Draft ISP 2024 - submission

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Introduction

My Background and approach to the Draft ISP

I have worked on energy issues for over four decades, for government, business, community and industry groups. My main focus has been on the demand side, and on climate impacts, but I have been actively involved in energy supply and market issues since the early debates of the 1990s. I have written a lot and made many submissions on energy market and system issues. My status as a Fellow at both RMIT and University of Melbourne, as well as the significant number of awards I have received reflect some respect for my work.

Engagement in the detailed development of the ISP has not been a major focus of my work for a number of reasons, including my view that my perspective does not seem to fit into the narrow groupthink of the energy supply sector that dominates Australian energy market policy. My starting point is that demand for energy is a 'derived need': no-one actually wants energy for its own sake. So failure to start energy analysis with an understanding of perceptions of consumers regarding the services they need, then consideration of the range of technologies that could provide them is, in my view, a fundamental but common failing. Unfortunately, as I explained in my submission to the consultation on the National Energy Performance Strategy, Australia has a 'black hole' regarding detailed data on end user efficiency of utilisation of energy for services. For example, in a project with the NSW government I found that overall system efficiency of

Compressed Air Systems in over 100 sites was around 15%. My research found savings potential of around 90% if CAS was replaced by alternative electric technologies that would also improve productivity (see https://www.a2ep.org.au/compressedair).

I have read the Draft ISP and a lot of the background documents. In doing this, it has become clear that to make meaningful inputs requires a commitment of large amounts of time – well beyond the capacity of most consumer groups and academics without funding. AEMO should fund teams of independent analysts and consumer representatives to cover the time needed to review, analyse, network, develop alternatives and engage with AEMO. Otherwise AEMO's understanding of issues will be largely shaped by established vested interests, existing policies that fail to reflect our future, econocrats and technocrats.

The ISP provides a very useful input to development of thinking about our energy future, and involves much impressive analysis and thinking. But the assumptions underlying it and the (often unconscious) boundaries applied limit its value in a time of disruptive change, and especially demand-side revolution. Its focus on existing policies and high-level estimates when evaluating energy efficiency/productivity are significant problems. We need an ongoing interactive, exploratory mechanism involving people with a wide variety of backgrounds. For example, people like Tony Seba (Think-X) consider fundamental trends and technology options. Circular economy, scope 3 emissions, value chain thinking, digitalisation and real-world experience of climate change all challenge fundamental assumptions of the Draft ISP.

So, while the ISP is valuable, it must be just one part of a much bigger process.

I recognise that staff within AEMO understand many issues that they cannot include in the ISP because of the boundaries set at higher levels. I suspect that, given a broader remit, they might produce a very different ISP. So my criticisms are not directed at the workers and analysts who have produced the ISP. The problem is with the overarching framework, the groupthink, the power of incumbents and politicians, and the limited allocation of resources for data collection, analysis and broader policy development in relation to demand-side issues and innovations.

When the national energy objectives still use the word 'price' when they should use 'cost' we face a fundamental barrier to consideration of reality. When 'price' is the focus', energy efficiency and other measures that don't necessarily reduce the price, but do reduce overall financial costs and societal costs and impacts, are easily ignored or understated. This is crazy. It simply reinforces a blinkered approach to energy policy. I noted that Appendix 6 p.77 acknowledges that less Energy Efficiency drives increased need for renewable electricity and firming capacity (by gas) and storage. Some sensitivity studies that explore this would be useful.

Key Issues

Assumptions about future demand for gas and gas-fired electricity

The ISP's modelling suggests substantial (and increasing) need for gas-fired generation beyond 2040. However its utilisation will be low, involving high capital costs spread over low utilisation, and risks ongoing carbon emissions from gas combustion.

A major study of the potential to use demand side management, enhanced utilisation of existing assets such as hydroelectric facilities and distributed energy resources is needed. A forthcoming paper by me and Amandine Denis-Ryan for IEEFA provides an example of the kinds of issues that must be addressed, using Tasmanian hydroelectricity and Basslink as an

example. I noted reference to utilisation of such assets in the Draft ISP, but these deserve serious exploration. Consideration of potential strong policies to improve existing building and HVAC equipment efficiency could make a big difference to the outcome of modelling.

