
From: [REDACTED]
Sent: Wednesday, 30 July 2025 5:55 PM
To: TPC Enquiry
Cc: [REDACTED]
Subject: The Cellars Hill Wind Farm Major Project draft assessment
Attachments: 2025 SUBMISSION TO CSIRO'S DRAFT 2024-25 GENCOST REPORT.pdf; Do we have a "Do as I do" or "Do as I say" government You decide by Carol-Ann Fletcher.pdf; Remembering Black Saturday 15th anniversary.pdf; VBRC Summary Royal Commission Victoria.pdf; Scapgoating climate to hide callous government malfeasance 22 Jan 2025.pdf; Calls for audit into Victorian wind turbines.pdf; TAS in a similar boat as Los Angeles when it comes to bushfire risk 20 Jan 2025.pdf

Dear TPC Planning and others,

I object and do NOT consent to the Cellars Hill Wind Farm Major Project for the following reasons:

According to Submission to CSIRO's Draft 2024-25 GenCost Report By Independent Engineers, Scientists and Professionals, 11 February 2025, written by:

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Jeremy Barlow, BE, MBA, FAIMM
William Bourke, BSc, BEng (Aero), MEng Sc.
Michael Bowden IEng (Electronics-UK); CPL; CQP
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James R (Jim) Simpson, (Ret., former business unit manager, OTC & Telstra)
Bill Stinson, Dip.Tech(Building), B.AppSc.(Building), Dip Labour Relations & Law, Cert. Design Sc. (Facilities)
James Taylor, PhD, MSc, BEng Elect (Hon), PEng, FCASI:

"Conclusions and Recommendations

Independent Engineers, Scientists and Professionals, 11 February 2025

1. GenCost fails to demonstrate that it is 'Australia's most comprehensive' report on NEM costs. It fails to include major cost elements funded by government and consumers. Its levelised cost of electricity (LCOE) method is aimed at providing investors with theoretical marginal investment indicators limited to investor costs, not national electricity costs, yet undisputedly this document is misused by government to justify its energy policies. GenCost should be much more forthright upfront in the disclaimer and executive summary regarding its true purpose.
2. GenCost's claim that wind and solar are the cheapest form of electricity generation are completely contradicted by whole-of-system ISP capital cost cash flow estimation – by a large margin as indicated in Appendix 2 to this submission and other reports. CSIRO needs to explain the reasons for this stark difference or clearly state that it is geared to investor interests and is not fit for purpose to underpin national energy policy. The warning on page 57 states that cash flow cost

models are more realistic but is not sufficiently prominent.

3. GenCost employs highly contestable assumptions and data concerning capacity factors, capital cost factors, facility lifetimes and spillage costs. CSIRO should rebalance the assumptions and data for consistency to ensure it does not unduly favour renewables.
4. GenCost fails to account for Consumer Energy Resources (CER), low voltage distribution network upgrades and disposal/remediation costs, which form a very large part of whole-of-system costs. CER by itself is 60% of all solar and battery capacities in AEMO's ISP. GenCost must include these costs – they are not free. A purposeful report should include all costs to the national economy, regardless of who pays.
5. GenCost's assumption that investors will have free access to previously built network resources is completely unrealistic in normal markets and particularly considering that grid design must be based on worst-case conditions, when all resources are at maximum utilisation. CSIRO must reconsider the whole GenCost approach to renewable integration costs.
6. GenCost's use of an unspecified electricity system model running 9 years of historical weatherrelated data to determine maximum integration costs based on the simple assumption that the grid will be reliable is a major mistake for many reasons.
 - a. The 2011-2019 AEMO data does not encompass all worst-case conditions, which recent freely available data from both Australia and overseas indicate. Wind droughts and solar outages are a common-mode failure affecting the entire NEM.
 - b. AEMO's use of a simulation model in the Integrated System Plan (ISP) illustrates the pitfalls, which are detailed in Appendix 1. CSIRO must provide details of the model used and how the criteria for reliability must include maintaining a viable dispatchable reserve margin under all conditions to protect against facility outages. The failure of the ISP to define worst-case conditions inherent to proper high reliability system engineering casts serious doubt on the integrity of its modelling and grid design with direct implications for GenCost.
7. Both GenCost and the ISP are important documents having major influence on energy policy with impacts on the entire economy and the security of all Australians. The criticality of the NEM to the well-being of the entire nation deserves rigorous and independent accountability by the same type of certification authority used in other fields such as aviation, transportation, telecommunications, civil works and the financial industry. CSIRO should support the establishment of a proper independent regulatory body to review, hold accountable and certify plans and implementation of the NEM." ([Attachment 2025 SUBMISSION TO CSIRO'S DRAFT 2024-25 GENCOST REPORT.pdf](#))

Furthermore, wind farms (which is a grievous misnomer because these turbines are NOT farms) are not only a highly likely potential fire hazard in and of themselves, and yes, even in the wintertime. The fact that the wind farms are to be connected to high voltage transmission lines, exactly like the 6 out of 11 high voltage transmission lines that killed 173 people, injured 414 more and did untold damage throughout Victoria in the 2009 Black Saturday fires, makes any wind turbine projects an unacceptable, extremely high electrical fire (NOT a normal fire you can put out with water) bushfire risk that is dangerous to human life, including our firefighters, territorial and mammal wildlife, and our valuable ecosystem and biodiversity.

You will also note, Felix Ellis, the Police, Fire and Emergency Management Minister said, "Tasmania is one of the most bushfire places in the world" and that, "[i]t's important that we do everything we can to make sure we are protecting our fellow Tasmanians from the risk of bushfire". This is the same article where he talks about the "If you light it, you own it" bushfire prevention campaign (*Tasmania in a similar boat to Los Angeles when it comes to bushfire risk* **The Advocate**, 20 January 2025).

So, my question to you and the Minister is, if this project, Marinus Link, and other similar wind turbine projects go through, littering Tasmania with these wind turbines and very ugly looking and potentially highly flammable high voltage transmission lines and electrical bushfires break out (which again, can even happen during the wintertime), are you, the planning commission and the Minister going to own those electrical bushfires?

I feel this is extremely important to ask because we are talking about people's lives here in Tasmania and how they could very easily potentially be lost, just like the 173 people who were killed in 2009 during the Black Saturday fires, with 2 of out those 6 high voltage transmission line fires exploding like Hiroshima bombs in Victoria. Can you imagine how much similar needless destruction such fires could do here in Tasmania? Needless because there was a Royal Commission into why the 2009 Black Saturday fires happened for the purpose of not repeating the same mistakes again, which I have included in this email for your review and for the Minister's review again. ([DO WE HAVE A "DO AS I DO" or "DO AS I SAY" GOVERNMENT? YOU DECIDE - BRADDON BEAGLE](#))

It is because of these reasons, along with other evidence I have attached to this email I feel that this wind turbine project and other wind turbine projects like it need to be scrapped now to prevent similar devastating fires from happening here in Tasmania, especially in NW Tasmania.

Thank you to Craig Garland and others in this email who are helping to hold this government accountable for their actions.

Kind regards,

Carol-Ann Fletcher
NW Tasmania

Sent with [Proton Mail](#) secure email.

Submission to CSIRO's Draft 2024-25 GenCost Report

By Independent Engineers, Scientists and Professionals, 11 February 2025

Aim

This submission to CSIRO/AEMO regarding the draft 2024-25 GenCost report by independent engineers, scientists and professionals (IESP) is made with the objective of providing useful feedback and insight into the true costs of implementing the government's Net Zero 2050 policy for the National Electricity Market (NEM).

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Conclusions and Recommendations

Independent Engineers, Scientists and Professionals, 11 February 2025

1. GenCost fails to demonstrate that it is 'Australia's most comprehensive' report on NEM costs. It fails to include major cost elements funded by government and consumers. Its levelised cost of electricity (LCOE) method is aimed at providing investors with theoretical marginal investment indicators limited to investor costs, not national electricity costs, yet undisputedly this document is misused by government to justify its energy policies. GenCost should be much more forthright upfront in the disclaimer and executive summary regarding its true purpose.
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 - b. AEMO's use of a simulation model in the Integrated System Plan (ISP) illustrates the pitfalls, which are detailed in Appendix 1. CSIRO must provide details of the model used and how the criteria for reliability must include maintaining a viable dispatchable reserve margin under all conditions to protect against facility outages. The failure of the ISP to define worst-case conditions inherent to proper high reliability system engineering casts serious doubt on the integrity of its modelling and grid design with direct implications for GenCost.
7. Both GenCost and the ISP are important documents having major influence on energy policy with impacts on the entire economy and the security of all Australians. The criticality of the NEM to the well-being of the entire nation deserves rigorous and independent accountability by the same type of certification authority used in other fields such as aviation, transportation, telecommunications, civil works and the financial industry. CSIRO should support the establishment of a proper independent regulatory body to review, hold accountable and certify plans and implementation of the NEM.

Table of Contents

Submission to CSIRO’s Draft 2024-25 GenCost Report	1
Aim	1
Conclusions and Recommendations	2
Table of Contents	3
Introduction	4
Detailed Assessments	4
1.0 Flawed Methodology	4
2.0 Cost Modelling Accuracy	5
3.0 Capital Cost Factors	6
4.0 2024 ISP Cost Estimates	7
5.0 Integration Cost Estimates	8
5.1 Ensuring System Reliability	8
5.2 Proper High Reliability System Design	10
5.3 Temporal Applicability	11
5.4 Free Existing Capacities	11
5.5 Facility Lifetimes	11
5.6 Capacity Factors	12
5.7 Exclusions	13
5.8 Transmission and Stabilisation	13
5.9 Distribution Networks	14
5.10 Disposal, Recycling and Remediation	14
5.11 Spillage	14
6.0 Whole-of-System Cost Modelling	14
Appendix 1 - The AEMO 2024 ISP Will Not Deliver Reliable Power	17
Appendix 2 - The Missing Whole-of-System Cost Model in the AEMO 2024 ISP	22

Introduction

Reliable and affordable electricity is essential for the nation's economy and in some cases to individuals who are medically dependent on it. It is the linchpin to national productivity. National security demands reliable power. Virtually all jobs depend on it. It is vital therefore that any changes to the NEM ensure that reliable and affordable electricity continue to be available in abundance.

There is increasing disquiet in the community about rising electricity costs and the impacts that renewables impose on the environment. There is more disquiet in the United Kingdom and Germany where renewables are having greater impacts, but it appears these lessons are being ignored.

The scientific community is beginning to acknowledge that the climate impacts of CO₂ emissions have been overstated and overhyped by media. The futility of reducing Australia's emissions in the face of overwhelming global emissions growth in major countries such as China, India and the US and all developing nations, is also contributing to a trend in declining public support.

Political and media dialogue is now focused on real concerns about future prosperity in an economy that is facing both energy shortages and massive cost rises. Jobs and businesses are on the line. We are already seeing instances where high energy costs are major factors in business closures.

There is an urgent need for full and forthright information. GenCost states that it a collaboration between CSIRO and AEMO¹. Its Executive Summary claims it to be "*Australia's most comprehensive electricity generation cost projection report.*" It is not. This submission identifies multiple serious failings with CSIRO's GenCost report and, given that AEMO's ISP is closely related, failings in the ISP too.

There are many. It is now time for CSIRO to have the wisdom from introspection and the courage to speak truth to power and to the public.

Detailed Assessments

As concerned citizens with deep backgrounds in engineering, science and business management, we present the following assessments to illuminate the shortcomings of the CSIRO 2024-25 GenCost Report. This work upgrades our previous submissions to AEMO on the 2022 and 2024 draft ISPs, AEMO's Inputs, Assumptions and Scenarios (IAS) consultation (August 2024) and the Senate Select Committee on Energy Planning and Regulation (October 2024).

Our concerns, together with those of many other highly qualified experts and organisations, focuses on reliability and costs; flashpoints that can no longer be dismissed or ignored.

1.0 Flawed Methodology

According to GenCost², "*The stated purpose of GenCost is to provide essential capital cost information for the modelling community to use in their own system cost studies.*" While the capital cost data, despite some contestable issues, is useful for user studies (we use it in our whole-of-system modelling), we consider the LCOE results to be controversial and not indicative of real-world costs.

The GenCost report starts with an 'Important Disclaimer' which states in part: "*The reader is advised and needs to be aware that such information may be incomplete or unable to be used in any specific situation.*" Presumably, this disclaimer is made for legal reasons but it also shows a lack of confidence.

¹ GenCost Executive Summary Pviii

² GenCost Section D.4.16 P108

GenCost also states³ that: *Modelling studies such as AEMO's Integrated System Plan do not require or use LCOE data. LCOE is a simple screening tool for quickly determining the relative competitiveness of electricity generation technologies. It is not a substitute for detailed project cashflow analysis or electricity system modelling which both provide more realistic representations of electricity generation project operational costs and performance.*" Despite this warning, GenCost makes definitive conclusions regarding the cost of firmed solar and wind⁴ being the lowest cost.

It is unfortunate that government ministers and managers do not make time to read such details. The ideological commitment to so-called renewables appears foundational. It is incontrovertible from ministerial statements that government energy policy is based on the stated assertion that *firmed wind and solar are the cheapest form of electricity generation as shown by CSIRO's GenCost reports.*

Our whole-of-system cost assessments in previous submissions, based on cashflow modelling as suggested by GenCost is more realistic, demonstrate that this assertion is incorrect. LCOE outputs shown in GenCost, even when modified by estimated (2030) integration costs, indicate exactly the opposite of whole-of-system capital cash flow modelling.

It is apparent that the basic LCOE methodology in GenCost is aimed at providing theoretical marginal investment indicators rather than total system costs⁵. They are two different things yet GenCost is hailed by government ministers as the authority to dictate the design of the national power grid through regulations thus bypassing qualified power systems engineers.

This difference in methodology urgently needs reconciliation to avoid misleading information from continuing to adversely affect national energy policy.

2.0 Cost Modelling Accuracy

Our assessments conclude that the AEMO 2024 ISP Step Change scenario does not represent a viable grid design for delivering reliable electricity because its proposed storage facilities and baseload generation capacities are grossly insufficient under worst-case conditions and very expensive.

Appendix 1 to this submission is a top-level modelling analysis of grid reliability, which was submitted to AEMO last August as part of the IAS consultation process. For this submission, it is updated with the subsequent release of AEMO's 2024 Electricity Statement of Opportunities (ESOO), which contains significantly reduced forecasts for future peak power demands in the Step Change scenario and reductions in annual energy delivery.

Our top-level capital cost analysis in Appendix 2, which was also provided to the IAS consultation, is based on whole-of-system modelling using generation and storage capacities from AEMO's 2024 ISP and capital cost factors from the draft 2024-25 GenCost. That analysis is more comprehensive because it takes into account facility lifetimes and estimates for transmission extensions, distribution infrastructure upgrades, grid stabilisation and disposal.

It is important to understand accuracy versus fidelity in all modelling.

- Accuracy is how well the analysis results predict future reality.
- Fidelity is the degree of detail embraced by the model.

Higher fidelity does not necessarily lead to more accuracy, especially when input data and assumptions contain great uncertainties.

³ GenCost Section 6.1 P57

⁴ GenCost Executive Summary Pxi and Figure 0-2 Pxi

⁵ GenCost Section 2.1.4 P20

We understand that predicting future costs over 25 years is extremely difficult. Changing situations can lead to errors of hundreds of percent (e.g. Snowy 2.0). GenCost acknowledges uncertainties in costings but does not quantify all of the impacts to their LCOE outputs.

GenCost's capital cost factors for generation and storage technologies are estimated by referencing multiple papers and sources, all of which suffer significant uncertainties. ISP capacity models are based on predictive modelling of electricity demand, weather impacts and social licence for CER availability among many variables, all of which contribute considerable uncertainties.

We argue that past experience shows it is prudent to assume that all cost models will exhibit indicative uncertainties of at least 30-50% and in some cases considerably more. Nevertheless, we suggest that using a simple top-level whole-of-system model is adequate to assess 25-year cost estimates since the uncertainties of the input data used by all models over a 25-year period dominates the accuracy of results, regardless of modelling fidelity.

When used in a comparative manner to assess various design options, most models can be expected to provide somewhat improved 'relative accuracy'.

3.0 Capital Cost Factors

GenCost defines future capital cost factors⁶ for various generation and storage technologies. It observes recent years when freight and raw materials rapidly increased costs. Its use of a 2006 to 2009 price bubble to show prices returned to previous expectations is not entirely realistic since the industry was much smaller at that time and basic power costs affecting manufacturing have been recently escalating much more rapidly.

GenCost's contention that *"...inflationary pressures for most technologies and the cost of some...such as solar PV and batteries are falling again"* is contestable. We believe this is only a small part of the story.

In our view:

- Renewables are now relatively mature technologies after 30 years of intensive development, thus making assumptions of substantial future cost decreases too optimistic.
- Labour costs have been hit with high inflation recently; these costs are not going to go down.
- The dominance of one country, China, in the entire supply chain for renewables makes higher future prices likely as competition is stifled and hence deserves more careful analysis.
- Increasing demand in global markets may cause price rises.
- Shipping costs are being hit by increasing fuel costs.
- Operating costs of renewables are greater than anticipated, as the UK and Germany have found.
- Subsidies for the cheapest form of electricity generation, which surely should not still be necessary) could be reduced, adding to manufacturing costs.

Compounding the uncertainties in predicting future costs are:

- a. realisation that the extraordinary costs involved are not affordable nor sustainable,
- b. the negative impact on national economies from unreliable intermittent power,
- c. many countries, including the largest, doing nothing or very little, to meet Net Zero goals,
- d. the withdrawal of the US from the Paris Accord,
- e. the mounting market failure of EVs,
- f. recognition that the science of climate catastrophism is overstated and overhyped, and
- g. the severe environmental impacts of solar and wind generation installations being regarded as unacceptable.

⁶ GenCost Section 5 P35

The ability to estimate the impacts of these factors is almost impossible, further reinforcing the substantial uncertainties in all future forecasting.

In our analysis, we bracket future costs by using both better known CSIRO 2024 cost factors flatlined across the next 25 years and CSIRO's optimistic capital cost factor projections. The difference in real total whole-of-system cost estimates (Appendix 2) for the 2024 ISP baseline is about 40%.

4.0 2024 ISP Cost Estimates

The AEMO 2024 ISP provides whole-of-system capacities and recommends the Step Change scenario, but does a very poor job at estimating whole-of-system capital costs. Its \$122 Billion “*present value*” estimate is not based on real cash flow costs, which the public understands. Its discounted cash flow methodology, by 7% per year, amounts to about a 40-50% reduction from real cash flow costs. On top of that several major cost elements have been ignored.

The ISP explicitly excludes very large costs⁷ for “*..commissioned, committed or anticipated projects, consumer energy resources (CER), or distribution network upgrades*”. All of these costs are impacts on the economy and must be borne by taxpayers and consumers. There is no justification for ignoring these major costs and past ‘sunk’ costs for proper comparison of various grid design options. Evaluation of such a major transition to the mission-critical NEM must be done on a whole-of-system cost basis, particularly for comparison with alternative options.

It might be argued CER costs are borne by individual home-owners so they do not contribute to power bills but they are real costs that home-owners pay to obtain the electricity they require. Residential capacities for solar and battery in the ISP are each 60% of all solar and battery capacities respectively. They constitute the largest fraction of the total transition cost, particularly since home batteries are more than double the unit cost of utility scale batteries⁸. Amortised over expected lifetimes respectively of 20 years and 10 years respectively, solar panels and batteries can easily double the home-owner's total energy bill.

The non-inclusion of commissioned, committed and anticipated projects in the ISP refers to transmission grid projects. The apparent ISP write-off of these so-called “*sunk*” costs is completely unjustified for proper disclosure and comparison of alternative options because transmission lines needed for renewables are largely unnecessary for alternative grid designs.

The cost of required upgrades to local low voltage distribution networks to accommodate CER is ignored by the ISP. Without these upgrades, local voltage instability risks exceeding network standards causing untold damage to appliances and equipment in homes and businesses. Despite the AEMO 2024 draft ISP promising to address these costs in the final ISP, it simply states: “*The ISP assumes upgrades and other investments needed to enable distribution networks and their operation will occur through other mechanisms....*”⁹

The failure to consider these costs distorts the GenCost analysis.

The evident failure to consider all costs in the ISP does a great disservice to the country and the public. The public deserves to know the real total costs involved in the transition of the NEM to renewables and its proper comparison with alternative options.

⁷ 2024 ISP Section 7.1 P74 footnote 33

⁸ GenCost Section 5.3.13 P51

⁹ 2024 ISP Executive Summary (P8)

5.0 Integration Cost Estimates

The conceptual approach embodied in GenCost is to calculate investment costs in individual technologies. It recognizes that intermittent and variable renewable energy (VRE) make grid reliability impossible without support from other resources, either baseload generation and/or storage¹⁰.

The complex modelling techniques are described in general terms but lack enough detail to make detailed conclusions. The following subsections provide comments on particular issues.

5.1 Ensuring System Reliability

GenCost states¹¹ that “An electricity system model is applied to determine the optimal investment to support each VRE share” and “We incorporate the uncertainty in variable renewable production by modelling nine different weather years, 2011 to 2019”.

It further states¹² that “..costs of VRE share scenarios were compared against the same counterfactual weather year to determine the additional integration costs of achieving higher VRE shares” and “..We use the maximum cost across all (nine) weather years as the resulting integration cost on the basis that **the maximum cost represents a system that has been planned to be reliable across the worst outcomes from weather variation.**” We hold serious reservations about the validity of this process.

Since GenCost is a collaborative project between CSIRO and AEMO, it is possible that the electricity system model referred to is AEMO’s model and that running simulations of the model across nine historical years (2011-2019) is the basis of this analysis. This approach is highly problematic regarding the assumption of reliability due to the following facts:

1. IESP has made multiple submissions to AEMO and the Senate Select Committee on Energy Planning and Regulation that demonstrate the ISP fails to show that the grid design is reliable. See Appendix 1 for details.
2. The nine historical years do not necessarily encompass worst-case conditions as data from 2010 and more recent years, and from overseas locations, demonstrate. Wind droughts coincident with regular solar outages during about 16 hours every day across the entire NEM and substantial solar reductions due to daytime clouds constitute a frequent common-mode failure over lengthy periods affecting the entire grid. Extra transmission lines cannot distribute power that does not exist; storages are too expensive and the ISP is grossly under-equipped.
3. The ISP’s “exploratory”¹³ use of an electricity simulation model¹⁴ allegedly demonstrating reliability of the design in an eight-day period of VRE drought is fraught with unrealistic assumptions:
 - a. **Reduced VRE outputs due to weather were not worst-case conditions for the simulation.** The 2024 ISP actually states¹⁵ “..future weather may not replicate the past, especially with climate change, so there may be longer and more widespread renewable droughts.”
 - b. **Past profiles of VRE production cannot be assumed to adequately represent future VRE production** due to major differences in geographic sitings.
 - c. The daily demand profile¹⁶ showing **a drop in consumption overnight by about 30% is highly contestable.** Future demands for overnight EV charging were predicted in the 2023 ISP as

¹⁰ GenCost Section 6.2.1 P58 and Section 6.2.2 P60

¹¹ Section 6.22 P60

¹² Section 6.6.2 P62

¹³ 2024 ISP Appendix 4 NEM resilience through prolonged VRE droughts P25

¹⁴ 2024 ISP Section 6.5 Reliability and security in a system dominated by renewables Figure 24 P72

¹⁵ 2024 ISP Section 6.5 System reliable during peak demand and renewable droughts P72

¹⁶ 2024 ISP Appendix 4 Section A4.2 The NEM’s demand profiles will continue to evolve P13

having a flattening effect. Growing demands for data centres and other businesses needing 24-hour reliable power will also flatten overnight demand.

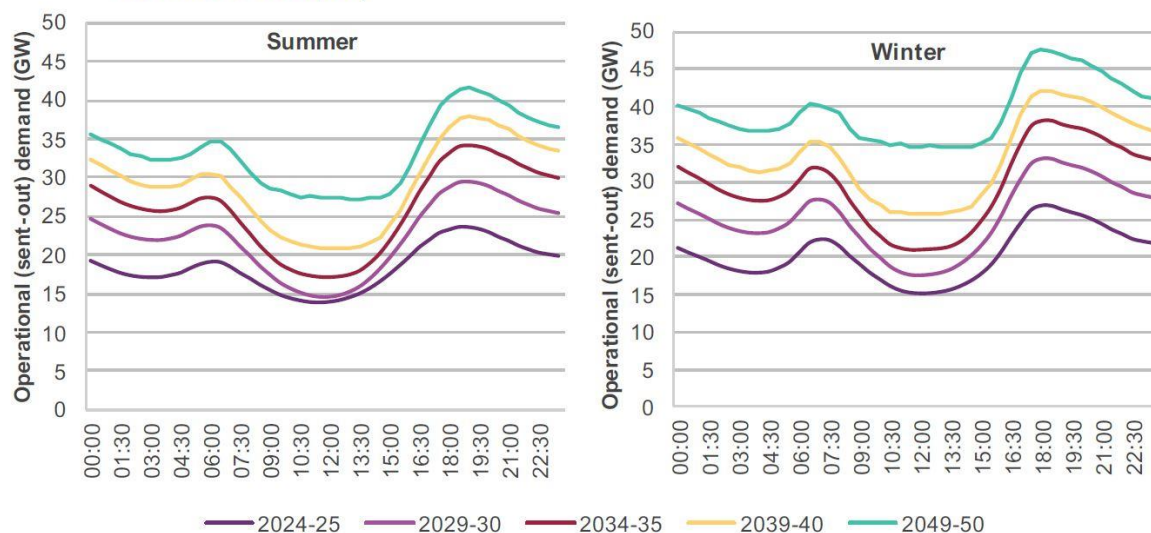
- d. The ISP admits that the simulations assumed “..NEM is projected to operate all available dispatchable resources (predominantly deep storages and gas)”¹⁷, thus making **no allowance for a dispatchable reserve margin (DRM) to guard against facility outages**, which we have advocated should be at least 20%. Our Reliability Assessment (Appendix 1) indicates that 2030 DRM in worst-case conditions of no solar and wind power will be minus 16% at night and as much as minus 30% in daytime, a guarantee of blackouts. In fact, it also states¹⁸ **“In this simulated test of extreme weather resilience, no USE (unserved energy) was forecast, although any additional unplanned outages beyond those modelled may cause reliability concerns.”**

This simulation approach is not proper system engineering design; it is an inappropriate illustration. DRM is the primary design parameter which determines reliability. This is underpinned by the fact that 2024 DRM under worst-case of no VRE was just 6%, down from 20% in 2019. The fact that AEMO was required on multiple occasions to issue public (Lack of Reserve) warnings of power shortages is testimony to this reality. The fact that NSW and VIC governments have been forced to strike secret deals with coal generators to keep them operating well beyond their planned (forced) shutdowns is further reinforcement. The 2024 ISP grid design is simply not fit for purpose.

Figure 3 from the 2024 ISP Appendix 4 below illustrates the assumed daily profile projected into the future. By 2050, the peaks in early evening fall about 22% by early morning compared to about 30% currently.

ISP Appendix 4 speculates¹⁹ that **“The daily demand profile is forecast to change significantly by 2039-40, as a result of growth in..”** EV charging (which it suggests may be shifted to midday by time of use tariffs just when most people are likely to be needing their EV), electrification of home gas appliances, distributed PV system uptake and potential hydrogen production (and data centre demands). A great deal of uncertainty remains regarding future daily demand patterns, yet AEMO modelling incorporates this profile into its simulations of future grid performance.

Figure 3 Operational sent-out demand average time-of-day forecasts, summer and winter, Step Change, 2024-25 to 2049-50 (GW)



¹⁷ 2024 ISP Appendix 4 NEM resilience through prolonged VRE droughts P25

¹⁸ 2024 ISP Appendix 4 A4.5 Operating the power system during long, dark and still conditions P28

¹⁹ 2024 ISP Appendix A4 A4.2 The NEM's demand profiles will continue to evolve P11

In the case of the daily demand profile, the best and most conservative approach is to assume a constant demand at peak, which we use in our analyses. Anything else would require a detailed analysis demonstrating a very high probability that the future demand profile will not exceed a given profile, and which would need a significant built-in safety margin.

The occurrence of severe VRE droughts is not as rare as the ISP states²⁰ **“The timing, severity and duration of prolonged dark and still weather conditions over a wide area are difficult to forecast, and indications are that these events are very rare.”** Consider the incontestable fact that solar falls to zero every single overnight period from about 4 pm to 8 am the following morning. Adding more solar farms is no solution when there is no sun, yet it is frequently advocated!

Then consider historical wind conditions using AEMO’s own data. Wind power over the entire NEM varies rapidly from zero to far above average at all times of day and night. The data across the whole east coast shows it frequently remains at zero (or very low) for periods from a few hours to several days. When NEM wind droughts occur during the 16 hours of zero solar power every day, VRE is zero or very close to it – these events happen frequently and are worst-case conditions. In addition, there are seasonal effects in weather patterns which can reduce solar and wind power well below average for months.

