

7 September 2016

Energy Security Taskforce Secretariat  
c/- Department of State Growth  
GPO Box 536  
Hobart, Tasmania, 7001

Dear Mr Geoff Willis AM,

I refer to the Tasmanian Energy Security Taskforce's (TEST) Consultation Paper published on 3 August 2016 inviting submissions by 9th September 2016.

I welcome the opportunity to comment on TEST's Consultation Paper and ask that you accept this letter and annex A : response to questions 1 to 7 as Steel Wave Power's comment for Tasmania's energy security as pertains to electricity.

It is noted AER's Tasmanian electricity distribution – Framework and approach 2017-2019 will support development of competitive markets for energy services and efficient investment in network and customer services, mainly under ACCC regulations, that a level playing field results for such investment from public and/or private sources. References to supporting items are below my valedictory.

I would be pleased to discuss this comment at your convenience. Should you wish to discuss this submission, please do not hesitate to contact undersigned.

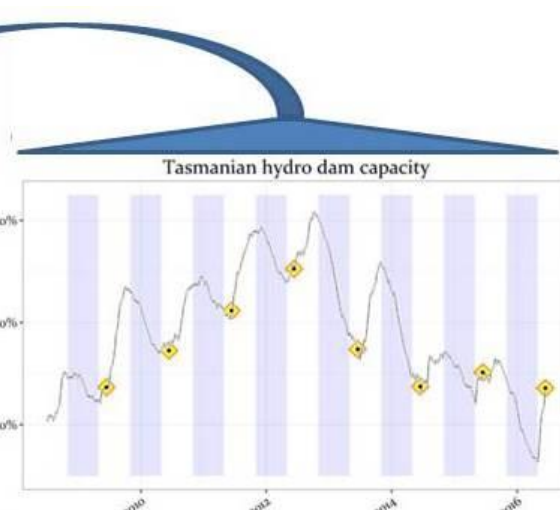
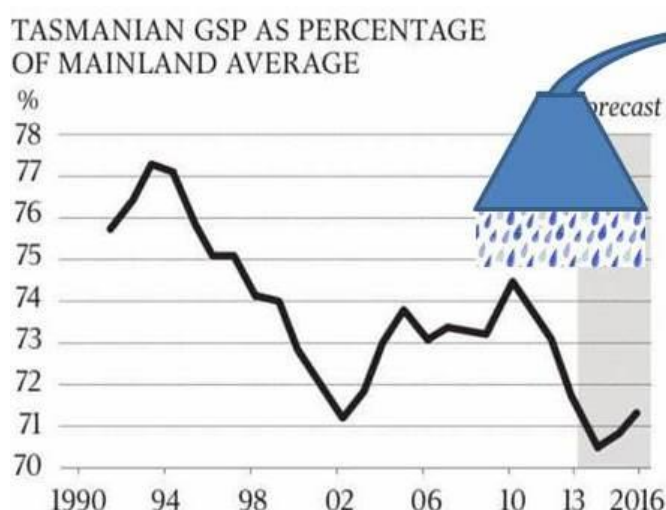
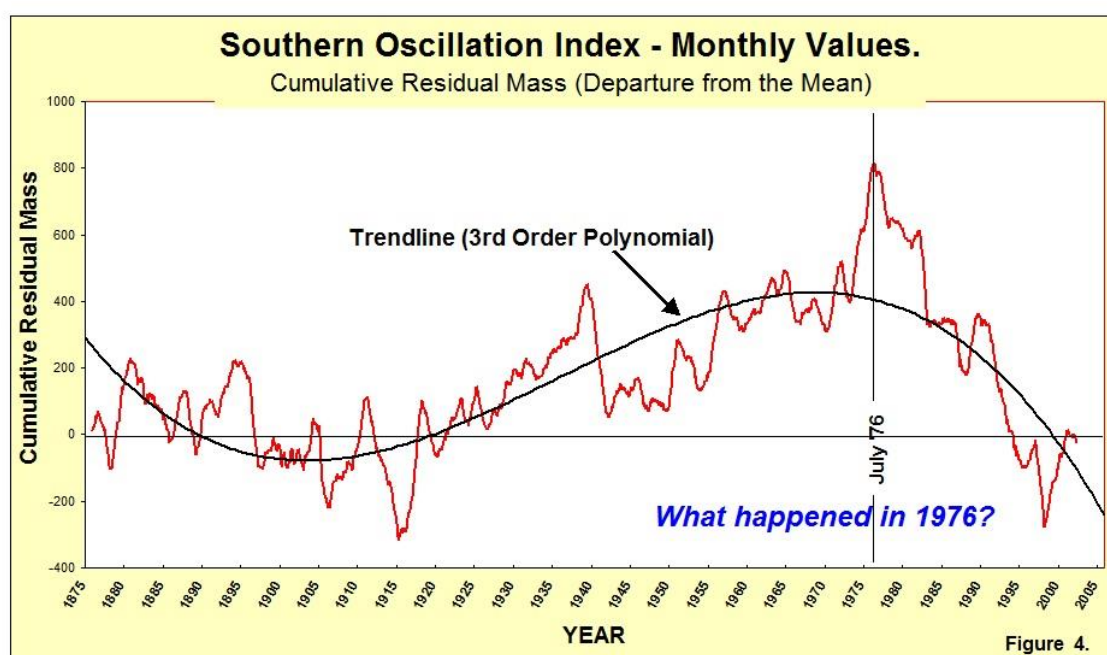
Yours sincerely,

