 493 (High Court), in particular per Gibbs J.
[46] (1981) 149 CLR 27 (High Court)
[47] (1994) 55 FCR 492 (Federal Court), per Sackville J.
[48] [2010] VSC 335 (Supreme Court) per Osborn J.

also affected. However, as we have indicated, s 5 nonetheless falls short of giving open standing to any person. An *interest* must still be demonstrated.

119 We note that, in *Geelong Community for Good Life Inc v Environment Protection Authority & Anor*[49], Cavanough J. had made passing comment that:

> The scope of the expression "a person whose interests are affected by the decision" in s 33B is not unlimited, although it awaits definitive judicial consideration.

That proceeding did not arise from an objector application under s 33B.

120 Justice Cavanough had the opportunity to make more detailed observations on the issue in *Thirteenth Beach Coastwatch Inc v EPA & Anor*[50], which did arise as an appeal from an objector application under s 33B. This decision received a great deal of attention in the proceeding before us. However, it should be noted that, helpful as his Honour's comments are in *Thirteenth Beach*, that case was more directly concerned with the reference to a party's 'interests' under s 33B(2)(a) of the EP Act (in relation to the objector's ground of appeal) rather than standing under s 33B(1).

121 From *Thirteenth Beach*, the following observations can be made:

- the applicant's standing had not been challenged before VCAT, and the applicant had therefore been found, at least implicitly, to be a person whose interests were affected by the EPA decision, within the meaning of s 33B(1). His Honour stated:

  > If that view be correct (which I need not and do not decide), then the word "interests" in s 33B(1) has a very wide meaning[51].

- in making this comment, Cavanough J referenced the decision in *One Steel Manufacturing Pty Ltd v Whyalla Red Dust Action Group Inc*.[52]. That decision had reinforced the notion that the phrase "a person whose interests are affected" did not create general standing to *any* person, but that some affected interest still had to be demonstrated (albeit in circumstances, in *One Steel*, where there was no provision similar to s 5 of the VCAT Act).

- although the word "interests" appeared in both ss 33B(1) and 33B(2)(a), the normal statutory presumption that the word should be given the same meaning in both instances was rebuttable, especially in relation to a large and frequently amended Act such as the EP Act[53]. After referring to the legislative history, Cavanough J commented:

[49] [2008] VSC 185 at [35]
[50] [2009] VSC 53
[51] *Thirteenth Beach* at [8]
[52] [2006] SASC 114 at [10]-[13]
[53] *Thirteenth Beach* at [10]

> … I note at the outset that the word "interests" has many senses and shades of meaning and that it is used in s 33B in two quite different contexts – standing to appeal and grounds of appeal[54].

- in s 33B(2)(a), in relation to the grounds of review and the determinative matter before him, his Honour adopted a narrow view of the word "interests"[55], based in part on an earlier decision in *Australian Conservation Foundation v Environment Protection Appeal Board* [56]. This is discussed further, below. However, his Honour carefully distinguished this finding, for the purpose of s 33B(2)(a), from use of the word "interests" in s 33B(1).
- the change to the EP Act in 1998, that introduced the phrase "a person whose interests are affected" into s 33B(1) to coincide with the introduction of s 5 of the VCAT Act) was confined to matters of standing. The meaning of "interests" in s 33B(2)(a) had already been shown to have a narrow meaning in *ACF v EPAB*. His Honour commented:

> The 1998 legislation should not be interpreted as having altered, by a side wind, the established, clear (narrow) meaning of "interests" in s 33B(2)[57].

122 It is clear that, in *Thirteenth Beach*, Cavanough J did not finally determine the question of standing under s 33B(1). However, his broader observations are entirely consistent with a wider meaning being given to the phrase "a person whose interests are affected" in s 33B(1), having regard to its legislative history, and that it should not be constrained by the narrower meaning given to the word "interests" in the equivalent provision to s 33B(2)(a) in *ACF v EPAB*.

123 *ACF v EPAB* was decided when the equivalent provision then in the EPA Act on standing still referred to a "person who feels aggrieved", and the direct issue in that case was standing on that basis, rather than the meaning of "interests" in what was then s 32(5) of the EP Act. The Full Court nonetheless gave a relatively wide operation to standing, having regard to the scope and purpose of the EP Act. The Court specifically distinguished between the grounds referring to "interests", including the then s 32(5)(a) (which equates with s 33B(2)(a) of the current Act), which were considered to have a narrow ambit, and the broader ground of review under the then s 35(2)(b) (which equates with s 33B(2)(b) of the current Act). Young CJ commented:

> In the Act with which we are concerned, it may be said that the busybody is allowed full sway for one of the grounds of appeal, upon which an appellant

[54] *Thirteenth Beach* at [10]
[55] *Thirteenth Beach* at [15] and following
[56] *ACF v EPAB* [1983] 1 VR 385 (Full Court), not to be confused with the High Court decision in *ACF v Commonwealth* referred to earlier.
[57] *Thirteenth Beach* at [18]

> before the Board may rely, has nothing to do directly with the personal position of the appellant or of any other party. I refer to the ground in para. (b) which is concerned with provisions of a licence or resulting conditions which are inconsistent with State environment protection policy. It is difficult to see how a person whose pecuniary or other direct interests in the narrow sense are said to be affected would seek to rely on this ground rather than upon the grounds under paras. (a) or (c). Thus the ground in para. (b) must contemplate that some other objector who feels aggrieved should have a right of appeal.[58]

124 Although care must be taken not to apply *ACF v EPAB* too strictly, given the slightly different statutory regime then in force under the EP Act, the decision implicitly supports a wider view of standing created by the ground now in s 33B(2)(b) – i.e. the opportunity for a person with no personal stake in the outcome to challenge a relevant EPA decision on the basis of inconsistency with a SEPP. This is to be contrasted with a narrower consideration of "interests" for the ground of review now in s 33B(2)(a). Justice Cavanough appears to have been of a similar view in *Thirteenth Beach*[59].

125 In *Linaker v Greater Geelong CC & Ors*[60], Gibson DP had found no difference between the use of the word "interests" in ss 33B(1) and 33B(2)(a). Despite referring to *Thirteenth Beach*, she did not refer to the distinction Cavanough J had carefully drawn between these two provisions, and she instead purported to apply his narrower view on s 33B(2)(a) (on the grounds of review) to the matter of standing. In doing so, and despite referring to s 5 of the VCAT Act, Gibson DP also adopted and applied the common law 'special interest' test from *ACF v Commonwealth*, *North Coast Environmental Council*, and *Environment East Gippsland*. For these reasons, we respectfully disagree with the decision in *Linaker*, and we choose not to follow it in this proceeding.

126 Insofar as there was some disagreement between the parties as to the proper interpretation we should give to *Thirteenth Beach*, *ACF v EPAB* and *Linaker* on this issue, it follows that we prefer the submissions of the EPA and EV/LIVE to those of Dual Gas.

127 We also adopt the views expressed in *Paul v Goulburn Murray Water Corporation*[61], a decision in relation to standing at VCAT under the *Water Act 1989* (but equally applicable to the EP Act), where the Tribunal indicated that:

- in considering whether a person's interests are affected by a decision, it is necessary to consider the context of the relevant enabling Act.

[58] *ACF v EPAB* at p395 per Young CJ. See also p402-3 per Marks J
[59] *Thirteenth Beach* at [13] and [16].
[60] [2010] VCAT 1806 (Red Dot)
[61] [2009] VCAT 970. For the record, we note that the Tribunal in *Paul* was constituted by two of the members sitting in this proceeding (Dwyer DP and Potts M).

This requires consideration of the "subject, scope and purposes" of the legislation under which the decision in question was made, and the nature of the reviewable decision itself[62].

- the Tribunal should be cautious in applying the meaning given to the word "interests" in other legislation, or legislation where a slightly different expression is used (e.g. where the person "may" be affected, or where the person is "aggrieved" by the decision). The context must be whether the applicant's interests are affected for the purposes of the enabling Act and the specific reviewable decision under that Act.

128 As we have indicated, it also remains the case that standing at VCAT is wide, but not unlimited. Some meaning must be attached to the words "a person whose interests are affected". Despite the apparent breadth of s 5 of the VCAT Act, Parliament must have intended that rights of review do not accrue to *any* person. As the second reading speech to which we have referred noted, and notwithstanding Young CJ's comments in *ACF v EPAB*, standing under s 5 is not intended to be conferred on a 'mere busybody'.

129 An interest must generally be established that reflects a concern or interest that places them beyond the category of a member of the general public. This does not however mean that a separate special interest must be demonstrated, or that a person whose interests are affected in the same way as others cannot have standing. Section 5(b) of the VCAT Act acknowledges that interests may be directly or indirectly affected, and expressly provides that a person may apply to the Tribunal whether or not any other person's interests are also affected by the decision. What is required is that the person seeking standing demonstrates a material connection with the subject matter of the decision under review – i.e. a genuine interest. Again, as the second reading speech noted, this may arise from a genuinely held and articulated intellectual or aesthetic concern in the particular subject matter of the decision, as opposed to a broader environmental concern generally.

Application of principles to objector standing in this proceeding

130 As we have indicated, a consideration of standing here requires a consideration of the subject, scope and purposes of the EP Act under which the decision was made, as well as a consideration of the nature of the reviewable decision itself. The parties all addressed us at some length on these issues.

131 As Marks J. had noted in *ACF v EPAB*:

> … the subject matter of the EP Act is the amorphous mass of air and water the real concern of all members of the public. I refer to what I

[62] See also, for example, *Allan v Transurban City Link Ltd* (2001) 208 CLR 167 at 174 and 184; and at a Tribunal level, *Brambles Australia Ltd v Power Marketing Pty Ltd* (1999) 16 VAR 143 at [29] et seq. In *Brambles*, the Tribunal found that a wide interpretation of s 5 of the VCAT Act was consistent with the general scheme of review under the EP Act

> have already said as to its essential concern, a social one of the widest import to members of the public throughout the State…[63]

Whilst some provisions and processes under the EP Act have changed over time, this sentiment as to the wide scope of the Act (and the potential impacts of decisions under the EP Act on the community at large) remains applicable. The EP Act establishes a broad framework for protection of the environment in Victoria, having regard to principles of environmental protection set out in the Act[64]. The purposes of the EP Act are clearly relevant to standing, and we disagree with the approach adopted by Dual Gas in attempting to 'cherry-pick' particular provisions of the EP Act to support a narrower view.

132 As the Tribunal noted in *Paul*, the difficulty in any given case is the determination of the point beyond which the affectation of a person's interests by a decision should be regarded as too remote or too general to support standing to make application for review[65], even where there is very wide (but not unlimited) standing. Each case turns on its own particular circumstances.

133 We nonetheless consider that there are some principles that can assist in resolving this difficulty, by reference not just to the scope of the EP Act itself, but to the particular nature of the reviewable decision. Factors that may be relevant here include the nature of the particular proposal for the works approval, the materiality or breadth of its potential environmental impact, and the involvement of the person in the works approval application process.

134 In the present case:

- the DGDP is being assessed primarily for consistency with the SEPP(AQM). Whilst the SEPP(AQM) deals with many types of emissions, it recognises only two "global issues" – the management of GHG and the management of ozone-depleting substances[66]. Wider standing may therefore be appropriate in these instances, because of the potentially broader 'global' impact, even where a person may not have a direct connection to the location of the works approval. We agree with the EPA that the review of a decision regarding the implications of GHG emissions within the current climate change context sets relevant parameters within which the interests of third party objectors may be considered.

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[63] [1983] 1 VR 385 at 403
[64] EP Act s 1A
[65] see, for example, *One Steel Manufacturing Pty Ltd v Whyalla Red Dust Action Group Inc.* [2006] SASC 114 at [14]-[15] per Debelle J. This principle applies equally to the statutory test for standing under the VCAT Act.
[66] SEPP(AQM) at cl 33-34 in the section "Management of Global Issues"

- for more localised impacts under the SEPP(AQM), such as the emission of particulates or NO_X, a greater connection may need to be established than for a global issue such as GHG emissions.
- despite the global nature of the GHG issue, there must still be a materiality threshold in relation to the type or size of the works or emissions that is relevant to whether a person's interests are genuinely affected, as opposed to being too remote or too general. The emission of a few tonnes of GHG from a small factory in Gippsland would not in our view give rise to standing under s 33B(1) to an objector in Mildura even though it represents an incremental GHG increase. It is unnecessary for us to determine where the line of materiality might be drawn. As we noted in our introduction, the DGDP is a major power station that will generate up to 4.2 million tonnes of GHG per annum over a 30 year projected life cycle and increase Victoria's GHG emissions profile by 2.5% over 2009 levels. In our view, this clearly raises potential issues of material interest or concern to all Victorians, and creates an almost unique level of "affected interests" and standing compared to the more usual sort of works approval matters that come before the Tribunal.
- in order to reflect that s 5 of the VCAT Act does not envisage open standing to all persons, we consider that there must also be a materiality threshold in relation to the connection of the person to the particular subject matter of the decision under review, so that the interest is not too general or too remote. We are not convinced that, under the present regime in the EP Act, the right to make an objection in response to a publicly advertised works approval application under s 19B will necessarily always carry with it the right for an objector to apply for review under s 33B(1). We do not need to decide this finally. However, participation in the process or some genuine connection with the proposal may be a relevant factor in demonstrating more than a general environmental concern, and something that amounts to an affected interest.

135 To the extent all four objectors raise global GHG issues in relation to a major GHG emitting proposal, and given the breadth of s 5 of the VCAT Act in acknowledging indirect interests of any kind, it might be thought that all four objectors warrant standing in this proceeding on these factors alone. Based on the above, we consider that EV, Mr Shield and DEA each have standing in this proceeding and each is "a person whose interests are affected by the decision" under review. In particular:

- EV is a peak environmental organisation recognised by government, with a wide community constituency. From the affidavit of Kelly O'Shannessy[67], we are satisfied that EV has a genuine connection with climate change issues across Victoria, and a specific and longstanding

[67] affirmed 17 October 2011 and filed in the proceeding.

involvement since 2007-08 in relation to the DGDP. EV participated throughout the works approval application process, including facilitating community-based objections, and it participated formally in the conference held under s 20B of the EP Act in relation to the DGDP. To our mind, it has clearly demonstrated that it is more than an activist group with general environmental concerns, and that it has substantive intellectual interests with regard the DGDP works approval decision and its broader implications for GHG emissions under the SEPP(AQM).

- Mr Shield is an individual resident in Moreland. He has no physical connection with the Latrobe Valley. Whilst it was argued by Dual Gas that he shared no greater interest in climate change issues, GHG emissions or the DGDP than that of the general public, we disagree. Mr Shield's concerns on climate change issues are backed by a level of intellectual research and reasoning that, in our opinion, clearly takes his interest beyond a passionate or emotional concern shared commonly with others. More particularly, from Mr Shield's submissions and affidavit[68], he has also demonstrated to our satisfaction a longstanding and committed intellectual involvement in the specific DGDP works approval process, including participation in the s 20B conference. This places his "interests" above those of the general public – at least in terms of standing.
- DEA's case for standing is a little more marginal in terms of global GHG issues, although it has participated internationally (as part of its parent organisation) in climate change matters affecting human health. However, from its submissions and the affidavit of Eugene Kayak[69], it has also demonstrated a longstanding involvement in health and environmental issues arising from the use of coal, and an involvement in the DGDP works approval process in relation to specific localised emissions of SO_2, NO_X and particulates arising from the DGDP and in the Latrobe Valley generally. Some of its members work in the region. We are satisfied that these factors are sufficient for it to establish affected interests in this proceeding.

136 Conversely to the other three objectors, we have found that LIVE does not have standing to bring its application for review. It may share a similar passion or concern with global GHG emissions to the other objector parties, but we are not satisfied that it has demonstrated a genuine connection with the DGDP beyond a general environmental concern.

137 According to the affidavit of Deborah Hart[70], it is a private organisation of only five members (albeit apparently with over 3000 'supporters'), and it appears to have a primary focus on local climate-change related lobbying

[68] affirmed 20 October 2011 ad filed in the proceeding.
[69] sworn 10 October 2011 and filed in the proceeding.
[70] affirmed 18 October 2011 and filed in the proceeding.

and activities centred on the Port Phillip area. Its website material reflects more general concerns with the use of brown coal, rather than any strong intellectual connection with the DGDP or its works approval process. Indeed, until filing its application for review, it appears not to have participated in the DGDP works approval process. Although Deborah Hart's affidavit deposes to her having made an objection to the DGDP "on behalf of LIVE", the email objection exhibited to the affidavit is in her name alone, uses the singular terminology throughout (e.g. "I object …), and a copy was separately forwarded to LIVE. There is no clear indication that the objection is indeed from LIVE. We are not satisfied on the material before us that LIVE has a materially affected interest in the particular decision under review, and its application is accordingly dismissed for lack of standing.

138 Even if we were wrong on the view we have reached on standing in this case, it would not in our view affect the outcome in this proceeding. We consider that, based on the submissions and evidence, both EV & DEA demonstrate a 'special interest' that would have satisfied a narrower common law test for standing if that applied, based on their respective affidavit material. Moreover, most of the matters argued by EV about consistency with the SEPP(AQM) still arise generally in the Dual Gas 'conditions' application in which EV is a joined party. LIVE's lack of standing has not affected the outcome given it had shared common submissions, representation and arguments with EV.

PART 5: CHALLENGE TO MR SHIELD'S GROUND UNDER S 33B(2)(A)

Introduction

139 As we have noted, s 33B(2) of the EP Act provides objectors with only two available grounds of review. All of the objectors raised an essentially similar ground of review under s 33B(2)(b) in relation to an alleged inconsistency with the SEPP(AQM), which we deal with in the main body of our reasons.

140 Only Mr Shield raised an additional ground of review under s 33B(2)(a), which provides the following ground:

> (a) that if the works are completed in accordance with the works approval, the use of the works will result in—
>
> (i) a discharge, emission or deposit of waste to the environment;
>
> …
>
> — which will unreasonably and adversely affect the interests, whether wholly or partly of that person.

141 At a threshold level, Dual Gas challenged whether this ground was open to Mr Shield, and sought that the ground be summarily struck out on the basis

that Mr Shield had no direct "interests" that could be unreasonably or adversely affected.

Consideration of issues

142 In our opinion, the decision of the court in *Thirteenth Beach* provides direct, clear and binding authority for the view that a narrow interpretation should be given to the term "interests" in s 33B(2)(a). In addition to the distinction between the word "interests" in s 33B(1) and 33B(2)(a) that we have referred to earlier, Justice Cavanough stated as follows:

> ... in my opinion, s 33B(2)(a) should be interpreted as referring to the financial, physical or other like personal interests of the particular applicant as an individual or as a corporation, as the case may be. In my view, it is only interests of that kind which can intelligibly be said to be capable of being "unreasonably and adversely affected" by the "use" of proposed works. By contrast, one would not normally speak of an intellectual, philosophical or emotional interest in the protection of the environment as being something capable of being unreasonably and adversely affected by the use of proposed works, even works to which the person or corporation was opposed on environmental grounds. It would be at least odd to refer to such use as being apt to unreasonably and adversely affect the objects or concerns of the person or corporation.
>
> Further, the provisions of s 33B(2) as a whole indicate very strongly that intellectual, philosophical or emotional concerns about the protection of the environment cannot constitute "interests" for the purposes of s 33B(2)(a). In my view, Parliament has made exhaustive provision in paragraph (b) of s 33B(2) as to the grounds able to be relied upon by a party with no personal stake in the outcome.
>
> …
>
> Moreover, I am probably bound to adopt a confined view of "interests" in s 33B(2)(a) because of the judgment of the Full Court in *Australian Conservation Foundation v Environment Protection Appeal Board*.[71]
>
> …

143 We consider that Mr Shield's ground under s 33B(2)(a) must properly be struck out, based on this authority.

144 Although we have found Mr Shield has standing based on his intellectual interest and genuine concerns (for the purpose of s 33B(1)), the ground under s 33B(2)(a) that he seeks to rely upon requires something of a more direct financial or physical interest, or a personal legal right, to be affected over and above that of a member of the general public. Mr Shield has demonstrated no such interest at that level. Based on the authority in *Thirteenth Beach* and *ACF v EPAB*, an intellectual, philosophical or emotional interest is insufficient to establish this ground.

[71] *Thirteenth Beach* at [12]-[15]

145 Even though Mr Shield claims a physical interest, through the air he breathes and the physical impacts of climate change, that interest is neither sufficiently direct nor suffered over and above that of a member of the public generally, for the purpose of the principles established in these cases.

146 Even if we are wrong on this, and the impact of increased GHG emissions on Mr Shield was held in some way to affect a direct physical or financial interest of Mr Shield, for example given the potential economic and social impacts of climate change on him, we still consider his ground under s 33B(2)(a) would fail. In our view, Mr Shield has not demonstrated that his interests, if so characterised, are 'unreasonably and adversely' affected by the use of the DGDP works over and above that of a member of the general public. Moreover, in considering the reasonableness of an adverse impact Mr Shield's "interests", that must properly be assessed by objective reference to the standards and policies of the laws of Victoria rather than Mr Shield's own view of his personal interests that might comprise a different set of standards or beliefs[72]. The basis for such a review arises under the ground available in s 33B(2)(b) – i.e. here, consistency with the SEPP(AQM) – rather than s 33B(2)(a).

PART 6: GREENHOUSE GAS EMISSIONS - IS THE DGDP PROPOSAL 'BEST PRACTICE' IN THE MANAGEMENT OF GHG EMISSIONS?

How does the issue of 'best practice' arise in this proceeding?

147 The relevant parts of cls 18, 19 and 33 of the SEPP(AQM) provide as follows:

> **MANAGEMENT OF EMISSIONS**
>
> 18 **General Requirements**
>
> (3) Generators of emissions must: …
>
> (c) apply best practice to the management of their emissions …
>
> 19 **Management of New Sources of Emissions**
>
> (1) A generator of a new or substantially modified source of emissions must apply best practice to the management of those emissions. …
>
> **MANAGEMENT OF GLOBAL ISSUES**
>
> 33 **Management of Greenhouse Gases**
>
> (1) Generators of emissions of greenhouse gases must manage their emissions in accordance with the provisions of Clauses 18 and 19. …

[72] Direct support for this proposition is also found in *Thirteenth Beach* at [13]

148 From these clauses, it is self-evident that the requirement to apply best practice relates to the *management of emissions* from the DGDP, rather than to the DGDP itself.

149 Under Part IV of the SEPP(AQM), the following definition is set out:

> '**best practice**' means the best combination of eco-efficient techniques, methods, processes or technology used in an industry sector or activity that demonstrably minimises the environmental impact of a generator of emissions in that industry sector or activity.

150 The issue of 'best practice' arises in this proceeding in three main ways:

- the objectors contend that the relevant industry sector within which 'best practice' must be considered is electricity generation generally or, as a minimum, the combined coal and gas sectors providing base-load power. Having regard to the lower GEI available from renewable energy or CCGT natural gas generators, they argue that electricity generation using coal as a fuel source is not (and cannot be) best practice, and is thus inconsistent with the SEPP(AQM).
- the EPA considers the use of an 'E class' turbine (instead of a 'F class' turbine) in the second train of the DGDP is inconsistent with 'best practice', and has used this as a basis for limiting the capacity of the DGDP from 600 MWe to 300 MWe.
- the EPA and DEA contend that SO_2 capture is 'best practice', and the EPA has placed a condition on the works approval to this effect. Dual Gas opposes this condition, and argues that the SO_2 condition does not represent (and goes beyond) best practice in Australia. DEA also contends that the DGDP does not utilise best practice for NO_X, particulates and other air quality indicators.

151 This Part deals with only the first of these matters, but some of the discussion is relevant to our later consideration of the other matters.

Industry sector or activity

152 We disagree with EV and the other objectors that the relevant industry sector within which 'best practice' for the DGDP must be considered (having regard to the definition in the SEPP(AQM)) is "electricity generation" generally[73]. That is perhaps the 'industry' itself, rather than a relevant sector or activity within that industry.

153 Moreover, we do not consider that either the wording or intent of the definition of 'best practice' leads to a view that the relevant industry sector or activity should necessarily be given only its broadest ambit. Nor do we consider that GEI is necessarily the sole or main determinant of whether there is a 'best combination' of processes and technology that 'demonstrably minimise the environmental impact'. That would lead to an

[73] EV Closing Submissions at [54] and following.

outcome that would only ever favour the lowest possible GEI outcome, without taking into account other possible environmental outcomes or benefits. Whilst that is exactly what some of the objectors contend for[74], we find such an argument unconvincing and one-dimensional, and counter to the multi-dimensional aspects inherent in the 'best practice' definition.

154 The objectors argue that renewable energy has a lower GEI than coal-based energy, and is thus 'best practice' electricity generation. However, if one discriminates between types of electricity generation in this way, then why should renewable energy be treated as a single type of electricity generation, or why should coal combustion and coal gasification be treated homogenously? If low GEI were the only relevant 'best practice' test within the electricity industry generally, it would mean that *only* one form of electricity generation could ever be 'best practice'. Even solar energy might not be best practice compared, for example, with wind power, if the generation of electricity from solar energy had a slightly higher GEI than wind by virtue of the energy used to create the photo-voltaic cells compared with the manufacture of wind turbines. Having regard to energy demand, available supply for both base and peak loads, and energy security, it is absurd to think that 'best practice' for electricity generation could only come from such a single limited source, at least in the short term.

155 The objectors' secondary position is that it is not necessary to exhaustively define the industry sector, but that in this case it 'at least' extends to coal and natural gas – with a CCGT having a clearly lower GEI than coal or coal-produced syngas. However, we consider that this argument fails for the same reason. As between coal and gas, it would effectively mean that *only* one fuel source could ever provide 'best practice' electricity generation. Here also, whilst the DGDP has the capacity to operate on natural gas alone, and one train may do so in the initial phase, it is proposed that the DGDP will operate primarily on syngas. We should assess it on that basis.