With so little storage (and insufficient resources to recharge it) and dispatchable generation in the ISP, **blackouts are a certainty.**

A fundamental shortcoming in the ISP appears to be lack of a clearcut definition of worst-case conditions to drive grid design for achieving reliability. The ISP design lacks necessary rigour, appearing to be based more on hope and optimism than hard facts. Basing GenCost VRE integration costs on AEMO’s inadequate model risks underestimation by a large amount.

5.2 Proper High Reliability System Design

IESP’s submissions on reliability conclude the ISP shows little understanding of high reliability system engineering practice (a conclusion AEMO denies) and that this reflects poorly into the GenCost report. A key design principle is absolutely critical:

A high-reliability system design must be based on worst-case conditions and then incorporate a margin of safety on top to guard against possible degradation of system capabilities.

Lives depend on getting engineering designs for high reliability right, whether it is a jetliner, a bridge, a building or a power grid. There are massive consequences for reliability failure.

The commercial aviation sector is particularly instructive. Hard lessons learned over decades have made it one of the most reliable transportation systems, governed by independent regulatory certification bodies. Two examples are worth noting:

1. A jetliner is loaded with enough fuel to make it to its destination even when encountering worst-case head winds due to weather, then a safety margin is added to allow the plane to divert to another airport in case of an outage at its destination.
2. Jetliners are structurally designed to safely resist worst-case loads due to weather turbulence and a substantial margin is added to ensure any degradation in structural strength during its lifetime will not endanger its safety. (The Comet jetliner in the early 1950s suffered two mid-air catastrophes from unsuspected metal fatigue leading to improved design practices across the entire aviation industry.)

²⁰ 2024 ISP Appendix A4 NEM resilience through prolonged droughts P25

Surely, the reliability of the NEM, which affects the entire economy, national security, jobs, well-being and the cost-of-living of all people, is just as important as it is in the aviation industry. IESP's submission to the Senate Select Committee on Energy Planning and Regulation advocated for the establishment of an independent regulatory certification agency with full technical and financial design analysis capabilities to hold AEMO accountable for the viability and safety of the NEM. It is a pity that this was not pursued in the final report.

5.3 Temporal Applicability

It is noted that VRE integration costs are modelled only for the 2030 LCOE case. Major subsequent growth in the grid design alters the balance of capacities in the NEM (per the ISP) thus leaving open the question of the applicability of the conclusions applicable to subsequent years.

5.4 Free Existing Capacities

The basic GenCost framework assumes free access to existing capabilities²¹ for back up. This may apply for a system operating at non-peak conditions but system design must instead be based on absolute worst-case conditions, as detailed above and in Appendix 1. This logically leads to the fact that to achieve reliability, all dispatchable (i.e. flexible) resources are employed for back up under peak conditions and an adequate dispatchable reserve margin is maintained to guard against facility outages. This most certainly does not lead to low integration costs as claimed by GenCost. It would be unrealistic to plan to add a certain amount of VRE and assume that the flexible resources are in surplus and therefore can reduce the added integration costs.

5.5 Facility Lifetimes

Some of the facility lifetimes provided in GenCost's Appendix B Table B.9 require examination.

The assumed lifetime of 30 years for solar and 25 Years for wind are somewhat optimistic. Solar outputs degrade by about 2% in the first year and 1% per year thereafter although there is considerable variation. This reduces outputs by about 20-30% respectively after 20-30 years. Damage (e.g. hail storms) can also impact average lifetime. Solar farms will consider replacement when outputs can no longer deliver adequate returns. Lifetimes of 20-25 years have been widely used in many reports.

Wind turbine outputs degrade at about 1.6% per year according to a study of 292 wind farms in the UK.²² Similar results were found by Lawrence Berkeley National Laboratory in a study of US wind farms, noting decline becoming steeper after ten years. Given the challenging conditions of operating environments and difficult access to the rotating equipment at high elevations, which requires constant lubrication, wind farm lifetimes are affected by serious failures such blade erosion, bearing wear out and fires as well as reduced outputs. A submission²³ to a Senate Select Committee on Wind Turbines pointed to world wide evidence showing some wind plants are barely managing 10 to 15 years. A more realistic lifetime is 20 years.

Nuclear plant lifetimes are listed in GenCost Table B.9 as 30 years, a figure that is far below reality. Section 2.1 discusses a 30 year "capital recovery" period as desirable because that would lead to operation in subsequent years free of capital costs and thus reduce interest costs. The proposed adoption of a 30-year capital cost recovery period increases LCOE in the first 30 years – somewhat convenient for comparison with VRE!

²¹ Section 6.2.1 Framework for calculating variable renewable P58 and Table 6-1

²² Stafell and Green, Imperial College How does wind farm performance decline with age. Renewable Energy 66 (2014) 775e786

²³ Anton Lang Submission to Senate Select Committee on Wind Turbines

The apparent mistake made in this GenCost section is that interest costs are compared to capital costs on a project basis. The reality, as shown in whole-of-system modelling in Appendix 2, is that the total capital costs required for the baseline ISP model are twice that for the nuclear mix alternative models. This has not been properly captured in the LCOE process.

Note that GenCost states²⁴ that “it is too early to be able to say what the total operational life is of more recent technologies such as solar PV and onshore wind.”

5.6 Capacity Factors

Low and high assumptions for GenCost capacity factors require a rigorous review.

The 32% solar capacity factor is close to a theoretical maximum of 33%, given that solar is effectively at zero output for 16 hours of every day and this does not leave much room for cloud cover and non-optimum sun angles. A figure of 28% is often used and is still optimistic. According to GenCost note 30 on Page 60, a lower 19% figure is closer to average capacity factor and therefore more realistic.

Wind power capacity factors are unrealistically high and may be based on unusual sites. It is possible that a particular site, due to specific geographic features may experience very high and steady winds but that does not translate to a figure to be used for a collection of wind farm sites spread over a wide geographic area. For example,²⁵ the Fosen Vind onshore facility in Norway was projected to have a 39% capacity factor “while United States annual capacity factors from 2013 through 2016 range from 32.2% to 34.7%.” Gencost postulates 29% to 48% for onshore wind capacity factors.

Offshore wind farms experience higher capacity factors due to more favourable and consistent winds. A Danish offshore wind farm recorded a capacity factor of 47.5% but this does not provide evidence that all wind farms around the Australian coasts will achieve the same level. Wind farm companies go to great lengths to survey potential sites for best wind statistics but the many constraints on regulatory approvals means that not all will have the same capacity factors.

The capacity factors for offshore wind are unrealistic with a low figure of 40% and high numbers at 52%, 54%, 57% and 61% in years 2024, 2030, 2040 and 2050 respectively. These also appear to be based on extreme outliers, which do not justify the application to a wider deployment of wind farms.

Nuclear plant capacity factors are assumed by GenCost to be in the 53% to 89% range.²⁶ GenCost rejects US experience showing over 94% as the average of many nuclear plants. Justifying 89% due to Australian inexperience is unrealistic and using coal plant records as the basis ignores the difference in some of the technologies and Australia’s track record with Lucas Heights. Furthermore, the nuclear technologies Australia will install will be more modern than US legacy plants.

Setting the lower figure at 53% is completely illogical by tying it to coal plants that are being deliberately sidelined (forced to operate at uneconomic low utilisation rates) in favour of renewables by policies, regulations and taxes. Favouring intermittent renewables over emissions-free nuclear power would frankly be ridiculous given nuclear’s advantages of long lifetime, reliable outputs, remarkably lower footprint, minimal damage to and disruption of the environment and dramatically lower vulnerability to weather and cyber attack. A future grid using nuclear power should prioritise its maximum utilisation to ensure its economics are as efficient as possible. It ticks all of the boxes and needs no back up other than a healthy grid DRM.

²⁴ GenCost Section 2.1.3 Allowing other technologies to benefit from multi-stage costing P19

²⁵ Wikipedia

²⁶ GenCost Section 2.2 Nuclear capacity factor range P21

5.7 Exclusions

GenCost explicitly excludes several very high cost elements²⁷. It states that rooftop solar is excluded from VRE share. Instead, its effect is to reduce the “demand load shape”. However, consumer PV resources are *60% of all solar in the ISP*. Their total cost, using ISP capacities times GenCost capital cost factors, to 2050 is \$112B and possibly \$155B if flat 2024 cost factors apply. On the other hand, utility solar cost is only \$71B to \$104B.

Keep in mind that high reliability design is driven by worst-case peak demand not some average demand shape used in a simulation model. The fact that consumer VPPs are expected by the ISP to contribute significant amounts of power to the grid to satisfy demands makes their exclusion unjustifiable.

The LCOE methodology does not appear capable of factoring in replacement costs for facility lifetimes. Batteries with a 10 year life, which are installed before 2030 will require replacement twice before 2050 and are the single most expensive cost element in whole-of-system modelling. See Appendix 2.

GenCost also states that “*..in 2030, a portion of customer-owned battery resources are assumed to be available to support the wholesale generation sector consistent with the approach taken in the AEMO ISP.*” It appears that these batteries supporting the grid may be the ‘free resources’ referred to in Table 6-1. The 2024 ISP makes consumer batteries, which cost more than twice per unit of storage than utility scale batteries²⁸, *60% of all battery capacity by 2050*. Their capital costs to 2050 are \$322B to \$463B, the single largest cost element in the ISP, whereas utility batteries cost is \$50B to \$75B. These cost figures are simply the capacities listed in the 2024 ISP multiplied by the capital cost figures in GenCost and include replacements.

The justification for GenCost excluding costs for consumer resources is incomprehensible, unless its purpose in the ISP is to downplay the real costs of VRE integration. These costs may be free to an investor but they are being paid for by a vast number of consumers. These exclusions make the GenCost results entirely questionable for guiding government energy policies.

GenCost also assumes that Snowy 2.0 and battery of the nation pumped hydro projects, various transmission projects and the Kurri Kurri gas plant are all completed “immediately” for inclusion of their cost in 2024 estimates and therefore provided free to investors in 2030.²⁹ That is convenient for investors, essentially making them sunk costs, but does not provide meaningful cost estimates that the public and government policy makers need. Markets simply do not operate by facility owners providing free products and services to others.

This assumption is a continuation of a belief among renewables proponents that back-up facilities and their costs address a purported weakness in the network design and are not chargeable against the highly variable and intermittent power facilities. Conventional baseload generation does not require back-up facilities. The lack of responsibility of VRE to provide power as and when needed by consumers is a fundamental error in energy policy. No sensible power systems engineer would willingly choose to employ intermittent and highly variable power generators dependent entirely on weather. And neither would expensive battery storages, which would require massive increases in VRE to recharge them, be considered.

5.8 Transmission and Stabilisation

GenCost provides transmission costs in 2030 for REZ expansion and other reasons of \$5.30/MWh and \$4.20/MWh respectively. These estimates appear reasonable given the 2024 ISP identification of the

²⁷ GenCost Section 6.2.2 Key assumptions P60

²⁸ GenCost Section 5.3.13 Battery Storage P51

²⁹ GenCost Section 6.2.2 Key assumptions P62

requirement to build 10,000 km of transmission lines. However, grid stabilisation facility costs are not explicitly explained.

5.9 Distribution Networks

Low voltage distribution networks require substantial upgrading to handle very large load variations introduced by CER, which cause voltages to swing beyond standards thus risking consumer appliances and equipment connected to the grid. The 2024 ISP ignores this cost completely as does GenCost. We estimate this will cost \$78B to \$156B in the next 25 years compared to \$35B to \$55B for transmission lines. Amortised over 30 years with projected energy delivered, it amounts to about \$11/MWh to \$22/MWh. It must be emphasized that this cost is driven by the need to place VRE assets in homes and businesses and then harvest power into the grid from VPPs. It is not required by all other forms of baseload generation. It is a VRE integration cost.

5.10 Disposal, Recycling and Remediation

The ISP does not make any mention of disposal, recycling and remediation costs associated with VRE. GenCost explicitly states³⁰ that its costs do not include plant decommissioning and recycling.

Given that rural residences are currently reaching a state of high anger concerning installation of transmission lines, solar farms and wind turbines, it is now clear in media reporting that developers have no obligation for set asides to cover these costs and once a plant comes to end of life, the company is usually wound up leaving land owners to cover substantial costs to decommission and restore their property.

These costs are difficult to model but we estimate them as much as \$26B to \$52B over the next 25 years. There is a good chance that governments will be forced to impose these costs on developers.

5.11 Spillage

GenCost puts a cost on spillage, the amount of energy by which VRE is capable of supplying minus the delivered energy. It notes the method of calculation³¹ and computes a figure of \$15.10/MWh in 2030 with a 90% VRE share. It is instructive to compare it to the 2024 ISP's 2030 design. We calculate that the 2030 ISP VRE is capable of delivering 240 TWh at capacity factors of 28% and 33% respectively for solar and wind compared to forecast demand consumption of 187 TWh. The actual delivered VRE energy, assuming 50% capacity factor for baseload sources, amounts to 121 TWh, a spillage factor of about 50%. i.e. the implication is for a doubling of the LCOE which is based on delivered energy not average capacity.

The same calculation for the 2050 design is for a VRE share of 85% but a larger overbuild in ISP capability results in a spillage factor even larger at 55%. These figures represent the actual ISP design, not some theoretical model. How does GenCost reconcile this large discrepancy?

6.0 Whole-of-System Cost Modelling

The whole-of-system cost modelling in Appendix 2 is based on the use of 2024 ISP figures for generation and storage capacities for 2024, 2030, 2040 and 2050. These are multiplied by projected draft 2024-25 GenCost capital cost factors to obtain optimistic (low) capital cost estimates. A second set of estimates using flat GenCost 2024\$ capital cost factors is used to provide high capital cost estimates.

Added to these cash flow estimates are modelled costs for transmission, stabilisation, distribution networks and disposal. These costs are more inclusive than those indicated in the draft 2024-25

³⁰ GenCost Section D.4.4 potential cost factors not included P99

³¹ GenCost Section 6.2.2 P64 note 36

GenCost for LCOE analysis and the 2024 ISP. It must be kept in mind that the baseline model (Step Change) of the 2024 ISP has been shown in Appendix 1 to have large negative DRMs indicating gross unreliability.

Appendix 2 provides two alternative models attempting to rectify the unreliability of the ISP, using extra gas generation and battery storages respectively, to obtain positive DRM at 20% or above. It also presents models of four mixed technology grid design alternatives per the Table 1 below.

The results of this whole-of-system modelling analysis are shown in Figure 1 below for both real cash flow costs and present value discounted cash flow by 7% annually. Both high and low estimates are presented to provide a bracket of uncertainty.

A summary of the whole-of-system analysis in Appendix 2 is as follows:

1. The 2024 ISP baseline capital cost estimate exceeds one trillion 2024 dollars and is far larger, by a factor of about two, than any of the four grid design alternatives. Real cash costs are also about twice the computed present value estimate, which itself is about four times the estimate of \$122 billion present value stated in the 2024 ISP.
2. The least expensive modification for improving the reliability of the ISP baseline design is to add significantly more gas generation, more than tripling it; the cost of augmenting with batteries is so expensive, it is simply unaffordable.
3. The gas dominant alternative model is the lowest capital cost but would have significant operating costs for fuel. (Note the baseline model also has gas generation fuel costs.)
4. Coal is the next lowest capital cost but has both coal and gas fuel costs. (Note the baseline model also has gas generation fuel costs.)
5. The two nuclear alternatives are slightly higher in capital costs but have very low fuel costs and offer increased lifetime of about 80 years.

Model	Coal	Gas	Hydro	Nuclear	Solar	Wind
1 Gas	0%	56%	8%	0%	37%	0
2 Coal	39%	17%	8%	0%	36%	0%
3 Nuclear/solar 1	0%	26%	8%	30%	37%	0%
4 Nuclear /solar 2	0%	16%	8%	40%	37%	0%

Table 1 Alternative Whole-of-System Configurations by 2050

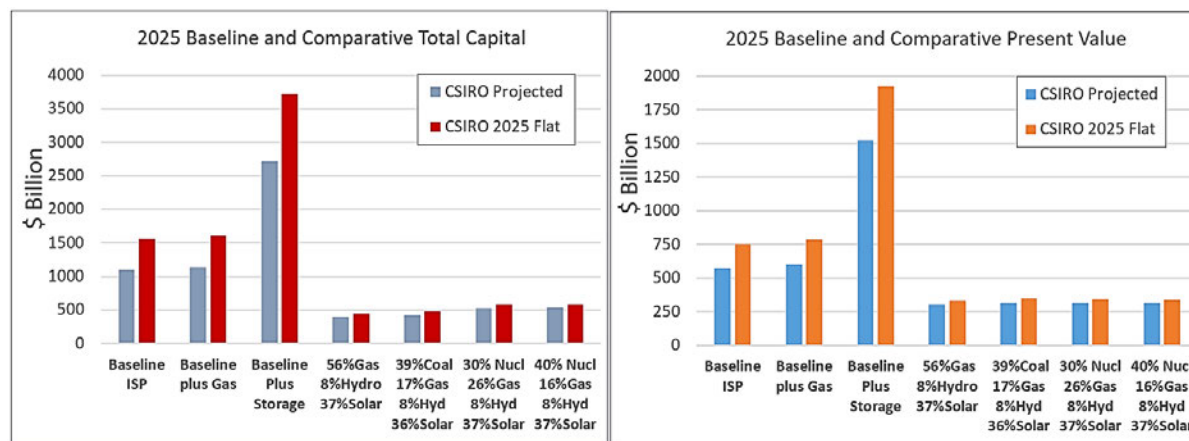


Figure 1 Whole-of-System Capital Cost Estimates

These results are probably no more or no less accurate than other models. However, the consistency of method applied to multiple grid design cases, likely gives improved relative accuracy. This analysis is founded on explicit ISP grid design data for the 2024 ISP baseline Step Change model and uses capital cost factors from the draft 2024-25 GenCost report.

The disparity between both the baseline model and baseline augmented with gas generation model as compared with the four alternative design models is a factor of about two – large enough to strongly indicate a valid result despite inherent uncertainties in model accuracy.

In light of these results, CSIRO should re-evaluate the LCOE methodology to explain why it indicates a result suggesting the complete opposite of whole-of-system analysis.

Appendix 1 - The AEMO 2024 ISP Will Not Deliver Reliable Power

AEMO's numbers just do not add up

A Report by Independent Engineers, Scientists and Professionals 11 August 2024 v3

Introduction

Our 9 February 2024 submission to AEMO and CSIRO concerning the *draft* ISP identified serious potential reliability problems resulting from AEMO's electricity grid design. Our inputs were largely ignored.

The final version of the ISP, released on 26 June 2024, essentially reveals the same deeply flawed model of the NEM electricity grid.

Failure to Address Clearly Stated Reliability Issues

AEMO's ISP suffers from severe deficiencies in capacities of both energy storage and baseload back up power, starting in the next few years and lasting throughout the entire period to 2050. It shows no evidence of rigorous system design engineering required for high reliability systems based on worst case conditions and healthy reserve margins.

By 2030, the dispatchable reserve margin falls from historic levels in excess of plus 20% to **minus 15.9%** and in subsequent years it is substantially worse. It cannot deliver adequate power when NEM-wide grid demand is maximum, when overnight solar is zero and wind output is close to nothing.

The negative reserve margin provides no allowance for facility outages for maintenance and repairs and leads to blackouts when demand peaks. The grid design also suffers from insufficient power capacity to quickly recharge the energy storages in order to prepare for the next set of worst-case conditions.

AEMO's own historical NEM data demonstrates periods of very low renewable energy production lasting 3 or more consecutive days and dramatic falls occur multiple times in a month. Periods of several months, when wind and solar outputs are well below long term averages, are evident in both Australian and overseas data. May 2024 witnessed several major wind droughts.

The energy storage capacity in the ISP is too low by at least a factor of ten. Adding more batteries and additional renewable generation to recharge them is completely unaffordable.

Deceptive Data Concerning Dispatchable Power

Figure 2 in the ISP is a graphical chart showing power from various generation sources and storages by year until 2050 (see next page).

It shows impressive growth to 2050 but almost all growth is in renewables, which have very low capacity factors (25-32%). Similarly, energy storage outputs show remarkable growth but most of these provide power for just a few hours. Much of it is from coordinated home resources which are uncertain and cost almost twice that for utility scale batteries. The dispatchable black line climbs to above 75 GW by 2050 but in truth, it is meaningless because much of it cannot be used to back up the grid when solar and wind power are largely absent for periods of 16 hours overnight, multiple days and significantly below average for periods of months.

This deceptive portrayal is merely a summation of maximum power outputs from all sources. A truthful depiction would, as a minimum include warnings to the effect that renewables provide less than one third of maximum power on average and not all dispatchable power provides practical levels for grid back up.

Figure 2.4 in our submission (see below) provided an alternative version of this chart showing the true dispatchable power over various periods based on ISP data for energy storages (ISP Figure 20). By 2040, the dispatchable power of AEMO's ISP design falls to just 30 GW for backup durations of one week but at the same time it indicates that for 16 hours overnight, it is only 37 GW. However, a proper engineering design with a 20% dispatchable reserve margin will require over 62 GW by 2040.

Figure 2 Capacity, NEM (GW, 2009-10 to 2049-50, Step Change)

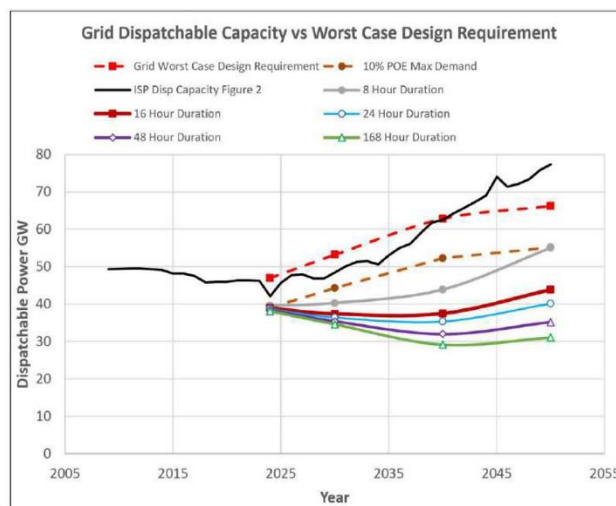
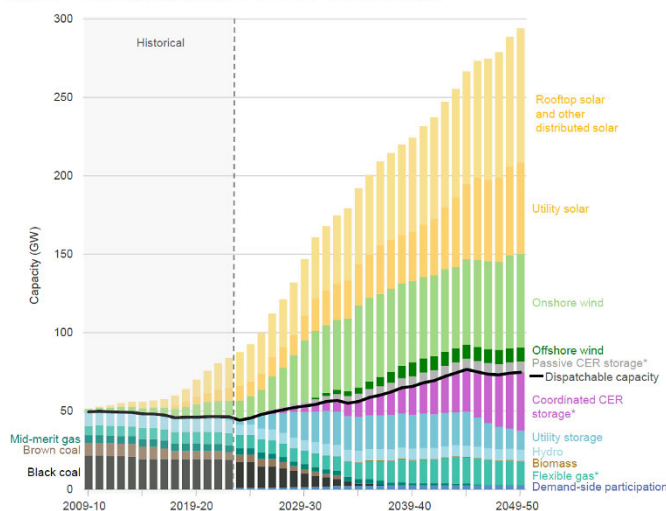


Figure 2.4 Dispatchable Power Capacity vs Grid Design as a Function of Duration

A Whole-of-System Power Budget Shows Failure of Reliable Power at Night

A whole-of-system power budget is fundamental to understanding the viability of the AEMO ISP and making a counterpoint to the CSIRO GenCost report, however, the ISP provides no system level power budget. In fact, the ISP does not contain any data on maximum demand. Instead, it forecasts average annual energy production figures. This is no way to design a high reliability system.

Proper high reliability engineering design requires use of real worst-case conditions plus a margin for facility outages for maintenance and repairs. A whole-of-system power budget (table on the next page) is based entirely on AEMO's ISP data.

The power budget is updated with August 2024 ESOO maximum grid demand data (v3).

We show that by 2030, the dispatchable reserve margin falls to minus 15.9% on a single 16-hour overnight period when solar and wind fall to zero and baseload sources are run at full capacity. Any facility outages for maintenance or repairs will make this figure worse. There is simply not enough baseload power nor energy storage capacity.

To restore the dispatchable reserve margin to at least plus 20% would require an additional 15.3 GW of baseload or equivalent stored energy outputs in 2030, rising to 19.5 GW in 2040.

In the event of multiple day wind and solar drought conditions, there is not sufficient surplus power during daytime to completely recharge expanded energy storages sufficient to handle another overnight period under worst case conditions. This was evident in the ISP's 8 day simulation of non-worst case conditions (see below).

Blackouts are inevitable. The AEMO ISP cannot deliver reliable power under worst case conditions. This is not a matter requiring fine tuning of the grid design. It is a massive failure.

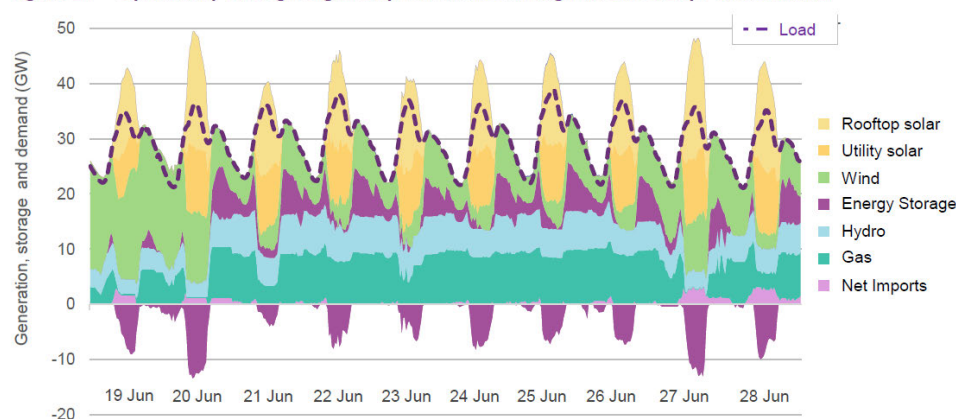
2024 Final ISP Top-Down Whole-of-System Power Budget														
AEMO NEM Grid Design per 2024 FINAL ISP														
Worst Case & 20% Reserve Margin			2024-25			2029-30			2039-40			2049-50		
24 hr Top-level Whole-of-System Power Budget			Capacity	Night	Daytime	Capacity	Night	Daytime	Capacity	Night	Daytime	Capacity	Night	Daytime
Duration hours				16	8		16	8		16	8		16	8
NEM Power Demand				GW	GW		GW	GW		GW	GW		GW	GW
10% POE Max Demand (ESOO 2024)	Relative to 2023		2.3%	40.0	40.0	-4.0%	42.6	42.6	-12.2%	45.9	45.9	-13.8%	47.6	47.6
Dispatchable Reserve Margin	20%			8.0	8.0		8.5	8.5		9.2	9.2		9.5	9.5
Total Power Design Requirement				48.0	48.0		51.1	51.1		55.1	55.1		57.1	57.1
Power Sources (Fig 2 2024 ISP)	Capacity Factors		Capacity	Delivered		Capacity	Delivered		Capacity	Delivered		Capacity	Delivered	
Baseload Power	Night	Daytime	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Coal - Black & Brown	100%	100%	21.2	21.2	21.2	11.44	11.4	11.4	0	0.0	0.0	0.0	0.0	0.0
Gas - Mid Merit & Flex	100%	100%	12.6	12.6	12.6	11.62	11.6	11.6	15.89	15.9	15.9	15.0	15.0	15.0
Additional Flex Gas	100%	100%	0	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0
Hydro	100%	100%	6.84	6.8	6.8	6.84	6.8	6.8	7.14	7.1	7.1	7.07	7.1	7.1
Biomass	100%	100%	0	0.0	0.0	0	0.0	0.0	0.45	0.5	0.5	0.45	0.5	0.5
DSP (Info only)			0			0			0			0.00		
Total Baseload Dispatchable			40.6	40.6	40.6	29.9	29.9	29.9	23.5	23.5	23.5	22.5	22.5	22.5
Energy Storage (Fig 20 2024 ISP)			GWh			GWh			GWh			GWh		
Snowy 2.0 + Borumba			0.0			349.80			397.75			397.75		
Deep			6.27			6.27			54.44			77.81		
Medium, Shallow, Coord CER			12.27			55.27			104.85			170.42		
Total Storage Capacity			18.5			411.3			557.0			646.0		
			Capacity	Delivered		Capacity	Delivered		Capacity	Delivered		Capacity	Delivered	
Storage Max Power Capacity			GW max	GW	GW	GW max	GW	GW	GW max	GW	GW	GW max	GW	GW
Snowy 2.0 + Borumba			0.0	0.0		2.2	2.2		4.2	4.2		4.2	4.2	
Deep (limited by max power output)			0.25	0.25		0.25	0.25		1.41	1.41		2.48	2.48	
Medium, Shallow, Coord CER (avg output overnight)			3.71	0.8		19.2	3.5		34.2	6.6		42.63	10.7	
Total Max Storage Power			4.0			21.65			39.81			49.3		
Avail. Storage Power Dispatchable				1.0	0.0		5.9	0.0		12.2	0.0		17.3	0.0
Total Dispatchable Power				41.7	40.6		35.8	29.9		35.6	23.5		39.8	22.5
Surplus/Deficit(-) wrt 10% POE Demand				1.6	0.6		-6.8	-12.7		-10.3	-22.5		-7.7	-25.1
Dispatchable Reserve Margin				4.1%	1.5%		-15.9%	-29.7%		-22.4%	-48.9%		-16.2%	-52.7%
VRE Renewables (Fig 2 2024 ISP)	Capacity Factors		Capacity	Delivered		Capacity	Delivered		Capacity	Delivered		Capacity	Delivered	
	Night	Daytime	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Wind: Onshore	0%	0%	13.0	0.0	0.0	39.3	0.0	0.0	51.9	0.0	0.0	59.5	0.0	0.0
Wind - Offshore	0%	0%	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0	0.0	9.0	0.0	0.0
Solar Utility	0%	0%	9.5	0.0	0.0	15.6	0.0	0.0	31.2	0.0	0.0	58.3	0.0	0.0
Solar Distributed VPP	0%	0%	23.5	0.0	0.0	36.1	0.0	0.0	60.2	0.0	0.0	85.7	0.0	0.0
Non-dispatchable VRE			46.0	0.0	0.0	90.9	0.0	0.0	152.2	0.0	0.0	212.5	0.0	0.0
Total Dispatchable + VRE Power				41.7	40.6		35.8	29.9		35.6	23.5		39.8	22.5
Surplus/Deficit(-) wrt 10% POE Demand				1.6	0.6		-6.8	-12.7		-10.3	-22.5		-7.7	-25.1
	Efficiency				GW			GW			GW			GW
Req'd Daytime Recharge Power	80%				2.5			14.8			30.4			43.3
Avail. NEM Daytime Recharge					-6.2			-17.6			-26.4			-28.8
Recharge Power Surplus/Deficit(-)					-8.7			-32.4			-56.8			-72.1

AEMO's Attempt to Demonstrate System Reliability is Misleading

In Section 6.5 “Reliability and security in a system dominated by renewables”, the ISP acknowledges the challenge as renewables approach 100% of generation. But it claims: *“Consumers should be confident that the NEM’s mix of technologies will keep electricity supply secure and reliable during normal operation, extreme peak demand and renewable droughts.”*

In the ISP, Figure 24 (p72) attempts to illustrate operability through an eight-day renewable drought for the “NEM except Queensland”. ISP Appendix 4 (Figure 15 p 26) reveals that this simulation test involved an “extended VRE drought event running from 21 June 2040 to 28 June 2040 (reflective of conditions observed historically in June 2019).”