Marcus Steel  
**Principal Application Engineer**  
**Steel Wave Power**  
**ABN: 72044918897**

References:

- A. <https://www.aer.gov.au/system/files/Steel%20Wave%20Power%20-%20Submission%20on%20Tasmanian%20electricity%20distribution%20Framework%20and%20approach%20-%202017%20Mar%202015.pdf> .
- B. <https://www.aer.gov.au/system/files/Steel%20Wave%20Power%20-%20Submission%20to%20framework%20and%20approach%20preliminary%20positions%20paper%20-%202015%20May%202015.pdf>

“When we mean to build,  
We first survey the plot, then draw the model;  
And when we see the figure of the house,  
Then must we rate the cost of the erection;  
Which if we find outweighs ability,  
What do we then but draw anew the model  
In fewer offices, or at last desist  
To build at all.”  
(William Shakespeare - King Henry IV part 2 act 1, sc. 3)



## Tasmanian Energy Security Taskforce - Question 1: What are the specific risks to Tasmanian energy security that you think the Taskforce should consider?

*"And oftentimes excusing of a fault doth make the fault the worse by the excuse." (Shakespeare - King John)*  
*"Until the advent of Basslink, Bell Bay will continue to play an important role in the management of generation risk, both in terms of supplementing managing water storages and in providing generating capacity in the event of other generation constraints."* - RELIABILITY REVIEW OF THE TASMANIAN POWER SYSTEM FOR 2001-2002 :::: That boat ran aground in early 2016.

### RELIABILITY REVIEW OF TASMANIAN POWER SYSTEM FOR 2001-2002

#### 4.2.5 Issues regarding low energy storage levels

##### Autumn 2002 incident

Record low yields were experienced in Autumn 2002, resulting in significant depletion of intermediate storages. In response to this situation the following steps were taken:

- One Bell Bay unit was brought into service.
- Voluntary load reductions were undertaken by a number of commercial and industrial customers.
- Storage management initiatives, including placing the Lake Echo Power Station by-pass into service and diverting water directly from Butlers Gorge dam to Wayatinah Power Station.
- Supplementary generation plants were initiated, involving plans to procure and install a number of 1MW diesel generators.

Significant inflows were experienced in June, which replenished the intermediate storages and allowed normal system operation to resume in late July.

The situation was managed by the Electricity Supply Ministerial Advisory Committee. A number of issues arose, including:

- Trigger points for thermal generation and supplementary generation.
- Supplementary generation availability and timing.

These issues are being addressed through Hydro Tasmania's Water Management Review, which is being conducted by the Energy Regulator.

To manage such situations in the future, Hydro Tasmania has instituted the following contingency plans:

- Placing the oil fired unit at Bell Bay on 5 days notice, in case the availability of full output from the gas fired unit was delayed.
- Commercial arrangements discussed with major customers for load reductions.
- Installation of a small supplementary generator at Bridgewater

### 2003 RELIABILITY REVIEW - ISSUES PAPER

#### 5.1.2 Short to medium term energy capacity

In the short to medium term, the intermediate hydro storages such as the Northern Headwater storages play a vital role in meeting the load. Record low yields in Autumn 2002 resulted in a severe depletion of these storages, requiring the implementation of a number of steps to avoid load restrictions.

To prevent a situation similar to Autumn 2002, The 2002 Reliability Report noted that Hydro Tasmania had the following contingency plan:

- Contractual arrangements for gas supply to the gas-fired unit will result in significant generation from that unit.
- The other Bell Bay unit will be placed on six weeks standby.
- In conjunction with Aurora, Hydro Tasmania is encouraging major industrial users to undertake maintenance during the autumn period.
- Plans are being progressed to obtain supplementary generation plant as necessary.
- Negotiations are continuing with large customers about possible load reductions should these prove necessary.

Given developments since the 2002 Reliability Review was published, is this contingency plan still appropriate?

##### Issues Arising:

Issue 5.1.1: Are there other energy capacity situations that need to be considered?

Issue 5.1.2: What is the probability of their occurrence?

Issue 5.1.3: What are the key impacts?

Issue 5.1.4: What are the options to contain the impacts?

Issue 5.1.5: What plans are in place to alleviate impacts?

### TASMANIAN ENERGY SUPPLY INDUSTRY PERFORMANCE REPORT 2003-04

## 4.7 Backup Energy Sources

### 4.7.1 Diesel Generators

Hydro Tasmania has developed an Emergency Response Plan for implementation of stand-by diesel generation. This involved the development of arrangements with suppliers of diesel engines to generate up to 60 MW of portable generation which could be made operational within 2 to 3 months. To test arrangements, Hydro Tasmania successfully tested a number of diesel generators at Bridgewater in August and September 2003. Hydro Tasmania has chosen Bastyan power station as the site for 60 MW of diesel generation should the need arise.

