

PUBLIC SUBMISSION.

30th January 2024.

To : **AEMO.**

REVIEW OF DRAFT ISP - CRITICAL ANALYSIS OF THE DRAFT DOCUMENT.

We thank AEMO for the opportunity to comment on the DRAFT ISP and acknowledge the challenge of consolidating the vast range of information in a fast paced and rapidly changing market. Our submission will only highlight problem matters in the draft report.

We do not accept the DRAFT ISP is currently fit for purpose.

We note 400 people attended the draft release of the report reflecting this matter of national importance. We recommend increased dialogue outside the echo chamber of the power industry, big industry energy consultants and the Canberra beltway.

The DRAFT ISP plans for the Australian power grid are unacceptable to small business.

About **OSH2™** :

Open Source Hydrogen is working to progress low cost green hydrogen produced on Australian farms. This is Green Hydrogen produced at farm level not in Government ordained Hydrogen Hubs. Our energy is family owned and will be used in the tractors, trucks and SUV's of regional Australia. Hydrogen will provide Fuel Cell BESS and stationery distributed grid scale generation capacity. Rapid grid expansion will be required to support this profitable agriculture crop with affordable wholesale (NEM) grid connection. To support this growth, AEMO and regulators like the failed South Australia Government - Hydrogen & Renewable Energy Act (2023) will require policy adjustment to match community expectations. This action is required to build grid infrastructure to support farm agri-business to deliver the immediate advantages of low cost **OSH2™** Hydrogen to Australian consumers.

CRITICAL ISSUES :

1. Grid infrastructure are not "Natural Monopolies" as promoted by Energy Networks. They are regulated oligopolies and AEMO's draft ISP should support all efforts to ensure competitive networks are approved and built. The DRAFT ISP provides insufficient guidance to State actors to ensure a vigorous competitive industry structure. The effect of the DRAFT ISP is to enforce restricted supply. At all times regulated competition growth should be a priority.
2. Competitive consumer power pricing will require AEMO to challenge the Industry/AustGov status quo to ensure "green shoots" are not given a dose of electricity monopoly herbicide.
3. A national plan that does not rigorously examine full State grid connection is a fail. Where is consideration of Western Australia - South Australia grid connections in the draft ISP ?
4. The AEMO "Optimal Development Path" fails to connect existing large scale mining & transport infrastructure. This reflects structurally faulty REZ mapping that fails to accommodate new industry hydrogen growth in remote regions. e.g Ceduna, SA.
5. The supporting data within Hydrogen baseline assumptions is factually wrong.
6. The DRAFT ISP discounts GREEN H2 EXPORTS. This is contrary to our Green Hydrogen export trade expectations and requires additional and immediate consultation.

Supporting Reference Pricing :

In this paper, for brevity, we reference two actual NEM price events :

NEM SPOT PRICE P1: Time = **22 December 2023 : Time 16:40.** QLD \$5.30, NSW \$4.94, VIC - \$52.60, SA -\$48.51, TAS \$10.64 . SA DEMAND = 866, SA GENERATION = 1144. Grid interconnection SA supply towards VIC = 453. VIC supply to SA = 175. SA Supply connection to NSW = 0. SA Supply connection to WA = 0. VIC supply to NSW = 347. VIC supply to TAS = 453.

NEM SPOT PRICE P2: Time = **25 January 2024 : Time 06:20.** QLD \$85.55, NSW \$88.40, VIC - \$111.40, SA \$175.98 . SA DEMAND = 1565, SA GENERATION = 770. Grid interconnection VIC supply to SA = 600 and Grid interconnection VIC supply to SA = 195. SA Supply connection to NSW = 0. WA Supply connection to SA = 0. VIC supply to NSW = -505. TAS supply to VIC = 386.

[These dates and times were selected randomly at the time of report writing.]

GROWTH MODEL – FOUNDATION ERRORS IN ASSUMPTIONS.

We consider the discount applied to GREEN EXPORT as incorrect and highlight this judgement error.

Evidence : GREEN HYDROGEN DEMAND.

Please consider **P1** power supply referenced previously at 16:40 on 22nd December 2023. If a typical fuel cell consumer SUV requires 5-7kg of Hydrogen to drive 550Km. H2 production is now competitive for heavy vehicles with grid connection using an H2 retail price below \$17.50/kg.

More importantly, the flawed draft ISP AusTIMES modelling is predicated on AEMO H2 power cost economics, delayed equipment efficiency and weak H2 transport. What if these assumptions are wrong because the power price in P1 is -\$48.51. Simply put, there is no requirement for efficient or expensive H2 processing with a negative power price. AEMO can safely assume all demand models regardless of incumbent industry views will be wrong if recurrent negative wholesale power pricing continues on the NEM. The bottom line impact of accelerated PV rooftop can be accelerated H2 grid demand. This fact based position is not reflected in the current ISP data or source AusTIMES modelling. Regardless of state government mismanagement such as recent measures by the South Australian Government to regulate and delay H2 private production and hydrogen exports, Hydrogen demand is expected to significantly accelerate with export demand and private use.