Figure 24 Operability through eight-day renewable drought, NEM except Queensland



This one-off test looks impressive but is merely an illustration far short of what a proper engineering analysis would require. A detailed examination of the data behind this test revealed the following:

1. It assumes imports of power from QLD, yet represents it as a partial system.
2. It assumes maximum power continuously from all dispatchable resources. i.e. no facility outages.
3. It assumes not-so-extreme VRE drought conditions were for 6 days not 8 as indicated by the light green wind data in the chart.
4. It assumes wind capacity factor was 10% in daytime; 13% overnight – not worst case.
5. It assumes solar capacity factor was 13-15% - not worst case.
6. Non-daytime grid demand in early evening was about 32 GW, afterwards decreasing by 31% to 22 GW; this profile is highly speculative in the face of increasing EV demand for overnight charging; no amount of social licence will be gained by draining EV batteries into the grid at night and forcing owners to recharge them during the day; worst case is a flat maximum demand.
7. The ISP admits that “reliability risk would be “elevated”, particularly if major generator or transmission outages occur” i.e. no facility outages were taken into account.

These are certainly NOT rigorous worst-case conditions. Instead of illustrating the reliability of the NEM grid design, this test indicates the extent to which the AEMO ISP misrepresents its viability. A close look at this chart shows no reserve margin at all – every night of the 8-day “drought” shows the very low load being exactly met by all dispatchable sources at 100% and 13% wind - no reserve margin at all, unlike daytime when solar exceeds load. In fact, this fortuitous result looks somewhat contrived.

This highly dubious simulation test has more to do with marketing than proper system engineering.

Conclusions

Despite its impressive appearance, the ISP contains fundamental technical drawbacks. From an engineering perspective, the AEMO ISP is seriously flawed and fails to provide assurance that the NEM grid design has been developed in accordance with modern system engineering principles for high reliability systems.

We therefore conclude the AEMO ISP, which underpins the entire national economy, will not serve Australian consumers and businesses with reliable electrical power. It is clear this plan has been driven by changes to National Electricity Rules by non-technical politicians and bureaucrats to set artificial goals for renewables divorced from engineering realities.

It is critically important and urgent that an ongoing review process be implemented with advice and input by independent experts to oversee AEMO and CSIRO work on the future NEM.

It is beyond time for AEMO to state clearly its worst-case design criteria, worst-case demand and minimum dispatchable reserve margin capable of providing usable outputs for periods of many days not hours. AEMO must then provide proper systems engineering analysis showing grid performance under these conditions.

It is painfully necessary to conclude that the AEMO ISP is either deliberately misleading or fails due to incompetence. Neither is acceptable in leading a transition which will likely end in disaster for the entire economy. We have no knowledge of the qualifications of AEMO's staff but it seems plausible that AEMO's operational success over the years must be due to highly qualified power systems engineers. The truth for this failure must be uncovered.

Independent Engineers, Scientists and Professionals

This report has been prepared and supported by independent engineers, scientists and professionals who have many decades of relevant experience and requisite qualifications without any monetary conditions, employment or conflicting interests.

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Appendix 2 - The Missing Whole-of-System Cost Model in the AEMO 2024 ISP

The Real Cost of the NEM Transition

A Report by Independent Engineers, Scientists and Professionals 31 July 2024 v3

Summary

The government has not provided a true estimate of cost for AEMO’s plan to transition the NEM to intermittent wind & solar, yet it claims adding reliable nuclear and gas power generation is too costly.

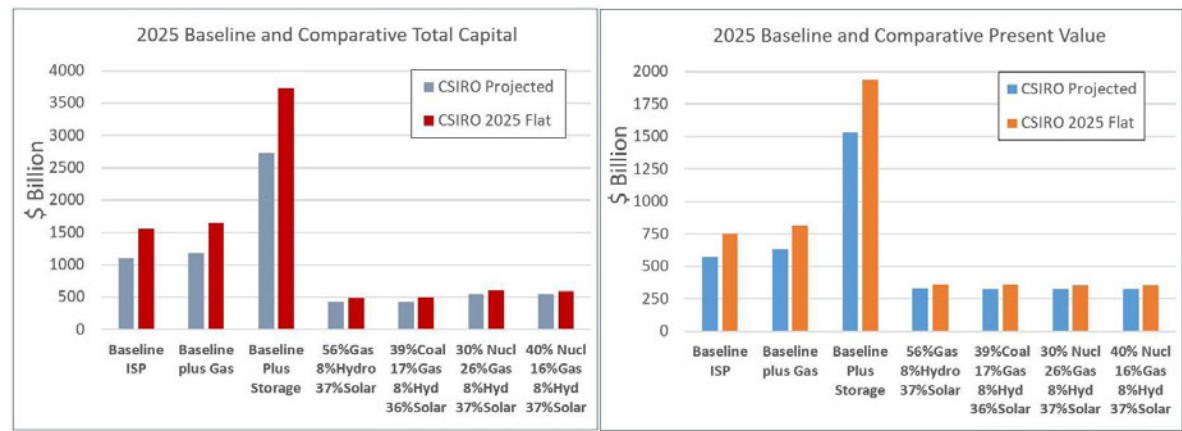
AEMO published its 2024 Integrated System Plan (ISP) in June. It contains only one paragraph³² to indicate annualised capital costs as either \$122 billion present value, not including “commissioned, committed or anticipated projects, consumer energy resources, or distribution network upgrades”. This unrealistic, poorly defined estimate needs much clarification.

The whole-of-system analysis in this report, draws on 2024 ISP capacities for generation and storages and CSIRO draft 2024-25 GenCost cost factors³³. It shows total capital costs for the 2024 ISP at over one trillion dollars – for a system unable to deliver reliable power³⁴. This is about twice the capital costs of four alternative grid designs using gas, coal and nuclear. When fuel costs for gas and coal are considered, nuclear plus gas designs are likely to be the least costly of all options.

A More Comprehensive Capital Cost Analysis

The whole-of-system cost charts in Figure 1 below provide both real total capital and present value for a top-level model of the planned NEM grid transition, showing a present value more than four times higher than the 2024 ISP figures. Estimates include both CSIRO’s somewhat optimistic declining future capital cost factors and its flat 2024 cost factors to reflect uncertainties in forecasting. The Baseline 2024 ISP estimates include all generation and storage costs including consumer energy resources, transmission lines, distribution network upgrades and other support costs to reflect the total costs to the economy.

Extending the Baseline ISP with additional gas or storage to overcome the major unreliability of the ISP’s design incurs extra costs and makes clear that ‘firmed renewables with batteries’ are unaffordable. Four alternative designs using gas, coal and nuclear provide comparisons. The results, based on AEMO and CSIRO data, show that the present transition plan is the most-costly approach by a large margin.



³² AEMO 2024 Integrated System Plan Page 74

³³ 2024 ISP Figures 2 and 20; draft 2024-25 GenCost Section 5.3;

³⁴ The 2024 AEMO ISP Will Not Deliver Reliable Power, Independent Engineers, Scientists and Professionals, 11 August 2024 v3

Figure 1 AEMO 2024 ISP Baseline and Comparative Whole-of-System Capital Costs in 2024 dollars.

Conclusions

1. Our analysis of the ISP uses a proper high reliability systems engineering approach to assess a 24-hour cycle under worst-case conditions of maximum demand, wind and solar droughts and the need for a minimum 20% dispatchable reserve margin (DRM)³⁵ to guard against facility outages. A whole-of-system 'Baseline ISP' power budget using 2024 ISP capacities shows the DRM at minus 15.9% by 2030 and falling lower by 2040. Widespread and frequent blackouts are certain.
2. Adding battery storages and extra wind & solar to recharge them ('firmed renewables') to achieve 20% DRM overnight results in completely unaffordable total capital costs of several trillion dollars and provides storage for just one 16-hour overnight period. And it still leaves daytime DRM massively negative. Battery storage capacity for one week requires \$5-7 trillion. Replacements every decade would cost upwards of \$3.5 trillion. This is simply not a viable path.
3. Alternatively, adding gas to existing hydro to essentially duplicate the grid when wind and solar are in drought requires a not-insignificant additional capital cost of \$30-60 billion. It would provide continuous backup capability but operate at lower utilisation making its economics unattractive.
4. The four alternative grid designs are 56% gas plus 8% hydro & 37% solar, 39% coal plus 17% gas, 8% hydro & 37% solar, 30% nuclear plus 26% gas, 8% hydro & 36% solar, and 40% nuclear plus 16% gas, 8% hydro & 37% solar. They provide reliable 24/7 power with less than about half the capital costs. The nuclear options, with lifetimes up to 80 years lasting far beyond 2050 compared with wind and solar, minimise costs for gas and probably reduce emissions to less than the Baseline ISP, once whole-of-life emissions for mining, processing and manufacturing of almost 900 times more material is taken into account. All four alternatives impose a tiny environmental footprint compared to the 1.6 million hectares for the Baseline ISP design maximising wind & solar.
5. It is clear that contrary to continual claims that wind & solar are the cheapest form of electricity generation, it is in fact the most expensive when proper whole-of-system estimates are made. The present plan for transition of the NEM is disastrous in terms of reliability, cost to the economy and in particular to the environment, without being a path to the lowest emissions.
6. The alternative cost models assume wind & solar installations taper off after 2030. At additional cost, some solar generation can be maintained in the long-term grid design.

Recommendations

1. A thorough investigation by independent authorities must be commissioned and immediate start be made to implement effective accountability mechanisms to counter the complete failure of public energy policy regarding reliability and energy costs based on misleading information from public institutions.
2. The AEMO ISP and CSIRO GenCost documents must be subjected to higher genuine standards for truthfulness, completeness and professional engineering processes in place of slavishly following flawed existing policies.
3. Embedding wind & solar targets into the National Electricity Rules must be halted to end the replacement of power systems engineers by politicians and government bureaucrats without proper engineering qualifications selecting technological design solutions.
4. Independent expertise for frequent technical and financial review must be employed in new on-going accountability processes at multiple levels and points in time with a mandate to examine and openly examine a wide range of technological approaches.
5. The AEMO 2024 ISP must be discarded and an immediate start be made on a new energy NEM plan considering all power system technologies.

³⁵ DRM is the sum of baseload power over maximum demand. In 2019 the DRM was plus 20% (AER)

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Attachment A Estimation Methodology

- A. The AEMO 2024 ISP provides the data (Figures 2 and 20) regarding NEM capacities of all generation (GW) and energy storages (GWh) in 2024-25, 2029-30, 2039-40 and 2049-30.
- B. The CSIRO draft 2024-25 GenCost report (Section 5.3) provides projected capital cost factor data (in 2024 dollars) for various energy technologies. This data excludes all subsidies, offsets and tax breaks, which nevertheless have to be paid by all consumers in one form or another.
- C. Since the projected cost factors are largely declining and are based on forecasts, which contain substantial uncertainties, a second estimate using flat CSIRO 2024 cost factors provides higher cost estimates reflecting potential upsides.
- D. A power budget for each grid design model is based on a 24-hour cycle broken into 8 hours centred on midday when solar is available and 16 hours overnight when solar is zero. The DRM is the surplus/deficit of the sum of baseload power over peak demand in each of the 8- and 16-hour periods. Stored energy is used only during overnight periods to contribute to dispatchable power; recharging takes place in daytime when solar is expected to be available but is also subject to weather conditions causing low outputs.
- E. Except for the Baseline 2024 ISP model using only the capacities specified in the ISP, the capacity data for other models is adjusted to achieve a DRM in each year of at least plus 20% to ensure reliability in the face of facility outages.
- F. The capital costs of Snowy 2.0 and Borumba pumped hydro facilities are taken from current government announcements. Costs of passive storages behind the meter are included because they lower demand while making no direct input to the grid.
- G. The capital costs prior to 2024-25 are estimated using the 2024 ISP capacities and CSIRO draft 2024-25 GenCost cost factors.
- H. The capital costs for each of three periods, 2024-30, 2030-40 and 2040-50 are estimated as the sum of the various generation capacities installed in each period plus the replacement for past installations that have exceeded lifetimes and valued by the cost factor for the mid-point of each period.
- I. The modelled lifetimes are 10 years for batteries, 20 years for wind and solar, 30 years for gas, 50 years for coal and 80 years for pumped hydro and nuclear.
- J. Costs for existing hydro facilities were not included in any models due to lack of data. Costs for existing coal plants were not included since they are near end-of-life and being retired.
- K. The present value estimate is derived by applying a 7% per annum pre-tax, real discount rate applied to capital expressed in 2024 dollars in three periods: 2024-30, 2031-40 and 2041-50 at mid points.
- L. The demand side participation (DSP) capacity defined by the 2024 ISP is not used since it is clearly not a source of power but rather a reduction in demand brought about by time-of-use tariffs and central controls to impose rationing on consumers. i.e. this misguided policy attempts to make customers serve a deficient grid design rather than the grid delivering power to consumers as and when required. Social licence is unlikely when the public discovers its ramifications.
- M. NEM peak demand is defined by AEMO's 2024 ESOO report for 10% Probability of Exceedance (POE) loads based on detailed forecasting.
- N. The AEMO ISP's use of daily demand profiles to demonstrate grid performance is rejected for use in high reliability system design, which requires worst case conditions. The advent of EV recharging overnight and data centre 24/7 loads will flatten future demand profiles (according to the 2022 ISP and supported by surveys which show most EV owners prefer/require overnight

charging). Incentives (e.g. punishing tariffs) to recharge during daytime when solar power is often in surplus is highly problematic and unlikely to gain social licence. Worst case system design must use a flat peak demand. The 10% POE peak demand design requirement provides further support for a conservative approach to worst case conditions.

- O. Other costs applied to all models include transmission lines, low voltage distribution networks, grid stabilisation facilities, land acquisition for transmission lines (land costs are included in Gencost cost factors for generators), and an allowance for disposal, recycling and remediation.
- P. While the accuracy of this whole-of-system cost estimation methodology is not precise, neither are all system model projections, which inevitably contain considerable uncertainties in predicting future costs and demands across 25 years. However, we apply the same methodology to all seven case models, thus making relative accuracy among them better than absolute accuracy.

Attachment B Cost Model Notes

Baseline 2024 ISP Case

The Baseline ISP 2024 grid design contains severe deficiencies in both baseload power and energy storage capacity causing the DRM by 2030 to be minus 15.9% instead the desired plus 20% – a shortage of 35% in dispatchable power. For 2040 and 2050, the shortages exceed 50%.

Such a design could only be based on hopes that weather conditions will always enable ‘some renewable power’ to be produced in ‘some parts’ of the grid to be delivered to the rest of the NEM by an extensive network of transmission lines. However, AEMO’s historical power supply data³⁶ tells a different story of frequent periods, often on windless nights, when NEM available solar and wind power capacity factors fall to zero or close to it for wind. Some drought periods can last for more than three days and repeated episodes can often occur with only short intervals in between. Prolonged months-long spells can cause average renewable capacity factors well below expectations.

The AEMO 2024 ISP is a deeply flawed grid design which cannot deliver reliable power – blackouts are inevitable.

The cost of transmission network upgrades is based on the 2024 ISP plan to install 10,000 km of new transmission lines. Costs are estimated to be \$1.3 to 2.0 million per km and subject to escalation. Significantly less transmission line costs are required for the four alternative cases.

The 2024 ISP “...assumes upgrades and other investments needed to enable distribution networks.... will occur through other mechanisms...”. This study makes an estimate for distribution network upgrade costs of 5-10 thousand dollars per house based on expert opinion³⁷. Much of this cost becomes unnecessary for the four alternative cases.

Stabilisation facilities such as synchronous condensers (costing \$10-20 million each) will increasingly be required as baseload plants with rotating machinery are retired in favour of systems using electronic inverters. However, as with the transmission and distribution network costs, much of this is unnecessary for the four alternative cases.

³⁶ Independent Engineers, Scientists & Professionals, Submission to AEMO CSIRO Draft 2024 ISP GenCost 9Feb2024, P18-20

³⁷ Electric Power Consulting Submission on the 2024 Draft AEMO Integrated System Plan

Land acquisition costs for transmission lines are estimated from \$200K-230K per km and are a subject of considerable debate in project approval hearings, where social licence is in short supply.

There is little information on projected costs for disposal, recycling and land remediation as a result of very substantial materials from expired wind turbines, solar panels and batteries. A nominal figure of \$1-2 billion per year in future is used as large volumes of required replacements build up in the Baseline ISP case.

Baseline Plus Additional Gas Generation Case

The 2024 ISP phases out coal generation by 2037 and replaces CCGT (merit) gas plants with OCGT (flex) gas plants (designed to some day burn hydrogen, if or when available). To restore a plus 20% DRM, this case adds much additional gas generation, starting in 2030, to more than triple the planned level by 2050. The daytime period is most critical since the minimal 2024 ISP storages will be depleted overnight and are primarily intended to handle short peak demands and transients.

Maximum gas generation, hydro and biomass baseload provide a 20% reserve margin indefinitely during daytimes which rises well above 20% combined with storages at night. At night, gas generation would probably be lowered to reduce emissions but also at the cost of reducing the capacity factors of gas plants and their economic efficiency.

One implication of this case is the need to assure domestic gas supplies and deliver infrastructure are sufficient.

Costs for transmission lines and other elements remain as for the baseline case. Table 1 provides a summary of key power system demand and DRM.

	2029-30		2039-40		2049-50	
	Night	Day	Night	Day	Night	Day
	GW	GW	GW	GW	GW	GW
Peak Demand	44.3	44.3	52.3	52.3	55.2	55.2
Baseload Power	53.2	53.2	62.5	62.5	66.5	66.5
Storage Power	5.9		10.8		16.2	
Dispatchable Reserve Margin %	33.3	20.0	40.1	19.5	49.7	20.5

Table 1 Baseline Plus Gas Generation Case

Baseline Plus Additional Storage Case

This case leaves gas generation the same as in the Baseline case and retires coal generation in the 2030s. A massive addition of extra utility battery storage of almost six times the level in the 2024 ISP by 2050, is required to achieve a DRM above 20% to protect against a worst-case wind & solar drought on windless nights. And this also requires a corresponding massive increase in wind & solar to recharge them.

Even this large storage capacity would only cover a single night under worst case conditions.

The capital cost is estimated at \$2.6-3.9 trillion. Since the marginal cost of adding batteries is \$485 billion per day of storage, a grid system with a seven-day battery storage capacity would have a total capital cost of \$5-7 trillion, even without adding more renewable recharge capability. The 10-year life of batteries also incurs massive ongoing replacement costs on the order of \$3.5 trillion per decade.

Moreover, two further interrelated problems need addressing. The DRM during daytime – absent storage outputs – is disastrously below minus 50% so that there is no means to recharge the large battery capacity in the event of a daytime wind & solar drought.

This reality forces reliance on a minimum level of at least 10% capacity factor for all wind and solar generation. This is not a real solution for DRM since wind & solar are not dispatchable.

In view of these estimates, this case, widely touted as “firmed wind & solar with big batteries”, is simply neither technically viable nor economically affordable.

A Gas Dominant Case (56% gas plus 8% hydro & 37% solar)

This case follows on from the Baseline plus added gas case. Capital cost is minimised by keeping the same gas generation, which together with hydro can indefinitely provide the plus 20% DRM both night and day. By halting further rollout of both wind & solar and battery storage after 2030, major capital cost savings are obtained as a trade-off against a lower reduction of operating emissions.

However, it should be noted that gas generation has about half the emissions of the present coal-based grid. This case also avoids the substantial emissions involved in mining, processing and manufacturing of all of the materials required for wind turbines, solar panels and batteries and their frequent replacements. The amount of such materials has been estimated at about 700-900 times the materials needed for a typical baseload power plant. Therefore, the net increase in emissions of this case may not be substantial.

Further, the very small environmental footprint of this alternative is negligible compared to wind and solar farms and is therefore another factor for consideration.

Another significant benefit is that gas and hydro facilities will run at higher capacity factors providing more attractive returns for investors, thus providing greater market stability and improving national productivity.

A Coal Dominant Case (39% coal plus 17% gas, 8% hydro & 37% solar)

This Case is a continuation of using coal generation and its expansion. Instead of retiring existing coal plants, they are replaced with high efficiency/low emissions (HELE) plants and expanded to double the present capacity by 2050. As for the previous case, wind & solar and storage rollouts are halted after 2030.

While limited emission reductions are evident in this case, potential exists for using advanced coal plant technology to improve efficiency. Carbon capture is not part of this model. However, benefits include the avoidance of renewable facility costs, a negligible environmental footprint and reduction of substantial emissions from mining, processing and manufacture of wind & solar.

As for the previous case, another significant benefit is that coal, gas and hydro facilities will run at higher capacity factors providing more attractive returns for investors, thus providing greater market stability and improving national productivity.

A Moderate Nuclear Case (30% nuclear plus 26% gas, 8% hydro & 36% solar)

For this alternative, the draft GenCost 2024-25 cost assumption for large scale nuclear power plants is used. Ongoing product development of SMR systems is proceeding briskly at multiple companies including Rolls Royce (the manufacturer of the planned AUKUS submarine reactors). SMRs offer a vision of production line manufacturing efficiencies for standard products, which will be approved by multiple countries as are commercial jetliners, thus simplifying and shortening the approval process.

It will be several years before SMR products are sufficiently mature to be able to assess their true cost factors. This has not prevented many countries from already placing orders for SMRs. Unless SMRs offer electricity costs that are competitive with large-scale nuclear plants, they will not become successful products and will simply disappear from the market.

Nuclear fission power plant technologies have a 70-year history of increasing safety, maturity, minimal environmental impact and zero operating emissions, which provides an attractive option.

This case posits a blend of gas (for fast reaction to load variations and grid transients) and nuclear power generation. The draft 2024-25 GenCost capital cost assumption for large scale nuclear plants can be favourably compared with other generation technologies when amortised for estimated lifetimes as indicated in Table 2, even though solar and wind cost factors ignore system integration costs. Financing interest costs for nuclear over an 80 year lifespan would actually be less than the interest costs of the ISP baseline over 80 years given its capital costs are twice as much.

From this comparison, a nuclear power plant is effectively much more competitive than the GenCost 2024-25 results would indicate.

	Nuclear	Gas	Solar	Onshore Wind	Offshore Wind
Draft GenCost 2024-25 Cost Assumption \$B/GW	8.5	2.0	1.4*	3.0*	6.7*
Lifetime Years	80	30	20	20	20
<i>Nuclear Cost Assumption \$B/GW Amortised to Equivalent Lifetime</i>	8.5	3.2	2.1	2.1	2.1

* Not including substantial system integration costs

Table 2 Equivalent Nuclear Capital Cost Factor Amortised for Equivalent Lifetime

In this case, rollout of wind, solar and storages are halted after 2030 because nuclear and gas baseload generation can run continuously, thus avoiding further capital costs. As its capital cost is much higher than gas plants, nuclear plant should be run continuously at high utilisation rates to achieve the lowest unit cost. The fuel cost per KWh is much less than gas. The gas component provides an ability to quickly ramp up and down to compensate for variable load demands.

Since nuclear plant installation is unlikely to commence before mid-2030s, it is vital that new gas generation facilities be launched as soon as possible supported by expansion of domestic gas production infrastructure on the east coast. Gas is a critical component of all viable future electricity grid options. There should be no equivocation, unless it is preferred to maintain coal generation indefinitely. Gas will be the bridge to and ongoing support to reliable nuclear generation.

If it is desired to maintain some level of wind & solar in the grid, the substantial gas generation in this Case provides plenty of scope for backing up wind & solar. However, this will lower the capacity factors of the gas plants thus increasing their unit costs and the wind & solar will incur additional capital costs and increased emissions from mining, processing and manufacture of wind & solar.

A Higher Nuclear Case (40% nuclear plus 16% gas, 8% hydro & 37% solar)

This case increases nuclear power generation while reducing gas and maintaining hydro outputs to further reduce emissions. The increased capital cost relative to the previous case of 40% nuclear needs to be traded off against the potential for emissions reductions.

BRADDON BEAGLE

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[HOUSING](#)

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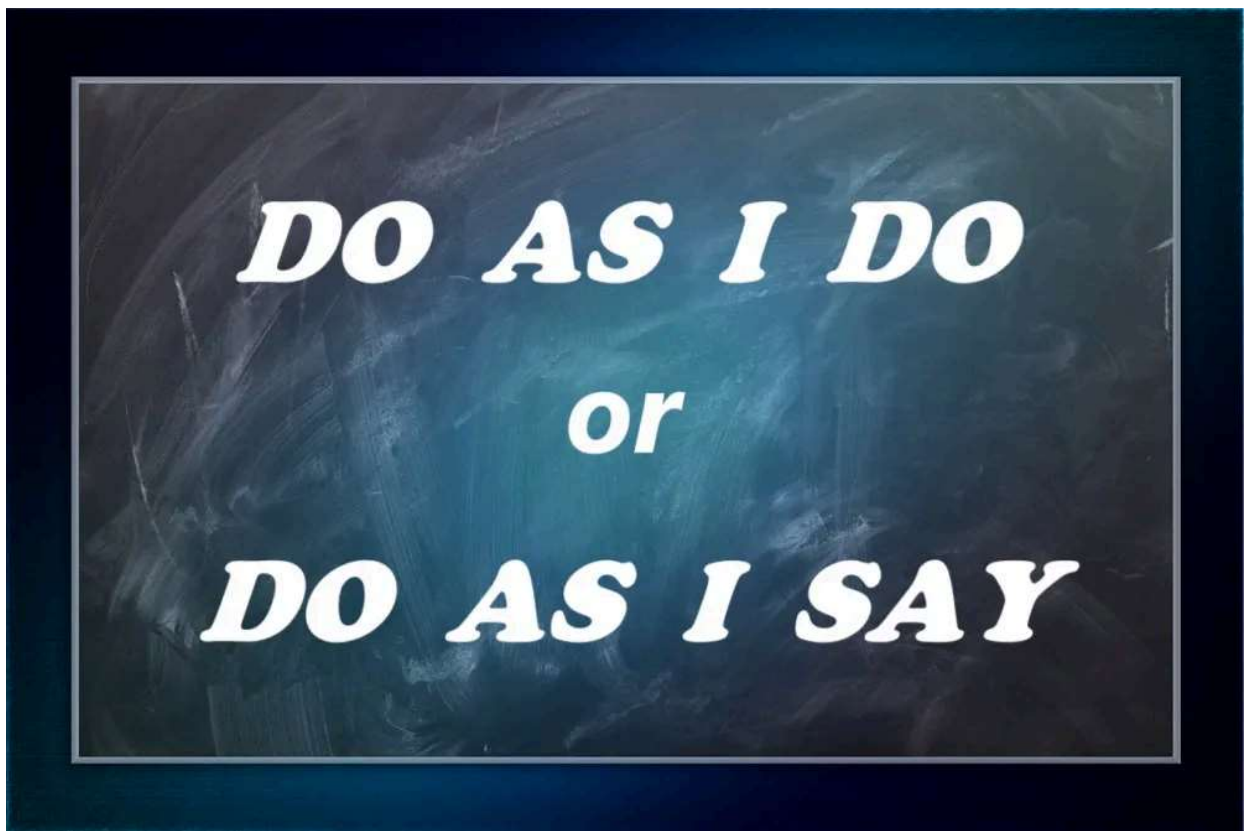


BRADDON NEWS. FROM THE PEOPLE, OF THE PEOPLE, FOR THE PEOPLE

DO WE HAVE A "DO AS I DO" or "DO AS I SAY" GOVERNMENT? YOU DECIDE

Posted on March 4, 2025

By CAROL-ANN FLETCHER



On the 20th of January 2025, Minister Felix Ellis announced in the online Premier of Tasmania page,

*"The message is simple – **your fire is your responsibility**. Reckless and accidental fires put people's lives and property at risk.*

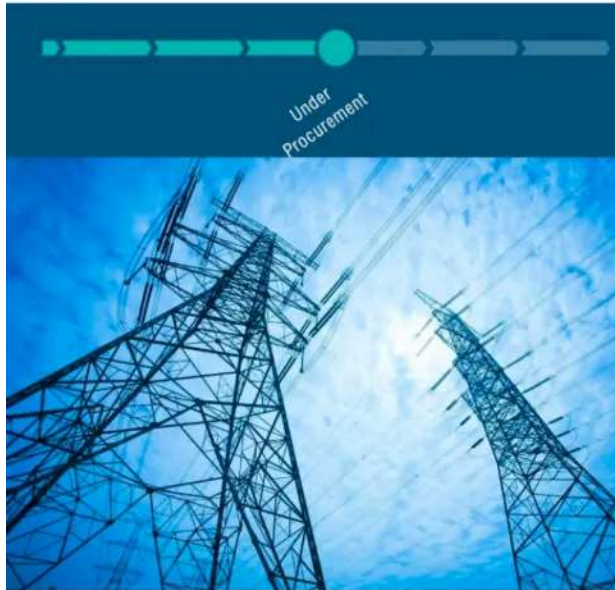
"Tasmania is one of the most bushfire prone places in the world, and through our Government's 2030 Strong Plan for Tasmania's Future, we're backing in campaigns like this to keep our communities safe."