156 Equally, we disagree with Dual Gas' contention that the industry sector should be defined as narrowly as the 'brown coal-fired electricity generation sector'[75], despite the fact that some Dual Gas and EPA witnesses supported this view. As we understand it, the novel IDG coal *gasification* processes and technology are not comparable with coal *combustion* in a conventional coal-'fired' power station such that they can easily be said to be representative of the same industry 'sector'. Moreover, if the industry sector was defined in this way, then existing generators of electricity in a coal-fired power station (such as Hazelwood) could never meet the requirement in cl 18(3)(c) of the SEPP(AQM) that they apply best practice to the management of their emissions if that, in turn, required them effectively to use a gasification process. The Dual Gas argument thus fails on a similar basis to that of the objectors, in that it leads to an assessment of

[74] e.g. Shield at Tribunal Book MSH.560.023 at para 2.1 c).
[75] Dual Gas Closing Submissions at [62]

'best practice' based on the lowest common denominator between types of electricity generation or sectors that are not directly comparable.

157 Additionally, we consider that the Dual Gas argument fails because it would lead to a 'best practice' comparison being made primarily with the existing brown coal-fired generators in the Latrobe Valley, which are all old and based on ageing technology.

158 In our view, some common sense needs to be applied to how best practice is assessed by reference to an industry sector or activity. We consider that the focus on defining an industry 'sector' in this proceeding is problematic. This is particularly the case as the definition of 'best practice' refers to an industry sector '*or activity*'. The intent of the definition of 'best practice', and its context where the term is used in cl 18 and 19 of the SEPP(AQM), is to provide a benchmark sector or activity that provides a relevant and reasonably comparable basis for assessing whether the 'best combination of eco-efficient techniques, methods, processes or technology' that 'demonstrably minimises the environmental impact' is being utilised by a new or existing generator of emissions in the management of those emissions.

159 In relation to the DGDP, in this context, we believe it is the relevant *activity* that is best suited to this comparative assessment, rather than reference to an industry sector.

160 Dual Gas suggested its proposed activity was "the integrated drying and gasification of Latrobe Valley brown coal to produce syngas; and the generation of electricity in a combined cycle gas turbine using the syngas, supplemented by the use of natural gas"[76]. We agree with the objectors that this definition of the activity is too narrow. It purports to establish the DGDP as its own unique activity, almost beyond comparison, and where there is thus no possible benchmark (other than the DGDP itself) against which best practice can be assessed. The Dual Gas attempt at a definition does however provide a starting point to how the activity or activities might be characterised.

161 The novel activity here is the gasification of coal to produce the fuel for the power generation. More conventional processes and technology are then used for electricity generation from gas and steam, albeit that the gas proposed here is predominantly syngas. There are therefore two combined activities that are relevant – coal gasification and gas turbine electricity generation.

162 Coal gasification is novel, but is not unique to the DGDP. There are other plants in Europe, the US and Japan involving the production of coal-based syngas[77]. A form of coalgas also provided the basis of 'town gas' used as a

[76] Exhibit D27

[77] Blatchford witness statement at p 8 (Table 2). We were advised there were 6 IGCC (i.e. gasification without integrated drying) plants in the world using coal as a fuel, with 4 more under construction, and a further 11 plants using other fuel sources such as petroleum or biomass. None use the IDG process.

power source last century (before natural gas became more widely available), including in Australia through smaller municipal distribution systems.

163 There is therefore a relevant activity (i.e. coal gasification generally, or the production of syngas) through which a reasonable 'best practice' assessment of the most novel aspect of the DGDP can be made, in terms of the management of emissions. We are satisfied on the evidence of Mr McIntosh (supported by Mr Blatchford) that the DGDP would comprise best practice in coal gasification, compared for example with the production of syngas in Europe that does not integrate the drying of the coal and its gasification. We accept, in particular, the evidence of Mr McIntosh who, after comparing the three main types of gasifiers currently in use, concluded that the air-blown fluidised bed gasifier proposed in the DGDP is best practice, on the basis that no other gasifier is currently available that would reduce the environmental impact of the DGDP to the same extent[78]. The IDG thus itself represents a 'best combination' process (even at this level) in the production of syngas that demonstrably minimises its environmental impacts.

164 We deal with the gas turbine generation component of the combined activity later in these reasons, in discussing the use of the 'E class' GT compared with an 'F class' GT. Similarly, for reasons set out later, we find that the combined cycle operation proposed is best practice compared to an open cycle GT.

International best practice?

165 The reference to syngas production in Europe, the US and Japan is based upon the premise that 'best practice' will often require a comparison with practices and processes outside of Victoria or Australia. We acknowledge that the IDG process proposed in the DGDP is not necessarily directly comparable with a gasification process that does not integrate drying with gasification, such as in Europe, but it provides in our view a better basis for a comparable assessment of best practice than a focus on industry sectors or other activities.

166 We note Dual Gas' contention that 'best practice' does not equate with '*international* best practice'[79]. We think this is a matter of context. In many circumstances, we consider that 'best practice' will invite a comparison with the best practices and processes used elsewhere in the world, particularly where the relevant techniques, methods, processes or technology under examination are novel or have a limited basis for

[78] McIntosh witness statement at [77]-[78]. We note that the EPA's other witness Mr Tsesmelis did not consider himself able to express a view on gasifier best practice given the limited technical material available to him.

[79] Dual Gas Closing Submissions at [75] and following. We note however that, despite the submissions of Dual Gas' counsel, the 'SKM Greenhouse Gas Assessment' prepared for Dual Gas itself makes a comparison to 'worlds best practice' - see Appendix D to works approval Application, at p 44

comparison in Australia (as here), and where the international best practice is reasonably available and achievable in Australia under Australian operating conditions. We acknowledge that there may be occasions where these circumstances do not prevail, and where 'best practice' may need to be assessed at a more localised level.

Is the DGDP best practice when considered holistically?

167 Although we think what we have outlined above is sufficient to demonstrate 'best practice' for the IDG gasifier, if considered separately as a component of the DGDP, we agree with both Dual Gas and EV that the assessment of 'best practice' requires a holistic or integrated assessment of overall best practice for the DGDP, rather than the component-by-component assessment supported by the EPA. The definition in the SEPP(AQM) refers to a '*best combination*' of eco-efficient techniques, methods, processes or technology that demonstrably minimises the environmental impact.

168 As we have also noted, it is also the case that the requirement to apply 'best practice' relates not to the DGDP itself, but to the management of GHG emissions from the DGDP.

169 The definition of 'best practice' uses the term 'eco-efficient', which is also defined in the SEPP(AQM), as follows:

> '**eco-efficient**' means producing more goods with less energy and fewer natural resources, resulting is less waste or pollution.

170 The objectors contended that the requirement for eco-efficiency effectively precluded the use of brown coal for 'best practice' electricity generation, as it sought to maximise the output based on environment performance. We note, however, that the definition uses *relative* (rather than *absolute*) terms – i.e. producing more with less, as a measure of efficiency. It does not require that goods only be produced with the lowest energy and least natural resources. Moreover, as set out earlier, we disagree with the objectors that the 'best practice' within which the concept of 'eco-efficiency' is to be considered here applies to electricity generation generally.

171 Conversely, Dual Gas contended that the IDGCC process did not produce *goods* and a requirement for eco-efficiency could not be applied at all. We agree that the definition is problematic if applied in an overly technical or legalistic manner. However, we consider a common sense and purposive approach should be applied to a definition in a statutory instrument such as a SEPP[80]. This leads us to the view that, as part of the defined term 'best practice', the defined term 'eco-efficient' can apply in similar fashion to the generation of electricity as to the production of goods. Here, the IDGCC process will generate more electricity with a lower GEI from less brown

[80] cf *Pacific Seven Pty Ltd v City of Sandringham* [192] VR 157 at 162-163 per Marks J., where a similar view was taken to the consideration and application of definitions in planning schemes.

coal. We consider that to be an eco-efficient process or technology for use in the DGDP in terms of its management of emissions.

172 This eco-efficient process or technology will result in less GHG emissions and a lower GEI from the use of the brown coal, and we consider the combination of processes and technology in the integrated IDGCC process, within the scope of the activity we have set out earlier, to be a 'best combination' that 'demonstrably minimises the environmental impact' of the use of brown coal to generate electricity.

173 To the extent the IDGCC technology within the DGDP leads to the creation of an alternative coal-based fuel source for power generation, we consider that the DGDP is also clearly 'best practice' when compared to the conventional use of coal or other IGCC technology. Although not called to give evidence, Professor Martin van der Burgt, an international gasification expert, had undertaken a holistic assessment of best practice as part of the EPA's assessment of the DGDP. He concluded that, on balance, the DGDP was best practice technology for managing emissions from the generation of power from brown coal, basing this opinion on matters including the following[81]:

- lower GHG emissions;
- the capacity of the DGDP to be CCS ready;
- the need for other alternative gasification processes to pre-dry the brown coal, rather than an integrated IDG;
- the relatively low levels of SO_2 and mercury emitted; and
- a very high efficiency in water use[82].

174 We agree with this assessment. Although not recorded by Professor van der Burgt, we think it also relevant that the process of electricity generation from the syngas utilises a CCGT (rather than an open-cycle GT), which represents best practice due to the re-use of the turbine exhaust gas.

175 It will be evident that we prefer the evidence of Mr McIntosh and the report of Professor van der Burgt to the objector's evidence provided through Dr Outhred and Professor Karoly. For the reasons outlined above, we disagree with Dr Outhred's assessment based on an industry sector comprising all generators in the NEM. We find his thesis, that a technology must be deployed and demonstrated before it can be considered best practice in the deployment of technology, is unhelpful to our deliberation in this proceeding. If that be the case, then the IDGCC technology cannot become best practice until demonstrated, but theoretically cannot be demonstrated

[81] Professor van der Burgt's partially redacted report is at Tribunal Book [EPA.010.172R-174R]. Our comments above generally endorse a summary of this material in the Dual Gas Closing Submissions at [106].

[82] We have earlier noted savings of 75% to 80% in water use, compared with a conventional coal-fired power station.

because it is not yet best practice. As we have indicated, we think a more purposive approach to the SEPP(AQM) definition of 'best practice' is warranted. Similarly, for the reasons outlined above, we do not accept Professor Karoly's assessment through which he essentially limits a consideration of 'best practice' to whether there is a low GEI, without reference to the relevant activity against which a comparable assessment can be made.

176 It follows from a proper consideration of the relevant *activity*, in context, and a holistic assessment of the DGDP as a whole, that the use of the DGDP pursuant to the works approval will represent 'best practice' for the purpose of cl 18 and 19 of the SEPP(AQM) in the management of GHG emissions. It will not therefore be inconsistent with the SEPP(AQM) on this basis.

177 The first of the objectors' grounds under s 33B(2)(b) of the EP Act therefore fails.

PART 7: GREENHOUSE GAS EMISSIONS – IS THE DGDP INCONSISTENT WITH THE AIMS, PRINCIPLES AND INTENT OF THE SEPP(AQM)?

How does the issue of inconsistency with policy arise in this proceeding?

178 The relevant parts of cls 18 and 33 of the SEPP(AQM) provide as follows:

> **MANAGEMENT OF EMISSIONS**
>
> 18 **General Requirements**
>
> (3) Generators of emissions must: …
>
> (a) manage their activities and emissions in accordance with the aims, principles and intent of the policy. …
>
> **MANAGEMENT OF GLOBAL ISSUES**
>
> 33 **Management of Greenhouse Gases**
>
> (1) Generators of emissions of greenhouse gases must manage their emissions in accordance with the provisions of Clauses 18 and 19 …

179 Although the reference in cl 18 of the SEPP(AQM) to the "aims, principles and intent of the policy" is a seemingly broad general requirement, the SEPP(AQM) contains three express clauses that respectively set these out. Clause 6 sets out "Policy Aims", cl 7 sets out "Policy Principles" and cl 8 sets out "Policy Intent". Relevant parts of these clauses are extracted below.

180 The issue of inconsistency with the aims, principles and intent of the SEPP(AQM) arise in this proceeding in three main ways:

- the objectors contend that the DGDP does not meet (and is thus inconsistent with) certain of the specified aims, principles and intent

of the SEPP(AQM), particularly the aim in cl 6(c), and the principles in cl 7 (1), (2) and (3), given the level of GHG emissions, both in absolute terms and the GEI.

- the EPA has used the principles of environmental protection in cl 7 as a basis for limiting the capacity of the DGDP from 600 MWe to 300 MWe, effectively deleting the second proposed 'E class' GT.
- the EPA and DEA contend that, without SO_2 capture, the DGDP would be inconsistent with the aims, principles and intent of the SEPP(AQM) and the related SEPP(Ambient Air Quality). DEA also contends that the exemption granted for NO_X and the absence of a condition for particulates is inconsistent with the aims, principles and intent of these policies.

181 This Part again deals with the first of these matters, but some of the discussion is relevant to our later consideration of the other matters.

182 For convenience, we have set out below some initial comments on individual aims and principles of the SEPP(AQM), but we ultimately consider that all of these matters need to be considered in an integrated manner, and in the context of cl 18(3), to reach a final decision.

'Inconsistency' with the SEPP(AQM)

183 There was some debate as to what needed to be demonstrated in order to establish 'inconsistency' with the SEPP(AQM).

184 We agree with EV that "inconsistency" is a term that should be given its ordinary meaning. Inconsistency with the SEPP(AQM) would not necessarily require a finding of direct antipathy. This is particularly the case where much of the SEPP(AQM) is qualitative. Common dictionary definitions of 'inconsistency' involved elements such as 'not in keeping, discordant, at variance, incompatible, incongruous' or 'lacking in harmony between different parts or elements'[83].

185 Equally, we agree with Dual Gas that:

- in assessing consistency with the SEPP(AQM), we are entitled to assume that conditions in the works approval will be met, and we should not assume non-compliance; and
- the words "will result in" and "will be inconsistent with" require us to be satisfied on the balance of probabilities that the use of the works will lead to the inconsistency. In order for the objectors to succeed, a positive finding is required.

[83] see EV Closing Submissions at [8] referring to Oxford and Macquarie Dictionary definitions.

186 Contrary to EV's submission, we therefore consider that the ground under s 33B(2)(b) will not be established through a demonstration of no more than a risk or possibility that there *may* be an inconsistency[84].

Preliminary issue – does cl 18(3) apply in this proceeding?

187 Dual Gas initially contended that cl 18(3) did not apply to the DGDP at all, on the basis that it applied only to existing generators. It argued that new generators had only to comply with cl 19, which is headed "Management of New Sources of Emissions", and which does not have a similar requirement.

188 We prefer the view of the EPA and EV that cl 18 does apply. Despite some overlap with cl 19, cl 18 is stated to contain 'general' requirements and is not limited only to existing generators. This is also consistent with the context of the part of the SEPP(AQM) within which both clauses appear, and with cl 33 that requires generators of GHG emissions to comply with clauses 18 *and* 19. Moreover, under the relevant objectors' ground of review under s 33B(2)(b) of the EP Act, we are concerned with the future 'use' of the works once the works are completed, and whether that use is inconsistent with the SEPP(AQM). Implicitly, if not expressly, this requires us to consider the general requirements (i.e. cl 18) under which the generator will operate, once established.

Aims of the SEPP(AQM)

189 Clause 6 of the SEPP(AQM) provides:

> 6 **Policy Aims**
> The aims of the policy are to:
>
> (a) ensure that the environmental quality objectives of the State Environment Protection Policy (Ambient Air Quality) are met;
>
> (b) drive continuous improvement in air quality and achieve the cleanest air possible having regard to the social and economic development of Victoria; and
>
> (c) support Victorian and national measures to address the enhanced greenhouse effect and depletion of the ozone layer.

190 The objectors contend that the DGDP is inconsistent with the aim in cl 6(c).

191 The SEPP(AQM) provides no assistance as to what constitutes the particular Victorian and national measures to which it refers. In a dynamic policy environment, these 'measures' are somewhat of a moveable feast, and changed even during the course of the hearing, as evidenced by the debate about a GEI standard set out above.

[84] see also *Western Region Environment Centre Inc & ACF v EPA and SITA Australia Pty Ltd* [2003] 13 VPR 221, particularly at [18]-[19]

192 It is noted that one of the aims of the policy is to *support* Victorian and national measures to address the enhanced greenhouse effect. That suggests that the SEPP(AQM) should be read as an adjunct to the achievement of these measures, rather than the measures being read down or subservient to the policy. The policy aim is also to support measures to *address the enhanced greenhouse effect* generally. It is not expressed in terms that indicate it should be read only to support measures that reduce GHG emissions in the short term.

193 We were taken by the parties through a variety of 'measures' that each thought we should have regard to in considering whether the DGDP was inconsistent with the policy aim in cl 6(c). These included, but were not limited to:

- specific Victorian regulatory measures such as those included in the SEPP(AQM), the SEPP(Ambient Air Quality), and the Protocol for Environment Management (Greenhouse Gas Emissions and Energy Efficiency in Industry);
- Victorian government policy (albeit for the then Brumby/ALP government) on climate change, including *Taking Action for Victoria's Future : Victoria's Climate Change White Paper - The Action Plan* (July 2010) and the associated *White Paper Implementation Plan* (October 2010); and *Victoria's Energy Future* (2010)[85];
- information on the what is considered to be current Victorian government policy on climate change and the energy industry, including *The Victorian Liberal National Coalition Plan for Energy and Resources*[86], and *Supporting the Development of Low Emission Brown Coal Technologies in Victoria* (a presentation by the Minister for Energy and Resources)[87];
- the Victorian *Climate Change Act 2010* (CC Act) and the Australian *Clean Energy Act 2011;*
- Australian government policy on climate change and the energy industry, including the *Clean Energy Future Package* (10 July 2011), *Securing a Clean Energy Future – the Australian Government's Climate Change Plan (2011), A Cleaner Future for Power Stations* (Interdepartmental report (November 2010)), the *National Energy Security Assessment* (2009), extracts from the *Carbon Pollution Reduction Scheme Green Paper* (June 2008) and the associated *CPRS*

[85] These and other related document are included in the Tribunal Book, particularly in Folder 3. In particular, *Securing a Clean Energy Future – the Australian Government's Climate Change Plan*, Commonwealth of Australia 2011 appears at Tribunal book EPA.050.1126
[86] Exhibit E-5
[87] Exhibit D-4

White Paper (December 2008); and specific government initiatives for CCS and the CFC[88].

- specific arrangements under the Australian government's *Energy Security Fund - Contract for Closure* program, including administrative arrangements (September 2011)[89] and *Energy Transition Plan* (25 January 2012)[90];
- the joint Commonwealth/Victorian announcement for the Carbon Net CCS project in the Latrobe Valley, under the Australian government's *CCS Flagship* program (February 2012)[91]; and
- the *Garnaut Climate Change Review*, completed for the Australian government (September 2008, and updated in June 2011).

194 Some of these documents provided to us represent discussion papers or policy, rather than direct 'measures' to address greenhouse issues, and some have arguably been superseded by later documents or do not directly apply to the DGDP proposal. Without analysing each document individually in these reasons, and despite some differences in emphasis, we believe that there are some consistent themes and trends that emerge from these documents at both an Australian and Victorian government level. These include a clear acknowledgement of climate change, the need for early action to reduce GHG emissions, and support for transition to a lower emissions energy sector which has a reduced reliance on brown coal. This includes specific measures such as the Australian government's CFC program to close up to 2,000 MW of high GEI generation capacity by 2020.

195 However, concomitant with these themes is an acknowledgement of the need to maintain energy security as part of the transition to a lower emissions energy sector, and the potential for the continued use of brown coal within a lower emissions energy sector through emerging technologies such as IDGCC, coupled with the possible use of CCS[92].

196 At a Victorian level, policies and measures include those set out in *Taking Action for Victoria's Future : Victoria's Climate Change White Paper - The Implementation Plan* (October 2010) to reduce emissions from brown coal generators whilst maintaining security of supply, and to provide support to the Latrobe Valley in this transition[93]. That implementation plan notes that transforming Victoria's energy system will take decades, and that no single form of generation will be able in the longer term to meet total energy needs[94].

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[88] some of these are included in Folder 3 of the Tribunal Book, or as exhibits, including Exhibits O-7, D-7, D-16 and D-17
[89] Exhibit D-15
[90] Exhibit D-31
[91] Exhibits D-28 and D-29
[92] see, for example, *Victoria's Energy Future* (2010) at p 16, Tribunal Book EPA.050.626
[93] Tribunal Book EPA.050.361 at p23-25
[94] ibid at p 22

197 Specific support for the DGDP is also acknowledged through the grants we referred to in the introduction to these reasons; namely the award of a conditional $100 million grant under the Australian Government's *Low Emissions Technology Demonstration Fund*, and a $50 million grant under the Victorian Government's *Energy Technology Innovation Strategy*[95].

198 We consider that programs that support lower emissions coal technology generally, within the Australian government's overall *Clean Energy Future Package*, are also clearly an example of 'measures to address the enhanced greenhouse effect' for the purpose of cl 6(c) of the aims of the SEPP(AQM). We acknowledge that other aspects of the *Clean Energy Future Package* support other aspects of the Australian government response to the enhanced greenhouse effect, such as:

- the commitment to reduce GHG emissions to 5% below 2000 levels by 2020, and to 80% below 2000 levels by 2050[96]; and
- measures to promote innovation and investment in renewable energy[97].

However, these are additional and complementary measures within an overall package (rather than competing alternatives), and none of the other measures we were taken to expressly seek to prohibit or restrict the use of lower emissions brown coal electricity generation in the future, nor the development of technology to support this.

199 Some objectors expressed a concern that approval of the DGDP would stifle opportunities for renewable energy to play a greater role in future energy supply, with the undoubted benefits for lower emissions electricity generation. From the perspective of the policy measures we have examined, we do not see that as likely. In particular:

- just as there are separate policies and measures supporting so-called 'clean coal' technology, there are other policies and measures at both a Victorian and national level separately supporting innovation and investment in renewable energy – e.g. the $10 billion to be invested through the Clean Energy Finance Corporation, and the $3.2 billion through the Australian Renewable Energy Agency[98].
- whilst there is strong support for renewable energy in policy and at a community level, Victoria's future energy security relies on a combination of fuel sources and technology to meet its energy demands. This can include renewable energy but will, for the foreseeable future, also include brown coal.

[95] Blatchford evidence, Tribunal Book at DGA.200.072
[96] *Securing a Clean Energy Future – the Australian Government's Climate Change Plan*, Commonwealth of Australia 2011 at chapter 2, Tribunal Book EPA.050.1126 at pp 14-15
[97] ibid, at Chapter 6 at pp 63-70
[98] ibid, at Chapter 6 at pp 64-66

- the Australian Energy Market Operator (AEMO) does not favour any one fuel source or technology. This is a matter for the market[99]. The carbon pricing mechanism and renewable energy target are expected, over time, to assist lower GEI electricity generators such as renewable energy to operate on an increasingly competitive basis in the market.
- renewable energy such as wind power has priority dispatch within the NEM (ahead of scheduled generation such as conventional coal-fired power stations or the DGDP), so as much renewable energy as is available and generated can be dispatched ahead of the DGDP.

200 It is therefore difficult to form a view that the use of the DGDP will be inconsistent with the aims of the SEPP(AQM) overall, if it is directly supported by some particular measures within the overall package of Victorian or national measures, and if it is not expressly discouraged or prohibited by any other measures. Indeed, the contrary appears to be the case.

201 We have referred, in the list of documents we reviewed, to the CC Act. We consider the CC Act separately, later in these reasons.

202 We have also referred, in the list of documents we reviewed, to the Protocol for Environment Management (Greenhouse Gas Emissions and Energy Efficiency in Industry) introduced by the EPA in 2002, and which was referred to us by the EPA. The PEM purports to specify steps to be taken by businesses to demonstrate compliance with the policy principles and provisions of the SEPP(AQM). For the record, we agree with EV that this document is of little relevance to this proceeding, as it is directed primarily to how business and industrial consumers of electricity can improve energy efficiency (and thus reduce GHG emissions) rather than being directed to generators of electricity.

Principles of the SEPP(AQM)

203 The relevant parts of cl 7 of the SEPP(AQM) provide:

> 7 **Policy Principles**
>
> The policy is guided by the following principles of environment protection:
>
> (1) ***Integration of Economic, Social and Environmental Considerations***
>
> (a) Sound environmental practices and procedures should be adopted as a basis for ecologically sustainable development for the benefit of all human beings and the environment.
>
> (b) This requires the effective integration of economic, social and environmental considerations in decision

[99] e.g. *Electricity Statement of Opportunities*, AEMO, 31 August 2011, and its update on the scope of generation investment in Victoria (Exhibit D-30)

making processes with the need to improve community well-being and the benefit of future generations.

(c) The measures adopted should be cost-effective and in proportion to the significance of the environmental problems being addressed.

(2) ***Precautionary Principle***

(a) If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

(b) Decision making should be guided by:

(i) a careful evaluation to avoid serious or irreversible damage to the environment wherever practicable; and

(ii) an assessment of the risk-weighted consequences of various options.

(3) ***Intergenerational Equity***

The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

…

204 There are several other principles of environmental protection set out on the SEPP(AQM) and the EP Act, but the EPA and the objectors referred primarily to these three in their submissions to the Tribunal. We therefore refer to these three specifically, but we have considered all of the principles in cl 7 as part of our integrated assessment.

Integration of Economic, Social and Environmental Considerations (the Integration Principle)

205 Insofar as the integration principle in cl 7(1) is concerned, we agree with EV that the purpose of this principle is to ensure that economic, social and environmental issues are given equal attention in decision-making – the so-called 'triple bottom line' approach to ecologically sustainable development. This means that development needs are taken into account in applying environmental objectives, and economic development must have regard to its environmental costs. As reflected in cases such as *Telstra Corporation Ltd v Hornsby Shire Council*[100], the mutual respect and reciprocity between these considerations can only be achieved through an integrated decision-making approach.

[100] (2006) 67 NSWLR 256, at 266 per Preston CJ, in part through adopting Principle 4 of the Rio Declaration on Environment and Development.

206 The application of this principle thus attempts to maximize the outcome of trade-offs between competing economic, social and environmental values. To this extent, we agree with the concession by EV that the integration principle is intended to pursue *optimal* protection of environmental values rather than *maximum* protection[101].

207 The objectors' primary contention is that the DGDP is inconsistent with this principle because of the high GHG emissions, without sufficient countervailing benefits or trade-off. Their reasons include that the DGDP is unlikely to displace electricity generation with a higher GEI, and provides no benefit in electricity generation that cannot be provided at a lower economic cost. They also argues that the economic viability of the DGDP is questionable, and some of the so-called benefits relied upon to support the DGDP (such as the CFC program and the potential for CCS) are speculative and arise independently of the DGDP.