### 4.7.2 Demand Side Management

Demand side management (DSM) in conjunction with diesel supplementary units is seen as a generation support alternative should the full use of Bell Bay not be sufficient to meet demand. A DSM agreement has been entered into with Aurora with the activation of DSM is based on set triggers to ensure security of supply is maintained. The present arrangements, which last until commencement of Basslink operations, ensures 47 MW of DSM from major customers will be available when called on in extreme drought conditions. This DSM is based on a commercial arrangement between Hydro Tasmania, Aurora and the particular customers.

*"O this learning, what a thing it is!"*  
*(William Shakespeare, "The Taming of the Shrew: Act 1, Scene 2")*

Hydro tested diesel generators at Bridgewater in August and September 2003.

*"About 80 diesel generators had to be shipped in to maintain power security for the state."* – 2016 Energy Crisis

### ELECTRICITY IN TASMANIA A HYDRO TASMANIA PERSPECTIVE - October 2009

#### Security of supply

Current industry modelling indicates that the combination of current and proposed on-island generation plus Basslink imports provides a significant buffer against hydrological variability or other contingencies in the Tasmanian generation mix.

Future supply-demand scenarios could range for example from (a) an under-supply situation; (b) a supply-demand equilibrium; or (c) an over-supply situation. New generation investment decisions should therefore be tested against multiple scenario outcomes rather than being predicated on a single supply-demand scenario.

Basslink, through its ability to import or export, provides a valuable balancing capability against an under-supply or over-supply situation.

*"What's past is prologue" (William Shakespeare - The Tempest, Act 2, Scene 1)*



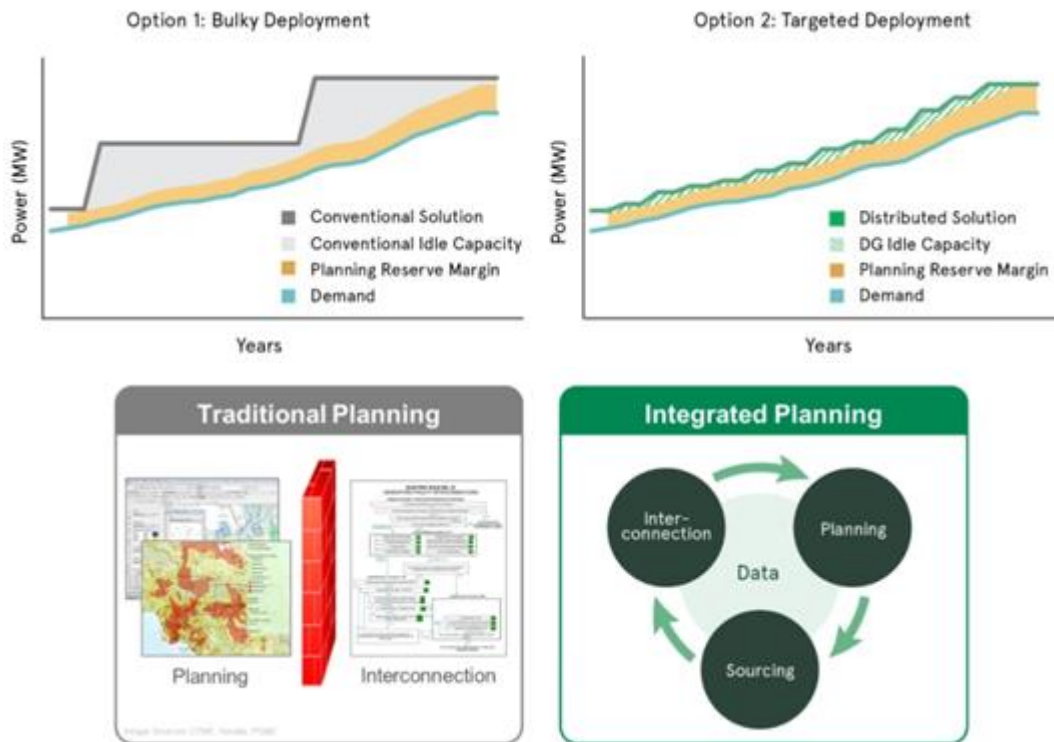
**Tasmanian Energy Security Taskforce - Question 2: What risks are acceptable to you or your business in terms of energy security and the risk/cost trade off? How well are you or your business able to manage energy supply disruptions?**

"We know what we are but know not what we may be." (William Shakespeare - Hamlet)

**Current Tasmanian Energy Security Design is Inefficient - number one risk to my business.** For example,

- How long has Cattle Hill Wind Farm (connection application 225 MW)<sub>a</sub> been on TAS "Gunna Do" list?
- Aren't powerline augmentations'<sub>b</sub> shown to be "penny-wise, pound-foolish" to fix energy security risk?
- How would a municipal waste and gas-fired power station<sub>c</sub> of 20 MW at Brighton be working for all?

To make energy security more efficient, grid planning has to modernise.