[You light it, you own it | Premier of Tasmania](#)



Just two days before Felix Ellis posted the above message, he was quoted in an Advocate story entitled, *'Tasmania in a similar boat' as Los Angeles when it comes to bushfire risk'* [Tasmania launches 'You light it, you own it' campaign | The Advocate | Burnie, TAS,](#)

"It's important that we do everything that we can to make sure that we're protecting our fellow Tasmanians from the risk of bushfire," Felix Ellis then went on to say, "That's about ensuring that you're not doing the wrong thing when it comes to fire, because a small fire at the moment in the middle of summer, in the middle of bushfire season can really get out of hand."



The North West Transmission Developments project (NWTD) will see the development of new and upgraded overhead high voltage alternating current transmission lines, linking substations at Palmerston, Sheffield, Burnie, Hampshire and Staverton.

However, it seems that Minister Ellis is happy to support a proposed Liberal Government plan to more quickly gain approval to build “large renewable energy projects” (which would also include building the high voltage transmission lines to support) via a state planning commission to help enable these projects to be built faster as reported by ABC News today. [Energy projects in Tasmania would be fast tracked under proposed law changes – ABC News.](#)

PROJECT HISTORY

May 2024 The Tasmanian Minister for Planning amended the notified corridor of the North West Transmission Developments to align with the Marinus Link corridor, following a request by TasNetworks. This step enabled TasNetworks to submit a Development Application and Environmental Impact Statement for assessment of the NWTD.

Why this is a major concern is that whilst Minister Ellis touts the importance of “all of us” (Tasmanians) having a part to play in preventing bushfires and promoting the new bushfire prevention campaign, “if you light it, you will own it”, it seems Felix Ellis, along with the rest of the Liberal government are unwilling to own or take any responsibility for how the 240km high voltage transmission lines proposed for NW Tasmania to be connected to Marinus Link ([Media-Release-HC-Announcement-24-December-2024.pdf](#)) could potentially cause Tasmania to have a Black Saturday bushfire, just as Victoria did in 2009 that claimed 173 lives.

See also: [Renewable_Energy_Coordination_Framework_May_2022.pdf](#)

What was the cause of the deadly Black Saturday fires?

According to an ABC News article dated the 2nd January 2024, “Six of the 11 most catastrophic Black Saturday bushfires were started by high voltage electric powerlines. The state’s regulator says power companies didn’t do enough to mitigate risk ahead of what is predicted to be the state’s most dangerous bushfire season in recent years.” [As Victoria’s bushfire season looms, one powerful reminder of Black Saturday hangs in the air – ABC News.](#)

What was the cause of the recent catastrophic Los Angeles fires?

On the 5th of January 2025, CNN reported, “California’s second-largest wildfire was sparked when power lines came in contact with a tree, Cal Fire says” that was written by Sarah Moon. Later in the same article, Sarah reported that PG&E who owns the power lines that caused this fire was also

responsible for and found guilty of “85 counts, including involuntary manslaughter and unlawfully starting the [Camp Fire](#), the deadliest fire in the state’s history.” And sadly, that is not the end of PG&E’s transmission lines causing fires. PG&E were charged in two criminal cases where they were charged with five felonies, 28 misdemeanours, involuntary manslaughter, unlawfully burning forests, structures, causing bodily injury etc.

And what was PG&E’s response in both criminal cases against them? They denied any “criminal wrongdoing”, even though they agreed that it was their transmission lines which caused the deadly and destructive fires. [California’s second-largest wildfire was sparked when power lines came in contact with a tree, Cal Fire says | CNN](#)

Liberal mismanagement in California was also cited as being responsible for “the worst wildfire seasons in recent memory” [California Wildfires: Liberal Leadership’s Costly Mismanagement Exposed](#)

Labor is no better. Just read this quote from Shadow emergency services minister Richard Riordan on the 1st of Oct 2024, where he stated on Sky News [‘Huge potential for disaster’: Allan govt slammed for failing to ensure all wind turbines have fire suppression technology | Sky News Australia](#):

“Mr Riordan said that about 80 per cent of all deaths and property losses from fire stem from electrical blazes caused by power, transmission or distribution systems, and there were now 1,500 wind turbines in the system with another 900 planned.

“This is a huge potential for fire risk,” the shadow minister said.”

So, if Tasmania is in a “similar boat” with Los Angeles in regard to bushfire risks, what should Felix Ellis do to prevent unnecessary high voltage transmission line bushfires, especially in NW Tasmania?

STOP all renewable projects including Marinus Link, wind turbines, solar farms, and lithium-ion battery storage containers that are proposed to be connected to 240km of high voltage transmission lines that will be scattered throughout Tasmania to “do the right thing” and “make sure that we’re protecting our fellow Tasmanians from the risk of bushfire”.

After all, as Felix Ellis has rightfully reminded us in his 2025 bushfire prevention campaign, “if you light it, you own it” and that should include Felix Ellis and the rest of the Liberal/Labor government who are pushing these renewables including the high voltage transmission lines against community will as both Felix Ellis and Nick Duigan are well aware of –

<https://www.youtube.com/watch?v=gCbmWzvwx2w&feature=youtu.be>

Why are the 240km of proposed high voltage transmission lines such a high and unacceptable bushfire risk?

Just over sixteen years ago, on the 7th of February 2009, 6 out of the 11 Black Saturday fires that took 173 lives and did untold damage to property, livestock, and wildlife, were started by high voltage transmission lines. This was such a devastating, large scale catastrophe that a Royal Commission was called to investigate why these fires happened and how they could be prevented in the future – [VBRC_Summary_PF.pdf, Remembering Black Saturday – 15th anniversary | Emergency Victoria.](#)

Cameron Stuart of Britannica.com on the 20th of January 2025, described the horrific, catastrophic, devastating Black Saturday fires in detail ([Black Saturday bushfires | Causes, Deaths, Map, & Location | Britannica](#)):

“On February 7 Victorians were told to brace for the “worst day” in the state’s history: weather forecasters warned of a record [heat wave](#) with temperatures soaring to 115.5 °F (46.4 °C), combined with gale-force winds of up to 56 miles (90 km) per hour. That day more than 47 major fires erupted across the state, 14 of them claiming lives or causing significant damage. The most deadly [conflagration](#), known as the Kilmore East fire, which claimed 121 lives, was sparked by a faulty power pole near the township of Kilmore East, 37 miles (60 km) north of [Melbourne](#). The flames quickly jumped a major highway and roared into a forest, where they turned into a giant fireball, dwarfing the resources of local firefighters, who could only flee in its path. Aided by steep slopes and powerful winds, this fire raced through a series of townships, including Kinglake (where 38 people died), Strathewen (27 perished), and [St. Andrews](#) (12 were killed), catching residents by surprise and trapping many in their homes. Some sought to escape by car as the fires approached, but dozens died on the roads as they were overtaken

by the fire, which leapt 330 feet (100 metres) above the tree line and was powerful enough to kill with radiant heat from nearly 1,000 feet

Late in the afternoon a sudden change in wind direction pushed the fire to the northeast, bringing new towns into its path. A parallel fire, known as the Murrindindi fire, also blew to the northeast, swallowing the unsuspecting tourist town of Marysville, where 34 people lost their lives. Fire experts said that these two fires alone released energy equivalent to that of 1,500 atomic bombs like the one dropped on Hiroshima, Japan."

And now today in the Advocate, it was reported that the Circular Head Coastal Awareness Network lost their court appeal against Robbins Island \$1.6 billion wind farm proposed by Philippines-based ACEN Australia which will greatly negatively impact the critically endangered orange-bellied parrot, migratory seabirds, and a facial tumour disease-free Tasmanian devil population.

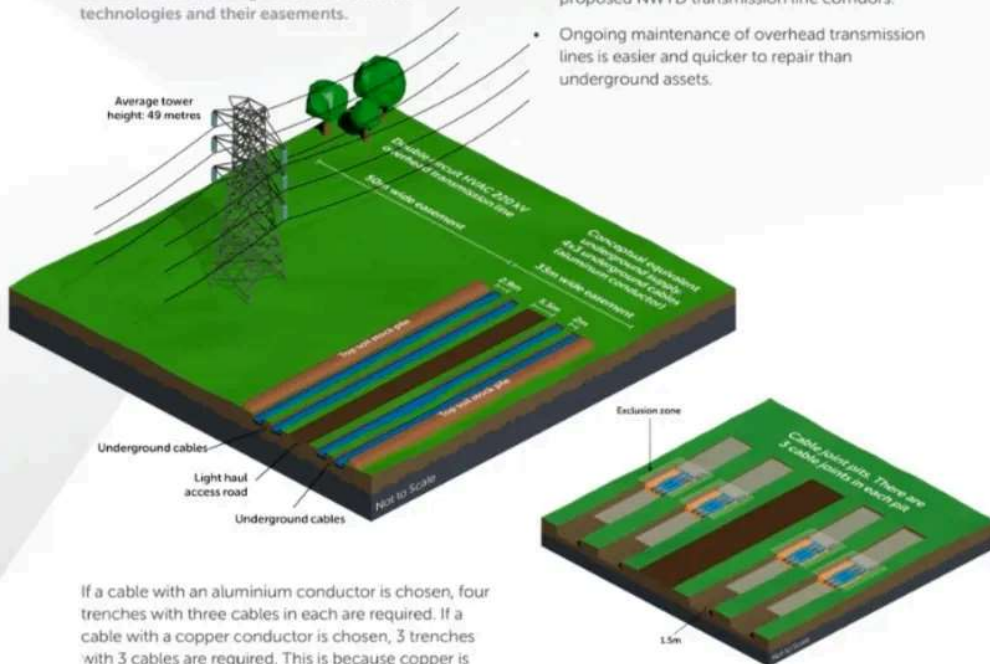
Why is the NWTD project using overhead transmission?

HVAC overhead transmission has been selected as the preferred method to transport electricity for the NWTD. This technology has been chosen because:

- Overhead HVAC lines will ensure Tasmania has the necessary energy transmission compatibility and capacity needed at an appropriate cost.

- HVAC underground cables pose technical limitations over long distances. Underground HVAC is typically only considered, for example, in a relatively short route length (approximately 50km) and in densely populated city areas where space is premium.
- HVAC overhead transmission lines will be constructed in a way that reduces impacts to landholders as much as practical.
- Overhead lines accommodate rugged terrain and landslip prone areas, which are features of the proposed NWTD transmission line corridors.
- Ongoing maintenance of overhead transmission lines is easier and quicker to repair than underground assets.

Figure 3: Conceptual diagram showing comparison between HVAC underground and overhead technologies and their easements.



If a cable with an aluminium conductor is chosen, four trenches with three cables in each are required. If a cable with a copper conductor is chosen, 3 trenches with 3 cables are required. This is because copper is more conductive than aluminium.

Cable joints are required every 1km. This is because standard HVAC cable drums hold a maximum of 1km in cable length.

Tasmanian Government: North West Transmission Developments - Why overhead transmission has been selected

This is why the 240km of proposed high voltage transmission lines are such a high and unacceptable bushfire risk to Tasmanians.

According to ABC NEWS today,

“Tasmania’s Environment Protection Authority (EPA) initially appealed the tribunal’s decision to the Supreme Court, but then withdrew after the government changed the law around the state’s coastal policy.

■
ACEN will require separate approval for transmission lines in the north-west."

What this means for Tasmanians is if the approval for the transmission lines go through, so will the very high potential of dangerous electrical bushfires breaking out from those high voltage transmission lines, even though the local NW Councils, State and Federal government, including Tanya Plibersek have had many constituents, me being one of them, who have brought to their attention how potentially dangerous and deadly the 240km proposed high voltage transmission lines are. It is because of this that I feel the local Councils, State and Federal government that are involved in pushing Marinus Link, wind turbines (both offshore and onshore) and the high voltage transmission lines are potentially putting themselves at an extremely high risk of being found culpable before a coronial inquest, which I also feel would be very embarrassing to the local, State and Federal government, given the "lessons learned" from the 2009 Black Saturday fires and what happened very recently in California.

So, my question to Felix Ellis and the rest of the Liberal/Labor government is, if all of you light them (electrical bushfires break out due to the dangerous and potentially deadly 240km proposed high voltage transmission lines that you and the rest of the Liberal/Labor government seem bound and determined to force on NW Tasmanian constituents, even many communities and constituent have already made it clear to you that they do NOT want them, are you going to do the right thing and own them?

After all, Regional Chief Simon Pilkington recently stated, ***"we're counting on every Tasmanian to do their part,"*** and went on to say, *"whether it's obeying fire bans, taking care with tools, or speaking up when you see others doing the wrong thing, your actions could save lives."*

Every Tasmanian means you too, Felix Ellis. Maybe that is something you and the rest of the TAS Cabinet could have discussed at your recent Cabinet meeting in Burnie on the 18th of February, just two days after Craig Garland's meeting in Burnie 2 days earlier.

Sardines, Seabirds, Salmon Farms & Fishers

What do we want in our coastal waters?

1 pm Sunday - 16 February, Burnie Town Hall

Come along to this free public meeting to hear about proposed developments in Bass Strait

Speakers

Tony Koslow, research oceanographer emeritus

Dr Lisa- anne Gershwin, prominent
marine scientist

Stuart Ritchie, Richey Fishing

Dr. Eric Woehler, OAM,
Australian Coastal Society

Louise Cherrie, Cherrie Consulting

Eloise Carr, Australia Institute

Craig Garland, Fisherman and MP

Krystelle Jordan, Aboriginal Land
Council of Tasmania

John Stanfield, Tasmanian Amateur
Sea Fishermen's Association



Hosted by Craig Garland MP, Independent for Braddon



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2 thoughts on “DO WE HAVE A “DO AS I DO” or “DO AS I SAY” GOVERNMENT? YOU DECIDE”



malcolmda23c54970 says:

March 4, 2025 at 10:11 pm

Congratulations Carol-Ann on a very concerning article. I fully agree with you that the Government need to put on legal notice about what they are recklessly rolling out on us and our communities.



Al Hort says:

March 10, 2025 at 10:35 am

Great research and article Carol-Ann. Add to the potential of these fires the self igniting solar home batteries being recalled at the moment and the EV's that are doing the same. It is a dud technology for a dubious reason. And then we have just added hydrogen, a very hard to store flammable gas, to the mix in Tas. The UK are currently paying Wind Factory Owners 130,000 pounds/hour to keep the turbines stationary as the grid cannot handle the up and down surge in input at the moment. The UK's plan is similar to the plan of our own political wombats. They are spending 260 billion pounds to save 7 billion in gas. Real good economics based on a false premise. None of it makes sense unless you are on the receiving end of government money through grants, subsidies or what ever they change the name to next to hide what they are spending our money on.

Well done Carol-Ann

AI

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March 2025

February 2025

January 2025

December 2024

November 2024

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Apprenticeship

Cultural

Culture

Education

Environment

Health

History

Human Interest

Learning

Mental Health

Political

Society

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Remembering Black Saturday - 15th anniversary

POSTED:

7 February 2024

Content warning: This story contains information and descriptions of the 2009 Black Saturday bushfires in Victoria, Australia and may be distressing. Reader discretion is advised.

Today marks 15 years since Black Saturday – a day that will forever be remembered for its widespread devastation and lifelong impacts on Victorians.

The Black Saturday bushfires occurred in February 2009, following a record-breaking heatwave.

Many Victorians suffered vast impacts to life and property as a result of the fires, which remain the worst bushfires in Australia's history in terms of loss of human lives.

Around 400 fires were recorded across the state that day, which ravaged more than 78 communities. Over 400,000 hectares were burnt, and thousands of homes and buildings were lost or damaged.

As smoke blanketed Victorian skies and turned them dark on that historical day, thousands of volunteers and emergency service personnel worked to protect communities right across the state.

As each year passes, the 173 lives that were lost will not be forgotten, nor will the long-lasting physical and emotional impacts on many Victorians.

15 years on, we reflect on the communities that came together in times of tragedy, pay tribute to those who risked their lives to protect others, and share the lessons that have shaped emergency response for future generations.

We sat down to hear from some of the people who were dedicated to protecting communities that day – and who continue to do so.

Here are their stories.

Black Saturday - 15 year anniversary



Rick Nugent

Emergency Management Commissioner Rick Nugent was working with Victoria Police on 7 February 2009. He clearly remembers the days leading up to Black Saturday and the predicted extreme weather conditions, following a significant heatwave the month prior.

“Saturday itself had an eerie feeling,” he says.

Commissioner Nugent says he vividly remembers saying to a colleague that morning, that the last time he remembered conditions with such significant heat and wind, was on Ash Wednesday.

“Whilst we knew it was a catastrophic day and everyone was preparing for the worst, I don’t think anyone could have foreseen what actually occurred.”

He says the police force had a significant role to play on Black Saturday and the months following. In fire impacted areas, local police responded quickly to support agencies, including helping people evacuate.

“Police had a really important role working with our agencies. There were occasions when many of our police risked their own lives to help people evacuate the area,” he says.

“Following the event, police had a really critical role to identify the many people who tragically lost their lives and inform relatives of the passing of loved ones.”

Commissioner Nugent also recalls the significant investigation into a deliberately lit fire in the Churchill area.

Reflecting on the community response during that time, he says it was something that he hadn’t seen before in his working life.

“People came from everywhere to help each other and to volunteer. The resilience and stoic nature of the community – they just get down and help – and came from right across the state and nation.”

Describing Black Saturday as a tragedy difficult to comprehend, Commissioner Nugent says, “It was a disaster so significant that 173 people lost their lives, 414 others were injured, many of them with lifetime scars and permanent injuries, and two thousand homes were burnt to the ground. The devastation was very hard to comprehend.”

“The way that communities got together, right across those fire impacted grounds, was phenomenal – supporting loved ones, neighbours and friends, and then rebuilding those communities,” he recalls.

A key thing Commissioner Nugent learnt from what he saw on Black Saturday, as well as in the more recent 2019-20 fires, is the importance of leaving early.

“Knowing where you live, what the fire risk is and leaving early – don’t wait until the last minute. Your home, your possessions can be replaced – lives can’t. There will be people 15 years on that are still grieving loved ones that perished on that day.”

“Have your fire plan ready, know your conditions and don’t rely on one source of emergency information.”

Over the past 15 years, there has been significant reform undertaken in the emergency management sector.

“Widespread reforms that have supported our preparation and prevention activities for emergencies, in particular fires, in this state. Our warnings and public information system has significantly matured, ensuring we get timely and accurate information out to communities to enable them to make those decisions.”

He says the exercising, planning and preparation by local councils, communities and all of the agencies has also matured in the years since.

During Black Saturday and the months following, Commissioner Nugent witnessed the dedication and strength of Victorian emergency services.

“I was incredibly proud of the efforts, commitment and professionalism of our police workforce at a really difficult time, and of all the agencies that put their lives on the line to keep communities safe.”

“I’m enormously grateful for all of those people for what they did on Black Saturday, and what they have continued to do since.”

Allyson Lardner

Allyson Lardner is the current Assistant Commissioner State Operations at Emergency Management Victoria. In 2009, she worked for the Department of Sustainability and Environment and lived in Horsham in western Victoria.

On Black Saturday, Allyson wasn’t on duty – she was home with her two young children. Her partner and a number of her friends and colleagues were out on the fireground.

She recalls seeing a black cloud of smoke at the end of her street, when she “kicked into gear”.

“My house, with myself and my children, was pretty much in the middle of the fireground on the outskirts of Horsham,” she says.

“We had made very deliberate, careful decisions to stay at home as our property was prepared. The fire did come quite close – it came to our back fence. With the help of our neighbours and CFA, it didn’t make it into any of our properties. Very fortunate from that perspective.”

Allyson says she took the strength of community for granted when she lived in Horsham.

“The resilience that communities have and the support - everyone came out to help each other. In hindsight, that is quite special. Not every community has that, and that is certainly one of the strengths out in regional Victoria,” she says.

“As a sector, we have tried to leverage that strength and build off it.”

Another key aspect Allyson has seen evolve since Black Saturday is the timeliness and accuracy of information for communities.

“Not just in warnings, but also accuracy of information about what’s going on, situational awareness and making sure that information is getting to the right people in the right places,” she says.

On reflection of the day, Allyson expresses how proud she is of her now-adult children.

“I gave them jobs to do, and they stayed home with me and did it. My eldest was on phone duty and still remembers answering the phone,” she says.

Allyson says her experience on Black Saturday contributed to who she is today.

“I think it collectively makes you who you are over time – being able to put all of that together with your experiences and learn from it – and be able to contribute into the sector and society.”

“Take those opportunities and learn from those experiences, and hopefully you can put them into something to make things better.”

Chris Hardman

Chris Hardman was the night shift Incident Controller for the Bunyip Ridge Track fire in Bunyip State Park, which was already burning before Black Saturday. Chris’ colleague David Nugent was the day shift Incident Controller for the fire.

On the Monday following Black Saturday, Chris transitioned to Deputy Incident Controller for the Kinglake-Murrindindi complex, based at Kangaroo Ground.

“Black Saturday began at midnight when I was on duty. I had been on those fires since Thursday – when we had 43 degrees, 41 degrees and then eventually 47 degrees on Black Saturday. The thing that was occupying my mind throughout those days was the unimaginable ferocity of this fire, and how it would unfold,” he says.

He remembers the “incredible intensity” of the fire as it moved through the landscape.

“I recall at 3 am, I had firefighters down by the Bunyip River and we had 30 metre flame height backing down a hill towards the river, which at that time in the morning was extraordinary,” he says.

“We didn’t have enough time to suppress that fire and I made the decision to evacuate those firefighters and get them into a safe location, but understanding that did put a lot more fire in the landscape and that fire was likely to have devastating impacts the following day.”

“Once we realised the implications of what this single day was, they will stay with us for the rest of our lives.”

The fires on Black Saturday and the days following had ongoing impacts on Chris’ mental health.

“For me, I really struggled. Although I was working on the Bunyip Ridge Track fire, the worst nine days of my life were working on the Kinglake complex, where I was attending a range of community meetings and people were asking me really unanswerable questions,” he says.

Chris turned to clinical support from psychologists to help him during that time.

“I had what I thought was going to be lifelong impacts on my ability to do my job.”

“Having that psychological support helped me work through why I was feeling the way I was feeling, and what impact Black Saturday had on me – and realise that it was a completely normal reaction to going through such a traumatic event,” he says.

After a few years had passed, Chris decided to return to bushfire management.

“I thought, I can’t let that experience go to waste. On the back of my experience on Black Saturday and other fires, I can continue to provide a service to the community.”

“Utilising that devastating experience, once I got through the trauma and had the help I needed, I felt that I could get back in the saddle and continue to contribute to helping protect the community. I think it strengthened me.”

Over the years, Chris says the biggest improvement he has seen is the channels of information, which allows people to make better decisions.

In his current role, Chris is the Chief Fire Officer of Forest Fire Management Victoria (FFMVic) and takes everything he learnt from that time into supporting our current firefighters.

“I need to know that the training, skills, capability and support of the people we put in front of these fires is the best it can be.”

When asked what he is most proud of during Black Saturday, Chris says the way agencies and communities collaborated.

“I saw the best of people in terms of working in extraordinarily difficult circumstances, and the way people collaborated and worked together for the betterment of the whole community,” he says.

“That’s a continued strength – I’m really proud to be part of the sector in Victoria. We have this mantra, ‘we work as one’ – it’s not a slogan, it’s true. Today, it doesn’t matter what colour your uniform is. There is a group of people who wake up every day with a view of putting the community at the centre of their

thinking and protect and support communities in the most difficult of times.”

David Nugent

Parks Victoria Director of Fire, Emergency and Enforcement David Nugent was the Incident Controller for the Bunyip Ridge fire on Black Saturday, based out of the Pakenham Incident Control Centre (ICC). He took over from Chris Hardman who had worked overnight.

Part of the planning by the ICC was around supporting communities north of the Princes Highway, from the edges of Melbourne near the Gembrook area, right through to Warragul.

Following Black Saturday and as the fires continued to burn across Victoria for weeks, David continued to work as an Incident Controller on other fires, in particular, out of the Woori Yallock ICC which supported communities around Marysville, into the Yarra Valley.

“My memory of Black Saturday is that sense of inevitability as I got up that morning. I was dealing with a fire that had been going for some days before and we had been warned about what was ahead,” he says.

“In this business, we can’t predict everything. We knew what was likely to happen – that the fire we were dealing with would continue to burn, and probably get out of control, which in fact it did.”

“But we didn’t know what else would happen that day.”

David remembers feeling shocked as he and his team began to understand the extent of the fires in other locations around Victoria.

“As the news started to come through, it was absolutely shock, uncertainty and sadness once we started to know that many people had lost their lives.”

After David finished his shift on Black Saturday, he drove home to the Yarra Valley, where he saw a horizon of fire.

“That responsibility that many of us have in having to do our job to help manage these emergencies, but then go home at a personal level and have to deal with that was something I encountered. There were days afterwards where I was in a situation that we ask the community, whether they should stay or go – so I had to deal with that myself, but then also continue to do my job.”

David says the Royal Commission process allowed for a very detailed look at how the event unfolded.

“Since Black Saturday, we needed to look at what happened and why, and what we could do about it, so we could avoid the extent of tragedy and loss of life in the future. It has resulted in us being able to save lives, there’s no doubt about that.”

“We’ve spent an enormous amount of time and effort into developing how we better tell the community what is happening during emergencies so they can make decisions, and help us, as agencies, respond and save lives.”

The Black Saturday bushfires highlighted the enormity of the job that emergency services have – something David says he continually reflects on.

“Black Saturday was something that many of us had never experienced before. It was a wake-up call for us to understand the potential of what can happen. We know that these events will continue to happen in the future – that highlights the importance and challenges of what we do.”

Although difficult to reflect on the day itself, David says it is important to acknowledge the life-saving work of emergency services.

“We planned, prepared and responded in a way that helped many people and the communities that were at risk. We had a great team of people – everyone is absolutely committed to what we do when we come together to fight fires.”

“I’m really proud that I can play a role in bringing those people together, ultimately with the outcome to save people’s lives.”

Reegan Key

Reegan Key was also working within the Pakenham ICC on Black Saturday.

She was in the Information Unit and says their ICC was lucky in a sense, as the fire they were managing was already burning.

“Our fire started on the Wednesday in Bunyip State Park, so we were working on it well in advance of Black Saturday. We had firefighters on the ground and had time to map out, with the predicted conditions, where we thought the fire was going to go, and which communities were likely to be impacted. So, in that context, we were lucky,” she says.

Reegan explains they were able to use the systems, processes and information available to spend time talking to communities prior to the day.

“Our biggest day aside from Black Saturday was the day before, when we ran six or seven community meetings, talking to each and every one of those communities about what was coming,” she says.

In reflection, Reegan says the predictions were accurate, as the fire escaped Bunyip State Park in the afternoon.

“We thought we would be in trouble if it came out too much earlier. We were able to stop the fire at certain points, before it got to the Princes Highway,” she says.

“We didn’t lose any lives. We lost multiple houses and properties were damaged, and the impact on communities was still really significant, but in reflecting on what happened that day in a lot of other areas, we were lucky.”