Incorporation of climate change issues

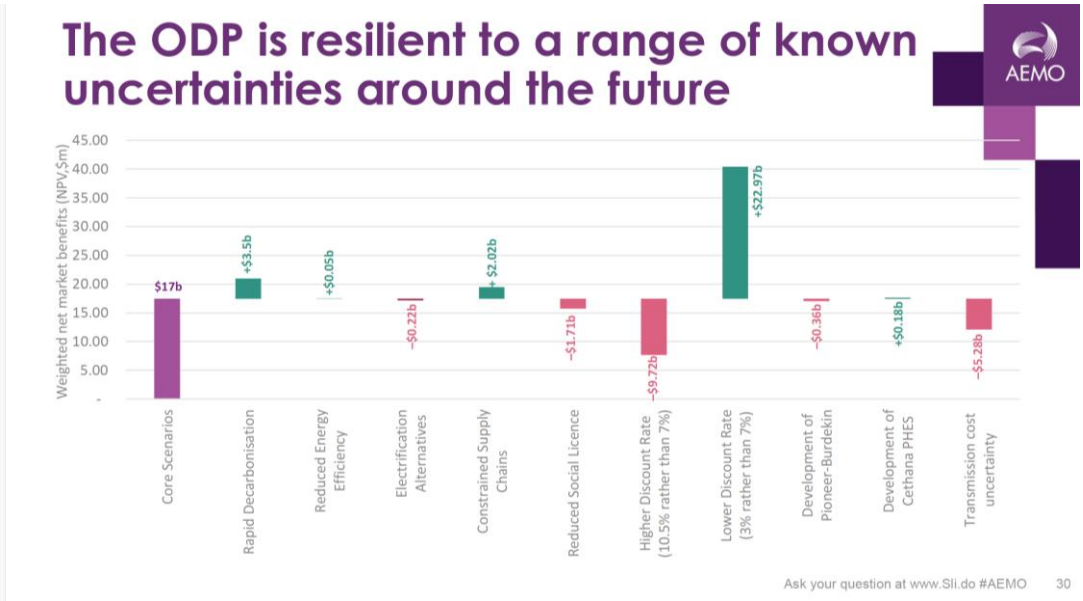
The draft ISP approach to addressing climate change in response to the recent change in the National Energy Objectives seems inadequate. It seems to apply a boundary condition that scenarios must meet the Australian government's present commitment. Then it applies a 'least cost' approach without incorporating any kind of carbon price to the individual options considered. Maybe I'm wrong but this seems to open-up distortions relative to assessments that incorporate a carbon price by distorting the cost-based decision-making process.

On p.81 the Draft ISP notes that it may include the value of 'emissions reduction' in the final ISP – if available! This should not be an option: at a minimum a range of carbon prices should be incorporated.

It is important to recognise that a carbon price may be applied in various ways. Government subsidies to consumers through VEU, ESS, grants programs etc are already effectively carbon prices, but they are paid for by taxpayers and energy consumers in ways that are not very visible. While the Safeguard Mechanism focuses on scope 1 emissions from large emitters, it provides an example of a limited trading scheme that could be applied to electricity in future. When the Australian government has set a limit of $75/tonne of emissions in the Safeguard scheme and EU carbon prices are well over $100/tonne, failure to factor significant carbon prices into the core of ISP modelling seems unrealistic.

Discount rates

In AEMO's powerpoint presentation on the ISP an interesting graph, shown below, appeared that does not seem to be in the Draft ISP. Some issues emerge from this. In particular, it shows how the *perceived* lifetime societal value of different strategies can vary dramatically if discount rates used for decision-making are varied. It seems that applying a 10.5%pa discount rate instead of a 3%pa reduces the 'weighted net market benefits' by over $32 billion.



Since businesses typically apply higher discount rates than governments when making decisions, this raises the question of how we can minimise the adverse societal impacts of application of high discount rates to energy-related decision-making. It should also be noted that investors in energy efficiency measures often expect very short payback periods: a typical 3-year payback is equivalent to applying a discount rate of around 30% per annum. This creates a serious distortion that works against societally beneficial decisions on demand-side action. Given that the NEO includes a requirement to act in the long-term interests of consumers, this issue deserves serious attention.