References for subscripts in questions a) to c) above:

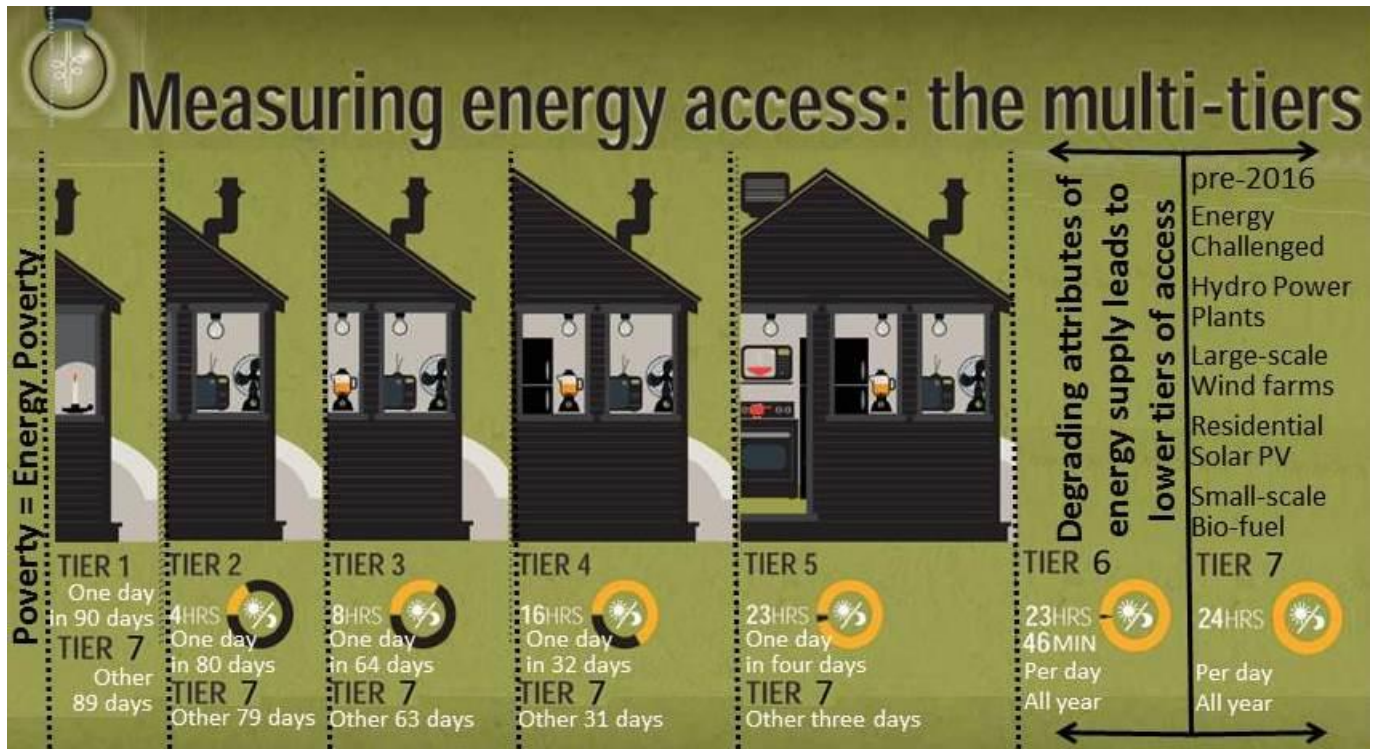
- Cattle Hill Wind Farm** – weblinks to **Interia Issues Working Group**

<http://www.aemc.gov.au/getattachment/e18b8f8e-fb88-43c6-9e02-b216ae92b997/Department-of-Infrastructure-Energy-and-Resources.aspx>  
<http://www.aemc.gov.au/getattachment/92d44062-06fe-460c-815f-246149285a48/Transend-Networks.aspx>  
[http://www.farrierswier.com.au/wp-content/uploads/2014/11/Best\\_practice\\_regulatory\\_analysis\\_of\\_emerging\\_RoCoF\\_problem\\_in\\_the\\_NEM\\_FSC.pdf](http://www.farrierswier.com.au/wp-content/uploads/2014/11/Best_practice_regulatory_analysis_of_emerging_RoCoF_problem_in_the_NEM_FSC.pdf)  
[http://www.electricity.dpac.tas.gov.au/\\_data/assets/pdf\\_file/0008/148193/OTTER\\_28.07.2011.pdf](http://www.electricity.dpac.tas.gov.au/_data/assets/pdf_file/0008/148193/OTTER_28.07.2011.pdf)  
[http://www.energyregulator.tas.gov.au/domino/otter.nsf/LookupFiles/Information\\_pack\\_provided\\_by\\_Hydro\\_Tasmania\\_at\\_presentation\\_to\\_OTTER\\_on\\_10%20September\\_2009\\_090916.pdf/\\$file/Information\\_pack\\_provided\\_by\\_Hydro\\_Tasmania\\_at\\_presentation\\_to\\_OTTER\\_on\\_10%20September\\_2009\\_090916.pdf](http://www.energyregulator.tas.gov.au/domino/otter.nsf/LookupFiles/Information_pack_provided_by_Hydro_Tasmania_at_presentation_to_OTTER_on_10%20September_2009_090916.pdf/$file/Information_pack_provided_by_Hydro_Tasmania_at_presentation_to_OTTER_on_10%20September_2009_090916.pdf)  
[http://www.energyregulator.tas.gov.au/domino/otter.nsf/LookupFiles/Hydro\\_Tasmanias\\_speaking\\_notes\\_to\\_presentation\\_made\\_to\\_OTTER\\_on\\_10%20September\\_2009\\_090916.pdf/\\$file/Hydro\\_Tasmanias\\_speaking\\_notes\\_to\\_presentation\\_made\\_to\\_OTTER\\_on\\_10%20September\\_2009\\_090916.pdf](http://www.energyregulator.tas.gov.au/domino/otter.nsf/LookupFiles/Hydro_Tasmanias_speaking_notes_to_presentation_made_to_OTTER_on_10%20September_2009_090916.pdf/$file/Hydro_Tasmanias_speaking_notes_to_presentation_made_to_OTTER_on_10%20September_2009_090916.pdf)  
[http://www.electricity.dpac.tas.gov.au/\\_data/assets/pdf\\_file/0008/148193/OTTER\\_28.07.2011.pdf](http://www.electricity.dpac.tas.gov.au/_data/assets/pdf_file/0008/148193/OTTER_28.07.2011.pdf)

