

Lockhart Hybrid Power plant - an opportunity for all Councils

Presented by Gordon Hinds

Better Energy Technology

Wednesday 13th of September 2023

REROC Conference

Better Energy Technology (BET)

- My company formed in partnership with Professor Donald Sadoway of MIT (Boston) to develop new battery technology in Australia in 2014
 - Liquid metal Battery (AMBRI)
- BET failed to gain support in Australia for that groundbreaking technology which has now been successfully developed by Bill Gates and the team at AMBRI
- Taking the learning from my course work at Boston University and MIT I elected to develop a demonstration of how renewable energy can be supplied 24/7 to a regional town and earn it valuable income from the energy export

Lockhart

- BET chose Lockhart because of its unique qualities in size, geography and technical infrastructure
- Big enough to be significant, but not too big
- About 1,000 people, 300 homes – perfect for modelling/scaling
- And it had strong town support
- To my knowledge a trial like Lockhart still hasn't been done despite hundreds of billions invested in renewable energy broadly in Australia
- The renewable 'revolution' is now touted as costing \$1 trillion and a lot of the technology will only last 20 years
- Energy Prices will not go down. They have to go up as investors seek payback
- The Lockhart project was designed to protect the town from energy price increases and provide energy security
- It was to turn a cost to the town (energy supply) to a profit



Generational Assets

- Lockhart
 - A 10 megawatt (MW) solar farm at the Zone Sub
 - 10MW/20MWH battery at the zone sub
 - Construction budget \$34 million
 - Average income \$6 million pa
 - Running cost \$1 million
- It could power a town of 1,000 people 24/7
- Lockhart consumes 17MWh a day
- The plant will generate 60 MWh a day
- MW is the power metric and MWh is the storage or accumulation over time metric



Storage (Batteries)

- To make renewables work 24/7 you need storage
- Batteries at Lockhart are the big revenue drivers
- It's only recently been possible to have bi-directional inverters to power hybrid plants like Lockhart where the plant is controlled by a single unit that manages both the solar and battery
- While the media reports solar as power 'x,000 homes' the truth is it only does so for 6 hours a day, and the average in NSW is less (4.3)
- So with 24 hours in a day, how do you power the other hours?
- You need batteries
- At Lockhart we have a 20MWh battery planned with capacity to increase it to 40MWh – so a big battery

Similar plant to Lockhart



Regional town's role

- The 'energy revolution' is happening in the backyard of Regional Australia
- There is no town I know of that has a meaningful stake in this revolution
- Short-term income from construction helps the town economy. The pie shop will do well during construction. The motel as well. The pub. That's about it
- Larger projects bypass the fees that would go to Council as they are 'state significant'
- There is no long-term benefit to towns
- To my mind Regional Australia is being ripped off
- Councils should have a stake in these developments
- Councils are generally starved of revenue and have mounting costs

What's in it for towns?

- Millions of dollars in extra revenue if they have an equity stake
- Councils aren't set up generally to be able to develop these renewable projects
- They need to collaborate
- Towns need to get the NSW Government on board
- ARENA and the CEFC should also come on board
- The benefits to towns are multiple
- If Matt Keane provided BET with a NSW Government guarantee for finance, BET offered to gift 30% equity to Lockhart Council, and provide discounted power to the town
- It was a great deal
- He proved to be tone deaf on the subject
- The NSW Energy Department team were equally uninterested
- Had our project been operating at Lockhart the 30% stake would have generated \$3 million in revenue to Lockhart Shire Council last year
- More than its revenue from rates

Regulations get in the way

- The regulations stand in the way of allowing towns to do what is proposed at Lockhart
 - NER
- That needs to change
- Regulators
 - AER
 - AEMO
 - AEMC
- Time doesn't permit me to delve into that issue but its very real, but with lobbying it can change
- If need be and there is a wish I am happy to invest time in a workshop where the details can be explained and solutions created

Government Role

- Federal Government
 - ARENA
 - Department of Energy
 - Clean Energy Finance Corporation (CEFC)
- State Government
 - Energy and Climate Change
 - Regional Development
- Councils
- It takes forever to gain approvals
- It took BET six years, I thought it would be one year
- The World War 2 was quicker

VE day May 5, 1945, the end of WW2



less than six years after the start
of WW2 on September 1, 1939

BET's go-ahead to progress from AEMO took longer to be secured than the entire second world war...



Level 22
530 Collins Street
Melbourne VIC 3000

Postal address
GPO Box 2008
Melbourne VIC 3001

T 1300 858 724
F 03 9409 8010
E info@aemo.com.au

4 August 2023

Darrin Edwards
Major Network Connections Manager
Essential Energy
PO Box 5730 Port Macquarie
NSW, 2444

By Email: darrin.edwards@essentialenergy.com.au

Dear Darrin,

Lockhart – Response to Proposed Access Standards

AEMO has completed its assessment of the proposed access standards under clause 5.3.4A(d) of the National Electricity Rules (NER) for the proposed Lockhart Hybrid Power Plant (the Project) with the following particulars:

Project	Lockhart Hybrid Power Plant
Connection Applicant	Better Energy Technology Pty (BET)
Type of Generation	PV + BESS Hybrid
Maximum Capacity at the Connection Point (or Dispatched Location)	9.9 MW
Connection Point	Lockhart Zone Substation 66 kV Bus
Connection Point Voltage	66 kV
Proposed System Strength Remediation	To be determined
Expected Commissioning Date	To be determined

1. Purpose

This letter documents AEMO's advice to the connection Network Service Provider under clause 5.3.4A(d) of the NER and is not to be used or relied on for any other purpose. In particular, AEMO's advice:

- Does not indicate that the Project is committed or likely to proceed to completion;
- Provides no assurance that the Project will be capable of meeting its applicable access standards on construction; and
- Should not be used or relied on to support any investment decision for the Project.