STRATEGIC ASSUMPTIONS DOCUMENT.

We have carefully considered the assumptions and recognise the immense effort of AEMO to prepare this report. We thank AEMO staff for publication of the draft ISP data and hope the following comments are understood to be essentially positive :

Example : CEDUNA REZ.

Ceduna is the largest industrial town in Western South Australia with the highest port bulk freight capacity in the region. The location has neither a connection to the NEM grid nor is included in the AEMO future ISP planning. How could this be adequate ? We highlight these regional planning inconsistencies in the draft ISP. AEMO should ask the question, What is the root cause of this error ?

BASELINE DATA ERRORS.

- Electrolysis power (e.g SOEC) models are outdated. Needs updated project economics.
- 5 year H2 project build. Faulty project calculations unless AusGov/State intentionally delays.
- Consideration of PEM data modelling that is consistently economically weak & expensive.
- Convenient 2% exports of Hydrogen (a random percentage of baseload capacity ?).
- H2 demand for DRI Metals programmed without sufficient consultation e.g OSH2 TiFe.
- Missing hydrogen ports based on faulty State planning & REZ mapping logic e.g CEDUNA, SA.
- Low cost land is essential to H2 and mirrors constrained AEMO grid REZ errors.
- Hydrogen price/margin models. Weakens ISP demand by discounting business applications.
- South Australia Gov H2 turbine \$581m cost does not reflect pre-approved Port Lincoln electricity grid duplication spend, desalination and perverse AusGov subsidies to large plants.

2024 ISP DELPHI PANEL.

“AEMO has decided that it is appropriate to use the scenario likelihoods as voted in the Delphi Panel process to inform the selection of an ODP in the Draft 2024 ISP”. (re: App1. Stakeholder engagement page 18. Figure 5).

This is the exposed weakness of the draft ISP. A group voted to say there was a 15% chance of Hydrogen exports growth. It really has to be said, this is not science, merely group opinion. How many in the room were Hydrogen exporters ? Retail energy consumers or large generators maybe, but how many in the room have invested AUD\$1 in developing hydrogen exports ? How many people in the room on an individual score of (1-10) have a high level of understanding on what is currently going on in this highly specialist engineering field ? Please quantify these questions above and then we will take the 2024 ISP DELPHI PANEL seriously. AEMO – you can do better.

As a clear example see : “enabling the utilisation of excess renewable generation spread across the NEM”; (re: App2. Gen & Storage page 28. Figure 15). We note the projected total absence of H2 exporters in NSW. How could there be NO exporters in NSW, particularly considering their probable decisions to relocate from South Australia following recent legislation & industry policy failure. We note the low quantum of export load presented and a basic misunderstanding about H2 demand. The statement above would be similar to describing Gladstone QLD and WA North West Shelf Gas projects as utilising “excess black gas”.

H2. THE BLACK GAS BASELOAD REPLACEMENT.

Green Hydrogen can be used for at call (SGAs) gas powered electricity generation (Fcell,ICE,sCO2). Within AEMO Dashboard, this will need to be a new class of generator similar to BIOMASS or GAS.

Green Hydrogen should now be reviewed for small baseload* and regional grid forming services.

- Note* : Provides additional benefits of a strategically diverse and sovereign fuel supply.

The relevant point is all state markets will require widespread minor NEM Grid built outside of the current proposed regional REZ areas. The current REZ target areas function as an industry “straight jacket” that work for first mover industry incumbents. The proposed limited REZ strategy is a FAIL.

Our criticism of the Draft ISP is the excessive focus on transmission efficiency. Clearly for electricity buyers, transmission efficiency is irrelevant if NEM Grid connection is unavailable, future supply is expensive or worst case, the lights go out. This is potentially the product offer within the Draft ISP.

CROSS BORDER SUPPLY CAPACITY.

We note the **P2** power supply referenced above during the period between 6:00am and 7:30am on 25TH January 2024. We note the interconnectors between NSW/VIC/TAS and SA were “FULL”. We further note the apparent curtailment of demand in South Australia and operational mix of 4% liquid fuel generators. It seems apparent to the casual observer that the planning arrangements for interconnectors to South Australia are now completely inadequate for the job of meeting all demand. Current data suggests the Draft ISP grossly underestimated the immediacy of the problem. We recommend rapid addition of new 800-1000Mw interstate grid capacity between NSW and South Australia. This addition would further support national capacity to Western Australia via Ceduna, SA.

INADEQUATE PLANNING FOR SMALL BUSINESS SECTOR ENGAGEMENT.