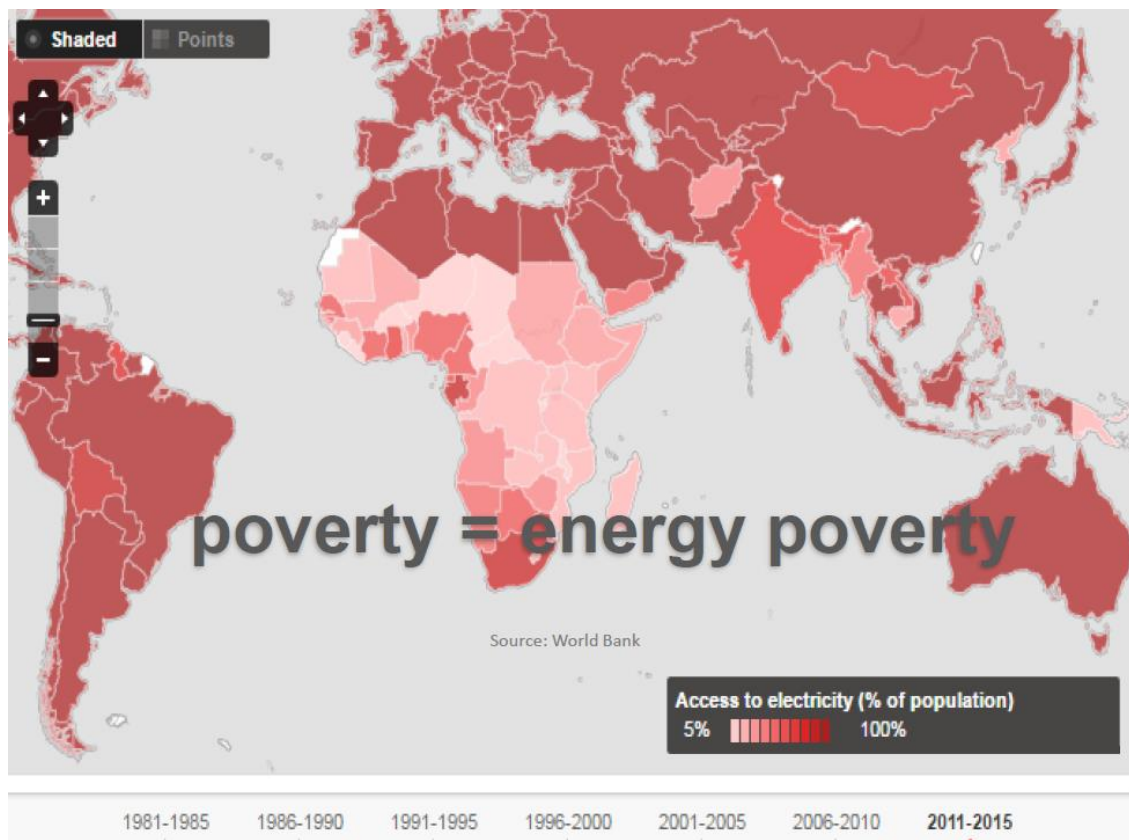
- Basslink HVDC is a powerline, Waddamana- Lindisfarne 220kV is a powerline, "Waddamana – Palmerston power supply security augmentation" is a powerline reliability upgrade, and so on.
- "Total Energy Services Tasmania Pty Ltd (TEST Energy) has publicly announced its plans to establish a municipal waste and gas-fired power station of around 20 MW at Brighton. TEST Energy has secured exclusive rights to utilise the SEGHERS technology from Belgium. Construction is expected to start on the \$90 million facility in early 2003." - Tasmanian Electricity Supply Industry Performance Report 2002

Tasmanian Energy Security Taskforce - Question 3: What level of reliable electricity supply is required by customers? Do customers consider reliability should be as close as possible to 100 per cent at all times, or would, for example, reliable supply closer to 99 per cent of the time be acceptable if the cost is significantly less?