208 As we indicate later in these reasons, we consider that the actual use of CCS technology in conjunction with the DGDP remains somewhat speculative and uncertain, and we have not given great weight to the potential GHG emission reductions or lower GEI that CCS may deliver in the longer-term in assessing whether the use of the works under the DGDP would be inconsistent with the SEPP(AQM).

209 There are, however, many other benefits of the DGDP that we have not dealt with at length in these reasons. In considering the integration principle, Dual Gas also took us to several other benefits that it argued supported a view that the DGDP would implement the aims of the SEPP(AQM). These included:

- regional-level benefits, including that the DGDP would counter-act the negative impacts of the closure of any existing powers stations, and the positive benefits of promoting new jobs and new skills in the Latrobe Valley;
- state-level benefits, including the development of technologies to better exploit Victoria's coal reserves and to better facilitate Victoria's energy security;
- national-level benefits, including responding to the Australian government's *Clean Energy Future Package*, and providing for a technology that would enable a coal-based power station to operate competitively in the NEM under a future market-based carbon pricing mechanism;
- global-level benefits, including the potential for more efficient and lower emission use of fossil fuels that are acknowledged to remain the dominant source of primary energy internationally in the medium term.

[101] following Gerry Bates, *Environmental Law in Australia* (7th ed, 2010) at p215, referenced in EV's Closing Submissions at [20].

210 These benefits are all important and we have accorded them due weight. For the record, we note that some of these benefits were analysed in a 'Triple Bottom Line' (TBL) Assessment prepared by SKM at the EPA's request. The author of the assessment was not called to give evidence, and the level of consultation, choice of indicators, and weighting applied in the assessment were challenged by EV through the evidence of Dr Dey. There will often be a debate about how adequately a TBL report deals with these issues in drawing together an *integrated* assessment of relevant economic, social and environmental indicators, and Dr Dey conceded there is always an element of subjectivity in this[102]. The SKM assessment is a helpful document for the perspective it offers, but it has its limitations and is not conclusive of the matters we must consider.

211 We note that cl 7(1)(c) of the SEPP(AQM) refers to the measures adopted in applying the integration principle should be cost-effective and proportionate to the environment problems being addressed. This ties in with the concept of proportionality in responding to the precautionary principle, discussed further below.

Precautionary Principle

212 The precautionary principle, set out in cl 7(2) of the SEPP(AQM) and in the EP Act, is an often misunderstood principle of environmental protection. In *Environment East Gippsland Inc. v VicForests*[103], Justice Osborn adopted the following conclusions about the precautionary principle, drawn from the careful analysis that Preston CJ had undertaken in *Telstra*[104]:

- the application of the precautionary principle and the concomitant need to take precautionary measures is triggered by the satisfaction of two conditions precedent or thresholds: a threat of serious or irreversible environmental damage and scientific uncertainty as to the environmental damage. These conditions or thresholds are cumulative. Once both of these conditions or thresholds are satisfied, a precautionary measure may be taken to avert the anticipated threat of environmental damage, but it should be proportionate[105];
- if there is not a threat of serious or irreversible environmental damage, or if there is no (or no considerable) scientific uncertainty, the precautionary principle will not apply[106];
- the precautionary principle is not directed to the avoidance of all risks[107].

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[102] Dey evidence, Tribunal Book EVL.600.642 at p 6.
[103] [2010] VSC 335 (Supreme Court), particularly at [188] and [203]-[211]
[104] *Telstra Corporation Ltd v Hornsby Shire Council* (2006) 67 NSWLR 256
[105] *Telstra*, at 269, following N de Sadeleer, *Environmental Principles: From Political Slogans to Legal Rules* (OUP, 2005)
[106] *Telstra*, at 271-273
[107] *Telstra*, at 275-276

- the degree of precaution appropriate will depend on the combined effect of the seriousness of the threat and the degree of uncertainty; and the margin for error may be capable of being controlled through an adaptive management approach[108];
- the precautionary principle requires a proportionate response. Measures should not go beyond what is appropriate and necessary in order to achieve the outcome in question. The application of the principle may require an assessment of risk-weighted consequences of optional courses of action. A reasonable balance must be struck between the cost burden of the measures and the benefit derived from them[109].

213 For the purposes of this proceeding, Dual Gas did not contest that there is a link between GHG emissions and climate change, that human-induced climate change gives rise to the risk of serious environmental damage, and that there is some uncertainty as to the precise extent of that risk[110]. The conditions precedent to the application of the precautionary principle to the DGDP are thus seemingly satisfied.

214 The EPA had considered that a proportionate response to this was to limit the capacity from 600 MWe to 300 MWe, so the EPA's purported application of the principle is already embodied in the decision the objectors now challenge. Given the uncertainty of the risks of climate change outlined by Professor Karoly, and the lack of certainty as to where the 'tipping point' may lie in terms of the more serious or irreversible consequences, any nett increase in GHG emissions represents a small but important incremental move towards that unknown point. We are thus not convinced that there is any great rigour in the EPA's application of the precautionary principle – i.e. why 300 MWe is better than 600 MWe (other than being half) as opposed to any other amount. Equally, the application of the precautionary principle does not require that there be zero risk arising from the use of the DGDP, or that there be zero GHG emissions. What is required is a *proportionate* response.

215 Under cross-examination, Professor Karoly conceded that a nett reduction in GHG emissions, for example if the DGDP *replaced* a higher GEI emitting generator such as Hazelwood, would be a small but important reduction in the risk[111].

216 In considering the precautionary principle, EV particularly emphasised the requirement of the decision-maker, as part of a proportionate response, to consider other options, such as:

- provision of an equivalent amount of power by the construction of a CCGT power plant with lower emissions; or

[108] *Telstra*, at 276
[109] *Telstra*, at 277
[110] Dual Gas Closing Submissions at [191]
[111] Karoly evidence, Transcript at p 1198

- refusing the application and doing nothing, avoiding emissions in the short term and enabling further development of gas turbine technology and CCS[112].

217 We agree with Dual Gas that the fact that there are less GEI intensive forms of electricity generation than the DGDP does not lead necessarily to a conclusion that the use of the DGDP will be inconsistent with the precautionary principle. Insofar as the DGDP arguably forms part of the transition to a lower emissions energy sector, it might be considered wholly consistent with the principle as a balanced and proportionate step toward this longer-term goal.

218 Both *Telstra* and *East Gippsland* emphasised that the precautionary principle is not directed to the avoidance of all risks. As quoted in *Telstra*, adherence to the adage 'when in doubt, do nothing' should not overshadow the complementary wisdom that 'there's such a thing as being too careful'[113]. Whilst the 'do nothing' option may be appealing to the objectors, we do not consider it a proper application of the precautionary principle on the facts of this case.

Intergenerational Equity

219 EV argued that the DGDP was inconsistent with the principle of intergenerational equity based primarily on two requirements identified in relation to energy production in *Taralga Landscape Guardians Inc v Minister for Planning (NSW)*[114], namely that the attainment of intergenerational equity in the mining and use of fossil fuels for energy production:

- needs to be sustainable, taking into account not only the environmental impacts of the mining and use, but also the benefits to future generations of the future exploitation and use of finite resources; and
- as far as practicable, needs to increasingly substitute energy sources that result in less GHG emissions, thereby reducing the impacts of anthropogenic climate change on future generations.

220 We are not persuaded that leaving brown coal in the ground, to be mined only if CCS is developed in the future, is the only rational and prudent response to the first of these requirements, as EV seemingly contended. We note from the policy discussion earlier in these reasons that the continued mining and use of brown coal for electricity generation is not prohibited, is broadly supported by government, and indeed is required for Victoria's energy security for at least the short to medium term.

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[112] EV Closing Submissions at [26]
[113] *Telstra*, at 276, following N de Sadeleer, *Environmental Principles: From Political Slogans to Legal Rules* (OUP, 2005)
[114] (2000) 161 LGERA 1, particularly at [73] per Preston CJ.

221 The second requirement however reflects the policy of moving to a lower emissions energy sector, and with lower GHG emissions overall. EV contends that the DGDP fails to substitute lower emission energy sources for higher emission sources, and perpetuates the continued use of brown coal in circumstances where the DGDP will compete with and displace other electricity generators, some of which already have lower emissions such as natural gas.

222 We deal with the possible displacement of natural gas later in these reasons. However, we are satisfied that the DGDP will not displace renewable energy given its priority dispatch within the NEM.

223 We note that, whilst the principle of intergenerational equity expressly refers to the present generation maintaining or enhancing environmental values for future generations, this will not necessarily require that every step towards meeting that principle must be in that one direction. Arguably, if the IDGCC technology is successfully demonstrated, albeit with a short term increase in GHG emissions arising from the use of the DGDP, the application of the IDGCC technology elsewhere in Victoria or internationally could lead ultimately to an overall reduction in GHG emissions from electricity generation in the longer term. This is essentially Dual Gas' case before us. There is thus a temporal element to the consideration of whether and when the DGDP will likely replace or displace more GEI intensive forms of electricity generation to the benefit of future generations.

Intent of the SEPP(AQM)

224 The relevant part of cl 8 of the SEPP(AQM) provides:

> 8 **Policy Intent**
>
> Emissions to the air environment will be managed so that the beneficial uses of the air environment are protected, Victoria's air quality goals and objectives are met, our air quality continues to improve and we achieve the cleanest air possible, having regard to the State's social and economic development. …

225 Having regard to the beneficial uses of the air environment in Victoria that are to be protected, the most relevant to the consideration of GHG emissions is in cl 9(1)(f) of the SEPP(AQM), namely "climate systems that are consistent with human development, the life, health and well-being of humans, and the protection of ecosystems and biodiversity".

226 The objectors contended that the GHG emissions from the DGDP would be inconsistent with this part of the stated policy intent. There was little argument to support this view, other than a reiteration of the arguments put in relation to the aims and principles of the SEPP(AQM) through the extent of GHG emissions, and we have taken it into account in our integrated assessment on this basis.

227 At a simplistic level, we find it difficult to accept that the DGDP is inconsistent with this broad policy intent in cl 8, if it is consistent with (and directly supported by) a specified aim of the policy in cl 6(c). The policy 'intent' does not imply any particular restriction on the emission of GHG, or the use of brown coal for electricity generation, nor does it seek to override any Victorian or national measures dealing with climate change. In terms of its contribution to a lower emission energy sector, the DGDP arguably assists in better managing emissions from electricity generation from brown coal and thus ensuring our air quality continues to improve.

Climate Change Act 2010

228 As noted in the introduction to these reasons, the CC Act forms part of Victorian legislation, with a preamble that includes the following:

> The Parliament of Victoria recognises on behalf of the people of Victoria the overwhelming scientific consensus that human activity is causing climate change.
>
> Climate change is a common concern of humankind and responding to climate change is a responsibility shared by all levels of government, industry, communities and the people of Victoria.
>
> …
>
> Early action to reduce greenhouse gas emissions will ease the task of long-term transition to an environmentally sustainable economy.

229 There are two parts of the CC Act that are of particular relevance in this proceeding - the GHG target in s 5, and the decision-making requirements in s 14.

230 We acknowledge that the CC Act has been under review, and note the Victorian government's advice, provided via the EPA, that "while the review is underway, it will be business as usual and the provisions of the Climate Change Act will remain operational"[115].

The GHG target

231 The relevant part of s 5 of the CC Act provides:

> 5 **Greenhouse gas emissions target**
>
> (1) The Minister must ensure that, by the year 2020, the amount of Victoria's greenhouse gas emissions is 20% below the amount of Victoria's greenhouse gas emissions for the year 2000.

232 We note that responsibility for meeting the 2020 target lies with the relevant Minister. We agree with the EPA and EV that, in considering whether the DGDP is inconsistent with the SEPP(AQM), that the target in s

[115] Media release by the Victorian Minister for Environment and Climate Change dated 22 October 2011 (Exhibit E-1)

5 of the CC Act is a relevant Victorian measure to address the enhanced greenhouse effect.

233 At the 300 MWe approved by the EPA, and operating at full capacity, the EPA indicated that the DGDP will increase Victoria's GHG emissions profile by approximately 1.25% over 2009 levels[116]. It was common ground that GHG emissions in Victoria had not materially increased in the decade following 2000, so the 2009 levels used as a comparative base by the EPA in this proceeding were relatively similar to the 2000 levels[117]. It is also common ground that the 'stationary energy sector' (and electricity generation specifically) is a primary contributor to Victoria's GHG emissions.

234 The figures suggest that, if the target in the CC Act is to be achieved, there will need to be a substantial reduction in GHG emissions over the balance of this decade. Despite this, at the hearing, the EPA was unable to indicate to us where Victoria (or the current Minister) stood in relation to strategies to achieve the 2020 target, or where approval of the DGDP specifically fitted into any such strategy. In particular, the EPA was unable to indicate why the 300 MWe it has approved would make it any more or less difficult to achieve the 2020 target. It was similarly unable to indicate why a 600 MWe proposal would make it any more or less difficult to achieve the 2020 target, other than that it produced double the GHG emissions.

235 The EPA assessment states that:

> This assessment agrees that the additional emissions from the DGDP will make it more difficult for Victoria to achieve the 2020 target, although a range of other measures could be used to achieve the reduction, including the closure of existing plant.
>
> If successful, the IDGCC technology might also result in the accelerated replacement of traditional brown coal-fired power stations with this technology, both in Victoria and other parts of the world. Such replacement of older power stations in Victoria may assist in meeting the target[118].

236 The assessment prepared as part of the works approval application states that if the IDGCC technology with a GEI of 0.73 t CO_2-e/MWh was to displace the current fleet of brown coal power stations in the Latrobe Valley, this would result in savings of approximately 24 Mt of CO_2-e emissions per annum. This is a 42% reduction over the 57 Mt CO_2-e currently estimated from these power stations[119]. As at 2009, Victoria needed to reduce its GHG emissions by approximately 28 to 30 Mt CO_2-e

[116] This is based on halving the 2.5% increase estimated from the 600 MWe plant.
[117] The Victorian Greenhouse Gas Inventory indicates Victoria's GHG emissions were approximately 118 Mt CO_2-e in 2000 and 122 Mt CO_2-e in 2009. See also the State and Territories Greenhouse Gas Inventories 2009, Department of Climate Change and Energy Efficiency, Commonwealth of Australia, 2011, Tribunal Book EPA.050.731
[118] EPA Assessment Report at p 18
[119] 'SKM Greenhouse Gas Assessment', Appendix D to works approval Application at p 50

per annum[120] to meet the GHG target in s 5 of the CC Act, so a 24 Mt CO_2-e reduction through broader application of the IDGCC technology (even without CCS) is highly significant.

237 That said, there was no evidence before us as to whether the IDGCC technology could be easily retro-fitted to existing Victorian generators nor was there evidence, even if this was possible, that this could occur within the 2020 target timeframe given the need to first demonstrate the technology through the DGDP. We can therefore treat this material only as indicative of potential benefits, rather than a likely means of meeting the GHG target by 2020. Those potential benefits nonetheless remain significant, as does the potential application of the IDGCC technology overseas.

238 The EPA's reference to plant closure is perhaps an indirect reference to the proposed Australian government initiative to close up to 2,000 MW of high GEI generation capacity by 2020 under the CFC program. Dual Gas implicitly acknowledges through its submission[121] that the capacity for the DGDP to replace or displace other more GEI intensive sources of electricity production would be consistent with the achievement of the 2020 target in the CC Act.

239 We agree that the closure of a material amount of higher GEI generation capacity appears to be the most likely mechanism through which Victoria could meet the 2020 target. The DGDP potentially assists in this process by providing replacement capacity, as discussed later in these reasons.

240 For the purpose of consideration of the objectors' contention that the use of the works for the DGDP will be inconsistent with the SEPP(AQM), we do not consider that this is made out by reference to the target in the CC Act. Whilst achieving the target in s 5 of the CC Act may well be made more difficult if the DGDP is approved without a consequential displacement of GHG emissions from other generators, this is not conclusive of any inconsistency with cl 18(3) of the SEPP(AQM) in relation to particular GHG emissions from the DGDP. The objectors adduced no evidence that the target in s 5 will not be met or cannot be met. There is no evidence to satisfy us that the 300 MWe DGDP approved by the EPA (or indeed a 600 MWe plant) will be the major contributing factor to Victoria not meeting the target such that it is inconsistent with this measure. The fact that the target *may* not be met, and this *may* be an inconsistency with one of several Victorian measures to address greenhouse issues, is not sufficient to demonstrate positively that there *will* be an inconsistency with cl 18(3) considered as a whole. Nor that there *will* be an inconsistency, for the purpose of s 33B(2)(b) of the EP Act, with the SEPP(AQM) as a whole.

[120] Based on the Victorian Greenhouse Gas Inventory figures for 2000 and 2009 provided to us.
[121] Dual Gas Closing Submissions at [193] and [132], referred to in more detail later in these reasons.

Decision-making requirements under the CC Act

241 Section 14 of the CC Act applies to certain decisions, where the decision-makers are required to have regard to climate change and GHG emissions. By reference to s 14(1) and Schedule 1 of the CC Act, the issue of a works approval by the EPA under s 19B of the EP Act is a decision to which s 14 directly applies.

242 The relevant parts of s 14 of the CC Act then provide:

> (2) A person making a decision or taking an action referred to in subsection (1) must have regard to—
>
> (a) the potential impacts of climate change relevant to the decision or action; and
>
> (b) the potential contribution to Victoria's greenhouse gas emissions of the decision or action …
>
> (3) In having regard to the potential impacts of climate change, the relevant considerations for a person making a decision or taking an action are potential—
>
> (a) biophysical impacts;
>
> (b) long and short term economic, environmental, health and other social impacts;
>
> (c) beneficial and detrimental impacts;
>
> (d) direct and indirect impacts;
>
> (e) cumulative impacts.
>
> (4) In having regard to the potential contribution to Victoria's greenhouse gas emissions, the relevant considerations for a person making a decision or taking an action are potential—
>
> (a) short and long term greenhouse gas emissions;
>
> (b) direct and indirect greenhouse gas emissions;
>
> (c) increases and decreases in greenhouse gas emissions;
>
> (d) cumulative impacts of greenhouse gas emissions.

243 We do not agree with Dual Gas that s 14 of the CC Act is only triggered in relation to the objectors' applications for review if one of their grounds under s 33B(2)(b) is first made out, and if we are then called upon to substitute a decision in place of the EPA's decision. To the extent it is relevant, we believe we can (and should) have regard to s 14 in considering the objectors' grounds of review, but within the limits of those grounds. Section 14 does not create a separate broader ground of objection. In any event, s 14 (6) of the CC Act provides that s 14 does not impose a limitation on any other decision-maker under an Act from considering climate change or GHG emissions.They remain relevant considerations.

244 It was common ground between the EPA and Dual Gas that s 14(2)(a) and (3) of the CC Act did not apply in this proceeding, on the basis that these provisions were intended to apply only to a consideration of the impacts of climate change on a proposal, rather than the impacts of a proposal on climate change. We do not need to decide here whether that view is correct. In the context of this proceeding, if s 14(3) applied, we do not believe it would raise materially different issues for our consideration that those arising under s 14(4).

245 We agree with the EPA that the factors in s 14(4)(a),(b) and (c) should be interpreted widely. For example, the reference to short and long term GHG emissions, and to direct and indirect GHG emissions, allows for a balanced consideration of both the GHG emissions from the DGDP itself as well as the potential for lower GEI and reduced GHG emissions in the power sector if the IDGCC technology is successfully demonstrated and adopted elsewhere. This is consistent with the operation of the principles of environmental protection.

246 The EPA highlighted that s 14(4)(a),(b) and (c) refer to the level of GHG emissions, and only s 14(4)(d) refers to the *impacts* of GHG emissions, in requiring a consideration of cumulative impacts. We agree with the EPA that the difficulty in assessing cumulative impact is often that no single proposal or event can be said, by itself, to irretrievably or significantly harm a segment of the environment. But arguing that a single proposal or event is immaterial because it is a tiny percentage in terms of its impact fails to acknowledge cumulative and incremental impacts[122]. This is consistent with the evidence of Professor Karoly about the level of uncertainty of where the climate change 'tipping point' may lie. In the case of the DGDP, the cumulative impact on Victoria's GHG emissions profile is of potential significance, and a relevant factor to which we have had regard.

Integrated assessment of aims, principles and intent of SEPP(AQM)

247 Given that cl 18(3) of the SEPP(AQM) refers to the "aims, principles and intent" of the policy collectively, and s 33B(2)(b) refers to inconsistency with the policy generally, we consider that these matters should all ultimately be considered holistically in order to determine whether there is an inconsistency with the SEPP(AQM) as a whole. This is consistent with the view of the Supreme Court in *Geelong Community for Good Life Inc. v EPA & Anor*[123], where it was stated that the various 'principles of environmental protection' in the EP Act (which are effectively mirrored in cl 7 of the SEPP(AQM)) should be balanced together in reaching a decision.

[122] adopting the comments in *BT Goldsmith Planning Services Pty Ltd v Blacktown CC* [2005] NSWLEC 210 at [90] per Pain J, and also her Honour's follow-up comments in *Gray v Minister for Planning (NSW)* [2006] NSWLEC 720, particularly at [122] and [138]
[123] [2008] VSC 185 at [34] per Cavanough J.

248 The task of undertaking an integrated assessment is made harder here because the SEPP(AQM) contains many provisions that are qualitative rather than quantitative. As we noted in our introduction, some of the relevant policies and measures debated before us are themselves in a dynamic state of change or political uncertainty. In such an environment, we do not consider it appropriate for the objectors to simply point to certain individual policies or measures relevant to the operation of the SEPP(AQM), and to pull them apart individually to expose the occasional anomaly or variant as evidence of overall inconsistency. Inconsistency with the SEPP(AQM) must be objectively assessed by simply weighing up all of the various factors, and reaching a balanced view as to whether the use of the DGDP "will be inconsistent" with the SEPP(AQM).

249 In weighing up the various factors that contribute to this balance, we have ultimately decided that the objectors have failed to make out their case that the use of the works for the DGDP will result in GHG emissions that will be inconsistent with the SEPP(AQM). This will be reasonably evident from the comments we have made on individual aspects of the aims, principles and intent of the SEPP(AQM).

250 The essence of the objectors case appears to us to be fundamentally based on the premise that the GHG emissions that the DGDP will generate, and the corresponding GEI, do not support the aims and intent of the policy to address the enhanced greenhouse effect and/or do not have sufficient countervailing economic, social or environmental benefits by way of a trade-off to justify approval by reference to the principles of environmental protection. We believe the objectors' case fails for a number of reasons.

251 At a threshold level, cl 18(3)(a) of the SEPP(AQM) provides that generators of emissions must '*manage* their activities and emissions in accordance with the aims, principles and intent of the policy'. In cl 18(1), the 'management of emissions' is given a specific meaning, including avoiding and minimising emissions, and the assessment, monitoring, control etc. of emissions. The aims, principles and intent of the policy thus provide a guiding basis for the management of emissions, rather than setting out any prescriptive control. The SEPP(AQM) does not itself provide a prohibition on GHG emissions, nor any particular limit or design criteria for GHG emissions. The fact that the DGDP will emit GHG, or have any particular level of GEI, does not of itself mean that the emission will be inconsistent with cl 18(3), or the SEPP(AQM) generally. At a broad level, there is no evidence that Dual Gas will not properly *manage* its activities and emissions, and we are entitled to assume that it will comply with any conditions on its works approval or a discharge licence. The EPA implicitly agrees with this, having at least seen fit to issue a works approval for the DGDP at 300 MWe.

252 The stated aim of the SEPP(AQM) is 'to support … measures to address the enhanced greenhouse effect'. The aim is not to prohibit GHG emissions *per se*, but to deal with the issue through a variety of measures. Within the

energy sector, the implicit aim is to transition to lower emissions electricity generation. We have already noted our opinion that the DGDP is consistent with (and directly supported by) some Australia and Victorian government measures to address the enhanced greenhouse effect and to facilitate this transition. There is no particular 'measure' that the objectors can point to within the broader Australian or Victorian regulatory or policy framework (for the purpose of cl 6(c) of the SEPP(AQM)) with which the DGDP will be directly inconsistent, and we consider there are none with which it is indirectly or qualitatively inconsistent. The policies and measures that support renewable energy are not inconsistent with policies and measures that support greater energy efficiency and innovative technology in the continued use of brown coal. They are all part of a package of complementary measures.

253 Although we agree with EV that direct antipathy is not required to prove inconsistency, there is nothing in these measures or broader policy, when considered holistically, that suggests that the DGDP is more generally 'not in keeping' with, or 'at variance' with the SEPP(AQM) on this basis.

254 More particularly, it will be evident from the discussion in the reasons that there are a range of factors, both positive and negative, short term and long term, direct and indirect, and quantitative and qualitative, that affect an integrated assessment of whether the use of the DGDP will be inconsistent with the management of emissions in accordance with the aims, principles and intent of the SEPP(AQM) and/or inconsistent with the SEPP(AQM) generally. These factors arise, amongst other things, from a consideration of the principles of environmental protection, the intent of the policy, and s 14(4) of the CC Act.

255 To this end, in dealing with the objectors' contention of inconsistency, the fact that the economic viability of the DGDP is questionable, or the fact that the DGDP may not immediately displace or replace electricity generation in the NEM with a higher GEI, are counter-balanced by other longer-term benefits if the IDGCC technology is successfully demonstrated, as well as the other direct and indirect benefits we have outlined above.

256 We agree with the objectors that two of the benefits relied upon by Dual Gas, being the CFC program and the potential for CCS, are somewhat speculative and perhaps not deserving of the importance that Dual Gas attached to them, unless linked more clearly to the DGDP. This does not detract from the fact that they are nonetheless potential benefits, and they are certainly not indicators of inconsistency with the SEPP(AQM). There is evidence that additional generating capacity will be required to provide security of capacity to facilitate the CFC program, and the DGDP would be well placed to provide this. There is also evidence that the IDGCC process lends itself well to future CCS readiness, more-so than conventional coal-fired power stations. The DGDP does not become inconsistent with the SEPP(AQM) even if those two factors are removed from the consideration. We deal with this material later in these reasons.

257 It follows from an objective assessment of the aims, principles and intent of the SEPP(AQM), that we find that the use of the DGDP pursuant to the works approval will not be inconsistent with cl 18(3)(a) of the SEPP(AQM), and will not therefore be inconsistent with the SEPP(AQM) more generally on this basis.