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Australian Energy Market Operator Ltd ABN 14 012 010 527
Lockhart Hybrid Power Plant 5.3.4A Letter

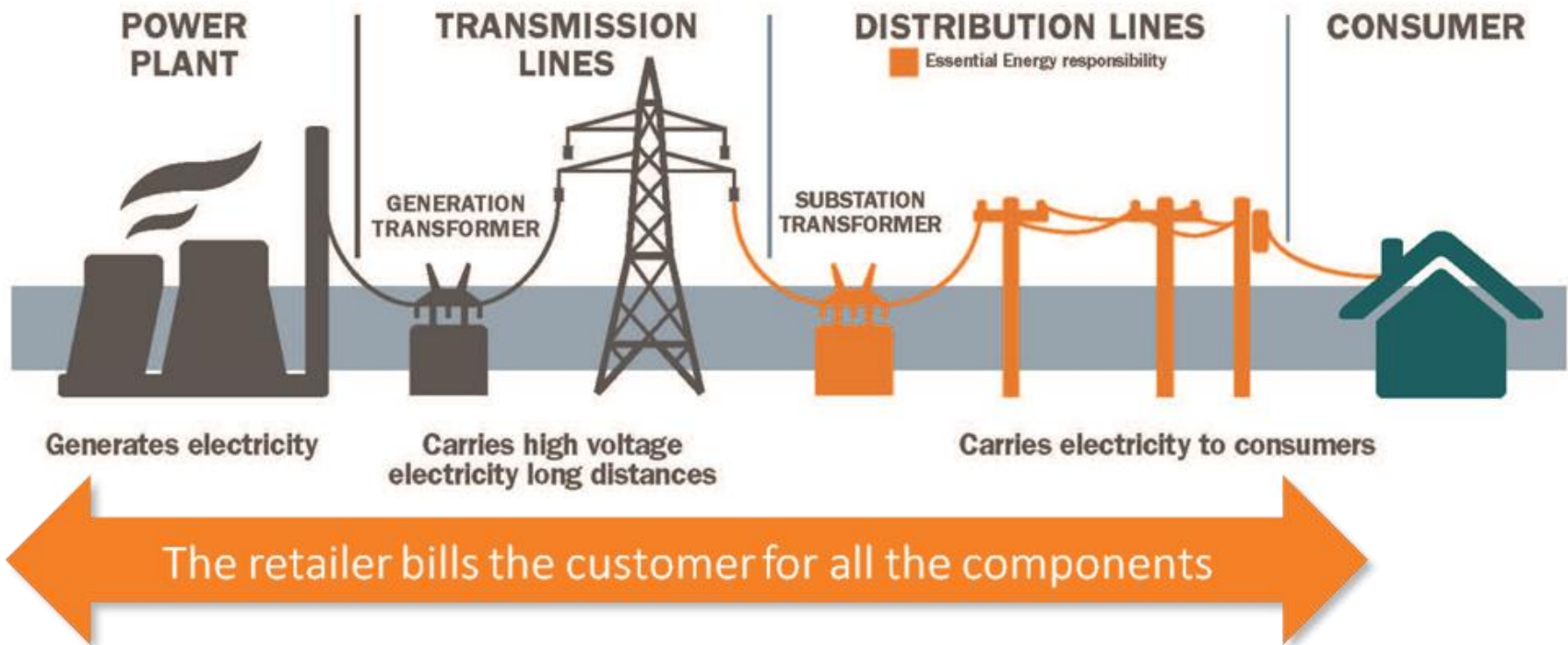


Getting connected to the NEM in Australia is a ridiculously slow, complex, and expensive process

Essential Energy

- Essential Energy is a key stakeholder as it owns the grid for the majority of councils
- The use of their grid allows towns to export power to major urban areas
- Rural Australia supplies food to cities
- Now it can supply power too
- Essential's grid enables that to happen

The Grid



Other community projects

- There are some 'community' projects around
- Grong Grong and Goulburn are two that spring to mind – there are others
- These are relatively small scale – Goulburn in particular. It has 30,000 people. It would consume 30 times Lockhart's energy needs so 510 MWh a day. To have power security and an export income the power plant at Goulburn would need to be at least 20 times larger with an investment north of \$500 million, closer to \$1 billion
- Community projects are driven by passion and only supply a fraction of the towns supply
- They are not owned by Council and have a few shareholders in what is ostensibly a 'non for profit' outfit with little chance of providing long-term income streams to reinvest when required
- In my view these are well meaning projects, driven by passion but essentially tokens

REROC Next Steps

- To become involved in the renewable revolution, councils need to get organized
- No one will present this to the NSW Government other than yourselves
- You need to agree on a strategy and lobby the NSW Government
- Creating independent income streams through the sale of electricity into the grid insulates Councils against the future vagaries of NSW grant funding
- You will need to collaborate with developers
- Time however is not your friend
- This opportunity will close and close soon (within years)

BET Contact

Gordon Hinds

gordon@betterenergy.tech

Better Energy Technology

0419266932

betterenergy.tech