"I like not fair terms and a villain's mind." (William Shakespeare - The Merchant of Venice)



"If it sounds too good to be true, it probably is" – customers, you get nothing for nothing.



Tasmanian Energy Security Taskforce - Question 4: How well are Tasmania's energy security risks understood and communicated to the community?

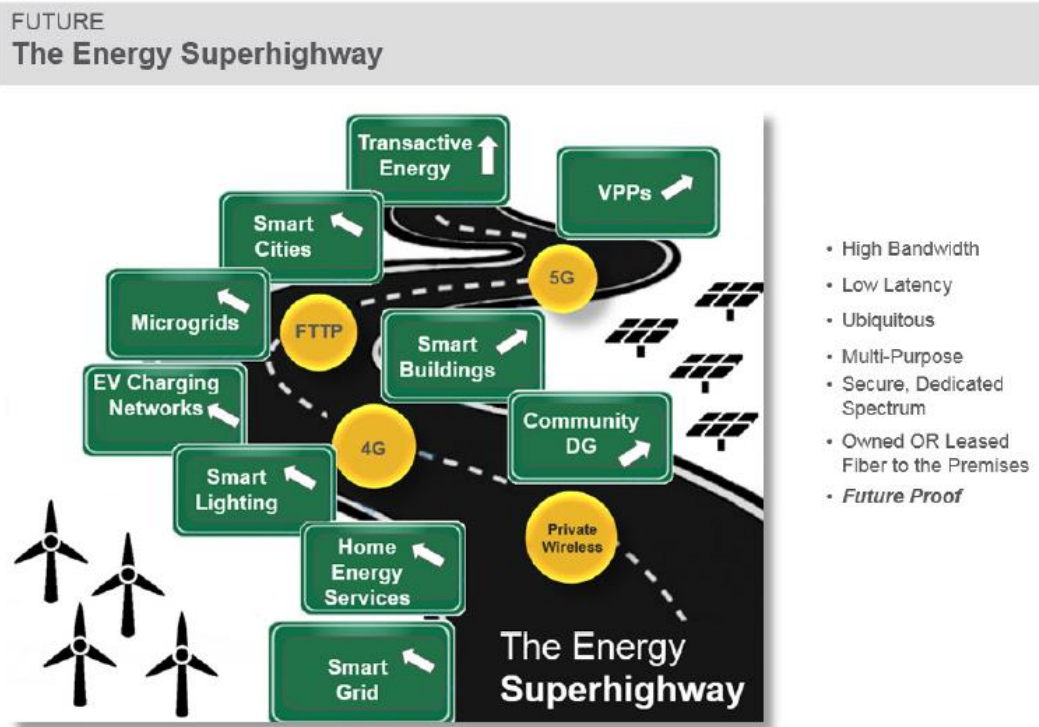
## **"Communications in the Energy Cloud"**

### ***The Energy Superhighway and the Future of Grid Connectivity***

Richelle Elberg (Principal Research Analyst) / Mackinnon Lawrence (Senior Research Director)

Navigant Consulting, Inc. 1375 Walnut Street, Suite 100, Boulder, CO 80302 USA

PUBLISHED 1Q 2016



## **VERSUS**

"It is a tale Told by an idiot, full of sound and fury, Signifying nothing." (William Shakespeare - Macbeth)

Tasmania has fallen behind the rest of the country for digital inclusion, despite being promised "first mover" advantage with the National Broadband Network. A new digital inclusion index, a measurement of people's ability to participate online, shows Tasmania is the worst performing state or territory in the country and the only region to go backwards in the past two years. Tasmania's rating of 48.2 for digital inclusion is 6.3 points below the national average. The Australian Capital Territory leads the way with a rating of 59.7. The ratings are based on eight criteria, including internet access, affordability and ability. The report's lead author, Julian Thomas from Swinburne University in Victoria, said Tasmania's rating was a concern. "The internet is becoming more and more about everyday life," Professor Thomas said. "The problem of not being online is increasing. "If you think back 20 years, if you did not have an email address it would not have been such a big problem, but these days it is a significant problem.

- TasICT chief executive Will Kestin said the results were surprising. "We feel there has been mostly positive progression for the state regarding connectivity and digital inclusion," he said. "The NBN is now meeting their roll-out milestones and the Government has done some good programs around 'digital readiness'."
- Tasmania's Information Technology and Innovation Minister Michael Ferguson said the report identified socio-economic factors which were well-known and longstanding issues in Tasmania. "To specifically address digital literacy, access and education we've introduced a wide range of programs," he said. "These range from those targeting the early primary years, such as Code Club, through to the IT's Your Career and IT@Work programs for older students. "It's by giving Tasmanians the education, tools and opportunities that we'll see the economic benefits of the NBN infrastructure."
- Prof Thomas said improving the digital ability of residents was something that the Government and community could do something about. "Digital ability is about the kinds of skills and types of things you do online – it goes to people's confidence and capacity," he said.