258 The second of the objectors' grounds under s 33B(2)(b) of the EP Act therefore fails.

259 The consequence of the failure of both of the objectors' main grounds under s 33B(2)(b), along with the failure of the additional DEA grounds discussed later in these reasons, is that all of the objectors' applications for review are dismissed. This means that the decision of the EPA to issue a works approval is effectively affirmed, subject to any variation of that works approval arising under the Dual Gas application to review conditions.

PART 8: SHOULD THE DGDP BE APPROVED AT 300 MW OR 600 MW?

Introduction

260 The EPA has approved the DGDP with the capacity reduced from 600 MWe to 300 MWe, primarily for the following reasons[124]:

- the initial use of an 'E class' GT in the second train of the DGDP with natural gas is inconsistent with 'best practice'. Delaying the second train allows for the possibility that a 'F class' GT may be available by the time the second gasifier is installed ;
- a 300 MWe power station is sufficient to demonstrate the IDGCC technology at a commercial level;
- approval of a single train confers greater flexibility on the EPA to reconsider the second train in light of the legislation, policy, and best practice in force at the time Dual Gas seeks to proceed with the second train;
- it would be contrary to the advancement of principles of environmental protection to allow a greater capacity at this stage. Approval of a single train is the appropriate precautionary approach, allowing demonstration of the technology at a scale consistent with its use in future plants, and minimising the risk that two 'E class' GTs could operate on natural gas if the technology fails.

261 Dual Gas contests the condition in the works approval that limits the capacity of the DGDP to 300 MWe. The arguments it uses to support this include the following[125]:

[124] EPA works approval Assessment at p 22-23
[125] see Dual Gas Opening Submissions at [77]-[82]

- the economies of scale from a larger plant would reduce the cost of capacity installed;
- the conventional 2 x 1 modular configuration proposed for the 600 MWe proposal (i.e. two gas turbines and one steam turbine) is more efficient and reliable than a 1 x 1 configuration the EPA has approved, and it may not be feasible to convert the 300 MWe to a 600 MWe plant at a later stage if two different classes of GTs are used;
- the environmental performance of a 600 MWe plant would be superior, albeit to a modest degree, in terms of rates of emission of air pollutants;
- the potential to displace or replace other higher GEI sources of electricity generation would be curtailed;
- the ability to redress anticipated shortfall in the NEM would be curtailed, including the ability to replace higher GEI capacity that might be closed under the Australian government's Contract for Closure (CFC) program; and
- a 600 MWe power station is still small, by world standards. A 600 MWe power station, using a conventional 2 x 1 configuration, would better commercially demonstrate the IDGCC technology at a more appropriate scale and configuration for its likely future use.

262 As a joined party, EV does not support the EPA decision, and considers that the EPA has misapplied the principles of environmental protection. In similar fashion to its own application for review about the 300 MWe already approved, it essentially argues that the 600 MWe proposal cannot be supported because of the high GHG emissions, and the lack of countervailing economic, social or environmental benefits by way of a trade-off to justify approval. It contends:

- there is no demonstrated need for the additional generating capacity that the DGDP will provide, and the economic viability of the DGDP is questionable, without the significant government subsidies;
- the DGDP is unlikely to displace electricity generation in the NEM with higher GHG emissions or a higher GEI, and will more likely displace electricity generation with lower GHG emissions and a lower GEI provided at a lower economic cost;
- two of the principal benefits relied upon by Dual Gas, being the CFC program and the potential for CCS arise independently of the DGDP and are not sufficiently linked to the DGDP approval to provide a trade-off for the increased GHG emissions that the DGDP will generate.

263 EV's arguments relate similarly to both the 300 MWe and 600 MWe proposals. For convenience, we have discussed these issues in this part of our reasons, because much of the discussion arises from the evidence of Dr

Washusen and Mr Walton called respectively by the EPA and Dual Gas. We have however have considered this material, insofar as it is relevant, in reaching our decision in relation to the objectors' applications for review.

264 These varying arguments are considered in grouped themes, below.

Extent of Tribunal discretion

265 We consider that our discretion is broader in assessing whether the DGDP should be approved at 600 MWe rather than 300 MWe, as opposed to our consideration of the objectors' applications for review. In particular:

- we are not constrained by the grounds in s 33B(2)(b) of the EP Act, where we were limited to assessing whether the use of the DGDP at 300 MWe is *inconsistent* with the SEPP(AQM). We are more clearly standing in the shoes of the decision maker in deciding what is the 'correct or preferable' decision[126] having regard to the particular condition under review. In this case, the condition under review (i.e. 600 MWe vs 300 MWe) is of very broad ambit, and so too are the range of issues we must therefore consider;
- we are required under s 37A of the EP Act to give effect to the SEPP(AQM); and
- although we disagreed with Dual Gas that s 14(4) of the CC Act did not apply to the objectors' applications for review, there can be no doubt that s 14(4) does apply to the review of this condition - as Dual Gas conceded.

Viability of the DGDP

266 A great deal of evidence was debated before us in relation to the viability of the DGDP, particularly through the evidence of Mr Walton and Dr Washusen.

267 Mr Walton focussed on the short run marginal cost (SRMC) of operating the DGDP under different scenarios. It is fair to reflect that even Mr Walton's evidence indicates that the DGDP is itself a marginal venture in being able to competitively dispatch electricity to the NEM. It relies on the carbon pricing mechanism to become more competitive with conventional coal-fired power stations, and an increasing price for natural gas in order to become more competitive with natural gas CCGT power stations.

268 The evidence of Dr Washusen suggested that it is better to focus on the levelised cost of electricity (LCoE), equivalent to the long run marginal cost. The DGDP will only be economically viable if it can generate enough revenue over its lifetime to recover its costs, including its capital costs and financing costs, rather than just covering its SRMC[127]. Although Dual Gas

[126] see *Macedon Ranges SC v Romsey Hotel Pty Ltd* [2008] VSCA 45 at [37] (Court of Appeal), following *McDonald v Guardianship & Administration Board* [1993] 1 VR 521 at 528 (Full Court)
[127] Washusen evidence, Transcript at p1305

has not been prepared to divulge the likely capital cost of the DGDP, it has been stated in the works approval application material as being 'above $750 million'[128]. Under various modelled scenarios, Dr Washusen has forecast that the DGDP cannot produce electricity at a LoCE lower than the expected long-term average wholesale price of electricity, and the DGDP would have a higher LoCE than a new natural gas CCGT power station unless there was a significant increase in the cost of natural gas beyond current projections[129]. Indeed, Mr Walton conceded that no new base load electricity generation is currently commercially viable, given the very low SRMC of existing coal-fired generators, and the DGDP was reliant on government funding grants to assist its viability at either 300 MWe or 600 MWe.

269 We agree with Dual Gas that it is not ultimately the role of the Tribunal to determine the attractiveness of the DGDP to potential investors, and that our focus should be on the DGDP's environmental performance balanced with broader economic and social outcomes for Victoria – i.e. in line with the integration principle. As Dr Washusen conceded, the underlying viability of the project is properly a role for the market. There may be other factors, such as the potential licensing revenues from a successful demonstration of the IDGCC technology at a commercial scale, which may be relevant to a decision to proceed. Under such a scenario, the capital costs of the DGDP may be regarded as something more akin to 'venture capital' risked in pursuit of (and ultimately to be funded by) future sales or use of the IDGCC technology beyond the DGDP *demonstration*. If this be the case, then the SMRC may be a relevant indicator for the viability of the DGDP if it at least covers its operating costs once constructed.

270 We agree with the EPA and EV that Dual Gas has made the viability of the DGDP a relevant issue in the consideration of environmental performance, by relying on the potential economic benefits of the DGDP as a factor relevant to the trade-off between economic, social and environmental factors. That said:

- based on Dr Washusen's evidence, the difference in capacity between 600 MWe and 300 MWe is not really determinative to whether the DGDP is viable. Without government subsidies and/or a significant increase in the carbon price over time, the DGDP is of questionable viability at *either* level of capacity.
- the debate between Dr Washusen and Mr Walton about viability seemed to us to be more about the *financial* viability (or 'bankability') of the DGDP, which is properly a matter for the market, rather than

[128] In its Triple Bottom Line report on behalf of Dual Gas, SKM had indicated an estimated project cost of $1.2 billion, and we understand Dr Washusen used this figure in his modelling. Mr Walton's evidence was that the capital cost of a 600 MWe DGDP would be more in the order of, but materially below, $1.74 billion - see Walton powerpoint presentation at p 15; Transcript at p 1240 Lines 1-17 and p 2413 Line 21

[129] Washusen evidence, Tribunal Book EPA 100.301, at [196]-[198]

the broader *economic* benefits or factors that may be relevant to the application of the integration principle.

271 Ultimately, we do not think that the issues concerning the financial viability of the DGDP are sufficient to justify refusal of the works approval or a reduction in capacity from the 600 MWe proposed.

272 Whilst not necessarily agreeing with all of the figures presented by Dual Gas, we agree with Mr Walton that there are likely economies of scale (in both capital and operating costs), and consequential reductions in both the SRMC and LoCE, if the DGDP were to operate at 600 MWe rather than 300 MWe.

273 We also accept the indications from Mr Walton and Mr Blatchford that the conventional 2 x 1 modular configuration proposed for the 600 MWe proposal will be more efficient and reliable than the configuration approved by the EPA for a 300 MWe power station, and it may not be feasible to convert the 300 MWe to a 600 MWe plant at a later stage if two different classes of GTs are used. This could lead effectively to there being two 300 MWe power stations side-by-side, rather than an integrated 600 MWe DGDP[130].

Is there a need for the generating capacity that the DGDP will provide?

274 One of the benefits of the DGDP claimed by Dual Gas is that it will address an anticipated shortfall in electricity generation capacity in the NEM, and that the reduction in capacity to 300 MWe will reduce the ability of the DGDP to address this shortfall[131]. On the evidence, we do not consider that this claim wholly stands up to close scrutiny. We accept the evidence of Dr Washusen that:

- there is a projected increase in demand for electricity in Victoria in the short term, but only in the order of 96 MWe in 2014-15 and 214 MWe in 2016-17. This shortfall is likely to be met by additional wind generation and transmission line upgrades.[132]
- future shortfalls in capacity due to increasing demand over time will likely create a need for more *peak load* power to respond to short, severe fluctuations in demand, rather than the steady *base load* power to be provided by the DGDP[133]. There are already projects planned or under construction to provide additional peak power capacity over time, for example through CCGT power stations using natural gas.
- in Victoria, the demand for base load power has remained relatively stable for the last decade in the range 4,800 MWe to 5,100 MWe[134].

[130] Walton evidence, Transcript at p 1422
[131] Dual Gas Opening Submissions at [82]
[132] Washusen evidence at [199]-[201]
[133] Washusen evidence at [150]-[152]
[134] Washusen evidence at [152] and [204]

275 Given the very large base load capacity already existing in the Latrobe Valley, there will likely only be a demonstrated 'need' for the additional generating capacity in the short term if it is required to cover any capacity shortfall in base load power that might arise if some existing base load capacity is closed. This may occur, for example, under the CFC program proposal to retire up to 2,000 MWe of high GEI coal-fired capacity by 2020. Indeed, this was Dr Washusen's conclusion[135], recognising that such replacement of capacity was capable of being provided through the DGDP. We deal with this issue further, below.

Potential for the DGDP to link to a demonstration of CCS

276 Dual Gas placed some emphasis on the potential of the DGDP to facilitate the implementation of future carbon capture and storage (CCS) in Victoria, although it carefully submitted that the merits of the DGDP did not rest on this. CCS is well-supported in Australian and Victorian policy documents[136] as a measure that may provide major benefits in reducing GHG emissions and responding to climate change through the lower emission use of coal.

277 The relevant experts were agreed that the IDGCC process is well suited to the implementation of CCS[137] - more-so than for a coal-fired power station. It is easier to capture CO_2-e emissions using gasification technology as compared with thermal or post-combustion technology. The Latrobe Valley is also well suited to CCS, being a brown coal generation hub close to geological sites within the Gippsland basin that appear well-suited to CO_2 storage.

278 Moreover, the benefits of CCS, if ultimately used in conjunction with the DGDP, are significant. The GEI 'as generated' for the modelled DGDP Cases 1, 2 and 3 would be further reduced by up to two-thirds, falling from a GEI of between 0.73 – 0.78 t CO_2-e/MWh to a GEI of around 0.26 t CO_2-e/MWh[138].

279 In the early phase of the hearing, we were informed that the Victorian government was supporting the CarbonNet project for funding under the Australian government's *CCS Flagship* program, and that the DGDP formed part of that project. Mr McIntosh indicated that the DGDP formed an important part of the CarbonNet initiative given its relative size within the project, and that it offered significantly better prospects for CCS than coal-fired power stations[139].

280 On 10 February 2012, we were informed that the Australian and Victorian governments had earlier that day announced that CarbonNet had been selected for funding under the *CCS Flagship* program and would receive

[135] Washusen evidence at [153] and [205]
[136] *e.g. Climate Change White Paper (The Implementation Plan)*, Victoria, at p 22-23 (Tribunal Book EPA.050.384-385)
[137] Blatchford at Transcript p 742, Tsesmelis at Transcript p 967, McIntosh at Transcript p1069
[138] Blatchford evidence at Transcript p 727, with the basis for calculation explained at Transcript p 742.
[139] McIntosh evidence at Transcript pp 1069-1070

combined funding of $100 million ($70 million from the Commonwealth and $30 million from Victoria) to support feasibility work as part of the $1 billion CarbonNet project to demonstrate CCS technology[140]. The announcement did not seek to pre-empt any approval of the DGDP as part of the CarbonNet project, noting that the DGDP works approval application was still before this Tribunal.

281 We consider that the DGDP does have potential to contribute ultimately to a demonstration of CCS technology, and as part of the CarbonNet project. The potential future benefits are a relevant consideration in determining whether the DGDP meets the aims, principles and intent of the SEPP(AQM). However, we consider that the realisation of that potential is still sufficiently uncertain, in terms of the technology being successfully demonstrated and/or the timing of its deployment, such that it cannot be relied upon as a benefit deserving of significant weight in our deliberations. It is certainly not determinative in the debate as to whether the capacity should be allowed at 300 MWe or 600 MWe. Dr Washusen was not aware of any power station currently using CCS, and considered the CCS technology may not be commercially or technically feasible for use for up to 20 years[141].

282 We believe, as Dual Gas rightly conceded, that the environmental performance of the DGDP needs to be assessed as it now proposed, without reliance on CCS.

283 Having said that, the EPA has proposed a condition in the works approval (not opposed by Dual Gas) that the DGDP be 'CCS ready'. We do not take this to mean that the DGDP be constructed on the basis that it can operate with CCS technology immediately. We prefer the view that CCS readiness entails, as the EPA condition provides, that the works make provision for the future installation of carbon capture equipment. Dual Gas referred us to the proposed international definition of 'CCS ready'[142], which is to similar effect but contains additional elements, including that a 'CCS ready' plant that will capture CO_2:

- is sited so that the transport and storage of captured volumes is technically feasible;
- is technically capable of being retrofitted for CO_2 capture at an acceptable cost when required; and
- has adequate space allowance for equipment, and connection to a future CO_2 pipeline or other transportation system.

[140] Media releases. Exhibits D-28 and D-29
[141] Washusen evidence at Transcript p 1457-1459. See also the International Energy Agency Clean Energy Progress Report, April 2011, quoted by Dr Outhred in his witness statement at Tribunal Book EVL.300.614-616
[142] *CCS Ready Policy: Considerations and Recommended Practices for Policy Makers*, Global CCS Institute, 17 February 2010 (Exhibit D-24) at p 4.

284 We are satisfied that the 'CCS ready' condition initially imposed by the EPA is appropriate, and that the use of the works for the DGDP can comply with such a condition. At the conclusion of the hearing, the EPA and Dual Gas agreed to expand that condition, and we have amended the condition to include the substance of what was agreed, which now appears in condition 3.2 (c). This includes a demonstration that there is sufficient space for future CCS equipment, which is consistent with the definition above.

285 The EPA and Dual Gas also proposed further wording on the extent of the footprint of the CCS equipment, but were unable to agree on the percentage of carbon monoxide or CO_2 in the syngas stream, or from the plant generally, that the footprint be designed to capture. There was no evidence or material debate before us on this to facilitate a resolution, and we note that the CCS condition was not formally the subject of the application for review. Given the uncertainties surrounding future CCS, we have declined to add the additional wording promoted by either party on this issue, and we leave it to further negotiation between them at a more appropriate time.

'E class' vs. 'F class' gas turbine

286 The DGDP proposes to use an 'E class' GT in each train. The EPA considers the use of an 'E class' turbine (instead of an 'F class' turbine) in the second train of the DGDP is inconsistent with 'best practice', and has used this as a basis for limiting the capacity of the DGDP from 600 MWe to 300 MWe.

287 We find the EPA approach unconvincing. The EPA's assessment report for the DGDP acknowledges:

> The operation of an E class gas turbine with syngas is best practice because no higher grade turbine is currently available from manufacturers/suppliers for use with this fuel[143].

288 This acknowledgement, clearly supported by the evidence of Mr McIntosh who was called on behalf of the EPA[144], should alone be enough to dispose of the matter. The DGDP, as proposed at 600 MWe, envisages two similar trains, both ultimately operating predominantly on syngas. Indeed, the EPA has supported the use of an 'E class' GT as best practice for the first 300 MWe train it has approved in the works approval. It acknowledges there is no 'F class' GT available for use with syngas for the DGDP. It is seemingly inconsistent with that assessment to not support an 'E class' GT for the second train intended ultimately to operate on the same basis.

289 It is common ground that an 'F class' GT is considered best practice for a CCGT operating solely on natural gas, and is more efficient than an 'E class' GT using natural gas. From the evidence of Mr Tsesmelis and Mr Blatchford, we understand that the efficiency gain is in the order of 12%[145].

[143] EPA Assessment Report at p 22
[144] McIntosh witness statement at [79]-[80].
[145] e.g. Blatchford, powerpoint presentation to Tribunal at p 36

290 The EPA therefore contends that the use of an 'E class' GT in the second train of the DGDP is inconsistent with 'best practice', as that second train will operate on natural gas alone in the first stage of the DGDP (until the second IDG gasifier is installed), and because the second train will continue to operate solely on natural gas if the 'demonstration' of the IDGCC technology fails. The EPA further contends that delaying the second train of the DGDP (i.e. reducing the capacity of the DGDP from 600 MWe to 300 MWe) allows the possibility that an 'F class' GT might be available by the time the second gasifier is installed, and minimises the risk that two 'E class' turbines could operate on natural gas in the event that the IDGCC technology fails.

291 Whether this is an appropriate 'precautionary' approach is discussed below. However, the outcome of that debate does not affect whether or not an 'E class' GT is currently 'best practice' for a GT intended to operate with syngas.

292 In our opinion, the EPA appears to confuse these two issues. We do not consider that the application of the precautionary principle, if it applies, would ordinarily lead to a proposal (or part of a proposal) being deferred when existing 'best practice' and its impacts are well understood, and just because a *better* practice may become available in the future. If that be the case, then few projects would ever proceed, as there will almost always be some improved process or technology in the pipeline. Alternatively, if that be the case, the EPA should have acted consistently and refused the first train (and the whole project) on a similar basis. Either an 'E class' GT is best practice for use with syngas or it isn't, and either the risk of an 'E class GT operating on natural gas alone is acceptable or it isn't. The EPA appears to be having a bet each way.

293 We accept the evidence of Mr McIntosh in relation to the potential future development of 'F class' GT technology. Given the limited existing use of syngas, there has been little recent advancement in technology for GTs using syngas, as opposed to GTs solely using natural gas. One 'F class' GT operates with syngas in Puertollano in Spain, but its use is not directly comparable here[146]. Moreover, Australia operates on a 50 Hz frequency cycle GT, as opposed to 60 Hz in the major overseas markets, which further limits the market for future technology advancement. Although Mr McIntosh initially indicated an 'F class' GT *may* be available for use with syngas in the 50 Hz market within 5 years, he conceded under cross-examination that this may not occur even within 10 years[147]. There is a bit of a 'chicken and egg' dilemma, in that technological advancement leading to 'F class' GTs becoming commonly available for use with syngas in the

[146] We understand the Puertollano plant derives syngas from a gasification process that does not include IDG, and the GT operates with a different frequency cycle. There was evidence that this is the only IGCC plant using an 'F class' GT, which has operated since 1998 (Tsesmelis witness statement at p17), but that this GT has been beset by numerous problems (Blatchford evidence at Transcript p 732-3)
[147] Trancript at p 1064

50 Hz market may await further demand for IDG projects in that market which, in turn, may await a successful demonstration of projects such as the DGDP. Mr McIntosh advised us that he was satisfied an 'E class' GT is current best practice.

294 We also accept the evidence of Mr Walton that Dual Gas has attempted, unsuccessfully, to source an 'F class' GT for the DGDP, but no manufacturer can provide a sufficient guarantee for its compatible use with the syngas to be derived from the IDG process.

295 The fact that the second train will operate on natural gas alone in the initial phase (until the second gasifier is installed) does not detract from the fact that this GT is intended to operate predominantly on syngas for most of its operational life. The evidence is that there is currently no 'F class' GT that can do this.

296 As we have indicated earlier, we agree with Dual Gas that the assessment of 'best practice' (and the reference in the definition to a 'best combination' of eco-efficient techniques, methods etc) requires a holistic or integrated assessment of overall best practice for the DGDP rather than a component-by-component assessment. We accept the evidence that a conventional, efficient and cost-effective configuration of the DGDP is to have both GTs feeding a single steam turbine, and that this reasonably represents a 'best practice' combination. There is no guarantee that a deferred second train 'F class' GT (if one existed) would operate compatibly with a first train 'E class' GT feeding the same steam turbine. We do not consider it would be 'best practice' to require Dual Gas to effectively split or change the proposed configuration.

297 The EPA's concern also seems to be based, in part, on an assumed risk that the IDGCC technology will fail, leading to the second train operating solely on natural gas with a less-efficient 'E class' GT for its whole operational life. This same level of risk applies to the first train but, in contrast to its decision with the first train, the EPA appears to find this risk acceptable. However, the evidence from all of the relevant technical experts is that the demonstration will most likely succeed. Given this, we must consider the DGDP as proposed, and we consider it appropriate to consider 'best practice' on the basis that the second train will predominantly use syngas.

298 The EPA also expressed a concern that Dual Gas may simply make a commercial decision to run the second train indefinitely on natural gas even if the IDGCC is successfully demonstrated. This is not what is proposed, and we think it appropriate to assess the proposal actually before us. However, the EPA's contention also makes little commercial sense. Given the markedly cheaper fuel source (i.e. syngas derived from coal, rather than natural gas), and the opportunity for the DGDP to ultimately provide competitive base load power through the IDGCC process, as well as the opportunity to sell the IDGCC technology worldwide if successfully demonstrated at a reasonably large scale (i.e. the 600 MWe proposed), there

is little commercial basis for Dual Gas to run the second train GT indefinitely on natural gas. If Dual Gas simply wanted to operate a 300 MWe or a 600 MWe natural gas power station, it would be cheaper, easier, and more profitable to do so as a stand-alone operation.

Principles of environmental protection

299 The EPA contends that the application of the precautionary principle supports its decision, as "the appropriate precautionary response"[148], to limit the capacity of the DGDP from 600 MWe to 300 MWe, to defer the second train for future reconsideration, and to minimise the risk that two 'E class' GTs could operate indefinitely on natural gas if the IDGCC technology demonstration is unsuccessful.

300 In our opinion, the deferment of the second train to allow for the potential for an 'F class' GT in the future is neither precautionary (in the sense that it appears to adopt a 'do nothing' approach to the second train) nor proportionate. Whilst this might be argued to reduce the margin for error through an adaptive response[149], by staging the works, an 'F class' GT with syngas, if available for the second train, would still lead to substantive GHG emissions from a 600 MWe power station if ultimately approved in a second phase, with only a relatively marginal efficiency gain. Moreover, on Mr Walton's evidence, there is no certainty that two different classes of GT would be feasible or work efficiently as part of a 2 x 1 configuration feeding a common steam turbine. The effect of the adaptive management proposed is therefore questionable.

301 We consider the debate about an 'E class' or 'F class' GT is a distraction from the more determinative issue in relation to the precautionary principle; namely whether the reduction in capacity from 600 MWe to 300 MWe is an appropriate and proportionate response.

302 Both Dual Gas and the objectors, at opposite ends of the spectrum, contend that the EPA approach is not a correct or proportionate response to the seriousness of the threat and the degree of uncertainty, nor a risk-weighted or balanced response having regard to the costs and benefits to be derived. The EPA approach was described to us variously as being 'feeble', 'curious' and 'sitting on the fence'. Whilst avoiding similar pejorative language, we find the EPA's approach unconvincing. The EPA impressed upon us on many occasions the significance of overall GHG emissions from the DGDP, if approved at 600 MWe rather than 300 MWe. However, if the 'serious threat' triggering the application of the precautionary principle is high GHG emissions, with some uncertainty as to the climate change consequences, we consider a simple halving of capacity and a halving of GHG emissions to be an unsophisticated response.

[148] EPA works approval assessment at p 23
[149] Cf *Telstra Corporation Ltd v Hornsby Shire Council* (2006) 67 NSWLR 256 at 276, discussed earlier

303 Despite being pressed on the issue, the EPA was unable to provide any real answer as to why a condition limiting capacity to 300 MWe provided any more meaningful or proportionate a response than, say, a condition limiting capacity to 200 MWe or 400 MWe or some other capacity sufficient to demonstrate the IDGCC technology. There appears to be little rigour in the decision to half the capacity of the DGDP.

304 Dual Gas noted in the context of the precautionary principle that:

> The risks posed by climate change have been expressly recognised by the Victorian Parliament. Specific legislative measures, including an emissions reduction target, have been implemented with a view to managing that risk (taking into account other societal goals). For those reasons already discussed at length above, not only will the DGDP not compromise the achievement of that target, it also has the potential to contribute toward its achievement. Indeed, as acknowledged by Professor Karoly, if the DGDP does ultimately replace (or indeed displace) existing brown coal fired-power stations operating within the Latrobe Valley, there will be a reduction in the level of climate change risk by "a small but important amount"[150].