She recalls they didn’t realise the extent of impacts across the state until the evening.

“The moment we realised how big that day was, was during the news, as we had been working since 7 am and for three days prior on this fire – and you’re in the zone and focused on the communities you’re working with.”

Reegan says she left home on the Wednesday before Black Saturday and didn't have a break until Labour Day, as some communities remained under constant threat with fires continuing to burn for weeks.

"Black Saturday and the days following still sit in my mind. The experience and work that followed with communities, and the resilience of those communities during that time, really stays with me."

Looking back at how Black Saturday affected her, Reegan says, "The main reflection I have is that this is my job now."

"VicEmergency exists now because of Black Saturday. The work we do every day is to continue to build and improve how we provide information during emergencies, and how we better prepare people in Victoria for all different types of emergencies."

Dawn Hartog

Dawn is one of Victoria's Public Information Officers, working at a state level, as well as regionally and at incident when emergencies occur. She currently works in the water emergency management space and has strong ties to CFA, as a board member and also as captain of the Toolangi Fire Brigade.

Dawn had been working at the State Control Centre (SCC) for a number of weeks leading up to Black Saturday. The day before, she recalls seeing the hands shaking of the person giving the weather report of what the day could bring.

She made the decision to go home to be with her family in Kinglake at the end of her shift, and not be at the State Control Centre on the 7th of February.

"In hindsight, I'm really thankful I was home with family and friends, as I was able to successfully defend my home, and that of my friends and neighbours around me."

Dawn says she got up early on Black Saturday and put the last actions into place to prepare their home, with the knowledge from the weather reports the previous day.

"Seeing a big cloud of smoke – that was when it became real. We knew what we had to do, theoretically, and as the day unfolded and the sky became darker and embers started coming into the backyard, it was eye-opening."

"I locked into 'I have a job to do, and I need to do it', and that's how I was for the rest of the evening. I had a responsibility that I felt," she recalls.

Dawn reflects on the now central focus of Public Information across emergency management.

"It has always been an area we have put warnings out and communicated with the public for a long time, but it has been great to see over the last 15 years how it has evolved, and how it is front and centre of decision-making."

Looking back, Dawn says she has always put the community at the centre of how she works but since Black Saturday, she is able to see things from a different perspective.

“Being home and having been a community member on the day, as well as emergency management personnel, I’m able to see it from the community’s point of view.”

Dawn is most proud of how she and her colleagues operate across the emergency management sector.

“I’m really proud of when the chips are down and things are tough, to see how everyone bands together and drops their badge or logo and focuses on what needs to occur.”

“Personally, it has really heightened my passion for the sector, the area and what we do.”

Jacqui Thurgood

On Black Saturday, Jacqui Thurgood was rostered on to work a night shift in the State Control Centre as a Warnings and Advice Officer.

“February 7 was a day of dread. It came towards the end of a really heavy fire season and was about the fourth day into Victoria’s most extreme heatwave on record. We knew it was going to be really bad. My dad was at the wheel of a CFA truck for a couple of weeks in Gippsland leading up to it.”

“Waking up on that day in inner city Melbourne, it was 46 degrees. I couldn’t see in front of me because it was so smoky, and the wind was blowing an absolute gale,” she says.

She recalls realising throughout her shift that the scale of what they were facing was uncharted territory.

“That night shift, it felt like it reached a point where we all realised, we were well outside our lived experience – the systems, processes and our experiences had been surpassed.”

“A memory that really sticks with me that night was the silence in the room when the police came out to say they believed the scale of the loss of life was really significant. I remember there was around 200 of us in the room – and there was just silence.”

Jacqui remembers everyone in the centre being focused and doing their best, but she says it felt like it wasn’t enough.

“We just couldn’t get the information out to people fast enough – and even if we did, the scale of the event and the consequences were just so big.”

“I feel really proud that everybody absolutely did their best – and everyone kept turning up to do their best. Even though Black Saturday was one day, it was at the end of a very heavy fire season, so people had been coming in for shifts for months at that point,” she says.

Jacqui also feels proud to have been part of the Royal Commission.

“The Royal Commission was a huge undertaking. We are lucky that when something of such significance occurs, the time and care is taken to go through in detail how we can try and avoid that happening again – so that was a really important thing to be part of.”

After some years had passed and following a break from emergency management while on maternity leave, Jacqui remembers how she felt when she returned to the SCC.

“It was healing, because it was so radically different. We had learnt and changed – particularly in the Information Unit. The priority given to getting actionable information to communities now almost feels on par with getting a truck on the scene.”

“Getting people the information they need is so powerful.”

John Cheevers

On Black Saturday, John Cheevers was a volunteer firefighter with the Country Fire Authority (CFA) and working on Greenvale Tanker 1, deployed to Humevale and surrounding areas. It was early on in his volunteer career.

“We learnt a lot that day – we had trained and were well prepared – but we still learnt a lot.”

“The preparation before the day, I don’t think we could have done any more, but no one could have prepared us for the actual day,” he says.

John and his strike team got the call up around 4 pm.

“We were ready – we had been waiting in case we were called. We were deployed to the staging area, and we could see the smoke in the hills,” he says.

He recalls a number of near misses over the course of the day, including when his team had to go into full shelter mode while they were on the back of the truck.

“The roar of the fire was so loud. When the fire front hits, it takes all the oxygen. I was having trouble breathing and was down on my knees below the heat shield for protection,” he says.

Before deploying, his crew leader told them the signal to go into protection mode was when the horn blew three times.

“I heard the horn blow. I looked at my colleagues and they were still fighting the fire. I grabbed them and we went into protection mode.”

John and his colleagues pulled the fire barrier curtain over themselves, and the only thing they could do was wait until the fire passed.

“We had no communication with the crew leader or the cabin,” he recalls.

“Eventually, we drove down the road. They stopped the truck and got out to pull the protection back and said, ‘thank god you’re still there’ – they didn’t know we were still on the back of the truck.”

Looking back, John remembers his team was able to rescue a family in Humevale, when fire ravaged their property.

“We managed to get them out, but they lost their home. We were lucky to be there at the right time for the family. The three people we rescued were the grandfather, father and son, so three generations from the one family.”

John credits Black Saturday as his motivation for the path of his career, now working in the SCC.

“I wanted to be able to do more. I wanted to work in roles that had more value for the community. After Black Saturday, I always wanted to work in the State Control Centre,” he says.

“As you get older, there’s less you can do on a fire truck but still plenty I can do from here.”



2009 Victorian Bushfires
Royal Commission

FINAL REPORT

SUMMARY

THE HON. BERNARD TEAGUE AO – CHAIRPERSON

RONALD MCLEOD AM – COMMISSIONER

SUSAN PASCOE AM – COMMISSIONER

ORDERED TO BE PRINTED

July 2010

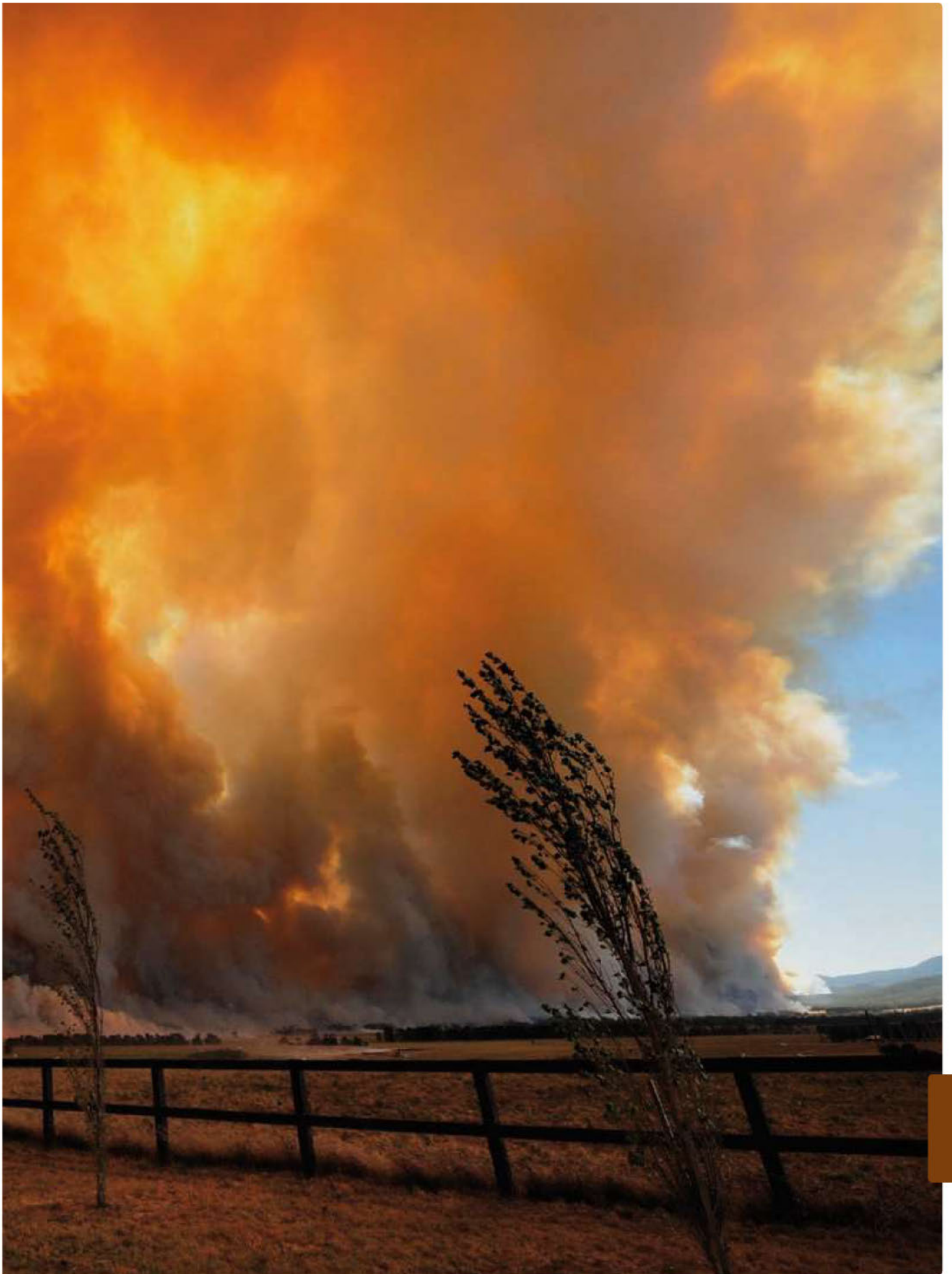
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2009 Victorian Bushfires
Royal Commission

Professor David de Kretser AC
Governor of Victoria
Government House
Melbourne 3004

Your Excellency

In accordance with the Letters Patent dated 16 February 2009, we have the honour of presenting to you the final report of the 2009 Victorian Bushfires Royal Commission.

It consists of four volumes and a summary:

- Volume I, *The Fires and the Fire-related Deaths*, describes the progress of the fires that burned in Victoria in January and February 2009 and summarises the results of the Commission's inquiries into the 173 associated deaths.
- Volume II, *Fire Preparation, Response and Recovery*, presents the Commission's conclusions and recommendations in connection with fire preparation, response and recovery.
- Volume III, *Establishment and Operation of the Commission*, describes how the Commission went about its work.
- Volume IV, *The Statements of Lay Witnesses*, presents the statements and associated materials of the 100 lay witnesses who shared with the Commission their experiences of the fires. As this volume contains some video footage, it is only available in an electronic version.

It has been a privilege to undertake this work. We hope that our findings and recommendations will help to ensure that we do not see a repetition of the tragedy of 7 February 2009.

Dated this 31st day of July 2010.

The Honourable Bernard Teague AO
Chairperson

Ronald McLeod AM
Commissioner

Susan Pascoe AM
Commissioner



PREFACE

The bushfires of Black Saturday, 7 February 2009, caused the death of 173 people. Black Saturday wrote itself into Victoria's history with record-breaking weather conditions and bushfires of a scale and ferocity that tested human endurance. The lives of many Victorians were changed forever, and many showed they are capable of deeds of great courage and compassion. Although some communities were physically destroyed, their members also displayed ingenuity, strength and resolve in the face of this calamity. There was also widespread devastation of considerable areas of the scenic forests and woodlands that form part of Victoria's natural heritage.

Eighteen months later, the landscape is healing, flora and fauna are returning, and individuals and communities are getting on with rebuilding their homes and lives. We acknowledge the losses—of family, friends, fellow citizens, homes, gardens, animals, and the many other things that people hold dear. We have seen the pain people have endured and continue to bear, and we know it will be a long road to full recovery for many. Bushfire is an intrinsic part of Victoria's landscape, and if time dims our memory we risk repeating the mistakes of the past. We need to learn from the experiences of Black Saturday and improve the way we prepare for and respond to bushfires.

The 2009 Victorian Bushfires Royal Commission was an important part of ensuring that those lessons are clearly defined and learnt. The Commission conducted an extensive investigation into the causes of, the preparation for, the response to and the impact of the fires that burned throughout Victoria in late January and February 2009. As Commissioners, we concentrated on gaining an understanding of precisely what took place and how the risks of such a tragedy recurring might be reduced.

In our deliberations we ensured that the voices of affected community members were heard. Our priority was to listen to people directly affected by the fires. We also ensured that the Commission's processes were firmly based in the community through open hearings (including in regional towns), web streaming so that people could listen to the hearings over the internet, public submissions, the participation of lay witnesses, the creation of the Black Saturday Gallery, and the participation of family and friends in hearings about people who died as a result of the fires. This access will continue: the Commission's website will remain active, and all the Commission's documentation will be available at the Public Records Office of Victoria.

This report is an important part of securing the memory of the fires. The first volume describes the origins and course of the 15 fires that wrought the greatest harm on 7 February and the response to them. It also tells the stories of the 173 people who died. Volume II looks at what lessons can be learnt from these experiences—how we can reduce the risk and impacts of fire and minimise fire-related loss of life in future. Volume III reports on the Commission's administration and processes. Volume IV reproduces the statements of the 100 lay witnesses who gave personal accounts of their experiences in the fires in late January and February and in their aftermath. The stories told by these people grounded our work. They continually reminded all at the Commission that bushfires deeply affect people and communities and that their needs and safety must be at the forefront of government policy.

The recommendations we make give priority to protecting human life, and they are designed to reflect the shared responsibility that governments, fire agencies, communities and individuals have for minimising the prospect of a tragedy of this scale ever happening again.

We offer this report to the Governor and the people of Victoria.

The Hon. Bernard Teague AO
Chairperson

Ronald McLeod AM
Commissioner

Susan Pascoe AM
Commissioner



CONTENTS

PREFACE	vii
SUMMARY OF THE REPORT	1–22
RECOMMENDATIONS	23–37
THE COMMISSION’S TERMS OF REFERENCE	38–41
THE PEOPLE WHO DIED	42



Image 1 The Redesdale fire



Source: Courtesy of Alex Ip.



SUMMARY OF THE REPORT

CONDITIONS ON 7 FEBRUARY 2009

Victoria endured one of its most severe and prolonged heatwaves during the final week of January 2009. The temperature in Melbourne was above 43°C for three consecutive days for the first time since records had been kept. Saturday 7 February was forecast to reach temperatures in the low 40s, accompanied by strong winds. In the lead-up to the day the Premier of Victoria, the Hon. John Brumby MP, described the state as 'tinder dry'. The Country Fire Authority and the Department of Sustainability and Environment, the State's primary bushfire agencies, warned that forests and grasslands were the driest they had been since the Ash Wednesday fires in 1983.

The conditions forecast for 7 February were realised, as were people's worst fears when fires broke out across the state. Temperatures were nearing 40°C by 11.00 am in many parts of the state and later climbed to the mid-40s. Numerous areas endured record-breaking maximums—including Melbourne, which reached 46.4°C. Strong winds in the morning grew to storm force as the day progressed, and a wind change moved across the state during the afternoon, greatly intensifying the fires. The Commission was informed that the CFA and DSE attended or patrolled 316 grass, scrub or forest fires on that day. Of these, the Commission examined in detail 15 fires that caused (or had the potential to cause) the greatest damage.

The most serious consequence of the fires was the death of 173 people. Left behind are families, friends and communities still trying to come to terms with their loss. Accompanying this loss of life is the fires' impact on property and the infrastructure that supports communities, as well as the substantial environmental impact, which will take years to fully reveal itself—let alone be ameliorated. It is extremely difficult to quantify the cost of a disaster like this, but the Commission estimates it to be more than \$4 billion.

This was one of Australia's worst natural disasters. It will be many years before its effects dim. Governments, fire and emergency services agencies and all individuals can learn valuable lessons from those days, so that we might reduce the risk of such destruction occurring again. It would be a mistake to treat Black Saturday as a 'one-off' event. With populations at the rural–urban interface growing and the impact of climate change, the risks associated with bushfire are likely to increase.

THE ROYAL COMMISSION

In the days immediately following 7 February the State responded to the consequences of this disaster. A relief effort to deal with immediate needs was the first priority. But it was also clear that the community needed to understand this tragedy and how to minimise the risk of a similar tragedy occurring in the future. On 9 February 2009 the Premier announced the State's intention to establish a royal commission. One week later the Hon. Bernard Teague AO, Susan Pascoe AM and Ronald McLeod AM were appointed as the Royal Commissioners.

The Commission's task was substantial. The Governor of Victoria, Professor David de Kretser AC, issued the letters patent, setting out the Commission's terms of reference, on 16 February 2009 (see page 38). The Commission began its work that day, giving early priority to community engagement: between 18 March and 8 April it held 26 community consultations in fire-affected areas, seeking to learn about the experiences and concerns of individuals affected by the fires. A directions hearing was held on 20 April 2009, and the hearing of evidence began on 11 May 2009 and concluded on 27 May 2010. During that time the Commission held 155 days of hearings—including eight days of regional hearings and 23 days examining the 173 fire-related deaths.

To conduct this inquiry properly the Commission needed to ground its work in an understanding of the reality of bushfire and its effects on people's lives. This imperative permeated the Commission's work, from the initial community consultations to the public submissions, the 100 lay witnesses who gave personal accounts of their experiences, and the involvement and support given to the families who attended the hearings into the fire-related deaths. The Commission felt that its work could, and should, contribute to individual and community healing, as well as accommodate the strong public interest in the inquiry. This commitment to people went beyond the requirement to ensure natural justice for represented parties and those potentially affected by the Commission's findings and recommendations: as much as possible, the people who were most directly affected by the fires were given a voice and their stories and views were heard.

The Commission views protection of human life and the safety of communities as the highest priority for bushfire policy and directed its efforts accordingly. This priority guided the Commission in its analysis, the collection of evidence, its reports and the formulation of its recommendations. The recommendations further reflect the Commission's recognition that individuals, fire agencies and Commonwealth, State and local governments share responsibility for preparing for fire and improving people's safety. While placing the preservation of human life at the heart of its deliberations, the Commission also sought to ensure that due consideration was given to Victoria's environmental sustainability.

The Commission was asked to inquire into and report on the causes and circumstances of the fires that burned in January–February 2009, the preparation and planning before the fires, all aspects of the response to the fires, measures taken in relation to utilities, and any other matters it considered appropriate. The letters patent directed the Commission to make such recommendations as it thought fit on preparation and planning for further fire threats and risks, land-use planning and management, fireproofing of structures, emergency response, communication, training, infrastructure and overall resourcing.

THE FIRES

The fires in January–February 2009—and in particular on 7 February—have deeply scarred the Victorian people and the landscape. The Commission therefore begins its report with a discussion of the 15 most damaging, or potentially damaging, fires that burned on 7 February, including those in which people died. Many of these fires were significant because of their size and impact; some of the smaller ones, however, provide insight into the differing circumstances and demands of the day. The Commission examined the following fires (shown here in the order in which they ignited):

- Delburn
- Bunyip
- Kilmore East
- Horsham
- Coleraine
- Pomboineit–Weerite
- Churchill
- Murrindindi
- Redesdale
- Narre Warren: Harkaway
- Narre Warren: Lynbrook—Coral Drive
- Narre Warren: Lynbrook—Golf Club Road
- Upper Ferntree Gully
- Bendigo
- Beechworth–Mudgegonga.

These fires were not the only ones that occurred during the 2008–09 bushfire season: DSE and CFA staff and volunteers fought hundreds of fires. The fire season was long and demanding, placing considerable pressure on firefighters even before the worst fires began in early February. Figure 1 shows the extent of the fires of January–February 2009.

Figure 1 The January–February 2009 bushfires



Victoria has a long, sometimes devastating, history of fire. The conditions on 7 February gave rise to particularly destructive bushfires. These very intense fires share some features that set them apart from less intense fires. Very dry fuels and strong surface winds resulted in erratic fire behaviour and the development of strong convective activity capable of lifting firebrands such as burning bark high in the convection column. Strong upper air winds transported burning bark downwind for many kilometres, resulting in long-distance fire spotting.

Spotting was an important factor in the spread of some fires. Firebrands carried by the strong winds spread from one ridge top to the next in areas of broken terrain. They were carried across sparse eaten-out pasture or areas where grass was less than fully cured and might otherwise have arrested the fires' spread.

Although they varied in their size and impacts, the most severe of the 7 February fires the Commission examined shared a number of features:

- Rapid fire spread followed ignition, which responding crews could not contain.
- Fires crowned in forested areas, which made them impossible for ground crews to control.
- Powerful convection columns were generated above the fires.
- Extensive forward spotting occurred as a result of the fuel type, the weather conditions and the topography.
- Late in the day a wind change altered the direction of fire spread and extended the firefront.

RECOGNITION OF THE FIREFIGHTERS

The Commission acknowledges all those who placed their lives at risk to fight the fires that burned in Victoria in January–February 2009, and particularly on and after 7 February. Its gratitude extends to career firefighters from all the government agencies involved, volunteers, private units, industry brigades, police, and ambulance and other emergency services workers, as well as firefighters who came from interstate and overseas to help. Were it not for their efforts the damage and loss would have been even greater.

The Commission particularly recognises the contribution of volunteers and their families. The strength of the CFA volunteer base was evident on 7 February; this includes its surge capacity, the local knowledge of its members and its rapid response. The Commission heard of volunteers preparing for the day, warning local residents and assisting with the confronting task of locating and identifying the dead. Countless more volunteers took up support roles.

Although not well known, private units play an important role in firefighting in many parts of Victoria. They are usually operated by farmers or landowners, and their equipment usually consists of a small multi-purpose farm utility with a portable tank and pump mounted on the rear. Operators might be members of the CFA but this is not always the case.

The operators of forest plantations above a certain size are required to have industry fire brigades. These brigades need only protect the plantation assets, but the plantation operator can, and often does, permit the brigade to operate outside its designated area.

The Commission acknowledges the firefighting support provided by industry brigades and private units and encourages continued cooperation between public and private operators. It is a practical and valuable expression of shared responsibility that strengthens the state's overall firefighting capacity.

THE FIRE-RELATED DEATHS

The greatest tragedy of Black Saturday, and one of the primary reasons why this Royal Commission was established, was that 173 people died as a result of the fires. This far exceeded the loss of life from any previous bushfires—including Ash Wednesday, in February 1983, when 75 people died in Victoria and South Australia.

Five fires claimed people's lives. The greatest loss resulted from the Kilmore East fire (119 people); it was followed by Murrindindi (40), Churchill (11), Beechworth-Mudgegonga (2) and Bendigo (1). The great majority of these people died on 7 February; four died in the following days or weeks as a result of the injuries they sustained on 7 February, and one person, an interstate firefighter, died as a result of injuries sustained after 7 February.

The Commission heard many accounts from people who survived the 2009 bushfires, but it was only by examining the circumstances of the deaths that it could complete its investigation of these fires. In particular, the examination of the circumstances of the deaths helped the Commission expand its knowledge of the way people understand and respond to bushfire. These inquiries also cast light on its consideration of matters such as planning and building regulation, the need for a broad range of safety options, and what makes a home defensible against bushfire.

RESPONDING TO BUSHFIRE

The response to the fires on 7 February was characterised by many people trying their best in extraordinarily difficult circumstances. There were many examples of people who met the challenge admirably. Nevertheless, some poor decisions were made by people in positions of responsibility and by individuals seeking to protect their own safety. The Commission is conscious of the pressure and difficulties people faced on the day, but it would be negligent if it overlooked the shortcomings: we need to learn the lessons so that problems can be avoided in the future. The Commission therefore examined the policies, systems and structures needed to ensure that government, fire and emergency services agencies and individuals make informed, effective decisions about their response to bushfires in a way that protects life and minimises loss.

VICTORIA'S BUSHFIRE SAFETY POLICY

As the fires of January–February 2009 burned fire agencies and individuals made crucial decisions in the context of an overarching policy for community safety in bushfires. That policy had become known colloquially as ‘stay or go’ but is more accurately described by its full title, ‘Prepare, Stay and Defend or Leave Early’.

As a result of its inquiries the Commission concludes that the central tenets of the stay or go policy remain sound. The 7 February fires did, however, severely test the policy and exposed weaknesses in the way it was applied. Leaving early is still the safest option. Staying to defend a well-prepared, defensible home is also a sound choice in less severe fires, but there needs to be greater emphasis on important qualifications.

The policy is now in transition. Since 7 February the State has improved the policy and the community education campaign that accompanies it, including in response to the Commission's interim recommendations. The Commission considers that, although the changes the State has made to date advance the policy, further change is needed.

The stay or go policy failed to allow for the variations in fire severity that can result from differing topography, fuel loads and weather conditions. In particular, it did not adequately account for the ferocious fires experienced on Black Saturday. A bushfire safety policy must be capable of dealing with the fact that every fire is different and must differentiate potential firestorms from most bushfires. The most fierce fires call for a different approach to community safety, for different advice, support and responses from fire agencies. On such days, if the initial attack fails to contain a fire, the operational focus and mindset of fire agencies should move to providing information and attending to community safety rather than fire suppression.

The stay or go policy tended to assume that individuals had a fire plan and knew what to do when warned of a bushfire threat. But many people did not have a well-thought-out plan and were left to make their own decisions without the benefit of assistance from the authorities. In addition, warnings—when they were given—were too narrow: they were directed at getting people to enact their fire plans, rather than giving more specific directions or advice. The Commission heard that many people wait and see what happens before leaving in response to one or more of a range of ‘triggers’, such as a fire being in their area, the situation becoming dangerous, or being personally told to leave. For these people the lack of alternatives—the provision of shelters and refuges or evacuation—became critical as a fallback option. Any policy must encourage people to adopt the lowest risk option available to them, which is to leave well before a bushfire arrives in the area. The Commission acknowledges, however, the reality that people will continue to wait and see, and a comprehensive bushfire policy must accommodate this by providing for more options and different advice.

The State has accepted that the policy options of leaving early or staying to defend do not fully cover the need for contingency plans, but it still appears reluctant to implement alternatives, arguing that the availability of a suite of options could discourage some people from leaving early. The Commission is concerned that the State's reluctance is reflected in the slow progress with community refuges and bushfire shelters. It simply does not face the reality that the earlier binary policy approach did not help many people who, for various reasons, did not find either option acceptable in their circumstances.

Advice about bushfires must also be provided to the community in a way that engages them. The population exposed to fire on the urban fringes is growing and the demographics are changing. It is essential that there be a continued focus on providing frank and meaningful advice about the risks and what is required to adequately prepare for and survive a bushfire. Local planning and emergency management processes are also crucial to the formulation of this advice. The fact that not all houses are defensible in all circumstances was recognised before 7 February. In the Commission's view this message needs to be conveyed more forcefully. An important observation from the circumstances of many of the fire-related deaths is that defensibility is affected by the surrounding environment—not just the land and vegetation immediately adjacent to a house. Being close to a heavily forested area can increase the ferocity of an approaching fire and the likelihood of heavy ember attack, making it harder to defend a house. Defending a house also requires at least two able-bodied, fit and determined adults who are physically and mentally prepared to work long and hard in arduous and dangerous conditions. The rigours of mounting a defence in the face of fires such as those on Black Saturday caught many by surprise. The Commission finds it particularly worrying that nearly half of the people who died were classed as ‘vulnerable’ because they were aged less than 12 years or more than 70 years or because they were suffering from an acute or chronic illness or disability.

Community education must continue to stress that staying in fire-prone areas on days when conditions are as severe as those on Black Saturday involves grave risk to one's life.

The policy approach also needs to recognise the important underlying principle of shared responsibility. A fundamental aspect of the Commission's recommendations is that everyone—the State, municipal councils, individuals, household members and the broader community—must accept greater responsibility for bushfire safety in the future and that many of these responsibilities are shared.

The Commission uses the expression 'shared responsibility' to mean increased responsibility for all. It recommends that State agencies and municipal councils adopt increased or improved protective, emergency management and advisory roles. In turn, communities, individuals and households need to take greater responsibility for their own safety and to act on advice and other cues given to them before and on the day of a bushfire.

'Shared responsibility' does not mean 'equal responsibility'. The Commission considers that in some areas the State should assume greater responsibilities than others; for example, the State and its fire authorities are likely to be more able than individuals to identify the known risks about bushfire. It is also necessary for the State, municipal councils and families to recognise the specific needs of vulnerable people, who might need early warning, assistance or separate consideration particularly on code red days.