**Tasmanian Energy Security Taskforce - Question 5: What existing frameworks for assessing and monitoring energy security might the Taskforce wish to consider?**

"Strong reasons make strong actions." (William Shakespeare - King John)

**EXHIBIT V-10: AMBIGUITY AND LEVELIZED COST**

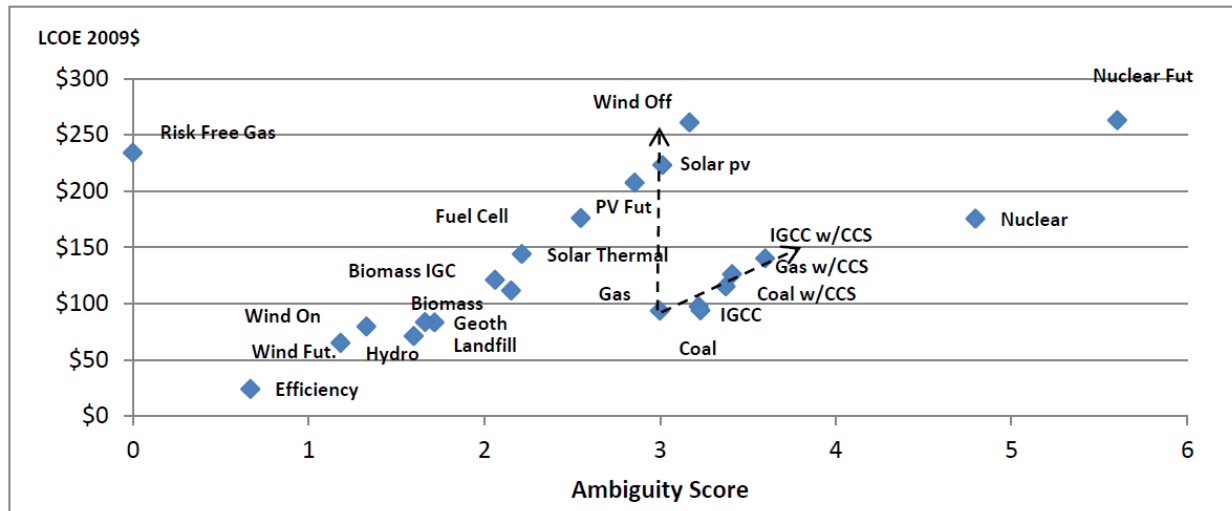


Exhibit V-10 combines the ‘new’ part of this analysis – the ambiguity scale – with the traditional core of utility regulation – levelized cost. The map is quite clear. Efficiency is especially attractive because it lowers cost and ambiguity, while renewables like hydro and wind, and biomass, as well as landfill and geothermal reduce ambiguity. The route to the future is also clear. It begins with efficiency, wind and a mix of other renewables, with gas as a complement. It then can proceed on one of two paths, a renewable route that goes through solar and offshore wind, which would continue to rely on gas as a complement, or a fossil fuel path that includes carbon capture and storage. Nuclear is the most unattractive of the resources.

***“LEAST-COST PLANNING FOR 21ST CENTURY ELECTRICITY SUPPLY  
MEETING THE CHALLENGES OF COMPLEXITY AND AMBIGUITY IN DECISION MAKING”***

Mark Cooper

Senior Fellow for Economic Analysis,  
Institute for Energy and the Environment, Vermont Law School  
June, 2011

***“Provision of Ancillary Services by Distributed Generators  
Technological and Economic Perspective”***

Martin Braun

Erneuerbare Energien und Energieeffizienz  
Renewable Energies and Energy Efficiency  
Band 10 / Vol. 10

Herausgegeben von / Edited by  
Prof. Dr.-Ing. Jürgen Schmid, Universität Kassel  
22th December 2008

***“NAVIGATING THE ENERGY TRANSFORMATION***

***BUILDING A COMPETITIVE ADVANTAGE FOR ENERGY CLOUD 2.0”***

MACKINNON LAWRENCE (Senior Research Director) / JAN VRINS (Global Energy Practice Leader)

Navigant Consulting, Inc.  
1375 Walnut Street, Suite 100  
Boulder, CO 80302 USA  
PUBLISHED 3Q 2016

## Tasmanian Energy Security Taskforce - Question 6: Which potential energy security solutions should the Taskforce consider?