305 Moreover, Dual Gas had earlier stated, in the context of the integration principle:

> It is clearly not the case, however, that the achievement of this target would be compromised by the operation of the DGDP in and of itself. Put differently, the fact that the DGDP will emit greenhouse gases into the atmosphere at the rates and volumes proposed, does not mean that the emissions reduction target will not be met. To the contrary, it is submitted that the capacity for the DGDP to *inter alia replace* and *displace* other (more greenhouse gas emissions intensive) sources of electricity production, means that the proposal should be considered wholly consistent with the achievement of the emissions reduction target[151].

306 These comments are just as relevant to Australia's national emissions reduction target (i.e. a reduction to 5% below 2000 levels by 2020, and 80% below 2000 levels by 2050) as to the Victorian target in s 5 of the CC Act.

307 Dual Gas has thus itself linked the proportionality of response to the integration principle and the precautionary principle, at least in part, to the likelihood of the DGDP replacing or displacing more GEI intensive forms of electricity generation, and thus reducing overall GHG emissions. We consider this to be a more meaningful application of the precautionary principle having regard to the seriousness of the threat posed by high GHG emissions. It also, in our view, better reduces the margin for error through an adaptive approach that seeks to link the impact of the GHG emissions from the DGDP to an actual displacement or replacement of higher GEI electricity generation, thus leading more transparently to an overall nett

[150] Dual Gas Closing Submissions at [193]
[151] Dual Gas Closing Submissions at [132]

reduction in GHG emissions for the same level of electricity generation in the future.

308 As we have earlier noted, the integration principle in the SEPP(AQM) and the EP Act also requires that the measures adopted as a response to the integration of economic, social , and environmental factors should be cost-effective and in proportion to the significance of the environmental problems being addressed.

309 We do not consider that the EPA's decision to reduce the capacity of the DGDP to 300 MWe is a satisfactory or proportionate response that gives effect to the SEPP(AQM) and the principles of environmental protection in the EP Act. Whilst there is no 'inconsistency' with the SEPP(AQM), as claimed by the objectors, there will still be substantive GHG emissions from the DGDP at either a 300 MWe or 600 MWe capacity. We thus consider the ability of the DGDP to displace or replace higher GEI electricity generation to be important to an overall integrated assessment of how we should best give effect to the SEPP(AQM), albeit to be balanced alongside other relevant matters, in considering what capacity should be allowed.

Will the DGDP displace or replace higher GEI electricity generation?

310 Dual Gas placed considerable emphasis on an examination of the environmental performance of the DGDP relative to the environmental performance of the electricity generation it has the potential to replace or displace[152].

311 We have elsewhere noted that, contrary to the initial assertions of some objectors, the DGDP will not displace renewable energy given its priority dispatch ahead of scheduled generation from coal and gas power stations.

312 The ability of the DGDP to displace other electricity generation from coal or gas in the NEM depends on its LCoE and/or SRMC, with factors affecting these including any future carbon price, fuel costs, and whether the generator has contract cover. In this regard, the DGDP will compete with conventional coal and gas generated power in the NEM.

313 Mr Walton's evidence was that the DGDP may become competitive with coal-fired power stations in the Latrobe Valley with a carbon price at around \$23/t CO_2-e, being the fixed carbon price for the first three years of the Australian government's carbon pricing legislation. Under his modelling, the SRMC for the Dual Gas Case 3, with a carbon price of \$23/t, would be \$35.43/MWh, compared to an estimated average of \$35.28/MWh for the coal-fired power stations[153]. This modelling is based on a number of assumptions as to fuel costs, plant efficiency, input costs, and GEI.

[152] see, for example, Dual Gas Closing Submissions at [143], [132] and [193]. Excerpts from the last two paragraphs are quoted earlier in these reasons.
[153] see slide 19 of Walton's powerpoint presentation to the Tribunal, dated 11 November 2011.

314 If the carbon price was to fall much below $23/t after its fixed period, noting a 'floor' of $15/t in the Australian legislation, and the lower carbon price operating in some European markets, the DGDP would be uncompetitive with coal-fired power generation even on this SRMC assessment[154]. The DGDP improves in competitiveness only with an increasing carbon price.

315 We have earlier outlined the evidence of Dr Washusen, to the effect that comparisons based on SRMC alone are inconclusive. If other costs for capital, financing, maintenance etc are factored in, the DGDP would clearly not be competitive with existing conventional coal-fired power stations in the Latrobe Valley, even at the fixed carbon price of $23/t. As Dr Washusen also noted, there are other variables such as the sensitivity of changes in fuel prices, the effect of a new generator in the NEM on spot prices, and the effect of on-going futures contracts and bilateral agreements between electricity generators and retailers which account for a large proportion of electricity sales, which would need to be considered. We are not convinced that Mr Walton's evidence provided the full picture, or a sufficiently reliable picture, of the competitiveness of the DGDP against coal-fired power stations. We have a real doubt on the evidence before us that the DGDP will displace higher GEI electricity generation from the coal-fired power stations in the Latrobe Valley under existing or likely short term operating conditions in the NEM, if considered on a stand-alone basis.

316 Moreover, rather than displacing higher GEI electricity generation from coal-fired power stations in the Latrobe Valley, the DGDP is in fact more likely to displace *lower* GEI electricity generation produced more efficiently from natural gas. Mr Walton expressly conceded this under cross-examination[155]. Whilst Mr Walton pointed out that there is no CCGT natural gas power station in Victoria yet existing that could be displaced in this way, some such powers stations are either approved or planned, and the DGDP may prevent those natural gas power stations from being competitive in the NEM.

317 Furthermore, even if the DGDP could marginally displace some coal-fired power at a carbon price of $23/t, the displaced coal-fired power may in turn displace natural gas-generated power, so that the nett result may still be the displacement of more efficient and lower GEI power generated from gas.

318 In any event, on the evidence before us and under current NEM operating conditions, we think it more likely that the DGDP would not displace coal-fired power with a higher GEI, and would displace gas with a lower GEI. The effect would therefore be that the DGDP will result in higher overall GHG emissions and a higher average GEI per unit of electricity produced. This does not of itself mean that the DGDP will be 'inconsistent' with the

[154] The graph at slide 20 of Walton's presentation, and Dual Gas' Closing Submissions at [149], both suggest the DGDP may still be competitive at a carbon price of slightly greater than $21/t, but this does not clearly follow from the more detailed assessment on slide 19.
[155] Transcript p 1368-1372

SEPP(AQM), given the way the SEPP(AQM) operates and the other overall benefits and trade-offs we have discussed earlier in these reasons. However, it is not necessarily indicative of a sound environmental outcome if the DGDP is considered solely on its own individual environmental performance as a power station.

319 Despite our finding that the DGDP is unlikely to *displace* higher GEI electricity generation through the ordinary workings of the NEM, Dual Gas also relies on the potential of the DGDP to *replace* higher GEI electricity generation.

320 Much weight was placed by Dual Gas on the Australian government's *Energy Security Fund - Contract for Closure* (CFC) program, through which it proposes to negotiate the retirement of up to 2,000 MW of high GEI generation capacity by 2020.

321 Three of Victoria's power stations – Hazelwood (1,600 MWe), Yallourn (1,450 MWe) and Morwell/Energy Brix[156] (170 MWe) – and two interstate power stations - Playford in South Australia (240 MWe) and Collinsville in Queensland (190 MWe) - have expressed interest in the CFC program, with any contracts due to be finalised by 30 June 2012[157]. Given the respective capacities of these power stations, and assuming contracts can be negotiated, it is therefore highly likely that most of the retired electricity generation under the CFC program would be expected to occur in Victoria[158]. Dual Gas argued that it would be well placed to address any shortfall in Victoria's generation capacity arising from implementation of the CFC program.

322 Dr Washusen gave evidence that if, for example, Hazelwood power station was retired under the CFC program, there would still be sufficient capacity to meet base load demand in Victoria. However, he conceded that, if the full 2,000 MWe was retired under the CFC program, a shortfall of 400 to 700 MWe of base load generation capacity would arise[159].

323 We do not know what amount of electricity generation (if any) will be retired under the CFC program, and the program operates independently of the DGDP proposal. However, if there was a 400 to 700 MWe shortfall created by the CFC program, we agree that a 600 MWe DGDP would be well placed to address such a shortfall.

324 Dr Washusen's evidence effectively suggests that if only part of the CFC program is implemented, it may lead to the closure only of 'surplus' capacity. If the DGDP was only to replace this surplus *capacity*, rather than actual electricity generation, then it is perhaps arguable that the DGDP would not lead to lower GHG emissions or lower GEI electricity

[156] For the record, we note that the Morwell/Energy Brix power station is owned by HRL, the parent company of Dual Gas.
[157] *Contract for Closure* program, administrative arrangements, September 2011 (Exhibit D-15) at p 3.
[158] Washusen evidence, transcript p 1503
[159] Washusen evidence, transcript p 1446

generation, as the remaining capacity from the higher emitting Latrobe Valley power stations would still be sufficient to meet demand, and to out-compete the DGDP in the NEM.

325 We do not necessarily agree with this argument. First, a reduction in generation capacity created by the CFC program, matched by the entrance into the NEM of a new generator such as the DGDP, is likely to have some effect on spot pricing in the NEM that may make the DGDP more competitive for the demand that exists. Secondly, and more importantly, the security of Victoria's energy supply is reliant on there being an element of surplus capacity to meet the ebbs and flows of demand, including occasional unexpected demand – e.g. caused by unexpected power station outages. Indeed:

- the Australian Energy Market Operator (AEMO) has noted that any plant closure under the CFC program is conditional on maintaining system reliability[160];
- the CFC program itself notes objectives to provide certainty as to the timing of closure of high GEI generation capacity, to provide sufficient time to facilitate investment in replacement lower GEI generation capacity, and to minimise the risks to energy security than may arise from an unplanned exit of electricity generation capacity[161]; and
- AEMO has recently stated:

> In relation to the Commonwealth Government's Contract for Closure (CFC) program, there is the potential for this to result in base-load plant being removed in the period 2016-2020. Having enough supply to meet demand will be reliant on private investment to replace this plant as well as meeting demand growth. Again, it is up to investors to assess the risks and profit margins of the technology they propose to use, and to consider their likely competitive position in the national context.[162]

326 We consider that the DGDP is well placed to provide part of this energy security and to replace part of the capacity retired under the CFC program. We do not agree with EV that the replacement energy capacity should necessarily be sourced only from natural gas or renewable energy so as to maximise the benefits of the CFC program in moving to a lower emission energy sector. Having the DGDP replace part of any capacity retired under the CFC program would have tangible benefits in reducing GHG emissions – e.g. a 600 MWe DGDP would achieve a 46% reduction in GEI 'as

[160] *Electricity Statement of Opportunities*, AEMO, 31 August 2011 at p 2-7, referred to in the evidence of Dr Washusen at [153].
[161] *Contract for Closure* program, administrative arrangements, September 2011 (Exhibit D-15) at p 2.
[162] Generation Investment Advice, AEMO, 10 February 2012 (Exhibit D30). The EPA and EV objected to the tendering of this document by Dual Gas during closing submissions, and after the close of formal evidence. However, the document was produced on the hearing day immediately following its publication by AEMO, and we consider it of some relevance.

generated' compared with the GEI from equivalent generation at Hazelwood[163].

327 Moreover, both government policy and AEMO have made it clear that no one technology or fuel source is preferred as part of this transition. The DGDP proposes only 600 MWe. There is seemingly plenty of opportunity for other technologies and fuel sources to provide other parts of the replacement capacity if the maximum 2,000 MWe is retired under the CFC program.

328 Further, there are other benefits if the DGDP provides part of the replacement capacity, including regional-level benefits. As indicated earlier, the DGDP could counter-act the negative economic impacts of the closure of any existing coal-based powers stations in the Latrobe Valley, and provide positive benefits in promoting new jobs and new skills in the area. We consider this regional level benefit to be relevant to an integrated assessment of economic, social and environmental considerations.

329 The economic reality is that the DGDP will not proceed unless Dual Gas is satisfied that it will replace or displace existing power generation. As Dual Gas' counsel noted in closing submissions:

> You heard not only from Dr Washusen but also from Mr Walton that the levelised cost of electricity of the proposed DGDP is such that it simply would not be viable unless there is a closure of an existing brown coal power station, or a reduction in the use of an existing brown coal power station. We call that replace or displace. There is no prospect on the evidence that Dual Gas will be able to build and operate its proposed power station if all the existing brown coal power stations continue to operate at their current capacity[164].

330 The concern for us is that there is a lack of certainty that the CFC program will proceed as proposed. Approving the DGDP without this certainty, and without any clear link between the CFC program and the DGDP, leaves open the likely prospect that the DGDP will not replace higher GEI electricity generation capacity, and will instead displace lower GEI electricity generation. If we are to consider the DGDP in isolation from the uncertainties of the CFC program, and given the CFC program operates independently of the DGDP, the conclusion to be drawn is that the use of the works of the DGDP would lead to a material increase in GHG emissions, and with no certainty that the DGDP will ever itself facilitate the transition to a future lower emission energy sector.

Conclusions on whether DGDP should be 300 MWe or 600 MWe

331 It will be evident from the foregoing discussion that we are of the opinion that:

[163] Dual Gas Closing Submissions at [139], referring to Blatchford evidence at Transcript p 722.
[164] Transcript at p 2273

- the EPA's decision to defer the second train to avoid the use of two 'E class' GTs is neither best practice nor a proper application of the precautionary principle;
- the EPA's decision to halve the capacity and halve the GHG emissions seems to us to be an uneasy compromise to allow Dual Gas to demonstrate the IDGCC technology, rather than a reasoned and proportionate response to the level of GHG emissions the DGDP will generate at either 300 MWe or 600 MWe, having regard to the relevant principles of environment protection – in particular the integration principle and the precautionary principle;
- conversely, there are likely economies of scale (in both capital and operating costs), and a more conventional and efficient configuration, if the DGDP were to operate at 600 MWe rather than 300 MWe.

332 In our view, a better application of the relevant principles of environmental protection for this works approval application, together with a consideration of the matters in s 14(4) of the CC Act and giving effect to the SEPP(AQM), is to deal more effectively with the extent to which the DGDP can replace higher GEI electricity generation. If this is achieved, then the level of capacity becomes less of an issue, and there is no basis to reduce the capacity from the 600 MWe proposed by Dual Gas. Indeed, the greater the amount of higher GEI electricity generation replaced, the better.

Condition linking DGDP to replacement of higher GEI generation

333 At the hearing, we explored with the parties whether, if we reached such a view, the issue could be resolved through a condition on the works approval – for example, by tying the commencement of works for the DGDP to the closure or decommissioning of an equivalent amount of higher GEI electricity generation in Victoria by 2020, such as under the CFC program. In that way, the DGDP would clearly meet its own objective of replacing electricity generation with a higher GEI, as well as achieving all the other benefits of the proposal. More particularly, the combined outcome would mean that the DGDP approval would itself lead directly to a nett *reduction* in GHG emissions from electricity generation in Victoria, and assist materially in meeting Australian and/or Victorian emissions reduction targets and facilitating the transition to a lower emission energy sector.

334 We are of the view that such a condition, if valid, would demonstrably give effect to the SEPP(AQM) and demonstrably tip the balance in favour of approval of the DGDP at 600 MWe. To our mind, it is a better and more proportionate response to both the integration principle and the precautionary principle than the capacity reduction proposed by the EPA.

335 Given the Dual Gas concession that the viability of the DGDP, as a matter of practical economic reality, is dependent on the DGDP replacing or

displacing higher GEI electricity generation[165], the imposition of a condition cannot be said to have significant commercial consequences for Dual Gas.

336 Dual Gas provided draft wording for a condition, and submitted that such a condition would be possible and valid. It nonetheless opposed the condition as being unnecessary as a response to the objectors' grounds of review, based on its submissions that the DGDP was not inconsistent with the SEPP(AQM). EV also agreed that such a condition would be possible and valid. It nonetheless opposed the condition, arguing that a finding of inconsistency with the SEPP(AQM) should lead to a refusal of the works approval.

337 We consider that the condition is appropriate in deciding to increase the capacity of the DGDP to 600 MWe, and does not rest on a finding of inconsistency with the SEPP(AQM). However, even if we were wrong that the use of the DGDP was not inconsistent with the SEPP(AQM), which would have led to a partial allowance of the objectors' applications for review, we consider that the imposition of this condition would have addressed that inconsistency.

338 EV also submitted that, if the DGDP was approved now in 2012, and the CFC program did not actually lead to the closure of an equivalent higher GEI capacity until 2020 (as proposed under that program), there would still be a nett increase in GHG emissions in the short term. However, in balancing short and long term impacts of GHG emissions, and taking into account that the DGDP will not be constructed and operational for 2 to 3 years at best, we consider that trade-off reasonable. It is part of the *transition* to a lower emission energy sector recognised by Australian and Victorian government policy.

339 Only the EPA contended that the condition may be invalid, relying on the decision in *Spurling v Development Underwriting (Vic) Pty Ltd*[166]. There the court had determined that a Tribunal-imposed condition precedent to the issue of a planning permit was *ultra vires* and invalid. That decision however turned on the wording of the then legislation, where the Tribunal was given power to "direct that any permit issued shall or shall not *contain* any specified condition"[167]. The Tribunal's decision had been that "subject to the consent of the Governor-in-Council to the sale of the land first being obtained, a permit shall issue subject to the conditions set out in the Notice of Determination". The condition precedent was not contained in the permit, and it was on that basis that the condition was held invalid. The decision in *Spurling* is thus distinguishable on its facts.

340 Here, s 37 of the EP Act empowers the Tribunal to "direct that a works approval shall or shall not be issued or transferred or be subject to a

[165] op cit, Transcript at p 2273.
[166] [1973] VR 1 (Supreme Court) per Stephen J
[167] S 22(1)(b) of the then *Town and Country Planning Act 1961*

specified condition". Here, also, we consider that the problem identified in *Spurling* can be avoided by including the condition in the works approval itself, rather than as a separate or external condition precedent. There are other similar conditions in the works approval, requiring things to be done (e.g. the obtaining of a planning permit, or submission of final plans) before the works approval takes effect or before construction can commence.

341 We consider that a condition tying the commencement of works for the DGDP to the closure or decommissioning of an equivalent amount of higher GEI electricity generation in Victoria meets the other usual tests for the validity of a condition. It is reasonable, and for a proper purpose that meets an objective of the regulatory framework under which the works approval is issued, and there is a direct nexus between the imposition of the condition and the approval granted.

342 We note we are imposing this condition in response to Dual Gas' application to review conditions, seeking to increase the DGDP capacity to the 600 MWe it had initially sought. Lest there be any doubt, without this condition, we would not support the increase in the DGDP capacity, despite the misgivings we have indicated about the EPA's underlying rationale for the initial 300 MWe approval.

The GEI condition

343 The works approval issued by the EPA requires the DGDP to comply with a GEI of 0.8 t CO_2-e/MWh (i.e. following the initially proposed Victorian government standard). The condition, as presently worded, does not indicate whether this is on an 'as generated' or 'as sent out' basis. We have commented on the background to this earlier in these reasons.

344 As we noted at the hearing, such a condition would create great uncertainty as to what is actually required for compliance through any future licence. The modelled Case 2 and 3 scenarios would meet a GEI standard of 0.8 t CO_2-e/MWh if on an 'as generated' basis, but not if on an 'as sent out' basis. The issue is perhaps somewhat academic because Dual Gas could ultimately comply with either GEI standard. If a GEI condition was imposed based on 0.8 t CO_2-e/MWh 'as sent out', the GHG emissions could be reduced to meet this standard through using more natural gas and less syngas in the fuel mix, which would in turn reduce the GEI. Such a requirement would however have commercial implications.

345 The Australian government has indicated a shift away from a formal GEI standard in favour of a market-based approach where the lowest-cost, most reliable technologies will succeed, subject to a carbon pricing mechanism. Its Draft Energy White Paper, released part-way through the hearing, states:

> … the implementation of carbon pricing is an opportunity to ensure that no further market-distorting non-complementary interventions are made and that current measures are reviewed against the Council of

> Australian Governments (COAG) complementarity principles for climate change mitigation measures.
>
> In this context, the Australian Government has decided not to proceed with the introduction of an emissions standard or carbon capture and storage standard for future coal-fired generation investment. An emissions standard is unnecessary in the presence of carbon pricing. Similarly, a carbon capture and storage standard would impose unnecessary regulatory and administrative costs and would be difficult to implement until a greater understanding of carbon capture and storage requirements is available. The government also considers such regulatory interventions to be inconsistent with a market-based approach to reducing greenhouse gas emissions. [168]

346 It is noted that this reference appears only in a *draft* white paper published for public comment. The draft white paper also states elsewhere that Australia's energy markets are entering a period of major transition[169], and that market drivers alone are not always sufficient to support an optimal innovation effort in the commercialisation of clean energy technologies, with some well-documented market failures[170].

347 Given the change in Australian government policy, and the review of Victorian government policy, Dual Gas' counsel suggested that the condition in the DGDP works approval requiring a GEI standard could now be deleted. The EPA and EV opposed this.

348 We consider that the fast-changing policy framework, the major transition that lies ahead in dealing with GHG issues, and the recently introduced but as-yet untested carbon pricing mechanism in Australia, all warrant a cautious approach in how we consider a GEI condition for the DGDP. Even if the Australian government does not adopt a formal GEI standard, it is still open for the EPA (or the Tribunal on review) to impose a relevant GEI condition having regard to the circumstances of any particular works approval application before it.

349 Markets do fail, or fail to operate as forecast, as evidenced by the so-called global financial crisis or, perhaps more relevantly, the relatively low carbon price currently operating in some European markets. Until there is a mature carbon pricing market established in Australia, we see merit in maintaining a GEI condition in any short-term approval for the DGDP. There may be a future market-driven incentive to do better than the condition, but the condition will usefully operate as something of a safety net. It will avoid the possibility of a market failure (or a low carbon price) that could lead to the DGDP operating with greater GHG emissions, or a higher GEI, than the forecasts upon which a decision to approve the DGDP is based.

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[168] *Draft Energy White Paper: Strengthening the Foundations for Australia's Energy Future*, Commonwealth of Australia, December 2011 (Exhibit D23). The quote appears in the Executive Summary at pp xx - xxi

[169] ibid at p xiv

[170] ibid at p 208-9

350 Quite apart from seeing merit in maintaining a GEI condition, we note that Dual Gas has not sought to challenge this condition in its application for review.

351 During the hearing, at our request, the EPA twice sought instructions from within the Victorian government about what was now proposed in relation to GEI, but was unable to obtain any unequivocal response. The EPA ultimately supported retention of the GEI condition, and argued for the more conservative 'as sent out' standard to be applied. However, unless or until there is a clearer standard of a different nature adopted by government, we have preferred a condition based on GEI 'as generated', primarily for the following reasons:

- it is the basis upon which the works approval application was submitted by Dual Gas and assessed by the EPA, and about which comparative data has been placed before us;
- it facilitates a greater use of syngas within the DGDP (and less natural gas), and thus better facilitates the 'demonstration' of the IDGCC process;
- in our opinion, it provides a sufficient 'safety net' as an upper level GEI for the DGDP in circumstances where there is no formal standard; and
- a GEI 'as generated' is being used by the Australian government as the preferred measure for its 'Contract for Closure' (CFC) program[171], and by the Australian Electricity Market Operator (AEMO) in its 'Energy Transition Plan'[172].

Conclusion

352 Having regard to the imposition of the condition linking commencement of the DGDP to the closure of an equivalent amount of higher GEI electricity generation, and the imposition of the GEI condition as a safety net for future environmental performance irrespective of any future carbon price, we consider it reasonable to allow the Dual Gas application for review in relation to this condition, and to vary the works approval to allow the DGDP to operate at a capacity of 600 MWe.

[171] see *Working Together for a Clean Energy Future*, Dept of Resources, Energy and Tourism, Australian Government, July 2011 (part of Exhibit O-7). See also the extracts from the *Carbon Pollution Reduction Scheme Green Paper*, June 2008, at pp 383-5, and the *Carbon Pollution Reduction Scheme White Paper*, December 2008, at pp 13-22 – 13-23, (both also part of Exhibit O-7).
[172] Exhibit D-31

PART 9: SULPHUR DIOXIDE (SO_2) EMISSIONS

How does the issue of SO_2 arise in this proceeding?

353 The EPA has imposed a condition on the works approval to address sulphur dioxide (SO_2) emissions. This condition requires Dual Gas to modify the plant to reduce SO_2 levels by 'at least 90% of uncontrolled emissions'. The level of uncontrolled emissions would be based on the average sulphur content of the coal feedstock.

354 Dual Gas opposes the SO_2 condition, and seeks that it be deleted. It does so primarily on the basis that:

- the use of low sulphur content coal and the low SO_2 emissions intensity of the DGDP are sufficient to satisfy the SEPP(AQM) requirements for best practice;
- the cost for reducing SO_2 emissions is not proportionate (both in capital and operational terms) to the environmental impacts being addressed, having regard to relevant principles of environmental protection[173]. Dual Gas contends this is because the SO_2 emissions for the DGDP are assessed as not exceeding the SEPP(AQM) design criterion, and will have minimal (if any) cumulative impact over and above present levels of emissions; and
- no brown coal-fired power station in the Latrobe Valley has, or is required to have SO_2 reduction controls, largely due to the low sulphur content of the sourced coal. Moreover, the DGDP works are expected to operate with 45% lower SO_2 emissions per MWh than any of these power stations.

355 Unsurprisingly, the EPA seeks to maintain the SO_2 condition. It contends that:

- the SO_2 condition is consistent with the aims and principles of the SEPP(AQM). For the purpose of cls 18 and 19 of the SEPP(AQM), the EPA argues that SO_2 emissions reduction technology represents best practice;
- even if SO_2 reduction is not best practice:
  - s 20C(3A) of the EP Act allows the EPA to require more stringent standards if required by local conditions, or where the pollution control technology required to achieve more stringent standards is commonly available in the industry; and
  - cl 30 of the SEPP(AQM) allows the EPA to require emissions to a greater extent than required by cls 18 and 19 to improve or maintain regional air quality within an Air Quality Control Region

[173] in particular, the relevant part of the integration principle in cl 7(1)(c) of the SEPP(AQM) that any measures adopted should be cost-effective and in proportion to the significance of the environmental problem being addressed.

(AQCR). The Latrobe Valley is one of two defined AQCR's in Victoria.