The future policy

The Commission understands the attraction of an uncomplicated policy framework that presents two clear options—stay or go—but such an approach is simplistic. Realistic advice is unavoidably more complex and requires subtlety. As a consequence, although the Commission suggests retaining the effective elements of the existing policy it also recommends augmenting and improving the policy in a number of areas:

- covering the full range of fires—with particular recognition of the heightened risk associated with the most ferocious fires on the worst of days
- strengthening warnings and improving their timeliness and dissemination
- providing more practical and realistic options such as community refuges, bushfire shelters and evacuation—including assisted evacuation of vulnerable people
- improving the quality and availability of advice on fire behaviour and house defendability and clearly conveying the message that among the risks of staying to defend are death and serious injury.

To be effective these changes need to be part of a well-designed long-term community education program that captures people's attention, makes allowance for local needs and circumstances, and is regularly evaluated and improved. Municipal councils should take a more active role in planning for bushfire, including planning for evacuation and shelter options in their municipalities.

Among the elements of the policy that should be retained are the following:

- the principle of shared responsibility—that there are legitimate and important roles for both individuals and the State
- encouragement to leave early as the safest option
- staying and defending still being a sound choice in less severe conditions and fires, providing certain precautions are taken
- emphasis on preparation, whether staying to defend or leaving early
- sound advice for individuals, households and communities—including a mix of specific and general advice delivered through various modes and media.

It will not be easy to maintain the focus on bushfire safety over time. Community memory of ferocious fires can fade because of the relative infrequency of such events. In these circumstances there is a risk of individual and collective underestimation of the risk—and possibly complacency. Individuals must remain vigilant, and the State should use community education and public awareness to break the cycle of complacency. Teaching bushfire history and safety in schools is important for maintaining community memory and awareness.

Image 2 The Bendigo fire



Source: Courtesy of The Bendigo Advertiser.

Finally, individual planning and action for bushfire safety can often involve hard decisions. For example, firefighting equipment and infrastructure are expensive, and some people in bushfire-prone areas who want to defend their homes might not have the financial means to prepare their home fully. Dilemmas such as this should be discussed in education programs under the revised bushfire safety policy.

The revised policy needs to challenge people to think about what they would do if bushfire threatened on a work day, during school holidays or when they had other plans (such as a party). They also need to ask themselves whether they are physically and mentally strong enough to cope with the demands of a sustained firefight, what would they do if their plans fail, and how would they protect their pets and livestock or would they leave them. People need to face the fact that bushfires do not necessarily arrive at convenient times. Their planning needs to reflect this reality.

EMERGENCY AND INCIDENT MANAGEMENT

The State's emergency management framework provides for planning, preparation and coordination in the management of crises and natural disasters. On Black Saturday new state-level operational arrangements were being trialled by the CFA and DSE. This was the first fire season (2008–09) that the agencies had been co-located and operating from the integrated Emergency Coordination Centre in Melbourne. The purpose of the iECC was to achieve effective strategic planning and coordination, better information sharing and faster decision making. People who worked at the iECC overwhelmingly considered that the outcome of the fires would have been far worse had the agencies not been co-located.

The Commission agrees with this conclusion but further concludes that the state-level emergency management arrangements still faltered because of confusion about responsibilities and accountabilities and some important deficiencies of leadership. True integration was not achieved: the CFA and DSE followed operating procedures that were not fully consistent, used separate technology systems, and in many cases performed duplicate functions. The State has acknowledged some of these problems, and since 2009 systems at the iECC (now the State Control Centre) have been upgraded and the centre's layout changed. The Commission endorses these improvements and supports the continued use of the State Control Centre for integrated emergency management.

The experience of 7 February also highlighted several areas in which high-level state arrangements need reform. On Black Saturday the roles of the most senior personnel were not clear, and there was no single agency or individual in charge of the emergency. The Commission notes changes made as part of the new coordination, command and control arrangements but considers that more should be done. It recommends that the roles be clarified, including through organisational change.

Even when the right policies and systems are in operation, strong and effective leadership is essential. On 7 February the leaders ultimately responsible for the operational response to the emergency were the Chief Officer of the CFA, Mr Russell Rees, the Chief Fire Officer of DSE, Mr Ewan Waller, and the Chief Commissioner of Police, Ms Christine Nixon. Although many of the functions associated with each individual's role might have been delegated to subordinates, these people were still ultimately accountable. The Commission concludes that some elements of the leadership provided on 7 February were wanting. Mr Rees and Mr Waller ought to have done more in relation to warnings (this was dealt with in the Commission's first interim report), supporting incident management teams and statewide planning. The Commission considers that Ms Nixon's approach to emergency coordination was inadequate. Ms Nixon herself acknowledged that leaving the integrated Emergency Coordination Centre and going home at about 6.00 pm on 7 February was an error of judgment. The Commission shares this view.

Although the Commission concludes that the Minister for Police and Emergency Services acted properly before and during the bushfires it considers that he should have raised the option of declaring a state of disaster with the Premier. The circumstances clearly met the criteria for such consideration. Even if practical cross-agency and community cooperation was already in evidence and no additional coercive powers were needed, such a declaration would have recognised the gravity of the situation and might have sharpened emergency agencies' focus on community safety and warnings. In the Commission's view, if circumstances potentially satisfy the criteria for declaring a state of disaster, the option of making such a declaration should be discussed with the Premier.

The Commission not only looked at state-level management but also at the management of individual incidents. Overall, AIMS (the Australasian Inter-service Incident Management System) was well understood and accepted by fire agencies. The Commission supports its continued use with some minor modifications to increase the profile of the Information Unit and recognition of the importance of local knowledge within level 3 incident management teams.

At the local level, the performance of individual incident management teams varied on 7 February, and the experience of the day demonstrated how important effective preparation is to good performance. It was invariably those IMTs that were well prepared, staffed by people with the appropriate training and experience, and well practised that managed difficult fires well. The Commission commends these groups for their planning and preparation. Problems that arose where this did not occur led the Commission to make recommendations about improving preparation, training and staffing, information flows and agency integration, so that more IMTs have the capability, competence and support needed to perform well in future fires.

In the lead-up to 7 February the State, including fire agencies, recognised that the day had the potential to be catastrophic and began planning and notifying the community and personnel accordingly. Pre-designated incident control centres were advised to be ready for a 'hot start'. In practice, however, the state of readiness of the ICCs and the level 3 incident management teams that staffed them varied. Again, the State has improved its procedures since 7 February, increasing the number of personnel required for a full level 3 IMT and establishing standards for pre-positioning teams. The Commission is concerned, however, that the revised standards do not go far enough, and it proposes that in all areas where a code red fire day is forecast a full IMT be in place from 10.00 am. Additionally, fire agencies should prescribe and audit a minimum number of joint training exercises for level 3 IMTs.

On 7 February not all the IMTs managing level 3 incidents were staffed by people with level 3 training, and facilities in the incident control centres from which IMTs operated were in some cases deficient. The Commission recommended in its first interim report that pre-designated level 3 ICCs be properly staffed and equipped. In response, the State allocated \$28 million to upgrade level 3 ICCs and divisional command points, the upgrade being scheduled for completion by 30 June 2010.

Further, the Commission's examination of shortages of level 3 Incident Controllers revealed major differences between the DSE system of accreditation (formal assessment of a candidate against known criteria) and the CFA system of endorsement (nomination or approval of a person to perform a particular role). Since both agencies provide members to joint IMTs, it is highly desirable that there be a uniform standard and selection process, to ensure that each Incident Controller, regardless of agency, has similar experience and competence. The Commission considers that DSE's accreditation process is rigorous and thorough and is suitable for use by both DSE and the CFA. The CFA's process is more subjective and less transparent. The Commission proposes that a uniform, objective and transparent accreditation process for level 3 Incident Controllers and a system of performance review be adopted and that a traineeship scheme be used to progress people from level 2 to level 3 positions.

Those IMTs that were poorly prepared or did not have access to fully qualified staff also often had the greatest difficulty managing information flows, which are crucial to the issuing of public warnings and informing firefighters of changing conditions and potential danger. In the light of the evidence, it is plain to the Commission that effective training is essential. The training needs to provide information on the services available at the State Control Centre—such as specialists trained in weather forecasting, fire behaviour analysis and predictive mapping—and to stress the importance of preparing timely written incident action plans (based on a standard template) within four hours of reported ignition of a fire.

In addition, skilled officers need to be supported by robust, consistent and coordinated information and systems for tracking fire vehicles and mapping fires. When the State's approach to fighting ferocious fires is so highly dependent on cross-agency coordination it is unacceptable that effective coordination of information systems has not been achieved.

Finally, roadblocks play an important part in maintaining public safety during a bushfire and after a bushfire can protect health and safety or facilitate fire investigations. On and after Black Saturday more than 4,500 roadblocks were established to regulate traffic on roads leading into and around fire-affected areas. The evidence revealed a number of systemic problems with the way the roadblocks operated, among them inflexibility, poor communication and denying access to firefighters. Since Black Saturday new guidelines have been released that improve the operation of full and partial roadblocks, allow an Incident Controller to delegate responsibility for the establishment and operation of roadblocks with the support of Victoria Police, and formalise a system of wristbands to identify people who can pass through a roadblock. Guidance is also provided on how police should exercise discretion at a roadblock. The Commission welcomes the new emphasis Victoria Police gives to compassion and commonsense in the exercise of discretion.

FIREGROUND RESPONSE

Successful response to a fire relies on an effective blend of personnel, resources and processes. On 7 February many operational systems worked well, particularly considering the weather conditions. For example, the Commission heard few complaints about firefighting equipment, which has been a priority for CFA investment in recent years. Many crews were on standby ready for initial attack, and some successfully controlled fires that were potentially very damaging.

The best opportunity to bring a bushfire under control is at or near the point of ignition, when the fire is small. The role of first attack is to contain the fire swiftly and minimise the risk to life and property. This is particularly important on days of extreme fire danger, when initial attack might be the only opportunity for containing a fire. Aircraft are an integral part of initial attack and, together with ground crews, provide continuing support during an extended fire. Depending on where they are stationed and their dispatch protocols, aircraft can often get to a fire and start the initial attack before ground crews arrive.

Image 3 Fires near Kinglake



Source: Courtesy of *The Herald & Weekly Times*.

During January–February 2009 aircraft played an important role in the responses to fires. On 7 February, however, their use and effectiveness were limited by the weather, which in many cases made flying unsafe. There were other impediments, too. For instance, the process for dispatching an aircraft requires a request for the aircraft to pass through three layers of authority before it is cleared by the State Air Desk. The system is cumbersome and in some cases delayed the air response. Alternative methods for rapid dispatch are used elsewhere in Australia and overseas, but Victorian agencies appear reluctant to consider the option of a faster response system. The Commission proposes that state policy be changed so that all personnel required to fly aircraft and support air attack are on standby on code red days and that aircraft are automatically dispatched to high-risk fires in designated areas.

The Commonwealth owns and controls aircraft that could be used for firefighting. Before the 2009–10 fire season it held an operational briefing, outlining its resources and capabilities to the states and territories. The Commission considers, however, that cooperation between the State and the Commonwealth would be strengthened by an agreement that allows Commonwealth aerial resources to be automatically incorporated in the State's preparedness planning and, where available, used on days of high fire risk.

More broadly, effective access to and use of technology is important to effective detection and management of fires and tracking of resources on the ground. As noted, various problems became evident with information technology at incident control centres, including because the CFA and DSE used different systems and incident management team staff sometimes had difficulty gaining access to both systems. This inhibited the use and transfer of information such as warnings, maps and situation reports. The Commission notes that the CFA and DSE are investing in systems aimed at rectifying many of these shortcomings, including through the extensive upgrade of level 3 incident control centres.

Resource tracking is often a manual and time-consuming process. It is essential Incident Controllers know the location of vehicles, personnel, equipment and aircraft so that fire management can be planned and directed and critical information, such as red flag warnings, can reach those on the fireground when they need it. The Commission identified two areas of concern. First, the CFA and DSE use different systems and the CFA system, by the CFA's own admission, has not kept up with emerging technology. Second, on 7 February there were widespread problems with radios and phones and crews not filling in the required paperwork, which made it difficult to track firefighters and vehicles. The Commission makes specific suggestions for improving information and tracking systems and proposes that standardising these systems be a priority.

Communications systems on 7 February were also hindered by poor coverage, lack of interoperability between emergency services agencies, and insufficient investment in new technologies. For example, the transmission speed of the paging system had been reduced in order to expand reception coverage, and this caused serious delays in other than the most urgent messaging. There were also communication difficulties between metropolitan and regional police because of incompatible radio systems. Further, radio 'black spots' meant that reception was poor or non-existent in some areas, and there was channel congestion and insufficient channel availability. These problems were exacerbated when fire damaged or destroyed radio and telecommunications infrastructure.

The State has begun work to resolve these problems, notably through the new Emergency Services Communications Strategic Framework, which has six priorities: seamless statewide communication, call taking and dispatch, consistent statewide quality of service, improved data services, location-based services, and community communication. Until the statewide communications system envisaged by the new framework becomes a reality, the CFA should continue to improve its existing communications system, including by resolving coverage deficiencies. There should also be further research into smoke interference with communications systems and equipment, and this problem should be recognised in CFA and DSE training for communications planners.

Firefighter safety

The CFA's and DSE's management of firefighter safety deserves commendation. The number of fires that needed to be tackled simultaneously, and their intensity, created enormous challenges and risks for firefighters on Black Saturday. At times conditions were chaotic on the fireground, communications were difficult, and supervisors and crew leaders were required to manage in extreme conditions. The fact that there were no firefighter deaths during firefighting activities on 7 February speaks volumes for the emphasis the CFA and DSE had given to training and safety awareness.

Improving firefighter safety is a focus for the CFA and DSE, especially since the Linton inquiry into the death of five firefighters in 1998. In the days before 7 February there was a strong emphasis on firefighter safety, including giving crews safety briefings. A number of crews praised the equipment and safety measures available to them during the burnovers on Black Saturday.

Despite this, the Commission heard that there is further scope to improve firefighter safety. Although no-one died during firefighting activities, regrettably two firefighters did die in February 2009. One firefighter died on 7 February when he left his crew to help a relative, and an interstate firefighter died on 17 February after being struck by a falling tree. There were also numerous occasions on which firefighters were in extreme danger and some were injured.

Firefighters caught in burnovers often lacked the accurate and timely information they needed to avoid risk. Inadequate briefings, communication and communication equipment, maps and weather information were common concerns. The Commission also identified several deficiencies in safety investigations and proposes that the CFA and DSE amend their procedures for investigating safety incidents and 'near misses'. Fire agencies should also focus on ensuring that they have thorough processes for identifying and approving particularly dangerous activities such as back-burns. The Commission recommends that this be supported by training for all personnel, to ensure there is a clear understanding of the responsibility of the Incident Controller in approving such activities.

The Commission is also disappointed at the low priority given to the appointment of safety advisers, despite such advisers being mandatory for level 3 incidents under the CFA and DSE joint standard operating procedures. These personnel ensure that safety is a priority and advise, guide and support the incident management team in identifying and dealing with safety concerns. On 7 February there were about 200 trained DSE and CFA safety advisers but only two were appointed to incident management teams.

Given the failure to appoint safety advisers and the dangerous situations that caught a number of firefighters unaware on 7 February, the Commission reaffirms that an officer responsible for safety must be appointed to all level 3 incidents. In addition, safety advisers should be renamed safety officers—consistent with recommendations from the Linton inquiry and consistent with the title given to other key personnel in an incident management team.

REDUCING THE NUMBER OF FIRES

It is axiomatic that the most effective way of reducing bushfire damage and protecting human life is to prevent fires from starting. It is obviously impossible to eliminate bushfires, but it is possible to reduce the risk and incidence of fires started as a result of human activity. Nine of the 15 fires the Commission examined were started as a direct or indirect result of human activity; five were associated with the failure of electricity assets, and the causes of four were thought to be suspicious.

Broader data suggest that about one-third of bushfires in Victoria might be lit by people acting with mischievous or criminal intent. Although the proportion of fires that are caused by electricity infrastructure is low—possibly about 1.5 per cent of all ignitions in normal circumstances—on days of extreme fire danger the percentage of fires linked to electrical assets rises dramatically. Thus, electricity-caused fires are most likely to occur when the risk of a fire getting out of control and having deadly consequences is greatest.

Victoria's electricity assets are ageing, and the age of the assets contributed to three of the electricity-caused fires on 7 February 2009—the Kilmore East, Coleraine and Horsham fires. Distribution businesses' capacity to respond to an ageing network is, however, constrained by the electricity industry's economic regulatory regime. The regime favours the status quo and makes it difficult to bring about substantial reform. As components of the distribution network age and approach the end of their engineering life, there will probably be an increase in the number of fires resulting from asset failures unless urgent preventive steps are taken.

The Commission considers that now is the time to start replacing the ageing electricity infrastructure and to make major changes to its operation and management. The seriousness of the risk and the need to protect human life are imperatives Victorians cannot ignore. The number of fire starts involving electricity assets remains unacceptably high—at more than 200 a year. Although it is not possible to eliminate the risk posed by electricity assets, the State and the distribution businesses should take the opportunity to invest in improved infrastructure and substantially remove one of the primary causes of catastrophic fires in Victoria during the past 40 years.

In view of the size of Victoria's electricity distribution network, any replacement program will take years to complete even if it begins immediately. It is therefore necessary to consider interim measures for reducing the bushfire risk associated with the current network and the Commission suggests ways by which this could be done.

The Commission considers that Energy Safe Victoria needs to take a more proactive role as the electricity industry safety regulator. In the past it has taken a largely passive role, focusing on confirming distribution businesses' bushfire mitigation plans and line clearance plans. It has not assessed in detail whether safety objectives contained in the *Electricity Safety Act 1998* are actually being achieved. The Electricity Safety Management Scheme regime has undergone important changes recently. It is now compulsory for the distribution businesses to participate in the regime and specify how they will meet their obligations under the Electricity Safety Act. Energy Safe Victoria should now also have access to more of the data needed to assess the circumstances of fires caused by failed distribution infrastructure and 'near misses', so that it can identify trends and take these into account in the development of bushfire prevention strategies.

Overall, the Commission is strongly of the view that Energy Safe Victoria's regulatory powers and resources need to be strengthened, including the organisation's ability to apply sanctions for non-performance. It proposes that Energy Safe Victoria have a clear mandate to prevent and mitigate electricity-caused bushfires and powers to fulfil that mandate.

The other major bushfire cause linked to human activity relates to fires that people deliberately or accidentally light. Deliberate fire-setters constitute only a small proportion of the population, yet their actions can cause enormous damage to individuals, communities and the environment. The evidence before the Commission suggests that there is a good deal of preventive activity under way at the local, state and national levels. There remains, however, considerable scope to improve the evidence base on deliberate fire-setting and so improve policy and program development; the extent and causes of this behaviour are not well understood.

The Commission notes that traditionally Victoria Police's approach to arson has focused on criminal investigation and emergency management, rather than crime prevention. This appears to be changing. Victoria Police has acknowledged that it is necessary to better understand arsonists and their behaviour and motivations in order to improve prevention and control. It advised the Commission that since 7 February 2009 it has greatly increased the attention it pays to arson prevention. Specifically, it has introduced a statewide arson prevention and detection strategy and a statewide Operations Response Unit, which will, among other things, increase visible police patrols in high-risk locations during periods of extreme bushfire risk.

The Commission welcomes the focus on research and evaluation of current and proposed strategies. It urges Victoria Police to continue to pursue a coordinated statewide approach to arson prevention and to evaluate this approach after the first fire season in which it operates, to determine whether sufficient support is being given to local initiatives.

The Commission also welcomes the national focus on arson prevention by the Ministerial Council for Police and Emergency Management. It encourages the Commonwealth, state and territory governments to ensure that the National Work Plan to Reduce Bushfire Arson has a suitable focus on evaluating current and proposed programs to encourage the development and sharing of best-practice approaches and gives priority to producing a nationally agreed framework for data collection.

REDUCING THE DAMAGE CAUSED BY FIRE

Fire is an integral part of the Australian environment, and the states in the south-east are most prone to bushfires. The risks associated with bushfires are also potentially increasing as a result of population growth in the rural-urban interface and the probable effects of climate change. The result is that, although it might be possible to reduce the number of severe fires and to be better prepared for fire, bushfire will never be eliminated from the Australian landscape.

Recognising that it is not possible to stop all fires, the Commission considered ways of reducing the loss of life and damage caused when fire does occur by reducing exposure to fire, helping to make homes more defensible, reducing the intensity and spread of fire, and helping people recover from the impact of fire.

PLANNING AND BUILDING

In all, 2,133 houses were destroyed as a result of the January–February 2009 bushfires in Victoria. The Commission heard many accounts of people who tried to defend a well-prepared house and failed. Many of the 173 people who died as a result of the fires had been trying to defend their home, a number of which had been prepared in accordance with CFA advice. These results demonstrate that where people live, the standard of the buildings in which they live, how those standards are maintained and, therefore, planning and building controls are crucial factors affecting safety in a bushfire.

The protection of human life should always be the overriding objective. Although it is not possible to guarantee that any building will survive a bushfire, particularly a ferocious one, the Commission considers that there are some areas where the bushfire risk is so high that development should be restricted.

Image 4 Looking to Melbourne from the Kinglake Ranges



Source: David Garaghty, courtesy of *The Herald & Weekly Times*.

The approach the Commission proposes acknowledges the complexity of the planning system and seeks to strengthen consideration of bushfire throughout the planning process by giving greater recognition to bushfire risk without imposing unacceptable biodiversity costs. This is the most effective way of maintaining the capacity to assess each development on its merits, while ensuring that such assessment attaches sufficient weight to the risk and impacts of bushfire. The Commission therefore proposes that the Victoria Planning Provisions relating to bushfire and the CFA guidelines for assessing permit applications in areas of high bushfire risk be amended in order to give priority to protecting human life and to ensure that development does not occur in areas in which either the bushfire risk or the environmental cost of making people safe is too high. The effectiveness of these controls should be reviewed at a later stage to determine whether the objective of substantially limiting the construction of homes in areas of high bushfire risk has been achieved. If not, more prescriptive controls should be introduced.

In addition, the Commission makes detailed proposals about the planning regime in order to improve information and understanding of bushfire through better mapping of both bushfire risk and Victoria's biodiversity. It also recommends that bushfire risk be accounted for in the application of controls on clearing native vegetation and that the construction of houses be restricted on high-risk blocks that are too small to enable a defensible space to be created and maintained.

In relation to building standards, the Commission concludes that construction standards for bushfire-prone areas do not adequately cover all the important components of bushfire risk. It recommends improving standards and clarifying objectives to redress these deficiencies. The high risk to any home that is built in the Flame Zone and is therefore likely to be subject to direct contact with flames must also be recognised. Deemed-to-satisfy construction standards are not appropriate for such dwellings. Because of the risk, each building must be designed specifically to respond to the conditions on the site.

Further, building regulations do not adequately cover the construction of non-residential buildings used by vulnerable groups—for example, schools, hospitals, child care centres and aged care facilities—in bushfire-prone areas. The building regulations need to contain specific standards for the construction of such buildings.

Applying land-use planning and building controls to minimise or reduce bushfire risk presents challenges. In particular, the planning and building systems operate prospectively and have little capacity to deal with past decisions and existing settlements or buildings in bushfire-prone areas, so they cannot account for people who are already living in areas of extremely high risk. The Commission therefore proposes that action be taken to help people move away from those areas where other bushfire risk-mitigation measures are not viable. In particular, the State should develop and implement a voluntary retreat and resettlement strategy—including non-compulsory land acquisition—for existing developments in areas at unacceptably high bushfire risk.

Even when bushfire safety is embedded in planning and building decisions it can be difficult to ensure that the standards that applied at the time of subdivision or construction are maintained. There is a need for mechanisms designed to ensure that bushfire safety continues to be a priority for building owners. The Commission puts forward a range of proposals aimed at facilitating continued maintenance of standards—including amending the *Sale of Land Act 1962* to require that vendor statements include information that will help potential buyers understand the bushfire risk of a property before they finalise the purchase.

LAND AND FUEL MANAGEMENT

Prescribed burning is one of the main tools for fire management on public land. It cannot prevent bushfire, but it decreases fuel loads and so reduces the spread and intensity of bushfires. By reducing the spread and intensity of bushfires, it also helps protect flora and fauna. Ironically, maintaining pristine forests untouched by fuel reduction can predispose those forests to greater destruction in the event of a bushfire.

About 7.7 million hectares of public land in Victoria is managed by DSE. This area includes national parks, state forests and reserves, of which a large portion is forested and prone to bushfire. DSE burns only 1.7 per cent (or 130,000 hectares) of this public land each year. This is well below the amount experts and previous inquiries have suggested is needed to reduce bushfire and environmental risks in the long term.

The Commission recognises that prescribed burning is risky, resource intensive, available only in limited time frames, and can temporarily have adverse effects on local communities (for example, reduced air quality). Nonetheless, it considers that the amount of prescribed burning occurring in Victoria is inadequate. It is concerned that the State has maintained a minimalist approach to prescribed burning despite recent official or independent reports and inquiries, all of which have recommended increasing the prescribed-burning program. The State has allowed the forests to continue accumulating excessive fuel loads, adding to the likelihood of more intense bushfires and thereby placing firefighters and communities at greater risk.

The Commission proposes that the State make a commitment to fund a long-term program of prescribed burning, with an annual rolling target of a minimum of 5 per cent of public land each year, and that the State be held accountable for meeting this target. DSE should modify its Code of Practice for Fire Management on Public Land so that it is clear that protecting human life is given highest priority, and should report annually on prescribed-burning outcomes.

To ensure continuing environmental protection, the State needs to improve its understanding of the effects of different fire regimes on flora and fauna. The Commission proposes that DSE expand its data collection on the effects of prescribed burning and bushfire on biodiversity. Maintenance and extension of data collection on Victoria's flora and fauna assets has not been a high priority. It needs to be improved so that more informed and scientifically-based decision making can accompany the development of prescribed-burning regimes that meet conservation objectives as well as accommodating bushfire safety considerations.

Managing clearing along roadsides is a particular challenge for municipal councils. The councils are responsible for bushfire prevention and mitigation and biodiversity management along local and some arterial roads; VicRoads has similar responsibilities for rural freeways and arterial roads. In some cases these roadsides contain the only remnant native vegetation in an area and offer important wildlife corridors and shelter. Consequently, differing objectives for road safety, biodiversity protection and bushfire prevention can be difficult to reconcile.

In the case of bushfires, roads and roadsides can be important fuel breaks, so road managers need to reduce the fuel levels in preparation for the fire season. Roads are also essential for people seeking to escape fires and for emergency services seeking access to fires. Since the 2009 fires land and road managers and the CFA have identified high-risk roads and are carrying out fuel-reduction work to reduce the future risks of bushfire.

The Commission is aware of the unresolved tensions between mitigation of bushfire risk and environmental conservation in the approach to roadside clearing and the legislative complexities to do with road safety, biodiversity and bushfire risk mitigation that affect roadside management. These concerns would be reduced if the State's planning provisions were amended to facilitate a broad range of roadside works to reduce bushfire risk, if municipal councils received better guidance to help them resolve competing environmental and bushfire management objectives, and if VicRoads implemented a systematic statewide assessment of bushfire risk for all roads.

RELIEF AND RECOVERY

The destruction wrought by the bushfires of January–February 2009 resulted in one of the largest recovery efforts seen in Australia. The Commission's observations on the early relief and recovery efforts are based on accounts of people's individual experiences and information it examined. Recovery for people, communities, local economies and the environment is difficult and requires a long-term approach. This process is being facilitated by the Victorian Bushfire Reconstruction and Recovery Authority, established on 10 February 2009.

In view of the scale of the disaster, the Commission considers that overall the initial relief and recovery efforts were well managed. Municipal council relief centres were generally activated quickly. They provided assembly points and places of refuge for people displaced by the fires and helped to lay a foundation for the progressive build-up of relief and recovery services. The Commission heard many expressions of gratitude from people affected by the bushfires for the care and attention they received at relief centres. The State and Commonwealth Governments' relief initiatives were generally prompt and well coordinated. The Minister for Police and Emergency Services coordinated recovery efforts at the State Cabinet level, as would be expected.

People from local communities, and then the wider community, responded generously to the obvious need for support to be provided to people rendered homeless and dislocated by the fires. Food, clothing and bedding flooded in to relief centres, and a great debt of gratitude is owed for this generosity.

But the chaos caused by a disaster of this scale inevitably meant that unanticipated situations arose and some plans failed. The Commission recognises that relief and recovery processes are complex and are made more so when the emergency is rapidly escalating and occurring at multiple locations. Continuing fires, inaccessible roads and loss of power and telecommunications hindered relief efforts and interfered with communication and mobility. This stress on the system brought into focus some community concerns about initial relief and recovery processes:

- The registration process in relief centres was frustrating to many as recovery agencies separately collected personal information from bushfire-affected people, adding to their trauma and slowing the agencies' ability to respond. It took some time for coordinated collection of information to become effective.
- Medical services were not always available locally, and initially there appeared to be poor coordination of some first aid services.
- Post-fire welfare checks were not well coordinated, especially for small, isolated communities and individuals who remained on their properties.
- Roadblocks were a source of frustration and difficulty for local residents, Victoria Police, the Department of Primary Industries, CFA volunteers and others coordinating relief efforts.