"How far that little candle throws his beams!" (William Shakespeare - The Merchant of Venice)

### Charting the course for Tasmania's energy cloud roadmap

3

Author(s)

✓ Dan Candotti ; ✓ Marcus D.W. Steel ; ✓ Andrew C. West

[View All Authors](#)
[Abstract](#)
[Authors](#)
[Figures](#)
[References](#)
[Citations](#)
[Keywords](#)
[Metrics](#)
[Media](#)

#### Abstract:

Grid electricity systems have evolved from un-complex systems and loosely coupled transmission grids, up to the state of the art present-day as highly complex and tightly coupled infrastructures, greatly based on automation systems with various levels of reliability. Tasmania's electricity ecosystem is both representative of international norms and sharply more mature in terms of renewable energy penetration. The management of the Tasmania's electricity infrastructure has become dependent on its information system infrastructure as automation continues to replace manual operations, and as market forces demand more accurate and suitable information as the power system equipment become older. Adapting Tasmania's electricity grid with Community Resilience Microgrids based on wind power, residential solar PV and stored energy systems requires more complex monitoring and control of the electricity network. The Energy Cloud concept [1] sits at the confluence of relevant technology trends enabling two-way flow of electrons, shared infrastructure with many users connected to multiple networks, blending of centralized and decentralized control and management, and maximum flexibility. The latest White Paper on Security Standards in IEC TC57 progresses two infrastructures - the power system infrastructure and the information system infrastructure - concurrently while supporting coherence with cyber security requirements for business processes involving Home Area Networks.

**Published in:** [Power and Energy Engineering Conference \(APPEEC\), 2015 IEEE PES Asia-Pacific](#)

**Date of Conference:** 15-18 Nov. 2015

**INSPEC Accession Number:** 15719132

**Date Added to IEEE Xplore:** 14 January 2016

**DOI:** [10.1109/APPEEC.2015.7380915](https://doi.org/10.1109/APPEEC.2015.7380915)

► **ISBN Information:**

**Publisher:** IEEE

**Visit weblink:** <http://ieeexplore.ieee.org/document/7380915/>

### The Energy Cloud: Today and Tomorrow

#### TODAY One-Way Power System



©2014 Navigant Consulting, Inc. All rights reserved.

- Large, centrally located generation facilities
- Designed for one-way energy flow
- Utility controlled
- Technologically inflexible
- Simple market structures and transactions
- Highly regulated (rate base) and pass through

#### EMERGING The Energy Cloud



(Source: Navigant Consulting)

- Distributed energy resources
- Multiple inputs and users, supporting two-way energy flows
- Digitalization of the electric-mechanical infrastructure: smart grid and behind the meter energy management systems
- Flexible, dynamic, and resilient
- Complex market structures and transactions
- Regulation changing rapidly around renewables, distributed generation (solar, microgrid, storage), net metering etc.

### "NAVIGATING THE ENERGY TRANSFORMATION

#### BUILDING A COMPETITIVE ADVANTAGE FOR ENERGY CLOUD 2.0"

MACKINNON LAWRENCE (Senior Research Director) / JAN VRINS (Global Energy Practice Leader)

Navigant Consulting, Inc.

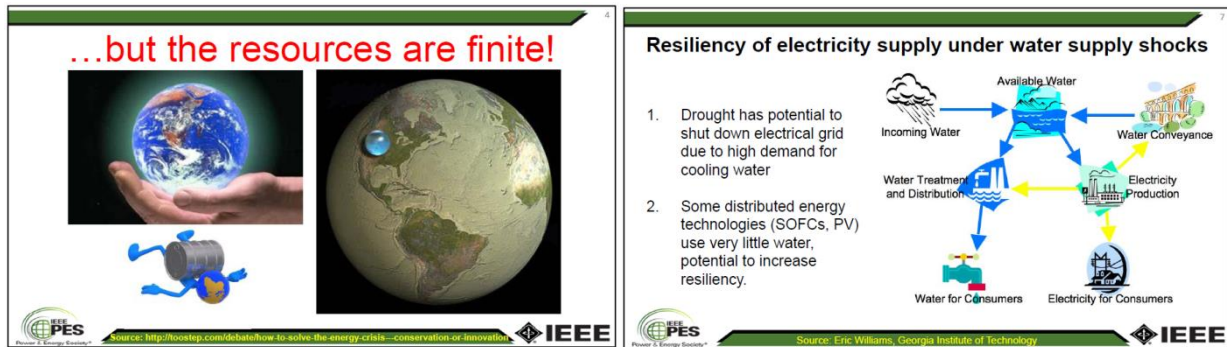


**Tasmanian Energy Security Taskforce - Question 7: What international examples of water storage management practices should be considered by the Taskforce when reviewing Hydro Tasmania's approach?**

**Tasmanian Energy Security Taskforce - Question 8: What governance arrangements might be useful to consider in strengthening water storage management in Tasmania?**

**Tasmanian Energy Security Taskforce - Question 9: What economic opportunities and risks are there for Tasmania associated with a second Bass Strait interconnector, and how would it improve Tasmania's energy security?**

"Go wisely and slowly. Those who rush, stumble and fall." (William Shakespeare - Romeo and Juliet)



## Conclusions

- Interactions are too complex to fully understand, model and account for
- Changes in patterns of use of resources are needed before they become irreversible
- Complexity of interactions and natural laws are forcing changes to be evolutionary...
- ...but that attitude is revolutionary!

*"Sustainable Energy Future: Evolution or Revolution?"*

2012 EEA Auckland, New Zealand, June 22, 2012

MIROSLAV M. BEGOVIC (then President-Elect, IEEE Power & Energy Society)