356 The EPA argues that ambient SO_2 levels are a potential problem within the Latrobe Valley AQCR. In its referral response to the works approval application, the Department of Health suggests that Dr Ross's air quality modelling indicates the Latrobe Valley AQCR is reaching a ceiling for SO_2. The Department thus believes that more positive control over SO_2 emissions is warranted than previously adopted for generators in the Latrobe Valley.

357 In its amended grounds[174], DEA had contended that that the emission levels of SO_2 had not been properly tested against criteria under the SEPP (AAQ) and/or NEPM. DEA now concedes the assessment of Dr Ross addressed this issue, albeit completed on behalf of the EPA rather than by Dual Gas. DEA continues to pursue a ground that any increase in SO_2 emissions has potential adverse health effects for residents in the Latrobe Valley and is consequently inconsistent with the SEPP(AQM) and does not apply best practice to the management of emissions. DEA therefore supports the EPA's condition for SO_2 emissions reduction.

358 Dual Gas argued that, given the SO_2 condition was already on the existing works approval for the 300 MWe DGDP, DEA had no basis for raising this issue under s 33B(2)(b). Moreover, given DEA had not sought to become a party to Dual Gas' application to delete the condition, Dual Gas contended that DEA's views were "of no moment"[175]. We consider Dual Gas' attempt to rely on such a technical objection to be somewhat disingenuous. Having regard to our role under ss 97 and 98 of the *Victorian Civil and Administrative Tribunal Act 1998*, we consider it appropriate to have regard to DEA's submissions on the SO_2 condition.

359 As we have found that a 600MWe power station is acceptable in terms of its GHG emissions, we have proceeded to consider the matter of SO_2 reduction primarily in terms of that level of capacity. We do not consider that DEA's concerns with SO_2, if considered separately, would ever have justified a refusal of the DGDP given the ability to deal with the matter through conditions on the works approval.

360 Before turning to these matters, we first set out the findings and conclusions of the SO_2 assessment made by Dr Ross, as these underpin the EPA and Dual Gas' submissions and our decision.

The assessment of SO_2 emissions

361 The assessment of SO_2 emissions has been dealt with primarily through the modelling work undertaken by Dr Ross, called by the EPA. Other experts for Dual Gas and the EPA have given some evidence about SO_2 reduction technology and its cost and/or the application of the SEPP(AQM).

[174] Tribunal book DEA.460.015
[175] Transcript at p 2435 - 2436

However, it is Dr Ross's assessment that enables us to guage the impacts of the SO_2 emissions, has been tested before us, and is used by Dual Gas and the EPA to support their respective positions. DEA called no evidence on this issue.

362 We consider Dr Ross' assessment and evidence of present and projected conditions when the DGDP is operating to be thorough, well grounded in the application of the numerical model CALPUFF, and presents an appropriate (and generally agreed) assessment of the calibration between current SO_2 emission scenarios and the historical SO_2 monitoring.[176] We have placed considerable weight on his evidence in this proceeding.

Assessment of SO_2 emissions in comparison to existing emissions

363 Dr Ross's oral evidence, expert statement and review reports indicate that:

- under the present day emissions regime in the Latrobe Valley AQCR,[177] ground level SO_2 concentrations are predicted to exceed the SEPP(AQM) design criterion at only one location. This location is confined to a discrete area south of the Loy Yang power station, with modelling indicating that the exceedance is due largely to emissions from the Loy Yang power station.[178]
- SO_2 emissions from the 600 MWe DGDP will not alter this outcome. In fact, in the area of the design criteria exceedance, the Dual Gas contribution represents around 0.015%, i.e. less than 0.1%, of the total cumulative ground level concentration of SO_2 at this location.[179]
- other than as outlined above, the 1-hour, 24 hour and annual average concentrations of SO_2 do not (and are not predicted to) exceed the SEPP(AQM) intervention criteria under present day conditions or the SEPP(AAQ) criteria derived from the NEPM air quality objectives. In fact, all modelled point receptors[180] chosen to represent a range of land uses including sensitive residential use are predicted to have concentrations that are one order of magnitude less than the SEPP(AAQ)/NEPM 24-hour and annual average criteria.[181]
- air quality monitoring station data indicates that over the 2007 to 2008 period, only three instances of SO_2 concentrations exceed the intervention levels established under the SEPP(AQM). This occurs at

[176] Ross evidence (witness statement of October 2011) at p 11, Tribunal book EPA.100.113; CAMM Report 9/11, p 52, Tribunal book EPA.100.243-245: Transcript at p 1527 lines 6-13 and pp 1550 line 30 to 1551 line 2.
[177] comprising four existing power stations and the Australian Paper Mill.
[178] Ross evidence (Oct 2011) at pp 7 and 17-19, Tribunal book EPA.100.109 and 119-121; CAMM Report 9/11 pp 7-62, Tribunal book EPA.100.199-254.
[179] Tribunal book EPA.100.247.
[180] which are independent of the grid manipulations that are disputed between Dr Ross and the Dual Gas commissioned assessments. Evidence about the use of grid size was given in Dr Ross' statement at pp 6 and 20, Tribunal book EPA.100.108 and 116; Transcript at pp 1527 line 30 to 1528 line 3; The independence of discrete receptors from the grid size was given orally –Transcript at p 1547 lines 4-18.
[181] CAMM Report 9/11 pp 7 -62 , Tribunal book EPA.100.199 - 254

Jeeralang Hill, which is a station acknowledged to be elevated above the sources and subject to topographic influences and upper level movement of SO_2 that do not represent impacts to the sensitive residential areas lower in the Latrobe Valley.[182]

- the frequency of various ground level concentrations of SO_2, as modelled under present day conditions, indicates that:
  - for 50% to 80% of the (modelled) year a substantive number of the one hour intervals have SO_2 concentrations at or close to zero[183] ;
  - for the vast majority of the time (97.6% of the modelled one hour intervals over one year) SO_2 ground level concentrations are less than 0.05 mg/m^3; and
  - with the exception of the location near Loy Yang, SO_2 ground level concentrations would not exceed the 0.45mg/m^3 design criteria (with or without the DGDP).[184]
- the 99.9 percentile ground level concentration contours of SO_2 on an annual, 24-hour and 1-hour averaging basis indicate no substantive difference between current emission scenarios and the addition of the 600 MWe Dual Gas plant, due largely to the greater proportionate contributions from existing sources[185].

364 What follows from the modelling by Dr Ross is that there is no indication that present day emissions are approaching or exceeding applicable criteria, including intervention criteria. Therefore, claims that SO_2 is reaching a 'ceiling' in the area (by Dr Denison and the Department of Health) are to be treated with great caution. Dr Ross' evidence demonstrates otherwise.

365 Further, the monitoring data used by Dr Ross to calibrate his model, and the data referred to by Dr Bellair[186], both indicate that, apart from Jeeralang Hill, there has been no exceedance of air quality criteria within the Latrobe Valley AQCR between 1995 and 2009.

366 The works approval assessment by the EPA similarly confirms that SO_2 ground level concentrations have not exceeded the SEPP (AAQ) air quality objective at any of its urban monitoring stations between 1998 and 2010. There have been only seven years in which the allowable 'one day per year'

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[182] CAMM Report 9/11 p 32 , Tribunal book EPA.100.244

[183] The range being location dependant. Comparisons are made between Morwell East and the location near Loy Yang power station; CAMM Report 55/10 at pages 22- 23 and CAMM Report 9/11 at pages 32-33 , Tribunal book EPA.100.155-156 and EPA.100.224-225

[184] ibid, Tribunal book references EPA.100.156 and EPA.100.225, Transcript at pp 1530 line 24 to 1531 line 14 and pp 1547 - 1549.

[185] The plots of the 99.9 percentile levels are a spatial distribution of these levels that are independent of the time at which the concentration may occur. Put another way, the plotted 9th highest concentration contours included in Dr Ross' evidence show the areal extent of these high concentrations but not when they occur. It is important to understand therefore that these contours do not represent a snap shot in time of the worst extent of a sulphur dioxide plume: See Transcript at p 1529 lines 27-31 and pp 1545 line 19 to 1546 line 26.

[186] Tribunal book DGA.100.050.

exceedance of this objective has itself been exceeded, totalling some 20 days of such event. These exceedances have been measured in the Strezlecki Ranges, outside the urban area, and are not considered to be breaches of the SEPP(AAQ) goals[187].

367 We conclude from the evidence that:

- present day emissions of SO_2 are at levels that do not present an unacceptable human health risk, as determined under the applicable criteria in the SEPP(AQM) attainment program; and
- the emission of SO_2 from the DGDP, without reduction technology being applied, is likely to result in only minor incremental increases in ground level concentrations across the Latrobe Valley AQCR.
- proportionally, the incremental increase from the DGDP would be inconsequential to the current ground level concentrations of SO_2 when measured against the SEPP(AQM) criteria, and be of no substantive consequence to the sensitive residential areas, given present day conditions.

368 At first instance, it would appear from this evidence that the DGDP is capable of achieving an important component of the SEPP(AQM) attainment program by complying with the design criteria and, more broadly, not emitting SO_2 to the extent that other air quality objectives would be at risk.[188] However, meeting the design criteria and not affecting quantitative measure of the air quality attainment program is but one of the criteria for consistency with the SEPP(AQM) and the objectives of the EP Act.

The levels of SO_2 emissions as a single source

369 Dr Ross' modelling also assessed the impacts of the DGDP as the only source of SO_2. This assessment is based on three scenarios - a 600 MWe power station, a 300 MWe power station, and a 300 MWe station with 90% SO_2 emissions reduction (i.e. with only 10% of emissions compared to the second scenario).

370 These assessments indicate that:

- the worst case (9th highest) 600 MWe emission impact would have peak ground level concentrations of approximately 0.10 mg/m^3 to 0.22 mg/m^3 (based on a 1 km grid and 250 metre grid analysis) near the DGDP, whilst the worst impacts over the surrounding residential areas would range from 0.025 – 0.1 mg/m^3.

[187] The highest recorded level has been 0.17ppm in 2008 compared to the criteria of 0.2ppm, Tribunal book EPA.010.133-R.
[188] in accordance with cls 16 and 28 of the SEPP(AQM).

- reducing the capacity of the DGDP by half (i.e. to 300 MWe), and hence halving the SO_2 emissions, halves the peak concentrations and reduces the extent of the worst case impacts.
- the effect of applying 90% SO_2 emissions reduction technology to a 300 MWe DGDP reduces the impacts to 10% of the concentrations without the technology. For a 300 MWe DGDP, this impact is so low as to be within the error range of the model - i.e. the ground level concentrations would be so low as to be inconsequential to air quality outcomes.

371 The testing of the 300 MWe scenarios indicates a direct 1:1 benefit in the use of SO_2 emissions reduction technology. It follows that a 600 MWe DGDP, with SO_2 reduction technology applied, will have its impacts proportionately reduced to 10% of the concentrations without the technology. For a 600 MWe DGDP, the worst impacts would therefore range from 0.0025 – 0.01mg/m^3. Again, this range is so low as to be partly within the error range of the model. As such, the assessment of SO_2 reduction technology demonstrates that the quantum of stand-alone emissions would clearly be so minimised as to be inconsequential to air quality, as measured quantitatively through the applicable SEPP criteria.

Is the proposal 'best practice' in terms of SO_2 emissions?

372 The same definition of best practice applies under the SEPP(AQM) to that set out earlier in these reasons, namely:

> '**best practice**' means the best combination of eco-efficient techniques, methods, processes or technology used in an industry sector or activity that demonstrably minimises the environmental impact of a generator of emissions in that industry sector or activity.

SO_2 emissions intensity

373 In similar fashion to our analysis of GHG and GEI, we do not consider that SO_2 emissions intensity is the sole or main determinant of what may constitute 'best practice' in the management of SO_2 emissions, although it forms part of that assessment.

374 Mr Blatchford's evidence is that, on average, the IDGCC process results in approximately half the SO_2 emissions intensity of current coal-fired power stations in the Latrobe Valley. While there was some dispute about the total annual quantum of the SO_2 emissions as between Mr Blatchford and Dr Denison, the evidence of Mr McIntosh supports Dual Gas' position.

375 Mr Blatchford estimates an annual SO_2 emission range of 6,000 to 9,000 T/yr, even under the highest sulphur content ranges of the coal to be used with the DGDP, and based on the DGDP operating at normal loads, using a syngas/natural gas combination for 85% of the year. Applying these emission rates to the power output rating of the DGDP yields a SO_2 emissions intensity that supports Mr Blatchford's projected outcome - i.e.

around 1.2 kg SO_2 per MWh compared to other coal fired power generators of just under 2.5 kg SO_2 per MWh.[189]. In reaching this outcome, his evidence highlights that:

- the stack emission rates adopted in the model for sulphur are based on the ninety-fifth percentile sulphur content of the Morwell-Driffield coal, a value of 0.54% db.
- the Morwell-Driffield coal is likely to be a preferred supply because it is convenient and the cheapest to use. This coal has average sulphur content of 0.33% db with a range of range 0.22 % db to 0.55 % db. The alternative source of coal from the Yallourn North Extension field has a sulphur content range of 0.23 %db to 1.01 %db with an average of 0.46 % db.[190]
- the majority of the sulphur content results lies within a tight band around the average with a small frequency of results at the lower content level and around 5% of results in the upper content band.
- coal from both fields contain calcium, which has the affect of capturing sulphur and reducing its availability for volatilisation to SO_2, with the Yallourn North Extension coal having a higher calcium content than the Morwell-Driffield coal. The loss of sulphur in this way has not been accounted for in the estimation of the stack emissions rate used in the modelling.[191]
- the coal supplies will vary in quality, with blending and rejection of material occurring depending on quality controls being applied. Current practices account for the variation in quality and seek to blend or reject poor quality coal including that with higher sulphur content. Therefore it is expected that peaks of high sulphur content coal would be smoothed out due to blending.[192]

376 Given such evidence, we accept that the adopted ninety-five percentile value is a reasonable estimate of the upper band of sulphur content in the coal supply, and an appropriate input into the emissions modelling to represent the worst case of normal operations as required under Schedule C of the SEPP(AQM).

377 We consider Dr Denison's assessment, estimating SO_2 emissions at 13,000 T/yr, to be overly conservative. It is based on the stack emissions rate adopted in the modelling, but applied for a full 365 day year of operation at maximum power output [193], rather than a worst case scenario under normal operations. It follows that Mr Blatchford's projections of SO_2 emissions are

[189] Blatchford's overhead presentation at page 42; Tribunal Court Book DGA.200.097.
[190] Blatchford evidence at p 30, Tribunal book DGA.200.096; Exhibit D-11, and Transcript at p 1725 to 1731.
[191] Transcript at pp 1725 to 1731 and pp 1738 to 1746.
[192] Ibid.
[193] See cross examination of Dr Denison at Transcript pp 1631 line 1 to 1633 line 11.

preferred. We consider it reasonable to draw the conclusion from this that the SO_2 emissions intensity from the DGDP will be approximately half that of the existing Latrobe Valley generators.

Assessment of 'best practice' for SO_2 emissions

378 Applying the definition of 'best practice' in the context of SO_2 emissions, we have previously commented on the relevant *industry sector or activity* within which 'best practice' for the management of emissions from the DGDP should be considered. All the experts agree, and Dual Gas does not argue otherwise, that SO_2 reduction technology is commonly available, and is applied to overseas coal-fired power generation and to other industries in Australia that process sulphur containing compounds such as the oil refining industry. Dual Gas contends that such a comparator is not relevant, as the comparison should be made only with brown coal-fired electricity generation in Victoria.

379 For reasons we have set out earlier, we have considered the relevant activities to be a combination of coal gasification and gas turbine power generation activity. As such, in the consideration of 'best practice' for SO_2 emissions (if considered on a stand-alone basis), the coal gasification component of the activity has some ready comparisons, not just with coal-fired power stations, but also with oil refining and other chemical processing industries in as much as it involves the processing of raw hydrocarbon resources to produce a refined product for use in other processes.

380 We have earlier indicated that whether 'best practice' equates with 'international best practice' will be a matter of context. Here, we accept the contention of Dual Gas that the common use of SO_2 emissions reduction technology as 'best practice' in Europe derives from specific environmental conditions and impacts prevailing there (such as 'acid rain') and is not directly applicable to Australian conditions – particularly where there is scope to respond to particular local conditions in Victoria through more stringent conditions under an ACQR or s 20C(3A) of the EP Act.

381 In terms of SO_2 emissions, we are satisfied that the IDGCC process is an *eco-efficient* one. Mr McIntosh's assessment highlights that the conversion of brown coal to gas represents an eco-efficient outcome, in that there are more units of power generated for lower SO_2 emission intensities per unit of coal being consumed when compared to other processes or uses of coal to generate power[194]. We agree with this assessment. In terms of the definition, the IDGCC process is one that is eco-efficient because it results in more electricity being generated[195] for less energy[196] and with fewer natural resources being consumed. The process results in less waste and

[194] McIntosh's evidence at p14; Tribunal book EPA.100.432-R; Transcript at pp 1052 – 1053.
[195] equating electricity generation with the production of goods, as discussed earlier in these reasons.
[196] the IDG process reduces reliance on additional natural gas or other forms of energy

pollution per unit of power generated as a consequence of the lower coal inputs.

382 It follows from the evidence of Dr Ross that the IDGCC process *demonstrably* minimises the *environmental impact* compared with comparable processes, in part through the substantial reduction in SO_2 emissions intensity even without SO_2 emissions reduction technology being applied. Having regard to Dr Ross' evidence, the application of SO_2 reduction technology would not demonstrably minimise this impact further – the incremental benefit is minor and partly within the error range of the modelling. When assessed on its own, the SO_2 emissions from the IDGCC process are well below design criteria.

383 At a more integrated level, the EPA conceded that the application of SO_2 reduction technology would marginally increase the GEI 'as sent out' (because electricity would be needed to operate the SO_2 technology)[197]. Despite the marginal loss in efficiency, GEI on an 'as generated' basis, and overall GHG emissions, would remain the same, and we have not considered this issue material to consideration of a 'best combination' of processes and technology. Equally, we give little weight to Dual Gas' reliance on there being virtually no SO_2 emissions if the DGDP operated solely on natural gas, as we consider (on Dual Gas' own evidence) that there a low probability of this scenario.

384 Mr McIntosh's evidence supports the view that the reduced level of SO_2 emissions is an 'advantage' over conventional coal-fired generators[198]. As we have noted earlier, Professor van der Burgt identifies this advantage as one of the reasons why the management of emissions from the DGDP represents best practice in an integrated or overall manner.

385 Based on these factors, and on a balanced and integrated assessment, we are satisfied that 'best combination' of processes and technology for the management of emissions from the DGDP, including SO_2 emissions, can be described as 'best practice' for the purpose of cls 18(3)(c) and 19(1) of the SEPP(AQM).

Is it enough to meet the test of 'best practice' for SO_2 emissions?

386 The EPA agitates that more than best practice is required in the control of SO_2 emissions for the DGDP, because SO_2 reduction technology is commonly available, and because of the concerns raised by the Department of Health about the Latrobe Valley approaching a 'ceiling' for SO_2. DEA supports these concerns.

387 Section 20C(3A) of the EP Act provides:

> 20C(3A) Despite anything to the contrary in subsection (2) or (4)[199], in issuing … an authorisation[200], the Authority may impose

[197] EPA Closing Submissions at [147].
[198] McIntosh evidence at p 22, Tribunal book EPA.100.440-R. Transcript at pp 1052 – 1053.
[199] ss (2) and (4) relate to consistency with policy, or a policy as varied.

> conditions in relation to the authorisation that require the observance of standards that are more stringent than would be required by the applicable policy if the Authority is satisfied that—
>
> (a) local environment conditions require a higher level of protection than would otherwise be provided; or
>
> (b) the pollution control technology or noise control technology required to achieve more stringent standards is commonly available in the industry.

388 The EPA had not relied upon s 20C(3A) in it initial assessment of the DGDP, but did so in the review proceeding. We agree it is relevant to our discretion, in considering whether the SO_2 condition should be retained or deleted.

389 Because the DGDP will be located in the Latrobe Valley AQCR, cl 30(1) of the SEPP(AQM) is also relevant, and provides:

> **30 Air Quality Management in Air Quality Control Regions**
>
> (1) For the purpose of improving or maintaining regional air quality within an Air Quality Control Region, the Authority may:
>
> (a) require emission generators to reduce their emissions to a greater extent than required by clauses 18 and 19; and
>
> (b) refuse to issue a works approval for a large new source of emissions unless emission reductions for other sources are able to offset the impacts of the proposed emissions.

At face value, cl 30 empowers the EPA to require a greater reduction of SO_2 emissions than required by 'best practice' under cls 18 and 19.

390 The standards for assessing air quality under the SEPP(AQM) are qualitative (e.g. meeting best practice) and quantitative (i.e. meeting design criteria or assisting in meeting air quality objectives under the SEPP(AAQ)). Through s 20C(3A), the EP Act affords a broad discretion to go beyond these standards, if it is satisfied it is appropriate to do so under *either* of the criteria set out in s 20C(3A)(a) *or* (b), with neither being contingent on the other. Clause 30 raises similar (but not identical) issues to the first criterion under s 20C(3A)(a). The broader discretion afforded under both these provisions gives cause for us to consider the qualitative aims, principles and intent of the SEPP(AQM) and EP Act.

Is there commonly available pollution control technology in the industry?

391 The experts for both Dual Gas and the EPA were agreed that available technology to reduce SO_2 emissions is well-proven and commonplace across many industries in Australia, and for power generators around the

[200] An 'authorisation' is defined in s 20C(1) to include a works approval.

world. It is also apparent from the expert evidence that the use of SO_2 reduction technology on the IDG plant is readily adaptable and presents no substantive technical difficulties.

392 The second criterion in s 20C(3A) is clearly met, and the potential for the exercise of the discretion under that provision is therefore available.

Are there local (air quality) environment conditions that require a higher level of protection?

393 The evidence on the first criterion under s 20C(3A) is more equivocal but ultimately weighs in favour of a SO_2 reduction requirement.

394 The EPA relies on the evaluation of Dr Denison, whose evidence is that the Latrobe Valley population is exposed to a disproportionate amount of SO_2 emissions. Of the estimated 210,000 tonnes[201] of SO_2 emitted in Victoria in 2009/10, 110,000 tonnes was emitted in the Latrobe Valley AQCR, of which 100,000 tonnes was due to the power generating industry[202].

395 Mr Blatchford's evidence is that the DGDP would add incrementally to the present day SO_2 emissions generated from other power stations in the Latrobe Valley AQCR - i.e. some 6,000 to 9,000 tonnes/yr added to the existing 100,000 tonnes/yr.

396 This material increase in SO_2 emissions arguably suggests that the Latrobe Valley may well be deserving of higher protection through more stringent SO_2 standards.

397 We say that the evidence is equivocal because, whilst the Latrobe Valley clearly has a disproportionate amount of SO_2 emissions when compared with the rest of Victoria, these absolute numbers are not of themselves conclusive that there are local environment conditions that "*require* a higher level of protection" (to use the words of s 20C(3A)(a)). We have found that Dr Ross' modelling shows that there is no indication that present day emissions are approaching or exceeding applicable criteria, including intervention criteria for SO_2 emissions. On the evidence, despite the area being in an AQCR, and the disproportionate amount of SO_2 emissions being released to it, we have found that the SO_2 emissions in the Latrobe Valley are not approaching a 'ceiling' in quantitative terms.

398 In terms of qualitative considerations, however, we have considered the fact that the Latrobe Valley AQCR is one of only two AQCRs in Victoria, and is said to have been declared in recognition of the particular threats that might arise from the concentration of power stations in the region and the associated impacts to air quality. Given such a context, the disproportionately high volume of SO_2 emissions occurring in the Latrobe Valley AQCR, and the balance of other principles of environmental

[201] Dr Denison's values were expressed in millions of kg/yr. For consistency with other evidence and the values we have expressed in these reasons we have converted these values to tonnes/year.
[202] Denison witness statement at [43], Tribunal book EPA.100.376; and Transcript at p 1582

protection we have set out later in these reasons, it is appropriate to require a higher level of protection to mitigate (or at least make no worse) the current proportion of SO_2 emissions occurring in the AQCR.

399 The first criterion in s 20C(3A) is therefore also met, and the potential for the exercise of the discretion under that provision is also available.

Is a further reduction of SO_2 emissions warranted to improve or maintain air quality in the Latrobe Valley AQCR?

400 As we have noted, cl 30(1) of the SEPP(AQM) raises similar (but not identical) issues to the first criterion under s 20C(3A)(a). Clause 30 provides a basis to consider a reduction of SO_2 emissions to a greater extent than under cls 18 ad 19, if it is warranted for the purpose of improving or *maintaining* regional air quality in an AQCR.

401 We have had regard to the context of the Latrobe Valley AQCR we set out earlier. In doing so, we consider the evidence of Dr Denison and Mr Blatchford, in combination, does trigger the exercise of discretion under cl 30(1) – in particular Mr Blatchford's evidence of an increase in SO_2 emissions by some 6% to 9%. This is a material increase, that arguably makes it difficult to maintain, let alone improve, regional air quality.

Exercise of discretion under s 20C(3A) of the EP Act and cl 30(1) of the SEPP(AQM)

402 Although s 20C(3A) and cl 30 are couched in terms of a wide discretion, the discretion is not unfettered and we are required to consider the context in which the discretion should be exercised[203].

403 On one view, given that s 20C(3A) of the EP Act clearly contemplates the imposition of more stringent standards than under the SEPP(AQM), this arguably reduces the application of the principles of environmental protection in cl 7 of the SEPP(AQM). Indeed, s 20C(3A) is prefaced that it is "despite anything in subsection (2) …", which is a subsection that otherwise requires that the works approval be consistent with the SEPP(AQM). However, given that these principles of environmental protection also appear in ss 1B to 1L of the EP Act, we prefer the view that these principles still have general application.

404 Dual Gas' contention is essentially that, although there is commonly available pollution technology to reduce SO_2 emissions, the very marginal benefit of the SO_2 reduction (based on Dr Ross' evidence) does not justify the very high cost of its implementation. Dual Gas thus relies upon the relevant part of the 'integration principle' in cl 7(1)(c) of the SEPP(AQM) and s 1B(3) of the EP Act; namely:

[203] e.g. see *271 William Street Pty Ltd v City of Melbourne* [1975] VR 156 at pp 162-163; *Protean (Holdings) Ltd v E.P.A.* [1977] VR 51 pages 58 to 60; *Melbourne Water Corporation v Domus Design Pty Ltd and Another* (2007) 16 VR 539 at [44] – [82]; and *Casey City Council v Seventh Day Adventist Church (Victorian Conference) Ltd* [2010] VSC 625 at [58].