The modelling within draft ISP fails to adequately consider flexible supply arrangement from the small/micro generator sector. Currently AEMO recognise the significant impact of private roof top PV solar supply & demand, unfortunately the planning arrangements are relatively silent on future growth and planning for small/micro scale private tradeable H2 generation.

MARKET STRUCTURES THAT SUPPORT MICRO GENERATOR CONNECTION.

In typical exchange based commodity markets, there is an open market with relatively low cost of entry and exit for trading parties. This is not the business case considered in the AEMO draft ISP. If you take an example of the ASX share market: A registered scrip exists in standard units, an online broker is registered on the trading platform, and trades are executed instantly at a retail cost of AUD\$8 per \$10,000 gross trade. This should be possible for micro generator owners selling “green power”. This could enable additional new flexible supply and higher electricity market “liquidity”. Considering AEMO receives AUD\$25.1m in indirect FY24 transmission network fees, (essentially small business/consumers have already paid for market access in their power bill), this adjustment to provide electricity market access should be possible and progress considered in the final ISP. Any change to improved market access would also greatly impact ISP H2 electricity forecasts.

We note this approach would more broadly share energy generation income within the community and can hasten zero emissions supply capacity through widespread community trade engagement.

DEMAND SIDE APPLIANCES.

There seems to be an underestimation of electrical appliance demand. Perhaps historic business as usual pervades the industry expectations of transition speed. Consider electrification of rail, truck or private vehicles. As green transport moves to regional areas, local charging will need to accelerate.

A glaring gap opens in the models from 2030 as the projected electricity demand gaps widen - depending on the scenario. A factual reality is that Hydrogen or battery trains can hop between grid charging points but eventually a grid will be required. The same will apply to electric cars driving on public holidays or major freights routes like the A1 highway (Sydney-Perth) supporting +40,000 heavy vehicle truck movements a year. How does AEMO propose to power these primary freight routes ?

GAS TURBINES – CONNECTING PEAKING INFRASTRUCTURE.

Immediate consideration should be given in the 2024 ISP to connection of Western Australia's +54% capacity of gas turbines to the NEM. E.g. 9 x turbines. SYNERGY Pinjar – Perth North. This will also assist to reduce Australian target emissions by providing additional price competition to distillate powered higher operating cost plants E.g SYNERGY – Kalgoorlie West 57Mw.

This nation building infrastructure will support high growth industrial (energy/mining) development between KALGOORLIE – WA and CEDUNA - SA. Previous and current DRAFT ISP's have ironically failed to consider or resolve this national supply gap. The projected route is rapidly deliverable being within the Australian Government controlled ARTC rail track corridor between Ooldea, SA and Kalgoorlie, WA. For simplicity we will call it REZ-SAWA (HVDC CEDUNA-KALGOORLIE). We note this REZ addition /correction is possible because the DRAFT ISP has already created a new REZ near Tasmania to satisfy AustGov. Please progress REZ-SAWA/HVDC CEDUNA-KALGOORLIE to match community expectations.

We understand AEMO and the DRAFT ISP must consider curtailment as a regulatory obligation. We note the current REZ planning arrangements do not meet that obligation. We also note the incorrect data prescribed for the CEDUNA, SA region as an example. We note the draft ISP failure to adequately consult and independently check supply and demand expectations for the target period.

BUSINESS MODEL FAILURE FOR INTERSTATE GRID CONNECTIONS.

The Draft ISP highlights a clear cost recovery model problem for AEMO and AustGov. Currently states pay for shared access to state grid interconnectors. This is a disagreeable indirect taxation method that is generally unseen by the retail consumer. However, the advantages of increased efficiency can benefit all consumers in all states by improved price competition. Avoiding TNSP duplication is not always preferable where low cost stranded energy is "straight jacketed" by monopoly operators.

For AEMO, introducing low cost generator competitors who build power production and add additional countercyclical capacity in unrelated weather and solar radiation regions is essential. Like NBN these national advantages probably require national funding. No pair of states can be expected to shoulder the construction cost burden of the national grid network build. The problem for the draft ISP is the assumed acceptance and support of the current grid funding model. This error limits rapid interstate grid build and supports the electricity industry status quo. That's a potential FAIL.

Thank you for the opportunity to comment on the Draft ISP.

IN CONCLUSION.

We note the incumbent industry's efforts to restrain new entrants by the various means identified in the DRAFT ISP. We seek AEMO's assistance to ensure small business competition is promoted.

We reject the proposed ISP as unfit for purpose particularly with consideration to Hydrogen growth.

We seek further consultation on matters raised prior to AEMO approval of the Final ISP.

Yours Faithfully,

Robert Sutton – CEO

LOST RIVER AUSTRALIA PTY LTD. **OSH2™**. SANDSTAR Mineral Resources.

Ceduna, South Australia.