Image 5 Marysville gathers to remember Black Saturday



Source: Courtesy of *The Age*.

- Non-insurance and under-insurance have impeded the rebuilding process.
- Fencing bordering public land remains a problem because of the requirement that private landowners bear the full cost of restoring damaged fencing between their property and public land.
- The coordination of animal relief after the fires was fragmented.

The State has since initiated changes to improve many of these processes.

The Commission considers it too early to comment in detail on the medium- to long-term recovery and reconstruction effort, but it encourages the review and evaluation of initiatives to support learning from experience.

BUILDING ON CURRENT KNOWLEDGE

Although there is much to learn from the experiences of Black Saturday, the Commission urges all involved in developing and implementing bushfire policy to look to the long term. Governments need to create an environment in which individuals, communities and fire agencies build on current knowledge in the light of future information and experience. To make people living in bushfire-prone areas safer, Victoria needs flexible policy that takes advantage of new technology and changes management practices to capitalise on potential improvements. Adaptive thinking and processes are best supported by good organisational structures, rigorous research, and continuous policy evaluation and improvement.

ORGANISATIONAL STRUCTURE

In the Commission's view, a disaster of the scale of 7 February will always put pressure on organisational processes and structures. In this case it highlighted serious deficiencies in top-level leadership as a result of divided responsibilities, and the operational response was hindered by differences between agencies' systems, processes and procedures. Individually, the problems identified might be resolved by changing working arrangements between the CFA and DSE, and work is already under way towards this. But, when considered collectively, the problems illustrate systemic failings that led the Commission to contemplate organisational change. The Commission does not consider that the shortcomings identified in connection with Black Saturday can be overcome simply by doing more of the same, even if it is done better.

Many of the concerns identified related to operational matters such as control, interoperability and interagency standards, leading the Commission to conclude that a focus on improving operational capability is required. In considering the role of organisational change in responding to these concerns the Commission sought a wide range of views from within Victoria, from interstate and overseas, and from the policy, operational and academic perspectives. A diversity of views was presented. There was no consensus about the best approach to organisational arrangements for Victoria's fire services agencies. Nor was a compelling model put forward.

In weighing the various opinions, the Commission was not convinced by the State's view that structural change is not needed and that the focus should be on refinement of existing arrangements. For many of the operational problems the Commission identified, previous attempts to improve coordination have failed. Typically, progress has been slow or incomplete or has not achieved the level of interoperability required. Neither is the Commission persuaded that radical reform, such as moving to a single fire service, is necessary or desirable at this time. There might be an intuitive attraction to merging agencies, but there is a risk that the merger itself becomes the primary focus of effort, which could easily distract attention and focus from the operational improvements the Commission considers to be the priority.

Further, if it were not done carefully, subsuming all elements into one agency could undermine the strengths of each agency. For instance, DSE's specialist expertise in forest firefighting—which is crucial given the fire risk that characterises Victoria's forests—must be maintained and strengthened. Additionally, there were no compelling criticisms of the governance structures of the fire agencies, and the Commission therefore proposes that the existing governance arrangements remain unchanged.

The absolute priority is to improve operational performance. In support of this, the Commission recommends modest and targeted organisational reform as a catalyst for change. This would involve improvements to common operational policy and standards, stronger coordination and unambiguous command and control, greater interoperability, and a strengthened capacity to provide an integrated response.

In keeping with these priorities, the Commission sees the immediate appointment of a full-time Fire Commissioner as a necessary first step. The Fire Commissioner would be an independent statutory appointment and the senior professional fire officer in Victoria. The position would not entail governance or management responsibility for the three fire agencies (the CFA, DSE and the Metropolitan Fire and Emergency Services Board). The Chief Officers of the agencies would, however, be directed by the Fire Commissioner on operational matters in preparation for and on extreme and code red days and for level 3 fires. The Fire Commissioner would be responsible for the following:

- developing and building operational capacity to prepare for the highest risk days
- the control of level 3 fires—standing delegations for level 3 fires would rest with the Chief Officers of the CFA, DSE and the MFB, who would also retain operational control over level 1 and 2 fires
- leading a program of reform to expand operational capability, interoperability and the resilience of Victoria's fire services. This would be set out in a three-year action plan endorsed by the Minister and would involve working closely with the Chief Officers, who would lead operational change in their respective organisations
- advising the Government on the metropolitan fire district boundary
- representing Victoria on operational matters in national committees.

The Commission also looked at the funding of fire services. Fire services in Victoria are currently funded through a mix of contributions from insurance companies, the State and municipal councils. Insurance companies recoup the cost of their statutory contribution to the CFA and the MFB by imposing a Fire Services Levy on insurance premiums for building and contents insurance.

The current model's claimed benefit is that the insurance premium is a good way of linking the charge for fire services to the fire risk of individual properties. Evidence suggests, however, that this link is at best tenuous. Fundamentally, the Commission considers that the current funding model lacks transparency and is inequitable since people who are not insured or are under-insured do not make a fair contribution to the funding of fire services.

The Commission takes the view that the lack of equity and transparency in the current arrangements constitutes a good reason for moving to another system. Several other Australian states and territories already require all property owners to contribute to fire services via a levy on property, as opposed to insurance, and the Commission proposes that Victoria also move to replace the Fire Services Levy with a property-based levy.

RESEARCH AND EVALUATION

Governments need to invest more in bushfire research to enable Australia to rebuild the capacity it once had as a leader in this field. The Bushfire Cooperative Research Centre (initiated by Australian and New Zealand fire and land management agencies, their research partners and the Commonwealth Government) contributes to this effort. Overall, the Bushfire CRC has made gains in re-establishing a community of researchers and has consolidated the research agenda, but it does not meet all research needs. To a large extent its research program is determined by its stakeholders (which has resulted in a focus on applied research) and its funding cycle and thus its research projects have been relatively short term. Commonwealth Government funding for the Bushfire CRC is due to expire in 2013.

A permanent national centre for bushfire research is needed with reasonable surety of long-term funding. In developing the model for such a body, governments should consider incorporating the following features:

- pure and applied research as well as long-term research projects
- strong governance arrangements—including research independence
- the location of the research centre, preferably in Victoria
- a balanced focus that includes physical, biological and social research
- links with teaching and promotion of graduate scholarships
- cross-institutional and jurisdictional collaboration
- international collaboration and sharing of knowledge
- the research priorities highlighted in evidence before the Commission.

The Commission's work revealed a number of research gaps and priorities. Some were raised by expert witnesses; others became apparent when the Commission was conducting its analysis. These gaps are a good starting point for considering short- and long-term priorities for bushfire research in Australia. They include the following areas:

- the effects of prescribed burning and bushfire on biodiversity and on reducing bushfire risk
- the establishment of databases to map Victoria's flora and fauna, to register Victoria's fire risk and to identify its bushfire-prone areas
- the extent of deliberately lit bushfires and the causes of fire-setting behaviour
- the long-term effect of trauma resulting from the experience of bushfire
- the effects of fire activity and smoke on radio communications
- the extent of road deaths in bushfires, including use of cars as shelters in bushfires
- house defendability in extreme conditions
- the circumstances of the thousands who survived the Black Saturday bushfires by leaving early or late or by defending their homes or sheltering
- the shelter options—including factors affecting the safety of different places of shelter and particularly motor vehicles in the open, dams, pools, creeks and water tanks.

In addition to this, the Commission invites the Commonwealth to take the initiative on two matters outside the proposed research framework. The first is to consider the development of nationally acceptable bushfire terminology. It became apparent during the Commission's hearings that a number of bushfire-related terms are cumbersome, have obscure meanings or are potentially confusing to the general public. The second matter arises from there being no agreed methodology for estimating the cost of bushfires. The Commission experienced difficulty performing its analysis because of the lack of data and the absence of an agreed methodology for estimating various costs. This is a deficiency in the nationally available bushfire information and an area in which further collaborative work is warranted.

Finally, if fire agencies are to lift their capability and performance and improve the response capacity of individuals and communities, they need to become true evidence-based learning organisations. The Commission proposes that the fire agencies adopt and fund a culture of reflective practice that routinely pursues current research, searches for best practice, and habitually evaluates policies, programs and procedures with a view to improving internal practice and that of the communities they serve. Policy—especially in an area such as bushfire safety—needs to be reviewed and evaluated periodically, with the results of such review and evaluation being used in the development of policy and program improvements.

IMPLEMENTATION

In response to the unprecedented events of Black Saturday, the State, the Commonwealth and local governments made changes to their policies and practices. The governments and agencies initiated some of these changes of their own volition; other changes were implemented in response to the recommendations in the Commission's interim reports.

Since the Commission's interim reports were issued the State has invested a considerable amount in infrastructure, technological improvements and wide-ranging amendments to policies and procedures. For example, it endorsed a 10-year Emergency Services Communications Strategy Framework to improve emergency services communications and developed the One Source One Message tool to enable all Incident Controllers to send bushfire warnings simultaneously to a range of outlets, including the CFA and DSE websites, Victorian Bushfire Information Line operators and media broadcasters. Although the State has shown a strong commitment to implementing the Commission's recommendations, the Implementation Monitor nevertheless noted some concern about the recommendations relating to the fire danger rating, 'neighbourhood safer places', and the preparedness of some incident control centres. The Implementation Monitor also noted slow progress in the local government sector.

The Commonwealth has also made progress implementing initiatives and the Commission's interim recommendations. Among the important developments are provision of funding to the states and territories for the procurement of the national telephone-based warning system, incorporating fire danger indexes in district and township forecasts issued by the Bureau of Meteorology, and moving speedily to initiate the development of standards for bunkers in bushfire-prone areas.

As this final report makes further recommendations, the implementation effort will be ongoing. The Commission notes that the recommendations of previous inquiries have not always been implemented. For example, recommendations recognising the importance of prescribed burning in managing bushfire risk have not led to suitable prescribed-burning targets for Victoria. The Commission therefore considers that there is a need for a process whereby governments and the community have access to transparent, independently verified information on the response to the Commission's recommendations.

The State should nominate an independent implementation monitor or the Victorian Auditor-General to provide to the people of Victoria a report within two years on implementation of the Commission's recommendations. The report should detail the progress made towards implementing each recommendation in the final report and the interim reports. Recommendations from the interim reports that have not been fully implemented (such as those concerning refuges) should be given specific focus. Other recommendations that should receive particular attention are those that governments have previously shown reluctance to implement (such as increased fuel-reduction targets) and major recommendations that will require substantial implementation effort (such as replacing ageing electricity distribution infrastructure).

Where appropriate, the annual reports of government and fire agencies should detail the outcomes and effectiveness of the response to the recommendations. If there is no discernible change, more extensive reform might be needed.

Implementation of the Commission's recommendations calls for effort on the part of all levels of government. This might prove particularly challenging for municipal councils. The Commission envisages that councils would take a much greater role in local planning and preparation for bushfire and in implementing existing planning and building laws within a framework that takes better account of bushfire risk, while continuing with their existing role in bushfire relief and recovery.

The Commission makes some suggestions that would also help to clarify processes for municipal councils in areas such as clearing roadside vegetation, but it is also sensitive to the imbalance in the financial capacity of various municipal councils and the difficulty they have obtaining technical expertise in relation to bushfire. In a perverse way, those councils that have the most pressing need to apply substantial resources and effort to make their communities more bushfire safe are in many cases those that are the least well resourced. The State should examine whether local government requires greater support, including funding, to ensure that individual councils have the capacity to implement the agreed changes.

THE COMMISSION'S REPORTS

The Commission produced two interim reports and a final report. The interim reports form part of the work and deliberations of the Commission and, along with the final report, should be regarded as one body of work.

This final report is the culmination of the Commission's work. It describes and analyses the bushfires of January–February 2009 and makes recommendations about changes needed to reduce the risk, and the consequences, of similar disasters in the future. It also describes how the Commission went about its task. The final report consists of four volumes:

- Volume I—The Fires and the Fire-related Deaths
- Volume II—Fire Preparation, Response and Recovery (Parts One and Two)
- Volume III—Establishment and Operation of the Commission
- Volume IV—The Statements of Lay Witnesses.

The conclusions from Volumes I and II are outlined in this summary.

Volume III describes the work of the Commission, the conduct of its inquiry, and its administration for the Victorian historical and public record. It will be useful for others who in future are faced with the task of establishing and running a royal commission.

In reflecting on lessons learnt from this Royal Commission, the Commission notes that, unlike other state jurisdictions or the Commonwealth, Victoria does not have specific legislation that deals with the role, conduct and powers of a commission of inquiry. This lack of a legislative basis caused uncertainty, which the Commission considers undesirable. Arising from this, the Commission proposes that the State consider legislation for the conduct of inquiries—in particular, the conduct of royal commissions.

Volume IV is an electronic volume that collates the statements of the 100 lay witnesses who shared their experience of the fires during the Commission's hearings. The lay witnesses were an important part of the Commission's work, giving an 'on the ground' perspective to the experiences and real-life examples of how fire policies and emergency procedures affect individuals and communities. This offers an important way of preserving personal memories of the fires. It provides insights into people's preparation for bushfire and how they reacted to the conditions of Black Saturday and serves as a powerful reminder of the impacts of the fires on individuals, families and communities.

Volume IV appears in electronic form only because, as well as containing written statements, it contains photographs, video footage, other documentary material provided as part of the evidence, maps, and satellite photographs taken before and after the fires to help illustrate the impact the fires had on different parts of the state. The quantity and nature of the material mean a printed version is impractical.

The State is responsible for making copies of the Commission's report available to the public and will be doing so through Information Victoria. The report is available in hard copy and electronically. The electronic version is available on DVD and via the internet; it contains hyperlinks that enable the reader to also read the evidence referred to in the report. For the next 12 months the electronic version of the report and other information about the Commission will be retained on the Commission's website, www.royalcommission.vic.gov.au. After that it will be available through the website of the Victorian Department of Premier and Cabinet.

RECOMMENDATIONS

In preparing its recommendations the Commission chose not to constrain the State with undue prescription: it wanted to obviate the risk of narrowing policy makers' vision. To complement the recommendations, the Commission expresses views and draws conclusions in the text of the report, proposing the type of action the State (and others) should take to deal with matters that warrant further attention. The Commission trusts that those responding to the report will attach substantially the same weight to these proposals as they accord the primary recommendations.

When the term 'State' is used in the recommendations it is not intended to be read narrowly. It applies not just to the elected government and the organisations that form part of the Victorian public service. Depending on the circumstances, it can also encompass public entities that make up the broader public sector, such as the Country Fire Authority, and the 'special bodies' defined in the *Public Administration Act 2004*, such as Victoria Police.

VICTORIA'S BUSHFIRE SAFETY POLICY

RECOMMENDATION 1

The State revise its bushfire safety policy. While adopting the national Prepare. Act. Survive. framework in Victoria, the policy should do the following:

- enhance the role of warnings—including providing for timely and informative advice about the predicted passage of a fire and the actions to be taken by people in areas potentially in its path
- emphasise that all fires are different in ways that require an awareness of fire conditions, local circumstances and personal capacity
- recognise that the heightened risk on the worst days demands a different response
- retain those elements of the existing bushfire policy that have proved effective
- strengthen the range of options available in the face of fire, including community refuges, bushfire shelters and evacuation
- ensure that local solutions are tailored and known to communities through local bushfire planning
- improve advice on the nature of fire and house defendability, taking account of broader landscape risks.

RECOMMENDATION 2

The State revise the approach to community bushfire safety education in order to:

- ensure that its publications and educational materials reflect the revised bushfire safety policy
- equip all fire agency personnel with the information needed to effectively communicate the policy to the public as required
- ensure that in content and delivery the program is flexible enough to engage individuals, households and communities and to accommodate their needs and circumstances
- regularly evaluate the effectiveness of community education programs and amend them as necessary.

RECOMMENDATION 3

The State establish mechanisms for helping municipal councils to undertake local planning that tailors bushfire safety options to the needs of individual communities. In doing this planning, councils should:

- urgently develop for communities at risk of bushfire local plans that contain contingency options such as evacuation and shelter
- document in municipal emergency management plans and other relevant plans facilities where vulnerable people are likely to be situated—for example, aged care facilities, hospitals, schools and child care centres
- compile and maintain a list of vulnerable residents who need tailored advice of a recommendation to evacuate and provide this list to local police and anyone else with pre-arranged responsibility for helping vulnerable residents evacuate.

RECOMMENDATION 4

The State introduce a comprehensive approach to shelter options that includes the following:

- developing standards for community refuges as a matter of priority and replacing the 2005 Fire Refuges in Victoria: Policy and Practice
- designating community refuges—particularly in areas of very high risk—where other bushfire safety options are limited
- working with municipal councils to ensure that appropriate criteria are used for bushfire shelters, so that people are not discouraged from using a bushfire shelter if there is no better option available
- acknowledging personal shelters around their homes as a fallback option for individuals.

RECOMMENDATION 5

The State introduce a comprehensive approach to evacuation, so that this option is planned, considered and implemented when it is likely to offer a higher level of protection than other contingency options. The approach should:

- encourage individuals—especially vulnerable people—to relocate early
- include consideration of plans for assisted evacuation of vulnerable people
- recommend ‘emergency evacuation’.

RECOMMENDATION 6

Victoria lead an initiative of the Ministerial Council for Education, Early Childhood Development and Youth Affairs to ensure that the national curriculum incorporates the history of bushfire in Australia and that existing curriculum areas such as geography, science and environmental studies include elements of bushfire education.

RECOMMENDATION 7

The Commonwealth lead an initiative through the Ministerial Council for Police and Emergency Management, facilitated by Emergency Management Australia, to develop a national bushfire awareness campaign.

EMERGENCY AND INCIDENT MANAGEMENT**RECOMMENDATION 8**

The Country Fire Authority and the Department of Sustainability and Environment amend their procedures to require the following:

- that at locations that attract preparedness levels A or B there be a full incident management team under the leadership of an accredited level 3 Incident Controller in position by 10.00 am on days of code red fire danger and a core incident management team (eight personnel) under the leadership of an accredited level 3 Incident Controller in position by 10.00 am on days of extreme fire danger
- that a full level 3 IMT be led by a level 3 Incident Controller unless the State Controller determines otherwise.

RECOMMENDATION 9

The Country Fire Authority and the Department of Sustainability and Environment prescribe and audit the minimum number and nature of level 3 joint training exercises in which incident management team staff (including volunteers) are required to participate.

RECOMMENDATION 10

The State clarify whether, during major fires, Victoria Police should discharge its coordination functions from the State Emergency Response Coordination Centre or from the State Control Centre.

RECOMMENDATION 11

The State consider amending the *Emergency Management Act 1986* and the *Emergency Management Manual Victoria* in order to achieve the following:

- remove the title of Coordinator in Chief of Emergency Management from the Minister for Police and Emergency Services
- clarify the function and powers of the Minister
- designate the Chief Commissioner of Police as Coordinator in Chief of Emergency Management, who would have primary responsibility for keeping the Minister informed during an emergency.

RECOMMENDATION 12

The State consider either amending the *Emergency Management Act 1986* or adopting a standing practice to require the Minister for Police and Emergency Services or the Chief Commissioner of Police to consult the Premier about the possibility of declaring a state of disaster for all of or any part of Victoria whenever the Minister or the Chief Commissioner of Police becomes aware of circumstances that make it a reasonable possibility that the criteria for making such a declaration will be satisfied.

RECOMMENDATION 13

The State consider amending the *Emergency Management Act 1986* to introduce a graded scale of emergency declarations short of a state of disaster.

RECOMMENDATION 14

The Victorian fire agencies amend the AIMS framework before the 2010–11 fire season in order to do the following:

- designate the Information Unit as a separate section reporting directly to the Incident Controller and require that the Information Unit contain a dedicated Public Information Officer whenever a full incident management team is required
- specify a set of functions in relation to which the Deputy Incident Controller for a level 3 incident will have oversight, which may be adjustable for a particular incident by agreement between the Incident Controller and the Deputy Incident Controller
- ensure that an individual with local knowledge is incorporated in an incident management team.

RECOMMENDATION 15

The Country Fire Authority and the Department of Sustainability and Environment:

- amend their procedures to require that an incident action plan summary be completed within the first four hours of an incident being reported and be provided to the State Control Centre and, where established, to the relevant Area of Operations Control Centre
- adopt DSE's incident action plan summary as the template to be used by all incident management teams and ensure that the template is included in the online IMT Tool Box
- provide regular training to IMT staff, highlighting the importance of information and reinforcing the support available from specialists within the State Control Centre.

RECOMMENDATION 16

The Country Fire Authority and the Department of Sustainability and Environment improve mapping support in the following ways:

- DSE providing mapping data free of charge to emergency response agencies
- greatly increasing the CFA's 'write' access to FireMap for incident management team staff
- establishing a joint DSE–CFA training program to ensure that mapping officers in level 2 and 3 incident management teams are fully trained in using FireMap, including in producing fire prediction maps
- requiring before the 2010–11 fire season that FireMap be used for joint incidents.

RECOMMENDATION 17

The Country Fire Authority and the Department of Sustainability and Environment establish before the 2010–11 fire season:

- a uniform, objective and transparent process based on the current DSE approach for the accreditation of level 3 Incident Controllers
- a performance review system for level 3 Incident Controllers
- a traineeship program for progression from level 2 to level 3 incident management team positions.

RECOMMENDATION 18

The Country Fire Authority and the Department of Sustainability and Environment amend their procedures to require that a suitably experienced, qualified and competent person be appointed as Incident Controller, regardless of the control agency for the fire.

RECOMMENDATION 19

The Country Fire Authority provide to all CFA volunteers an identification card or similar to facilitate their passage through roadblocks established in accordance with the 2009 Guidelines for the Operation of Traffic Management Points during Wildfires.

FIREGROUND RESPONSE

RECOMMENDATION 20

The Country Fire Authority and the Department of Sustainability and Environment amend their policies on aerial preparedness and standby arrangements, their dispatch protocols and the management of aircraft in order to do the following:

- require that at locations that attract the risk assessment or preparedness level A on code red days all personnel needed for air operations must be on standby by 10.00 am
- establish a system that enables the dispatch of aircraft to fires in high-risk areas without requiring a request from an Incident Controller or the State Duty Officer.

RECOMMENDATION 21

The State, in conjunction with Emergency Management Australia and the Department of Defence, develop an agreement that allows Commonwealth aerial resources that are suitable for firefighting and support activities to be incorporated in preparedness plans and used on days of high fire risk.

RECOMMENDATION 22

The Country Fire Authority and the Department of Sustainability and Environment standardise their operating systems and information and communications technologies with the aim of achieving greater efficiency and interoperability between agencies.

RECOMMENDATION 23

The Country Fire Authority review and improve its communications strategy as a matter of priority and develop a program for identifying and responding to black spots in radio coverage.

RECOMMENDATION 24

The Country Fire Authority and the Department of Sustainability and Environment amend their procedures for investigating safety incidents and 'near-misses' to ensure that all dangerous incidents, including back-burns, are fully investigated and that all relevant people are consulted and informed of the results.

RECOMMENDATION 25

The Country Fire Authority and the Department of Sustainability and Environment require without exception that all relevant staff be trained in the need for Incident Controller approval to be obtained before a back-burn is lit.

RECOMMENDATION 26

The Country Fire Authority and the Department of Sustainability and Environment adopt the title 'safety officer' (as opposed to 'safety adviser') and require without exception that a safety officer be appointed to every level 3 incident management team.

ELECTRICITY-CAUSED FIRE**RECOMMENDATION 27**

The State amend the Regulations under Victoria's *Electricity Safety Act 1998* and otherwise take such steps as may be required to give effect to the following:

- the progressive replacement of all SWER (single-wire earth return) power lines in Victoria with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk. The replacement program should be completed in the areas of highest bushfire risk within 10 years and should continue in areas of lower bushfire risk as the lines reach the end of their engineering lives
- the progressive replacement of all 22-kilovolt distribution feeders with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk as the feeders reach the end of their engineering lives. Priority should be given to distribution feeders in the areas of highest bushfire risk.

RECOMMENDATION 28

The State (through Energy Safe Victoria) require distribution businesses to change their asset inspection standards and procedures to require that all SWER lines and all 22-kilovolt feeders in areas of high bushfire risk are inspected at least every three years.

RECOMMENDATION 29

The State (through Energy Safe Victoria) require distribution businesses to review and modify their current practices, standards and procedures for the training and auditing of asset inspectors to ensure that registered training organisations provide adequate theoretical and practical training for asset inspectors.

RECOMMENDATION 30

The State amend the regulatory framework for electricity safety to require that distribution businesses adopt, as part of their management plans, measures to reduce the risks posed by hazard trees—that is, trees that are outside the clearance zone but that could come into contact with an electric power line having regard to foreseeable local conditions.

RECOMMENDATION 31

Municipal councils include in their municipal fire prevention plans for areas of high bushfire risk provision for the identification of hazard trees and for notifying the responsible entities with a view to having the situation redressed.

RECOMMENDATION 32

The State (through Energy Safe Victoria) require distribution businesses to do the following:

- disable the reclose function on the automatic circuit reclosers on all SWER lines for the six weeks of greatest risk in every fire season
- adjust the reclose function on the automatic circuit reclosers on all 22-kilovolt feeders on all total fire ban days to permit only one reclose attempt before lockout.

RECOMMENDATION 33

The State (through Energy Safe Victoria) require distribution businesses to do the following:

- fit spreaders to any lines with a history of clashing or the potential to do so
- fit or retrofit all spans that are more than 300 metres long with vibration dampers as soon as is reasonably practicable.

RECOMMENDATION 34

The State amend the regulatory framework for electricity safety to strengthen Energy Safe Victoria's mandate in relation to the prevention and mitigation of electricity-caused bushfires and to require it to fulfil that mandate.

DELIBERATELY LIT FIRES

RECOMMENDATION 35

Victoria Police continue to pursue a coordinated statewide approach to arson prevention and regularly review its approach to ensure that it contains the following elements:

- high-level commitment from senior police
- a research program aimed at refining arson prevention and detection strategies
- centralised coordination that includes comprehensive training, periodic evaluation of arson prevention strategies and programs, and promotion of best-practice prevention approaches
- a requirement that all fire-prone police service areas have arson prevention plans and programs, according to their level of risk.

RECOMMENDATION 36

The Commonwealth, states and territories continue to pursue the National Action Plan to Reduce Bushfire Arson in Australia, giving priority to producing a nationally consistent framework for data collection and evaluating current and proposed programs in order to identify and share best-practice approaches.

PLANNING AND BUILDING**RECOMMENDATION 37**

The State identify a central point of responsibility for and expertise in mapping bushfire risk to:

- review urgently the mapping criteria at present used by the Country Fire Authority to map the Wildfire Management Overlay, to ensure that the mapping used to determine building and planning controls is based on the best available science and takes account of all relevant aspects of bushfire risk
- map and designate Bushfire-prone Areas for the purposes of planning and building controls, in consultation with municipal councils and fire agencies
- finalise the alignment of site-assessment methods for planning and building purposes, taking into account bushfire risk to human safety as well as to property.

RECOMMENDATION 38

The State implement a regional settlement policy that:

- takes account of the management of bushfire risk, including that associated with small, undeveloped rural lots
- includes a process for responding to bushfire risk at the planning stage for new urban developments in regional cities, the process being similar to that used for new developments in Melbourne's Urban Growth Zone.

RECOMMENDATION 39

The State amend the Victoria Planning Provisions relating to bushfire to ensure that the provisions give priority to the protection of human life, adopt a clear objective of substantially restricting development in the areas of highest bushfire risk—giving due consideration to biodiversity conservation—and provide clear guidance for decision makers. The amendments should take account of the conclusions reached by the Commission and do the following:

- outline the State's objectives for managing bushfire risk through land-use planning in an amended state planning policy for bushfire, as set out in clause 15.07 of the Victoria Planning Provisions
- allow municipal councils to include a minimum lot size for use of land for a dwelling, both with and without a permit, in a schedule to each of the Rural Living Zone, Green Wedge Zone, Green Wedge A Zone, Rural Conservation Zone, Farming Zone and Rural Activity Zone
- amend clause 44.06 of the Victoria Planning Provisions to provide a comprehensive Bushfire-prone Overlay provision.

RECOMMENDATION 40

The Country Fire Authority amend its guidelines for assessing permit applications for dwellings, non-dwellings and subdivisions in the Bushfire-prone Overlay in order to accommodate the amendments to the Wildfire Management Overlay that are implemented as a result of recommendation 39 and make the guidelines available to municipal councils and the public. The revised guidelines should do the following:

- substantially restrict new developments and subdivisions in those areas of highest risk in the Bushfire-prone Overlay
- set out the CFA's guidelines for assessing permit applications for dwellings, non-dwellings and subdivisions—including the minimum defendable space requirements for different risk levels
- clarify that the CFA will approve new developments and subdivisions only if the recommended bushfire protection measures—including the minimum defendable space—can be created and maintained on a continuing basis
- emphasise the need for enduring permit conditions—in particular, conditions for the creation and maintenance of minimum defendable space to be maintained for the life of the development.