> The measures adopted should be cost-effective and in proportion to the significance of the environmental problems being addressed.

405 The costs of implementing SO_2 reduction are claimed by Dual Gas to range between $90 million to $120 million for a 300 MWe DGDP[204], and up to $195m for a 600 MWe DGDP[205]. Under cross-examination, Mr Walton conceded that Dual Gas had estimated the costs at only $20 million in discussions with the EPA as part of the works approval assessment[206], although he claimed that costing was 'provisional'.

406 Mr Tsesmelis disputes the higher Dual Gas figures, and has independently estimated the cost more in the order of $30 million to $35 million.

407 There seems to us to be great uncertainty as to the Dual Gas's estimates, and Mr Walton's evidence was that much of the cost (and hence the economic impact estimates) are "preliminary" in nature[207]. Further, Mr Walton's estimate of the cost impost on a 600 MWe plant is derived proportionality on a cost per kW basis derived from the 300 MWe case[208], which is at odds with his evidence of a lower proportionate economic impact for the implementation of SO_2 reduction in a 600 MWe DGDP, because the economies of scale afford some saving in capital and operating costs.

408 We agree with the EPA that there was a tendency for Mr Walton to rely on worst case scenarios. The level of uncertainty in the Dual Gas estimates, and the very wide disparity with Mr Tsesmelis' independent estimates, leads us to place less weight on the claims made by Dual Gas and to generally prefer Mr Tsesmelis' evidence on this issue.

409 We have earlier noted that Dual Gas' estimates of capital costs for the DGDP is also a matter of great uncertainty, ranging from "above $750 million" and "in the order of, but materially below 1.7 billion" (and with $1.2 billion used in the SKM Triple Bottom Line assessment prepared for Dual Gas), but with Dual Gas unwilling to divulge its actual figures. This aside, in relative terms, the costs of implementing the SO_2 emissions reduction technology ranges, based on Mr Tsesmelis' estimates, in the order of 2% to 4% of the capital costs.

410 Although overall GHG emissions and GEI 'as generated' will not change with implementation of SO_2 emissions reduction technology, the technology will create a marginal inefficiency in terms of reduced power sent out given the internal power consumption require to operate the SO_2 plant. Mr Blatchford estimates this reduction for a 300 MWe DGDP to be about 1% (based on internal power consumption of 2.8 MWe to operate the

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[204] e.g. $90m in Blatchford reply statement (Tribunal book DGA.200.220), $100m in Dual Gas further and better particulars (Tribunal book DGA.260.031), and $120m in Walton evidence (Tribunal book DGA.200.124)
[205] Walton evidence at Tribunal book DGA.200.124
[206] Transcript at p 1264 line 30
[207] Transcript at 1265 to 1266.
[208] Walton powerpoint presentation at p 13; Transcript at 1266 to 1267.

plant). While there will be an increase in internal power consumption, Mr Blatchford estimates that there would only be a drop 0.3% in overall power generation efficiency, and that such a reduction is not of concern in terms of the overall process efficiency of the plant[209] . He nonetheless estimates that this reduction will result in lost revenue in the order of several million dollars a year[210], and a GHG emissions 'penalty' (in terms of GHG resulting from internal power consumption rather than the generation of electricity for public use) of approximately 15,000 t CO_2-e per year[211]. This would double for a 600 MWe DGDP.

411 Although material to Dual Gas' financial modelling for the DGDP, we do not consider the proportionate (but relatively small) increase in capital costs or the proportionate (but marginal) efficiency loss and lost revenue, to be an unreasonable impost for the implementation of commonly available pollution reduction technology for SO_2 emissions, having regard to the integration principle.

412 Further, the principle of 'proportionality', within the integration principle, is but one of many principles of environmental protection set out in the SEPP(AQM) and the EP Act. As we have noted earlier in these reasons, consideration of these principles requires an integrated and balanced approach, which applies equally to the consideration of the SO_2 issue.

413 Other principles of environmental protection[212] we have had regard to emphasise the need to:

- adopt 'sound environmental practices and procedures … as a basis for ecologically sustainable development for the benefit of all human beings and the environment';
- effectively integrate 'economic, social and environmental considerations in decision making processes with the need to improve community well-being and the benefit of future generations';
- '…ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations';
- those 'who generate pollution and waste should bear the cost of containment, avoidance or abatement'; and
- wastes should be managed in accord with the waste hierarchy in which avoidance or reuse are primary objectives as opposed to

[209] Transcript at p 788 Lines 10-12. The difference between the energy loss and efficiency loss being due to an ability to recover some efficiencies through greater heat exchange and generating more steam due to the absence of sulphur in the syngas stream (Blatchford powerpoint presentation at p 44; Transcript at p 762. There is also a consequential lessening of coal input into the process if sulphur reduction plant is operated (Transcript at p 763).
[210] Transcript at pp 789 - 790.
[211] Dual Gas Closing Submissions at [283] and footnote 282; Transcript at page 2445, lines 29-30.
[212] SEPP(AQM) at cl 7 and EP Act at ss 1B – 1L

disposal (taken in this case to be emitted unchecked into the air for dispersal).

414 At a principled level, despite the evidence that the Latrobe Valley AQCR air-shed is not reaching a 'ceiling' for SO_2 emissions, based on Dr Ross' evidence, it is also a relevant aim of the SEPP(AQM) to:

> …drive continuous improvement in air quality and achieve the cleanest air possible having regard to the social and economic development of Victoria[213].

415 This aim speaks clearly of an aspiration, whenever possible, to improve conditions rather than maintain the status quo. That this aim is qualified by the need to have regard to social and economic outcomes in Victoria does not dissuade us from a conclusion that this aim is best achieved by not allowing further contributions of uncontrolled SO_2 emissions. Indeed, a balancing of the evidence before us suggests that the DGDP represents an opportunity to advance the use of common technology in the electricity generation sector in the Latrobe Valley that will achieve cleaner air (by way of lower SO_2 emissions), that is reasonably economic (in terms of implementation and operating costs relative to capital costs), and which will assist in achieving the social benefits said to be an outcome of this proposal.

416 Viewed against these principles, the reduction in SO_2 emissions:

- will be a sound environmental practice that assists in sustainable development by contributing at the very least to maintaining and potentially (in the longer term) improving the air environment in the Latrobe Valley AQCR, albeit we accept in an incremental manner;
- will contribute to an improvement in the well being and benefit of future populations in the Latrobe Valley through an incremental decrease in SO_2 emissions which will be more significant if and when other higher GEI generators are retired or withdrawn from service;
- will assist in maintaining and eventually improving the air environment for the benefit of future generations; and
- will capture and processes sulphur, which has the acknowledged capacity for re-use by other processing industries rather than seeing it expelled into the atmosphere as a pollutant/waste.

417 We find that, in balancing the aims and policy principles of the SEPP(AQM) and the cost/ benefits relevant to these principles, the consistency of applying a SO_2 reduction condition outweighs the relative costs that Dual Gas complains of. Overall, in taking an integrated approach to this question, we find the requirement to apply SO_2 reduction technology to be consistent with the SEPP(AQM).

[213] SEPP(AQM) at cl 6(b). See also the policy intent at cl 8.

418 It therefore follows that there is support for the exercise of discretion under s20C(3A) and cl 30(1) to require SO_2 reduction as part of the DGDP works approval. We consider it appropriate to do so in this case.

Should a requirement for SO_2 reduction await CCS?

419 Aside from the increase in internal power consumption and relative increase in GEI, Mr Blatchford, Mr McIntosh and Mr Tsesmelis agree that as part of implementing CCS technology in the future, sulphur removal from the syngas stream would be required. Dual Gas advised that as the DGDP is likely to be involved in the Carbon Net CCS project, SO_2 reduction technology will ultimately be added to the DGDP.

420 It is common ground that the capacity of any sulphur reduction plant under a carbon capture program would need to be increased (to accommodate higher gas flow regimes) and hence some infrastructure requirements for sulphur reduction in association with carbon capture will be different to requirements without this process.

421 Mr Tsesmelis agrees with the evidence of Mr Blatchford that a retro-fit of pre-carbon capture sulphur reduction plant would see some redundancies, or would operate inefficiently if fitted for CCS before it was needed. On this basis, we accept that requiring SO_2 reduction before any CCS technology is deployed presents some financial impost and potentially introduces inefficiencies into the DGDP. However, Dual Gas did not contend that such requirements would prevent the DGDP from proceeding.

422 Further, we have found that there are great uncertainties as to when or whether CCS technology would be applied to the DGDP, if ever, notwithstanding the agreement of all the technical experts that the IDG process readily lends itself to such technology.

423 We are therefore not persuaded that the disbenefits from installing SO_2 reduction before CCS technology is incorporated into the DGDP is sufficient to overcome the other reasons we have set out that weigh in favour of this requirement.

The possible changes to NEPM & SEPP criteria

424 In reaching our conclusions on the issue of SO_2 emissions and reduction requirements, we have been mindful of the evidence of Dr Denison that the present day NEPM criteria for SO_2, on which SEPP(AQM) criteria and SEPP(AAQ) air quality goals are based, are under review. This review follows from a NEPC[214] committee review of various studies on the impacts of SO_2 (and other noxious air quality parameters)[215]. A central point from this review that is raised by Dr Denison and relied upon by DEA is that

[214] National Environment Protection Council.
[215] *National Environmental Protection (Ambient Air Quality) Measure Review*. Review Report. Prepared for the National Environmental Protection Council. May 2011 (Exhibit O-19).

overseas and Australian studies are identifying that there is no threshold for the effects from SO_2 exposure (and some other pollutants).

425 We have had regard to this review. We note the conclusions as to the data for 'no threshold for effect'[216]. We acknowledge that there are recommendations for a review of the assessment and potential management of ambient air quality by this committee due to such evidence. The recommended review may lead to a possible change in SO_2 criteria on an ambient air quality monitoring basis. However, the review is in its early stages and there is uncertainty as to what will be the eventual changes if any to the ambient air criteria or how future criteria may be applied.

426 Of particular relevance is a suggested shift toward an 'exposure reduction' approach to applying standards (criteria) in recognition that there are no thresholds for some pollutants, such as SO_2. Such an approach recognises there will always be some 'residual risk' notably to the more sensitive and vulnerable members of the population (such as those with pre-existing conditions such as asthma). The NEPC committee sets out that the 'exposure reduction' approach is considered to be 'more beneficial to public health' and 'potentially more cost effective' by addressing wider regional population exposures rather than specific localised areas. The approach is said to do this by:

> …improving air quality in places where the greatest number of people are likely to be exposed [to the pollutant(s)], rather than reducing high concentrations…in small localised areas. This exposure reduction framework takes into account the fact that no lower threshold for effect has been identified and that any reduction in exposure is likely to result in a health benefit to the population.[217]

427 With such uncertainty, one might well argue, as the EPA and DEA have, that a cautious approach is warranted, and hence some form of reduction in SO_2 emissions should be imposed on this basis. However, in the event of future changes resulting from the review, the EPA has the power under the EP Act to require amendments to any works approval or licence to address such changes. There is thus recourse to achieve higher emissions standards if warranted in the future due to a change in the regulatory framework. The decision to allow some additional SO_2 emissions (albeit at a much reduced level with the requirement for reduction technology) is therefore not one that we consider presents a threat of serious or irreversible environmental harm. As such, there is no trigger to apply the precautionary principle and thus postpone any approval of this proposal subject to the establishment of new criteria as has been suggested by DEA.

[216] We further note that this data particularly highlights the vulnerability of those in the population with pre-existing comprised health condition or an increased vulnerability due to age.
[217] NEPC Review Report, op cit, at p 29.

Summary of findings and conclusions on SO_2

428 From a purely risk assessment perspective of balancing potential impacts to beneficial uses of the environment for the totality of the proposal, we would ordinarily agree that the weight of technical evidence falls in favour of not requiring SO_2 reduction technology to be added to the process.

429 However, a relevant aim of the SEPP(AQM) is to 'achieve the cleanest and healthiest air environment possible for Victoria'. Here, having regard to the discretion open to us under s 20C(3A) of the EP Act and cl 30(1) of the SEPP(AQM), and a consideration of the principles that underscore those provisions, we do not find that Dual Gas' concerns about the added cost of implementation outweighs these other policy principles. We believe there is a sound basis in this case to go beyond 'best practice' and the quantitative achievement of the SEPP Attainment program, and to achieve other important outcomes that ultimately assist in achieving continuous improvement in air quality in the Latrobe Valley AQCR.

430 Accordingly, we conclude that at the present time, the requirement for SO_2 emissions reduction is appropriate and reasonable, and that the relevant condition of the works approval should remain, albeit in a slightly varied form.

431 The condition on the works approval had sought a 90% reduction in the overall sulphur dioxide emissions. Because sulphur dioxide will be emitted untreated from the char burners, Mr Blatchford highlights that this 90% requirement translates into a 94% reduction from the syngas streams.[218] The higher level of removal has cost and operating implications. If a sulphur reduction condition is to be imposed, Dual Gas submits that the condition should apply the 90% reduction requirement only to the syngas stream. We consider this to be acceptable given that:

- the focus of the original EPA assessment was on treating the syngas stream to 90% reduction and not the overall sulphur dioxide emissions.[219]
- the focus of all expert evidence was on treating only the syngas stream.
- Mr Blatchford's evidence is that when assuming average levels of coal sulphur content, some 6,000 to 9,000 t/yr would be emitted, compared to the 13,000 t/yr based on the ninety-fifth percentile content assumed in the emissions modelling.[220] A 90% reduction from the syngas stream would thus result in emissions ranging from some 600 to 1,300 t/yr (from the lowest average estimate to the ninety-fifth percentile), demonstrating a significant reduction over untreated emissions.

[218] Blatchford powerpoint presentation at p 43; Transcript at p 757 lines 1-10.
[219] EPA works approval assessment at p 26; Tribunal Book EPA.010.133-R.
[220] Exhibit D-11.

432 We have amended what is now condition 3.2 a) accordingly. In order to provide certainty as to what is meant by average SO_2 content we consider that the condition should require SO_2 reduction equipment that will achieve a 90% reduction in the SO_2 emissions from the syngas stream (as determined from a rolling monthly average of the sulphur content of the coal feedstock).

PART 10: NOX, PARTICULATES, AND OTHER AIR QUALITY INDICATORS

NOx emissions

433 The proposed power plant will result in emissions of nitrogen oxides at rates that exceed the limit established under the SEPP(AQM). Having considered these exceedances the EPA has granted an exemption from compliance in accord with cl 22 of Schedule E of the SEPP(AQM) because:

- the emissions do not exceed the design criteria set out under Schedule A of the SEPP(AQM);
- the proposed measures for the reduction of NOx emissions represents best practice for the form of burner technology required for syngas and equivalent to best practice reductions can be achieved by steam injection during any operation of the turbine(s) with 100% natural gas.
- compliance with Schedule E limits would preclude the development of innovative control or energy saving technology.

434 DEA objects to the granting of the exemption on the grounds that:

- there is emerging evidence of adverse health effects from levels of NO_2 that are below the current NEPM ambient air quality standards; and
- notwithstanding the assessment indicating the low level of NO_2 assessed for this project, there may still be health affects.

435 DEA also complains about the lack of assessment for 24-hour and annual average emission concentrations of NOx within the Latrobe Valley AQCR. It is submitted that such assessment is necessary to assess potential health affects. It is DEA's position that the proposal does not accord with best practice in the control of NOx emissions and is inconsistent with the SEPP(AQM).

436 The EPA and Dual Gas dispute these claims, relying on modelling of projected emissions levels to rebut the health affects and assert that it is appropriate for the exemption under cl 22 of the SEPP(AQM) to be granted or in the case of Dual Gas asserting that no exemption is necessary in the first instance.

437 Our consideration of the NOx emission issues for the most part is similar to that we have undertaken for SO_2, save for the fact that Schedule E of the

SEPP(AQM) sets out limits for new stationary sources located in AQCR's. Being a new stationary (power station) source in the Latrobe Valley AQCR, schedule E applies to this works approval application. Schedule E sets the following emission limits for NOx that are applicable to power generation:

- for power station boilers for generation of electricity of rated output of 250MW or more – 0.7 g/m^3 when solid fuels are used (with a note indicating under some circumstance not relevant to this application the limit may be increased to 0.78 g/m^3).
- for gas turbine power generation with a rated output equal to or more than 30MW – 0.07 g/m^3 based on the use of gaseous fuels.
- for gas turbine rated less than 30MW – 0.07 g/m3 for gaseous fuels and 0.15 g/m^3 for 'other fuels'.[221]

438 Dr Bellair suggests that being coal-fired, the limit to be applied to the IDGCC proposal is for solid fuels. We reject this evidence. The terms of Schedule E of the SEPP(AQM) are directed toward the type of power generation source first and then the fuel type. Clearly, as is stated in the works approval application, this proposal is for two combined cycle plants (i.e. turbine and heat recovery systems) to generate power, fuelled in the main by syngas[222].

439 In terms relevant to the schedule and the applicable limits to be applied, the sources of emissions are from:[223]

- the exhaust from the GTs fired by a gaseous fuel (syngas), and
- the char/ash burner boiler which are used to generate steam that is used in conjunction with steam from the GT heat exchangers.

440 Accordingly, at a rated output of 185MW per turbine, the 0.07 g/m^3 limit applies to the GT train and at a rated output of approximately 275MW, the 0.7 g/m^3 for the operation of the char/ash boilers arguably applies. We say 'arguably' for the latter, due to the fact that the 275MW is generated from a combination of steam sources which do not fall neatly within the designation of the SEPP(AQM) schedule. In any event, it is the gaseous fuel limit that is the focus of the exemption challenged by DEA by way of the fact that DEA's complaint is focussed on the management of emissions from the GTs.

441 The gaseous fuel emissions from the turbine component of the IDGCC train is estimated to range from 0.09 g/m^3 to 0.1 g/m^3, which is above the 0.07 g/m^3 limit.[224]

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[221] There is some question in the way the table at Schedule E sets out these limits and which criteria apply to each category of turbine. We have applied what appears to be the commonly accepted limits for the gas turbines and as adopted in the DEA submission.
[222] Tribunal book EPA.020.298 and EPA.020.305.
[223] We have ignored for present purposes the air-preheating and the pre-drying stack emissions. Dual Gas application material (Tribunal book EPA.020.482) indicates these two sources to be inconsequential.
[224] EPA works approval Assessment Report; Tribunal book EPA.010.134-R.

442 Under the terms of cl 22(1)(a) of the SEPP(AQM), the design criteria under Schedule A is not to be exceeded and no beneficial uses of the environment can be adversely affected. If so satisfied, then one of the other three criteria, under clauses 22(1)(b), (c) or (d), also needs to be satisfied.

443 For the purpose of cl 22(1)(a), the evidence of Dr Ross that the NOx design criteria is not exceeded is not disputed. For the reasons we have set out earlier about our confidence in Dr Ross's assessment, we have no reason to find otherwise. The NOx concentrations under the various scenarios modelled by Dr Ross are all at least one order of magnitude below the criteria indicating a high level of compliance can be achieved.

444 Thus the first criterion under cl 22(1)(a) is satisfied - i.e. while the emission rate limit is marginally exceeded, the design criterion for ground level concentrations is met by the proposed level of emission.

445 The EPA also asserts that the proposed means of addressing NOx emissions is best practice for the mix of syngas and natural gas operations. If the operation of the turbines should convert to full use of natural gas, a condition of the works approval requires conversion of the burners to the dry low NOx type.

446 There is agreement between the technical experts that the proposed means of reducing NOx emissions achieves equivalent to best practice for gas fuelled turbines. There was no substantive challenge to this evidence. Nor was there any challenge to the evidence that the accepted best practice of using dry-low NOx burners cannot be applied to the use of natural gas in the event that the DGDP does not continue to operate on syngas. We accept this evidence and as consequence accept that the means of NOx management proposed by Dual Gas is consistent with a best practice outcome. This satisfies one of the other three criteria, namely that under cl 22(1)(d).

447 While this proposal also represents innovative technology, we are not persuaded that it fully satisfies the terms of 'innovative control or energy saving technology' set out under cl 22(1)(c). We offer no further view on this as it was not an area addressed by the parties, and we do not rely on this criterion to reach our conclusions as to the appropriateness of the exemption.

448 Notwithstanding that the proposal meets the SEPP(AQM) design criteria, DEA argues that health risks are not addressed because there is now evidence through the NEPM review that there is no safe human health level of exposure to NOx (primarily the agent NO_2).[225] Thus, it is argued that the beneficial uses are not protected, or at the very least, until there is more certainty as to the affects of NOx, application of the precautionary principle should lead to a conclusion that no exemption from the schedule E limits should be given. On this basis, DEA submits that the granting of the

[225] DEA Closing Submissions at [68] and [70] – [71].

exemption, and its reliance on it by Dual Gas is inconsistent with the SEPP(AQM).

449 These arguments are similar to those mounted against the issue of SO_2 emissions and the foreshadowed review of pollutant criteria for ambient air quality.

450 In addition to what we have said about the NEPM review earlier, it is useful here to reflect on the commentary in the NEPC Review Report that:

- there is a community expectation that meeting air quality standards achieves full protection and that exceedances of the standards represent major health issues;[226]
- such an expectation is a misunderstanding of the risk weighted approach to formulating air quality standards particularly where there is 'no evidence of a clear threshold for effect'; and
- implementing standards under the NEPM will minimise risks as much as possible[227] but does not eliminate them.

451 This in line with Dr Denison's evidence that:

> …it is not possible to have a situation whereby there are no health effects related to these pollutants [where health effects are observed at very low levels] as this would mean zero emissions from all sources.[228]

452 We make the following points in response to DEA's claims:

- the criteria established under the NEPM are for ambient air quality, and adopted into the operation of the SEPPs for the purpose of air quality objectives. These criteria are therefore applied to regional air quality and not for evaluating individual sources.
- the design criteria are established to assist in meeting the air quality objectives when having regard to individual sources.
- all criteria so established have been established in recognition that some residual risk remains.
- as Dr Denison's evidence states the level of risk 'has been agreed [to] through a consultative process with all stakeholders in the establishment of the SEPPs'.[229]

453 In applying the design and air quality objective standards therefore, we are obliged to accept that these criteria establish an acceptable level of risk. Not withstanding that the rate of emissions of NOx may be above the SEPP(AQM) limit at schedule E, we are satisfied that in meeting the design

[226] NEPC Review Report, op cit, at p 17
[227] ibid, at p 18.
[228] Tribunal book EPA.100.381 at [85].
[229] ibid.

and other relevant criteria, these emissions do not present an unacceptable level of risk.

454 Further, DEA's position is not tenable as it seeks to establish a regime of 'no risk' - a regime which even the NEPM review recognises will not exist under any revised framework. Even if it were possible for us to do so, we are not persuaded by the submissions of DEA that it is appropriate to go beyond that which the SEPP(AQM) contemplates.

455 Having regard to the ability of this proposal to meet the risk related criteria in a satisfactory manner and that the proposal can achieve best practice controls to reduce the emissions in this way, we are satisfied that the required tests under cl 22(1)can be met. Accordingly, it is accepted that the exercise of discretion afforded under cl 22 to exempt the proposal from compliance with the Schedule E NOx limits is acceptable.

Particulate matter

456 The works approval application and the review by the EPA indicate that:

- particulates generated in the syngas fuel stream will be removed by best practice sintered metal filters. This is necessary to protect the turbine blades from particle impact damage, a fact confirmed in evidence by Mr Blatchford.[230] The outcome is an emissions rate that approaches that of natural gas combustion and a particulate emissions intensity of 0.03 g/sec per MW, which is one third of the equivalent licensed emission intensity of existing coal fired power stations in the Latrobe Valley.
- the char burners are to be fitted with high efficiency bag filters. This represents best practice for this source of particulates.

457 DEA sought to challenge the manner in which the EPA had assessed the proposal for impacts from emissions of airborne particulate matter and other air quality indicators, notably mercury. However in respect to particulates, DEA accepts that:

- in terms of particulate $PM_{0.1}$ there is insufficient information to establish emission limits; and
- accepts that there has been appropriate modelling of $PM_{2.5}$ emissions and that any emissions will be appropriately managed through the imposition of licence conditions.

458 Accordingly, it does not pursue these grounds.

459 Nevertheless, DEA maintains its concern about the possible lack of safe levels of particulate emissions, that the present day criteria may not address this issue and expresses a view that application of the precautionary

[230] Blatchford evidence at p 34 (Tribunal book DGA.200.100); powerpoint presentation at p 41; Transcript at p753, lines 15 to 23.

principle and principle of intergenerational equity require a consideration of background particulate levels and appropriate levels of management.

460 In this respect, we note that Dr Ross's assessment did indeed take account of background sources of particulates, applying a blanket airborne concentration of 0.02mg/m^3 to the air-shed. At this level the contribution of particulates from all other emitters and from the Dual Gas proposal is indicated to be at least one order of magnitude less than the background and well below the design criteria of 0.08mg/m^3. Similar results are indicated for SEPP AAQ criteria.

461 In terms of consistency with the SEPP(AQM), we find there is no cause for further requirements over and above the proposed methods of particulate matter capture and treatment. Taking into account such outcomes, along with the facts we have set out before that the control of particulates emissions representing best practice, we see no reason why the precautionary or intergenerational principles should be invoked in the manner suggested by DEA.