It is also puzzling that changes to energy efficiency and electrification have such small impacts on weighted market benefits in the graph. It seems that the multiple benefits of energy efficiency, which often far exceed the value of energy savings, are ignored. The International Energy Agency has published extensive reports on this issue.

Need for recognition that spot markets fail to deliver intended outcomes

My understanding is that the intent of the spot market is to send a financial signal to potential investors to encourage investment that will lead to long-term consumer benefit. However, the main beneficiaries of this approach seem to be incumbent generators and gentailers. The emerging reality is that state and federal governments are intervening through various contractual and institutional approaches. How does the ISP factor in impacts of existing interventions? Could it model outcomes of alternatives to the present flawed mechanism?

How do we deal with rare and uncertain events?

The Draft ISP recognises the potential significance of rare and uncertain events, for example by exploring how a Variable Renewable Energy 'drought' might be managed. Its conclusion is that such events could be managed, but a lot of gas-fired and hydro generation would be needed to manage them. It also concludes that more gas-fired generation will be needed, but it will be used less often. Surely such a costly solution should be evaluated and alternatives explored? Is it realistic to expect investors to build such assets without significant policy changes?

Transition from gas and gas-fired generation

The Draft ISP's approach to transition away from gas seems limited. It seems to assume some hydrogen will be distributed in gas distribution systems, though the emerging consensus seems to be that this approach is difficult and costly, and it will not be able to compete with efficient electrification within the residential and commercial sectors.

It also assumes high adoption of hydrogen by industry (p.23 assumes 8-10% H2 for residential and 40-80% for industry). As I pointed out in my recent submission to the federal government's *Future Gas* paper, poor quality data and optimistic estimates of efficiency of gas use in industry mean it is very likely that requirements for industrial high temperature heat are being significantly over-estimated. Also, as renewable electricity costs fall and supply chains emerge, electric alternatives to gases are becoming more attractive.

The simplistic example below shows that simple, flexible and precise electric technologies such as resistive or induction heating may match possible future renewable gas prices while having much lower capital costs and requiring less renewable electricity capacity, though firming through storage (eg high temperature thermal storage and/or batteries), demand management etc may be required.

	price/MWh	price/GJ	Eff	end use price/GJ
elect	50	13.89	0.9	15.43
gas		12	0.75	16

AEMO's Gas Statement of Opportunities shows that southern state gas and gas-fired electricity demand in winter is around 3 times higher than in summer, with even higher spikes, presumably in cold weather. Yet it does not seem to focus attention on how this seasonal high demand could be better managed at least societal cost. This seasonal issue is likely to become more challenging as coal-fired generation is phased out and more solar (which has lower output in winter) enters the scene. Is investment in more gas-fired generation that is not used very often a sensible response?

When this situation is combined with AEMO's concerns about gas supply shortfalls in southern states, addressing the situation in ways that limit peak winter electricity demand seems even more urgent and central to planning.

How will 'non-energy' markets respond to spillage of 20% of RE?

The Draft ISP flags that its approach will likely lead to 'spillage' of up to 20% of renewable electricity. This surely is a significant societal cost, and may provoke negative responses from large and small generators. The ISP should explore ways of limiting this waste of money. Or does it assume that, once this has been pointed out, 'the market' will address it in an optimal way?

Adapting to climate change

As the lived reality of climate change, particularly extreme events, becomes more visible to the community and governments, it will be increasingly important for AEMO and others to develop and adapt datasets to incorporate the potential impacts, and model effects of options that may emerge. Public attitudes and government policies can change quickly, so development of practical contingency strategies will be of increasing importance.

Potential AEMO role in maintaining grid stability

On p.67 the Draft ISP notes that AEMO holds some battery capacity in reserve to stabilise power lines and allow them to operate at higher levels. It also has RERT, and other options such as contracts to maintain available capacity are emerging. These are costs, so there should be some evaluation of the costs and benefits of alternatives that reduce these costs, including distributed and demand-side options. Options such as use of batteries as 'virtual' powerline capacity, and even transportable batteries (eg trains of batteries, as discussed recently by Peter Newman in a RenewEconomy article) are attracting increasing interest.