RECOMMENDATION 41

The State:

- amend the Victoria Planning Provisions to require that, when assessing a permit to remove native vegetation around an existing dwelling, the responsible authority and the Department of Sustainability and Environment, as referral authority, take into account fire hazard and give weight to fire protection purposes
- develop guidelines for determining the maximum level of native vegetation removal for bushfire risk mitigation, beyond which level the application would be rejected.

RECOMMENDATION 42

The Department of Sustainability and Environment develop and administer a collective offset solution for individual landholders who are permitted to remove native vegetation for the purpose of fire protection.

RECOMMENDATION 43

The Department of Sustainability and Environment conduct biodiversity mapping identifying flora, fauna and any threatened species throughout Victoria and make the results publicly available. The format used should be compatible with that used for Bushfire-prone Area mapping.

RECOMMENDATION 44

The Country Fire Authority produce for community guidance material on fire-resistant landscape and garden design, including a list of fire-resistant species.

RECOMMENDATION 45

The State press municipal councils—in particular, Murrindindi Shire Council—to urgently adopt a bushfire policy in their Local Planning Policy Framework and incorporate bushfire risk management in their planning policies and strategies for rebuilding communities such as Marysville, Kinglake and others affected by the January–February 2009 fires.

RECOMMENDATION 46

The State develop and implement a retreat and resettlement strategy for existing developments in areas of unacceptably high bushfire risk, including a scheme for non-compulsory acquisition by the State of land in these areas.

RECOMMENDATION 47

Standards Australia do the following:

- amend the objective of AS 3959-2009, Construction of Buildings in Bushfire-prone Areas, to ensure that it incorporates reducing the risk of ignition from ember attack
- review, and amend as appropriate, the testing methods prescribed in its standards for Tests on Elements of Construction for Buildings Exposed to Simulated Bushfire Attack (AS 1530.8.1 and AS 1530.8.2) to ensure that, so far as is possible, the methods provide a reliable predictor of the performance of construction elements under bushfire conditions.

RECOMMENDATION 48

The Australian Building Codes Board do the following:

- amend the performance requirements in the Building Code of Australia to ensure that they incorporate reducing the risk of ignition from ember attack
- work with Standards Australia to effect expeditious continuing review and development of AS 3959, Construction of Buildings in Bushfire-prone Areas, and other bushfire-related standards referred to in the Building Code of Australia
- negotiate with Standards Australia and SAI Global Ltd an arrangement for free online access to AS 3959-2009, Construction of Buildings in Bushfire-prone Areas, the other Australian standards referred to in AS 3959-2009, and any other bushfire-related Australian standards referred to in the Building Code of Australia
- amend the Building Code of Australia to remove deemed-to-satisfy provisions for the construction of buildings in BAL-FZ (the Flame Zone)
- include in the Building Code of Australia bushfire construction provisions for non-residential buildings that will be occupied by people who are particularly vulnerable to bushfire attack, such as schools, child care centres, hospitals and aged care facilities.

RECOMMENDATION 49

The State modify its adoption of the Building Code of Australia for the following purposes:

- to remove deemed-to-satisfy provisions for the construction of buildings in BAL-FZ (the Flame Zone)
- to apply bushfire construction provisions to non-residential buildings that will be occupied by people who are particularly vulnerable to bushfire attack, such as schools, child care centres, hospitals and aged care facilities
- other than in exceptional circumstances, to apply a minimum AS 3959-2009 construction level of BAL-12.5 to all new buildings and extensions in bushfire-prone areas.

RECOMMENDATION 50

Standards Australia move expeditiously to develop a standard for bushfire sprinklers and sprayers.

RECOMMENDATION 51

The Victorian Building Commission, in conjunction with the Country Fire Authority, develop, publish and provide to the community and industry information about ways in which existing buildings in bushfire-prone areas can be modified to incorporate bushfire safety measures.

RECOMMENDATION 52

The State develop and implement, in consultation with local government, a mechanism for sign-off by municipal councils of any permit conditions imposed under the Bushfire-prone Overlay and the regular assessment of landowners' compliance with conditions.

RECOMMENDATION 53

The State amend s. 32 of the *Sale of Land Act 1962* to require that a vendor's statement include whether the land is in a designated Bushfire-prone Area, a statement about the standard (if any) to which the dwelling was constructed, the bushfire attack level assessment at the time of construction (where relevant) and a current bushfire attack level assessment of the site of the dwelling.

RECOMMENDATION 54

The State amend the *Country Fire Authority Act 1958* to enable the Chief Officer to delegate the power to issue fire prevention notices.

RECOMMENDATION 55

The State initiate the development of education and training options to improve understanding of bushfire risk management in the building and planning regimes by:

- providing regular training and guidance material to planning and building practitioners
- helping a suitable tertiary institution design and implement a course on bushfire planning and design in Victoria.

LAND AND FUEL MANAGEMENT**RECOMMENDATION 56**

The State fund and commit to implementing a long-term program of prescribed burning based on an annual rolling target of 5 per cent minimum of public land.

RECOMMENDATION 57

The Department of Sustainability and Environment report annually on prescribed burning outcomes in a manner that meets public accountability objectives, including publishing details of targets, area burnt, funds expended on the program, and impacts on biodiversity.

RECOMMENDATION 58

The Department of Sustainability and Environment significantly upgrade its program of long-term data collection to monitor and model the effects of its prescribed burning programs and of bushfires on biodiversity in Victoria.

RECOMMENDATION 59

The Department of Sustainability and Environment amend the Code of Practice for Fire Management on Public Land in order to achieve the following:

- provide a clear statement of objectives, expressed as measurable outcomes
- include an explicit risk-analysis model for more objective and transparent resolution of competing objectives, where human life is the highest priority
- specify the characteristics of fire management zones—including burn size, percentage area burnt within the prescribed burn, and residual fuel loading
- adopt the use of the term 'bushfire' rather than 'wildfire'.

RECOMMENDATION 60

The State amend the exemptions in clause 52.17-6 of the Victoria Planning Provisions to ensure that the provisions allow for a broad range of roadside works capable of reducing fire risk and provide specifically for a new exemption where the purpose of the works is to reduce bushfire risk.

RECOMMENDATION 61

The State and Commonwealth provide for municipal councils adequate guidance on resolving the competing tensions arising from the legislation affecting roadside clearing and, where necessary, amend environment protection legislation to facilitate annual bushfire-prevention activities by the appropriate agencies.

RECOMMENDATION 62

VicRoads implement a systematic statewide program of bushfire risk assessment for all roads for which it is responsible, to ensure conformity with the obligations in s. 43 of the *Country Fire Authority Act 1958* and with the objectives expressed in the VicRoads 1985 Code of Practice.

ORGANISATIONAL STRUCTURE

RECOMMENDATION 63

The State enact legislation designed to achieve two specific ends:

- appoint a Fire Commissioner as an independent statutory officer responsible to the Minister for Police and Emergency Services and as the senior operational firefighter in Victoria
- make the Chief Fire Officer of the Department of Sustainability and Environment a statutory appointment.

The Fire Commissioner should have responsibility for the following:

- promoting and directing reform aimed at increasing the operational capability, interoperability and resilience of Victoria's fire services
- developing and building operational capacity to prepare for the days of highest bushfire risk and exercising control over level 3 fires as the permanent State Controller
- providing to government periodic advice on the metropolitan fire district boundary on the basis of triggers, frequency and criteria approved by government
- representing Victorian interests on operational matters in national committees.

RECOMMENDATION 64

The State replace the Fire Services Levy with a property-based levy and introduce concessions for low-income earners.

RESEARCH AND EVALUATION

RECOMMENDATION 65

The Commonwealth establish a national centre for bushfire research in collaboration with other Australian jurisdictions to support pure, applied and long-term research in the physical, biological and social sciences relevant to bushfires and to promote continuing research and scholarship in related disciplines.

MONITORING IMPLEMENTATION

RECOMMENDATION 66

The State appoint an independent monitor or the Victorian Auditor-General to assess progress with implementing the Commission's recommendations and report to the Parliament and the people of Victoria by 31 July 2012.

REFLECTIONS

RECOMMENDATION 67

The State consider the development of legislation for the conduct of inquiries in Victoria—in particular, the conduct of royal commissions.

THE COMMISSION'S TERMS OF REFERENCE

Following are the Commission's terms of reference, as issued on 16 February 2009.

**ELIZABETH THE SECOND BY THE GRACE OF GOD
QUEEN OF AUSTRALIA AND HER OTHER REALMS AND TERRITORIES,
QUEEN, HEAD OF THE COMMONWEALTH**

To The Honourable Bernard George Teague AO
Ronald Neville McLeod AM
Susan Mary Pascoe AM

GREETINGS:

WHEREAS:

- A. On Saturday 7 February 2009, the State of Victoria experienced the most devastating bushfires in its history, resulting in a catastrophic loss of life and public and private property.
- B. The State of Victoria is recognised as a region subject to a very high fire risk and has previously experienced extensive bushfires, most notably in 1939, 1944, 1969, 1977, 1983, 2003, 2005 and 2006.
- C. A range of inquiries conducted after those bushfires has led to the development of a coordinated State-wide approach to planning for, and responding to, bushfires and an extensive network of career and volunteer emergency services personnel.
- D. The weather conditions on 7 February were unprecedented in terms of high temperatures, low humidity and wind speeds, following years of drought. The conditions on that day also followed a heatwave and bushfires, including in Gippsland, in late January 2009.
- E. Over 4,000 fire service volunteers and career staff immediately responded to combat more than 300 fires across Victoria on 7 February and over 10,000 personnel were subsequently involved in the largest coordinated emergency response and community recovery operation in the State's history.
- F. The State acknowledges and commends the significant dedication and efforts of staff and volunteers in responding to this emergency in extremely difficult conditions.

- G. Notwithstanding the scale of these efforts, there was an unprecedented loss of life, extreme property damage, and major community trauma and displacement.
- H. The Governor of the State of Victoria, in the Commonwealth of Australia, by and with the advice of the Executive Council, has therefore deemed it to be expedient that a Commission should issue to you in the terms set out below.
- I. It is anticipated that in conducting Our Commission you will take into account the important role and functions of the Coroner, Victoria Police, the Director of Public Prosecutions and the Victorian Bushfire Reconstruction and Recovery Authority, and that you will consult with each of those persons or bodies to the extent that you consider appropriate in order to avoid the inquiries of Our Commission from interfering unnecessarily with the functions of those persons or bodies.

NOW THEREFORE the Governor of the State of Victoria, in the Commonwealth of Australia, by and with the advice of the Executive Council and acting pursuant to section 88B of the **Constitution Act 1975**, appoints and constitutes you

The Honourable Bernard George Teague AO
 Ronald Neville McLeod AM
 Susan Mary Pascoe AM

to be Our Commissioners

AND HEREBY APPOINTS The Honourable Bernard George Teague AO to be Chairperson of the Royal Commission.

FOR THE PURPOSE of inquiring into and reporting on the following matters:

- 1. The causes and circumstances of the bushfires which burned in various parts of Victoria in late January and in February 2009 ("2009 Bushfires").
- 2. The preparation and planning by governments, emergency services, other entities, the community and households for bushfires in Victoria, including current laws, policies, practices, resources and strategies for the prevention,

identification, evaluation, management and communication of bushfire threats and risks.

3. All aspects of the response to the 2009 Bushfires, particularly measures taken to control the spread of the fires and measures taken to protect life and private and public property, including but not limited to:

- (a) immediate management, response and recovery;
- (b) resourcing, overall coordination and deployment; and
- (c) equipment and communication systems.

4. The measures taken to prevent or minimise disruption to the supply of essential services such as power and water during the 2009 Bushfires.

5. Any other matters that you deem appropriate in relation to the 2009 Bushfires.

AND WE direct you to make such recommendations arising out of your inquiry as you consider appropriate, including recommendations for governments, emergency services, other entities and the community on:

6. The preparation and planning for future bushfire threats and risks, particularly the prevention of loss of life.
7. Land use planning and management, including urban and regional planning.
8. The fireproofing of housing and other buildings, including the materials used in construction.
9. The emergency response to bushfires.
10. Public communication and community advice systems and strategies.
11. Training, infrastructure, and overall resourcing needs.

AND WE do by these presents give and grant you full power and authority to call before you such person or persons as you shall judge likely to afford you any information upon the subject of this Our Commission, and to inquire of and concerning the premises by all other lawful ways and means whatsoever.

AND WE declare the powers of the Commission at the discretion of the Chairperson may, at any time, be exercised by one or more Commissioners.

AND WE will and command that this Our Commission shall continue in full force and virtue and that you shall and may from time to time and at every place or places proceed in the execution thereof, and of every matter and thing therein contained although the same be not continued from time to time by adjournment.

AND WE direct you to conduct your inquiry as expeditiously as possible and to furnish US with:

- (i) an interim report focusing on immediate actions that can be taken prior to the 2009-2010 fire season, by 17 August 2009; and
- (ii) a final report by 31 July 2010 or such later date as WE may be pleased to fix.

IN TESTIMONY WHEREOF WE have caused these Our Letters to be made Patent and the Seal of the State to be hereunder affixed.



WITNESS His Excellency Professor David de Kretser, Companion of the Order of Australia, Governor of Victoria and its dependencies in the Commonwealth of Australia at Melbourne this 16th day of February Two thousand and nine in the fifty-eighth year of Our reign.

By His Excellency's Command

Premier of Victoria

Entered on the record by me in the Register of Patents Book No 44 Page No 111 on the 16th day of February 2009.

Secretary, Department of Premier and Cabinet



THE PEOPLE WHO DIED

The Commission focused on improving Victoria's bushfire safety, so that the lessons learnt from the tragedy of Black Saturday will make the state a safer place. It offers this report and its recommendations to the Government and people of Victoria in memory of those who lost their lives.

ARTHURS CREEK

Josef Matheis
Glenys Matheis

BENDIGO

Mick Kane

CAMBARVILLE

David Balfour

CALLIGNEE

Fred Frendo
Scott Frendo
Annette Leatham
Martin Schultz

FLOWERDALE— HAZELDENE

Ronald Barling
Richard Hall
Gavin Dunn
Bob Harrop
Daniela Marulli
Jesse Inzitari
Aldo Junior Inzitari
Donald Walker
Helen Walker
John Walker
Cheri-Lee Walker

HAZELWOOD SOUTH

David Gibson
Colin Gibson

HUMEVALE

Barry Johnston
Lloyd Martin
Mary Martin
Allan O'Gorman
Carolyn O'Gorman
Stuart O'Gorman

JEERALANG JUNCTION

Gertrude Martin

KINGLAKE

Adrian Brown
Mirabelle Brown
Matthew Brown
Eric Brown
Brielle Brown
Neeve Buchanan
Mackenzie Buchanan
Melanie Chambers
Penelope Chambers
Daniel Clark
Rob Davey
Natasha Davey
Jorja Davey
Alexis Davey
Mark Butler
Mike Flynn
David Holcombe
Carol Holcombe
Geoff Hyde
Suzanne Hyde
Gennaro Laudisio
Graham O'Shea
Debbie O'Shea
Trey O'Shea
Lyric O'Shea
Dimitrios Tsimiklis
Tanja Tsimiklis
Richard Zann
Eileen Zann
Eva Zann
Karma Hastwell

KINGLAKE WEST

Krystal Breeze
Nathan Breeze
Teagan Haymes
Tina Wilson
Rex Norris
Paul Rolands
Karen Rolands
Caitlin Rolands
Nicola Rolands
Lesley Leahy
Kiona Gibson
Jye Gibson
Ava Gibson
Eileen Gillespie
Brian Naylor
Moiree Naylor

KOORNALLA

Alan Jacobs
Miros Jacobs
Luke Jacobs
Nathan Charles

MARYSVILLE

Jamie Bowker
Nicole Jefferson
Kevin Bradwell
Melissa Bunning
Glenis Delmenico
Lesleigh Webb
Dalton Fiske
Elizabeth Fiske
James Gormley
Julie Wallace-Mitchell
Aileen Hoskin
Geoff Grady
Patrick Jennings
Dean Lesmana
Rudi The
Laurel Lewis
Elizabeth Liesfield
James Liesfield
Matthew Liesfield
Coralie Lynch
David Lynch
Alen Mawson
Errol Morgan
Harley Morgan
Isak Nilsson
Kirstie Nilsson
Colin Paul
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Marie Walsh
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Gail Leonard
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Scapegoating climate to hide callous government malfeasance

By Paul Driessen | January 22nd, 2025 | 9 Comments

Wildfires near Los Angeles have left Pacific Palisades looking like Dresden after the WWII fire-bombings. Over 12,000 homes, schools and businesses have been incinerated, dozens of people have died, at least 70,000 have been left homeless, and fires still rage.

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the Wall Street Journal, Washington Times,

Paul Driessen is senior Investor's Business Daily



Paul Driessen

AccuWeather estimates that just two of the fires will destroy \$135-150 *billion* in property!

It's a doubly horrific tragedy, because most of the death and devastation could have been prevented.

California has 33,000,000 acres of federal, state and private forestland – equivalent to Wisconsin. As the state's population expanded, forests and wildlife increasingly merged with human habitats. And yet federal and state land managers – compelled by ideology, activists, legislators and judges – have steadfastly refused to permit timber cutting, tree thinning or brush removal, or take other actions that would reduce the likelihood of conflagrations.

So many trees are so jammed together now that they're starved for space, water, nutrients and sunlight. Many are diseased. They are skinny matchsticks, primed to erupt in flames. Some 36,000,000 trees died just in 2022, across just 8% of these forestlands. But even dead and diseased trees are rarely removed.

Rainy fall and winter months stimulate tree, brush and grass growth. Parched summers dry everything out. Extended dry periods leave all this fuel ready to ignite for more months.

Lightning, sparks from cars or power lines, campfires and arsonists set areas aflame. Dry Santa Ana winds (40-70 mph, with gusts of 120-150 mph) whip fires into infernos. Depleted, defunded fire departments often arrive long after they could extinguish fires in their infancy.

The conflagrations generate still more powerful winds that carry embers, branches, even small trees thousands of feet – often into communities that are ill-prepared to cope.

(www.GFACT.org) and author of books and "Opposing Viewpoints" books used in high schools and colleges. Hi PAUL DRIESSEN is senior policy analyst for the Committee For A Constructive Tomorrow (GFACT) and other public policy institutes that promote environmental stewardship, enhanced human health and welfare and personal liberties and civil rights (Spain), Germany (change, energy and environmental, human rights, corporate social responsibility, work sustainable development and renewable energy issues in articles and research papers on radio, press, gas of life, and Climate type exposed. Authors personal and other conferences. His article are posted regularly or

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Paul Driessen

This barely begins the litany of California government failures that help cause repeated fire calamities. However, state and local politicians adroitly avoid responsibility.

Their most common excuse is manmade climate change. They even have a new fear-inducing term: hydroclimate whiplash! Fossil-fuel-driven climate change supposedly brought two exceptionally wet winters, spurring unprecedented plant growth – and then caused unprecedented arid conditions and previously unheard-of Santa Ana winds that made these infernos unpredictable but inevitable.

Calling the massive, repeated government failures “incompetence” is too generous. Deliberate, callous, destructive malfeasance is more apt. Criminal may be appropriate.

Governor Gavin Newsom wants a special session to discuss spending \$25-50 million to “Trump-proof” state policies. He wants to use a new \$10-billion “climate bond” to reduce farm and ranch greenhouse gas (GHG) emissions, improve “equitable access to nature,” build more parks in “disadvantaged communities,” upgrade ports to handle deepwater offshore wind projects, and more.

California is still pouring billions into EV subsidies, its “clean” energy transition, and the \$100-billion “bullet train to nowhere.” It’s spending more billions supporting “sanctuary” status for illegal immigrants, maintaining gender and DEI programs, and ministering to America’s largest number of homeless people – which will now include 70,000+ who’ve lost everything to the 2025 wildfires.

One wonders whether they’ll treat these now-homeless taxpayers as well as they have illegal populations.

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Paul Driessen

Legislated restrictions on how companies may conduct fire-risk assessments and what rates they can charge for homeowners insurance in high-fire-risk areas have caused insurers to leave the state or stop issuing new policies. Hundreds of thousands of families are now uninsured, underinsured or dependent on the state's FAIR Plan, which has only \$385 million in reserves.

Meanwhile, California devoted only \$2.6 billion to "forest and wildfire resilience" across all state-managed forestlands, including Topanga State Park, where the fires started, right next to what once was Pacific Palisades – versus \$14.7 billion for EVs and "clean renewable energy."

With memories of the horrific 2018 Paradise (Camp) fire still causing nightmares, Mayor Karen Bass cut \$17.6 million from the Los Angeles Fire Department budget, fired 100 firefighters who didn't get Covid vaccines, and was partying at an embassy reception in Ghana as the fires erupted

LA Fire Department Chief Kristin Crowley (salary: \$654,000) has spent millions on DEI programs and hiring more women, gays and minorities.

Deputy/Diversity Chief Kristine Larson (salary: \$307,000) says victims want to see emergency responders that "look like" them, and if she isn't strong enough to carry your husband out of a fire, he "got himself in the wrong place."

They then failed to keep extra firefighters and firetrucks on duty as winds picked up just before the first forest fires were spotted – apparently to avoid paying overtime. That meant the LAFD couldn't get there before fires roared out of control.

Exhausted firefighters trying to save multi-million-dollar homes in Palisades ran out of water. A major reason was that LA Water and Power Department CEO

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Janisse Quiñones (salary: \$750,000) had the 117-million-gallon Santa Ynez Reservoir drained to repair cracks in its base. A full reservoir would have replenished huge storage tanks that feed and pressurize local fire hydrants.

Quiñones has said her “number one” priority is equity and social justice. Does that explain why the reservoir was drained in February 2024; no contractor was hired until November 2024; and even then no workers, equipment or materials were in place for 24/7 repairs?

Just as callously incompetent, why was there no plan (or no action taken) to utilize fireboats, tugboats, barges and other vessels from Long Beach Harbor and the San Diego Navy Base? Many are equipped with water storage, pumps, hoses and nozzles. They could spray seawater directly on coastal homes or run hoses ashore to connect to fire hydrant systems.

Some salt would remain in soils and kill some plants. However, the choice should be easy. Lose some prized vegetation to lingering salts – or have prized vegetation, homes, priceless heirlooms and artworks, and everything else incinerated by raging infernos. Homeowners never got to make that choice.

The incineration of these forests and communities released far more greenhouse gases than all the state’s now-shuttered coal- and gas-fired power plants would have over many decades.

Further complicating matters, the fires sent ash and pollutants into skies and left toxic chemicals behind – from plastics, paints, batteries, solvents and other materials in homes, buildings and vehicles. They’ve contaminated waters and soils, which could result in long cleanup and rebuilding delays.

Governor Newsom says he wants to expedite rebuilding. But LA health officials say debris removal

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and reconstruction are prohibited until licensed officials have carefully examined sites for toxics – dangerous or barely detectable levels? New building codes for fire resistance? Or homeowner demands for them?

Citizens need to discuss all this at town hall meetings, before the next conflagration strikes – inevitably, if proper forest and water management and personnel hiring are not implemented immediately. Put simply, the woke idiots responsible for this rampant destruction and loss of life must be replaced with people who understand their Number One Job is protecting citizens from crime, fires and other natural disasters.

Mr. Newsom also wants an investigation into the loss of fire hydrant water pressure. Californians have good reason to suspect he’s merely trying to find excuses and scapegoats, so that he and his favorite legislators can save their political hides.

Golden Staters need to revamp their political, bureaucratic, policy and woke systems. They need to rely less on government – and more on themselves, the way the Getty Villa and several neighbors did in Malibu, thereby saving homes, treasures and lives. Otherwise, these needless tragedies will be repeated.

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7 hours ago

One of America's foremost drone maker has announced that it will build a billion dollar factory in Ohio, starting immediately. The CA based firm waited until Biden was gone because much of its product was military tech, and Biden was delaying and slow walking tech acquisition in my opinion. Clearly Biden and Milley were more concerned about the Chinese than America. The firm chose Ohio it said, because of the highly skilled workforce and proximity to material manufacturers it needs to make its product.

4,000 new new direct jobs jobs will be created.

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He's pointing at ELOON!!!!!!.....

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**"Global Warming": Multiple Records Were Just
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STOP THE GREAT RESET OF 2030



4 hours ago edited

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It's pathetic that while the same noisy, self absorbed elite left wing mouthpieces (LA Mayor and CA Governor) for man made climate change keep pounding the scare drum about how California will be drier and hotter and fires will be worse did little or nothing to prepare for it. Firefighting and prevention is still done the way it was in the 1960s.

But hey! Give them credit for trying. They cut oil production, chased away a couple of refineries that make the special gasoline blend required by the state, spent billions on the homeless industrial complex with virtually no progress and banned lawnmowers! And LA has "road diets".

periodicals, and Greenhaven Press "Opposing Viewpoints" books used in high schools and colleges His book Eco-Imperialism: Green Power - Black Death documents the harm that environmental policies often have on poor families, by restricting access to life enhancing modern technologies. It has been published in the United States, Argentina (Spanish), Germany (German), Italy (Italian) and India (English). He also wrote Cracking Big Green: Saving the world from the Save-the-Earth money machine (with Ron Arnold), Miracle Molecule: Carbon dioxide, gas of life, and Climate Hype Exposed.

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8:27pm Monday, November 4th, 2024

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to conduct an urgent review into the state's wind turbines ahead of the bushfire season.

There are concerns they lack fire safety equipment – putting key infrastructure and regional communities at risk.

The Herald Sun reports Energy Safety Victoria has no records on whether the state's 2,500 wind turbines have internal fire suppression systems.

It's raised questions over whether current regulations are sufficient in the transition towards renewable energy.

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'Tasmania in a similar boat' as Los Angeles when it comes to bushfire risk



By [Sarah Fittock](#)

January 20 2025 - 3:42pm



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 A backburning operation at Arthur River in 2016. Picture file.

Emergency services have banded together to launch a new campaign in the name of fire safety.

The new 'You light it, you own it' campaign has been launched by the Tasmania Fire Service and Tasmania Police in conjunction with Crime Stoppers Tasmania.

It urges all Tasmanians to take personal responsibility, follow fire safety guidelines, respect fire bans and ensure any fire they light is properly managed.

It comes after bushfires were sparked across the state this weekend, including one at King Island on Saturday and a vegetation fire at Mowbray.



■ A star-studded list of celebrities are offering once-in-a-lifetime experiences like a private golf lesson with a pro player or a cooking demonstration from a celebrity chef.

Crime Stoppers Tasmania chair David Daniels said the campaign targets "recklessly lit and accidental fires".

"Unlawfully lighting fires and disregarding fire permits is a serious crime ... and there's a lot of that going on," he said.

"We know the bushfires have devastating effects ... so please speak up if you see people disregarding total fire ban permits or any permits."

Police, Fire and Emergency Management Minister Felix Ellis said Tasmania is one of the most bushfire-

prone places in the world.

"It's important that we all do everything that we can to make sure that we're protecting our fellow Tasmanians from the risk of bushfire," he said.

"That's about ensuring that you're not doing the wrong thing when it comes to fire, because a small fire at the moment in the middle of summer, in the middle of bushfire season, can really get out of hand.

 Start the conversation

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"We've seen the tragic consequences of bushfires in places like Los Angeles at the moment and Tasmania is in a similar boat when it comes to our bushfire risk."

Mr Daniels said the campaign started "our counterparts in the other jurisdictions in Victoria".

"And they were successful with it," Mr Daniels said.

"We've followed suit because it's about the time of the year when we felt that we needed to get the public awareness motivated out there."



📷 Aftermath of 2022 bushfire near Rosebery. Stock photo. Picture by David Bellamy.

Simon Pilkington, Tasmania Fire Service regional chief for the Southern Region said this season has

been a "relatively moderate season so far in Tasmania".

"We've had some lightning strikes come through, which always pose a hazard, but so far it's been reasonably moderate," he said.

"During periods of high fire danger, fires can develop quickly and they can impact communities in a very short space of time.

"If anyone sees any activity on days like that, you need to help us prevent that catastrophic impact to the community, so please consider your actions and notify us quickly so we can mount an appropriate response."

For more information about fire permits, seasonal restrictions, and fire safety, visit www.fire.tas.gov.au or contact Tasmania Fire Service directly.

For more information or to report a crime anonymously to Crime Stoppers Tasmania visit www.crimestopperstas.com.au or call 1800 333 000.

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Sarah Fittock
Journalist



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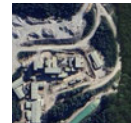
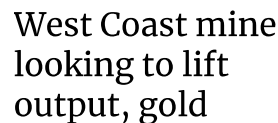
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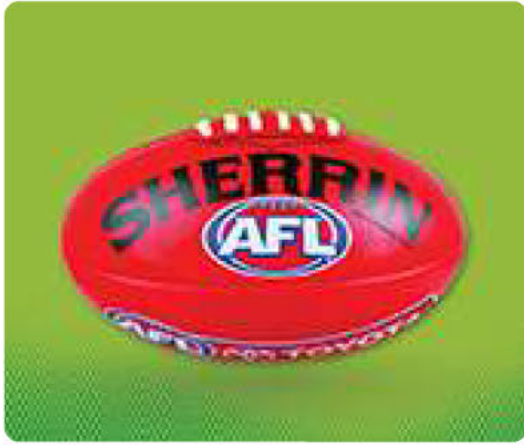


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