Other air quality indicators

462 In its grounds the DEA raises issue about compounds it terms 'toxic' that are generally associated with coal fired power station emissions. Such compounds are generally described as organic, metalloid or metal compounds. DEA's submissions focussed on mercury as the greatest concern to DEA. She outlined the health issues with mercury, the impact from bio-accumulation in the food-chain and that a large proportion, perhaps over one third of industrial mercury emissions are due to coal fired power stations. [231]

463 The emissions of mercury and other air pollutants compounds were assessed in the works approval process. The emissions of such compounds are required to be reduced to the maximum extent achievable in accord with the SEPP(AQM).[232] The EPA considers that this is achieved in the IDGCC proposal by a combination of:

- efficient combustion processes in the generation of syngas and turbine combustion to minimise the production of organic compounds; and
- 'highly efficient' particulate removal processes, as described earlier, that will capture toxic particulates such as respirable crystalline silica and metal compounds that attach to particles.[233]

464 That said, it is recognised that some compounds, such as mercury, can be emitted as vapour. Vapour however is not the issue for DEA as its health effects are of less concern compared to that of bio-accumulation in the food

[231] At pages 22 and 23 of the DEA's closing submissions.
[232] Clauses 18(3)(c) and 19(2).
[233] EPA Closing submissions at page 162, [876] to [877].

chain. It is the latter that results in exposure to and accumulation of mercury in humans.[234]

465 While we recognise such concerns are one's widely held, we are not persuaded by DEA's submissions that the emissions of mercury from the DGDP are inconsistent with the SEPP(AQM) and/or otherwise present a sufficient risk to warrant refusal of the works approval. Relevantly:

- the proposal is acknowledged to achieve the 'maximum extent achievable' (MEA) criterion for such compounds, a fact not challenged by way of any evidence bought before us.
- what technical information that is before us indicates the current emissions of mercury and Class 3 air quality indicators are below design criteria, even at the 99.9 percentile concentration.
- Dual Gas emissions of Class 3 indicators and mercury have been assessed and are predicted to make no discernable change to ground level concentrations within the Latrobe Valley AQRC.[235]
- Earlier we noted that because of the more efficient use of coal in this proposal, there is a resultant lower emissions intensity for SO_2. By way of the same logic, the emissions intensity for Class 3 air quality indicators and mercury must similarly be improved over other existing coal based power generating plans in the region, representing an improved outcome for electricity generation based on coal as the ultimate fuel source. The assessment of the proposal by Dr Martion J van der Burgt on behalf of the EPA supports this conclusion.[236]
- A causal link between mercury emitted by Latrobe Valley power stations and accumulation of mercury in the marine food chain has not been established by evidence. To merely assert that because power stations world wide result in one third of emissions to the environment and that there is mercury accumulating in the marine environment is insufficient. This argument may have more weight if the proposal was located in a region that may influence marine environments, but such a link has not been established by DEA.

466 We thus do not accept DEA's submission that the emissions of mercury represents a contribution of mercury that renders fish and seafood unsafe, thereby reducing the ability of future generations to utilise natural resources or increasing the related health risks.

[234] DEA closing submission at pages 22 and 23; Transcript 2120 line 19 to 2121, line 10.
[235] EPA works approval Review, Tribunal book EPA.010.136-R; HRL Technology Assessment report June 2010, Tribunal book EPA.020.629 to 660; and HRL Technology Briefing note for Mercury, November 2010, Tribunal book EPA.010.027-R to 033-R.
[236] May 2011 review report at pp 154-155; Tribunal book EPA.010.157-R at EPA.010.166-R to167-R.

PART 11: NOISE

467 The works approval contains conditions to achieve noise limits established in accord with the Noise From Industry in Regional Victoria (NIRV) Guidelines.[237] The noise limits proposed by the EPA have been determined on the basis of impacts to the nearest sensitive residential land use and an allowance for additional development of industrial land in the vicinity of the Dual Gas premises.

468 Dual Gas does not resist the need for noise limits, nor does it dispute that if surrounding industrial land were to be developed, decreases in its noise emissions would be consistent with the NIRV. The argument from Dual Gas is however that the converse may be true. It cites the potential for a number of plants operating under the umbrella of Energy Brix to close. If this were to occur, or indeed no other industrial development were to occur, the steps taken to meet the lower limits would be an unnecessary cost impost. Dual Gas therefore seeks flexibility within the terms of the works approval conditions, to address its noise emissions to the appropriate level now and build in the capacity to address future noise limits that may apply in the future.

469 Dual Gas contends that the decision here is more of a policy than a technical issue.

470 As a starting point, it is perhaps relevant to note that the NIRV is a guideline and not a policy in the sense in which a policy is defined under the EP Act: '***policy*** means a State environment protection policy or a waste management policy'.[238] As such, limits determined in accordance with the NIRV are not statutory limits. Such limits can only be given effect through an authority (such as a works approval or licence) or other statutory device such as a planning permit.[239] The inclusion of a work approval condition determined under the NIRV is therefore important in establishing the boundaries or limits to noise emissions for this plant.

471 It is also important that any limits meet the intent of the EP Act and be consistent with other decision making approval processes. It is appropriate to note that unlike the issues we have addressed in relation to air quality and the application of the aims, principles and intent of the SEPP(AQM), no SEPP applies in the assessment and control of noise in regional Victoria. We have therefore reflected on the context of our decision about noise in terms of the EP Act. This includes taking account of what ss.19A, 20C(3)(a) and 20(3A) set out and the intent of any condition on the works approval to ensure no adverse noise pollution occurs having regard to the principles of environmental protection set out under the EP Act.

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[237] EPA Publication 1411, October 2011. In the works approval assessment phase, these guidelines did not apply, rather the Interim Guidelines for Control of Noise from Industry in Country Victoria (N3/89) were applied. The change in guidelines does not affect the proposed noise limits or the position of EPA or Dual Gas.

[238] Section 4 of the EP Act.

[239] Part 1 Overview, NIRV October 2011; Tribunal book reference EPA.050.1467.

472 We agree that the response to noise emissions should be proportionate to the impact and the benefit achieved, as per the integration principle etc. We also consider that given the enormity of any retro-fitting task to address any multiple sources of noise requires us to contemplate the benefit of pro-active management steps to address this issue.

473 While Dual Gas points to the potential for some power generating plant(s) to be retired from the locality of the Dual Gas site, it also is apparent to us that on retirement of older technology, newer technology power plant, such as the DGDP proposed here, may be developed. Alternatively the defunct land may be put to other industrial use. In any event, as a matter of fact, there is sufficient potential for land in and around the Dual Gas site for further industrial development. Such development has the potential to incrementally add to noise impacts on adjoining sensitive areas. The NIRV seeks to address such impacts by applying a 3dB(A) or 5dB(A) penalty depending on the development potential of surrounding land. In the context of possibly three or more sites being capable of further redevelopment, or redevelopment of existing power plant sites, we consider the 5dB(A) penalty to be appropriate.

474 On the balance of these issues, we consider that the conditions put forward by Dual Gas to address current noise limits with inbuilt design to address future limits to be insufficient. Firstly we note that the cost estimate of $10 million to address the noise limits is by Mr Walton's own evidence an estimate based on concepts and is not a particularly accurate figure.[240] Secondly Mr Walton indicates that the costs of the works, while having a financial impact on the capital cost, would only change it by a 'very small factor'[241]. Further, it would appear from Mr Walton's evidence that some opportunities might arise from the contract of supply and construct to meet these limits through revised design and construction options at costs below the estimate provided by Dual Gas.

475 Given such uncertainties as to the actual costs, we are not persuaded that the cost put forward by Dual Gas is reliable. In terms of the basis of Dual Gas' argument as to the economic impact, Mr Walton's evidence leads us to the view that even in allowing for a possible cost of up to $10 million, the impact to the DGDP will be very a small factor

476 Balanced against this cost is the benefit. While at first instance a 5dB(A) reduction is seemingly small[242], the cumulative effect of reducing the noise emissions is what is important. This cumulative effect is that a lower noise limit for Dual Gas will allow comparable noise generating sources to establish and operate on adjoining land without impacting on the amenity of the nearby residential areas. Having regard to the planning controls and

[240] Transcript at page 1270 Lines 8-21.
[241] ibid.
[242] most acoustic experts generally advise that a 3dB(A) to 5dB(A) increase is barely detectable

development intended for such land, this is an outcome that is consistent with orderly planning.

477 Requiring the lower limit is therefore seen to have both environmental and wider economic and social benefits to the Latrobe Valley. We find that these are sound reasons when weighed against the vagueness of the costs said to be incurred, but in any event of a relatively inconsequential impact to the project. Accordingly we will direct that the noise targets in Condition 2.6 remain at the levels set by the EPA.

PART 12: TOWN PLANNING ISSUES

Validity of works approval

478 The relevant part of s 19B of the EP Act provides that:

> (7A) If a planning scheme requires a permit to be obtained under the *Planning and Environment Act 1987* for the proposed works and a permit has not been issued, any works approval issued by the Authority for the proposed works must be issued subject to a condition that the approval does not take effect until a copy of the permit is served on the Authority by the applicant.
>
> (7B) Any works approval issued in contravention of …ss (7A) is void.

479 The EPA had followed the earlier subsections of s 19B and had referred to the works approval application to Latrobe Shire Council that had, in turn, advised the EPA that no planning permit was required for the DGDP. The EPA relied on this advice in good faith and had not imposed the condition otherwise required by s 19B(7A). Subsequently, it became apparent that a planning permit *might* be required for the DGDP, as part of the works is within an area covered by an Environmental Significance Overlay[243]. The EPA thus became concerned that its works approval may be void by reference to s 19B(7B) and that this may, in turn, render the applications for review and the Tribunal proceedings void or ineffective.

480 The Tribunal agrees with Dual Gas that this concern is misconceived. Under s 4(2) of the VCAT Act, a 'decision' capable of review is widely defined. It includes a decision made in the *purported* exercise of a function under an enabling enactment, or a decision that *purports* to be made under an enactment even if it was beyond the power of the decision-maker. The EPA's decision to issue the works approval in this case is thus capable of review, irrespective of whether the works approval it issued contains the condition under s 19B(7A). If the Tribunal decides that a works approval

[243] see statement of evidence prepared for Dual Gas by Marco Negri, town planner with Contour Consultants, dated September 2011. This statement had been filed during the interlocutory phase of the proceedings when the town planning issues were first raised, and Mr Negri was not called as a witness.

should issue, and accepts that a planning permit is (or may be) required, it can add the relevant condition.

481 All relevant parties, including the EPA, ultimately accepted this view. Based on the material before us, it is not possible for us to finally determine whether a planning permit is required for the DGDP, as the final building footprint of the power station is not yet finalised. However, we accept the concession by Dual Gas that the safer or better view is that a planning permit *is* required for the DGDP and that we should impose a condition on the works approval under s 19B(7A).

Consideration of town planning issues under s 37A EP Act

482 The second way in which planning issues arise in this proceeding is by reference to s 37A of the EP Act, the relevant part of which provides as follows:

> 37A In determining an application for review or a declaration under this Part the Tribunal must—
>
> (a) take into account any relevant planning scheme …[244]

483 This provision is couched in mandatory terms even though there are no planning issues raised in the grounds of review before us, and we therefore requested the parties to make submissions on the planning scheme matters we should have regard to. We note that a planning scheme is an instrument of a broad discretionary character, and we are not deciding this proceeding as a *planning* decision-maker. We consider our role in taking account of the planning scheme is to consider whether there is any provision in the scheme that might clearly militate against the issue of this particular works approval.

484 The 'relevant' planning scheme here is the Latrobe Planning Scheme. From the parties' submissions, we are satisfied that, under this planning scheme:

- the DGDP is not a prohibited use or development on the land.
- the land is within a Special Use Zone (Schedule 1) that makes express provision for brown coal mining and electricity generation.
- whilst the land is subject to an Environmental Significance Overlay (Schedule 1) under which a permit may be required, the ESO recognises that "the coal industry is of national and state importance due to its use as the primary source for the electricity generating industry in Victoria"[245].
- the State Planning Policy Framework seeks to protect brown coal resources, but also seeks that planning should adopt a best practice environmental and risk management approach, and manage the

[244] Section 37A of the EP Act also requires the Tribunal to take into account, where appropriate, any adopted planning scheme amendment or any s 173 agreement. There are none affecting this proceeding.
[245] Latrobe Planning Scheme, Schedule 1 to cl 42.01

potential for environmental change to impact on the environmental, economic and social well-being of society. For the protection of air quality, the planning policy uses the SEPP(AQM) for guidance[246].

- The Local Planning Policy Framework recognises the importance of electricity generation and coal mining within the local economy, promotes new technology designed to reduce GHG emissions, and recognises investment in clean coal technology[247].

485 We also note that the Minister for Planning did not require an EES to be prepared for the DGDP, for reasons including:

> 1. The construction of the proposed power station would not have significant adverse effects on environmental values, as it would be located on an existing industrial site with no significant landscape, waterway, biodiversity or cultural heritage features.
>
> 2. The proposed power station site is already zoned under the Latrobe Planning Scheme to provide for brown coal mining, electricity generation and associated uses, and the establishment of a new energy generation facility is unlikely to significantly increase off-site hazards relative to existing industrial activities that are adjacent to the site.
>
> …[248]

486 Taken as a whole, we consider there is nothing in the planning scheme that directly militates against the issue of a works approval for the DGDP, and indeed some broad planning policy support for a project in the nature of the DGDP. We have considered these matters (as required by s 37A of the EP Act) and, given our comments above, we have found it unnecessary to refer expressly to planning scheme issues elsewhere in these reasons.

PART 13: CONCLUSION

487 It follows from all of the above that the objectors' applications for review fail, and they are dismissed.

488 It also follows that the Dual Gas application for review succeeds, but only in part. Whilst we have considered it appropriate, on the evidence, to allow a works approval for the DGDP with a capacity of 600 MWe, we have done so subject to specified conditions to be included within the works approval, including a new condition that effectively prevents the DGDP from commencing until the retirement of an equivalent amount of higher GEI generation capacity in Victoria is secured, as well as maintaining a condition requiring the works to be designed to operate at a GEI of 0.8 t CO_2-e/MWh should remain, with the GEI to be measured 'as generated'.

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[246] ibid, cl 14.03, 13 & 13.04-2
[247] ibid, cl 21.01, 21.03 & 21.07
[248] decision of Minister for Planning dated 23 November 2009, noted in DGDP works approval Application at p 26

489 Dual Gas has been unsuccessful in its application to delete or modify the conditions proposed by the EPA for SO_2 capture and noise attenuation. We have decided that these should remain, subject to varied wording.

PART 14: POSTSCRIPT – RESPONSE TO REVIEW OF THE CLIMATE CHANGE ACT 2010

490 We have earlier noted the rapidly evolving regulatory and policy framework within which we have had to consider the applications before us, with changes occurring during and after the hearing process. Indeed, we expressly canvassed with the parties at the conclusion of the hearing the fact that there may be further changes to the policy framework during the period our decision was reserved including, in particular, the foreshadowed tabling of the review of the CC Act. We indicated then that, whilst we are required to accord procedural fairness, we would not consider it necessary to hear further from the parties in the event of any change of policy if the parties' views would be reasonably self-evident from their submissions at the hearing. We indicated that we would seek further submissions only if we considered it exceptional and necessary to do so[249].

491 The EPA noted that it was unrealistic for anyone to expect that we would go into some cellar and write our decision without being aware of the changing world around us[250]. It requested that, in the event of a change in government policy whilst our decision was reserved, we at least acknowledge the release of the new policy in our decision, so that the parties were aware that the Tribunal had made its decision with knowledge of it. We do so through this postscript.

492 The Tribunal had been about to publish its decision, in the form of the reasons in Parts 1 to 13, when it became aware on 27 March 2012 that the Victorian government had tabled the report of the review of the CC Act, together with its response[251]. From the Tribunal's brief review of this material, it appears that the Victorian government:

- supports in principle the report's recommendation to retain the preamble to the CC Act;
- supports the report's recommendation to retain the decision-making requirements in s 14 of the CC Act; and
- supports a recommendation to repeal the GHG target in s 5 of the CC Act, and to instead acknowledge the national target for GHG emissions of 5% below 2000 levels by 2020, and that the national

[249] Transcript at pp 2580-2582
[250] Transcript at p 2581
[251] *Review of the Climate Change Act 2010*, Department of Premier & Cabinet, December 2011, and the *Victorian Government response to the Climate Change Act Review*, Victorian Government, March 2012, both sourced by the Tribunal from www.climatechange.vic.gov.au

carbon pricing mechanism is the primary means through which the national target will be met.

493 The Victorian government response also indicates that the government would clarify its position on the need for a separate GEI standard for new power stations, given the Australian government's decision not to introduce such a standard. On 27 March 2012, the Minister for Energy announced that Victoria would not proceed with a Victoria-specific GEI standard[252].

494 The review of the CC Act and the possibility that the Victorian government may move to repeal the GHG target in s 5 of the CC Act or not proceed with a GEI standard, were canvassed during the hearing. We have not therefore considered it necessary to seek further submissions on these issues.

495 The GHG target still remains in the CC Act. Unless and until it is repealed, it is still part of the existing Victorian law to which we must have regard. Our comments in relation to the target stand. We have nonetheless also considered the implications of its repeal. Given our finding that the use of the DGDP is not inconsistent with the SEPP(AQM) even if the GHG target in s 5 of the CC Act applies, it follows that the repeal of the target would not affect that conclusion. More generally, there is still a national GHG emissions target (now also supported by the Victorian government) to which we have had regard.

496 Although the Victorian government has indicated it will not implement a formal GEI standard, we had already considered the similar and earlier decision of the Australian government not to implement such a GEI standard. For the reasons we have earlier outlined, we still consider the GEI condition should be maintained in this works approval. Our comments in relation to the GEI condition stand. We note also that, in its application for review, Dual Gas had not sought to challenge the condition imposing a GEI standard in the DGDP works approval.

497 It follows that our decision has not changed as a consequence of the Victorian government's response to the review of the CC Act. There are provisions in the EP Act for Dual Gas to seek an amendment of the works approval, or to seek a different outcome in a future licence, if it considers this is warranted through any consequential changes to the regulatory or policy framework that may arise from the CC Act review.

Mark Dwyer
Deputy President &
Presiding Member

[252] Media release from Minister for Energy and Resources :'*Victoria adopts Commonwealth position to reject new emissions intensity restrictions*', 27 March 2012.

APPENDIX 'A' – WORKS APPROVAL AND CONDITIONS

WORKS APPROVAL

Issued under Section 19B of the *Environment Protection Act 1970*

This works approval allows the occupier to construct works at the premises subject to the attached conditions.

OCCUPIER: DUAL GAS PTY LTD (A.C.N. 117 102 244)

REGISTERED ADDRESS: UNIT 9, LEVEL 1, 677 SPRINGVALE RD, MULGRAVE VIC 3170

PREMISES ADDRESS: COMMERCIAL RD, MORWELL VIC 3840

APPROVAL NUMBER: WA67043

ORIGINAL DATE OF ISSUE: 20 MAY 2011

DATE OF RE-ISSUE FOLLOWING DETERMINATION OF VCAT APPLICATIONS FOR REVIEW: [insert date prior to re-issue]

.....
[insert name]
MANAGER, AUTHORITY DECISIONS

Works Description

This approval allows the construction at the premises of works and associated equipment for an integrated drying, gasification combined cycle power station with a maximum "sent out" electricity generating capacity of 600 MWe, where electricity is generated using a combination of "syngas" (derived from brown coal) and natural gas.

Works Approval Objectives

Subject to an exemption under clause 22 of the *State Environment Protection Policy (Air Quality Management)* in relation to Schedule E oxides of nitrogen emissions for as long as the plant operates as a syngas plant, the works approval holder shall adopt the following objectives for the protection of the environment:

- meet environmental quality requirements for all segments of the environment. This includes meeting the general provisions of the *Environment Protection Act 1970*, State environment protection policies, and Industrial waste management policies. In particular,
  - *State environment protection policy (Waters of Victoria);*
  - *State environment protection policy (Groundwaters of Victoria);*
  - *State environment protection policy (Air Quality Management);*
  - *State environment protection policy (Prevention and Management of Contamination of Land);*

- *Interim Noise from industry in regional Victoria ('NIRV' — EPA publication 1411);*
- *State Environment Protection Policy (Control of Noise from Commerce Industry and Trade) No. N-1.*

- operate in accordance with best environmental practice at all times; and
- take opportunities to minimise waste and continuously improve environmental performance.

Works Approval Structure

This approval consists of the following parts:

1. General Conditions

- includes conditions relating the works to the application, and specifies a date for the expiry of the approval

2. Works Conditions

- conditions which relate to construction of works necessary for protecting the environment

3. Reporting Conditions

- conditions requiring the submission of technical reports to EPA

4. Plan of Premises

- plan of the premises covered by this works approval.

5. Plan of the Works

- plan of the works, which will form part of this works approval when approved by the EPA under condition 3.1

1 GENERAL CONDITIONS

1.1 This works approval will expire:

a) two years from the date of issue unless the works have been commenced by that date to the satisfaction of EPA;

b) on the issue by EPA of:

i) written notification that all works covered by the works approval are complete; and

ii) a licence relating to all such works.

1.2 This works approval allows the construction of the following works and associated equipment -

a) two integrated coal dryer/gasifiers, ,

b) two 'E class' combined cycle gas turbines,

c) two heat recovery steam generators,

d) one steam turbine and generator;

e) one air cooled condenser;

f) two char burners.

- with a 'sent out' electricity capacity of not more than 600 MWe.

1.3 The works as specified in condition 1.2 must be constructed in accordance with the relevant parts of the works approval application accepted on 2 September 2010 ("the application") as augmented or amended by:
a) additional information supplied to EPA by the occupier between the date of acceptance of the application and 20 May 2011 ('the information'). [Note:Where information supersedes the information previously provided in relation to the same subject, the most recent information applies for the purpose of this condition.]
b) the reports and plans specified in conditions 2.7, 3.2 and 3.3 as approved by EPA ("the reports");
c) the conditions of this works approval; and
d) the Plan of the Works specified in condition 3.1 as approved by the EPA--except that, in the event of any inconsistency arising between the amended application, the reports, the conditions of this works approval, the conditions of this works approval and the content of the reports shall apply.

1.4 This works approval will not take effect until any planning permit which is required under the *Planning and Environment Act* 1987 has been issued by the Responsible Authority.

1.5 Construction of the works approved by this works approval must not commence until such time as the Australian Government has entered into contracts under its 'Contracts for Closure' program (or through any similar program or commercial agreement) which provide for the closure by 2020 of at least 600 MWe of coal-fired electricity generation in Victoria.

2 WORKS CONDITIONS

2.1 The plant must be designed in a manner which enables it to operate at Greenhouse Gas Emissions Intensity (GEI) of 0.8tCO2-e/MWh 'as generated' to the satisfaction of EPA.

2.2 Construction may not commence until EPA has given the occupier written approval of the reports and plans specified in conditions 3.1, 3.2 and 3.3.

2.3 The occupier must construct all exhaust stacks to discharge wastes so that:
a) the minimum height of each stack and the maximum diameter of each stack is as set out in Table1, unless varied by the Plan of Works approved under condition 3.1:

Table 1: Stack dimensions

	Height	Diameter
i) Combined cycle gas turbine stack[s]	80m	5.05m
ii) Char burner stack[s]	80m	1.37m
iii) Air Pre Heater stack[s]	80m	0.43m
iv) Pre Dryer stack[s]	80m	1.31m

b) the outlet of each stack will allow free vertical discharge of wastes;
c) each stack is clearly labelled with a unique number; and
d) provisions for sampling are included in accordance with EPA Publication

No. 440.1, *A Guide to the Sampling and Analysis of Air Emissions and Air Quality*.

2.4 The occupier must install on the main process exhaust stack a device capable of continuously and accurately measuring and recording the concentration and mass emission rate of:
a) sulphur dioxide;
b) nitric oxide;
c) nitrogen dioxide;
d) carbon monoxide; and
e) particulate matter (PM10).

2.5 The occupier must install all equipment and containers in which oil products and oil-containing wastes are used or stored in a bunded area or areas, each of which must be constructed in accordance with EPA Publication No. TG 347/92, *Bunding Guidelines*, and so that:
a) the base and walls of each bunded area are:
   i) impervious to all chemicals to be stored or used within the area;
   ii) free from fissures, gaps and cracks;
b) each bunded area is not connected to the stormwater drainage system;
c) the surface of each base is graded with a slope of at least 1% towards a sump; and
d) each sump is fitted with a manually operated isolation valve.

2.6 The noise design targets for the purpose of condition 3.2 are specified in Table 2 and are to be assessed in accordance with *State Environment Protection Policy (Control of Noise from Commerce Industry and Trade) No. N-1*.

Table 2: Noise Design Targets

Noise Modelling Location	Noise Design Targets		
	Day period	Evening	Night period
46 McLean St, Morwell	45 dB(A)	39 dB(A)	34 dB(A)
22 McMillan Street, Morwell	46 dB(A)	42 dB(A)	38 dB(A)
46 Wallace St, Morwell	48 dB(A)	42 dB(A)	37 dB(A)

2.7 A detailed hazard and operability analysis must be undertaken prior to the completion of final plant design and any necessary corrective measures must be included in the constructed works to the satisfaction of the EPA.

2.8 Provision must be made for the future installation of Dry Low NOx technology in the event that the plant ceases to operate as a syngas plant.

3 REPORTING CONDITIONS

3.1 Before commencing construction, the occupier must submit to EPA for written approval a Plan of Works that includes detailed plans and specifications for the works specified in condition 1.2, including the dimensions of the main buildings, equipment and facilities.

3.2 The Plan of Works under condition 3.1 must be accompanied by a report, including details of:

a) sulphur dioxide reduction equipment that will achieve a 90% reduction in the sulphur dioxide emissions from the syngas stream (as determined from a monthly rolling average of sulphur content of the coal feedstock);
b) noise sources with specifications, locations and attenuation equipment that is demonstrated by acoustic modelling to achieve the noise design targets specified in condition 2.6; and
c) provision for the future installation of carbon capture equipment, demonstrating that there is sufficient space, as determined by design studies, for the carbon capture equipment, construction activities and the effective handling of environmental and safety issues; and
d) provision for the future installation of Dry Low NOx technology in the event that the plant ceases to operate as a syngas plant.

3.3 Before commencing construction, the occupier must submit to the EPA for written approval a construction environmental management plan which addresses identified risks and includes:

a) the management of noise emissions;
b) the management of stormwater runoff (including provision of a stormwater retention basin and sediment flocculation pond upstream of the EBAC settling pond);
c) the management of hazardous materials uncovered during site clearance or excavation; and
d) an incident notification protocol whereby the occupier will immediately advise EPA of any incident at the premises that may result in off-site environmental impacts.

3.4 Before commissioning can occur, a commissioning plan must be submitted to and approved by EPA.

4 PLAN OF PREMISES

[insert plan prior to re-issue, as per existing plan of premises]