WINTON GEOTHERMAL ENERGY PROJECT UPDATE

IPWEAQ CQ BRANCH CONFERENCE
EMERALD 10 JUNE 2016
Agenda

- Introduction – LGIS and Geothermal Energy
- Latest on Winton geothermal energy project procurement
- Developments on distribution of geothermal power at Winton
- Update of wider renewable energy program
- News of potential ARENA funding
- Summary
About LGIS

Established 10 years ago to provide a range of specialist services designed to service the local government sector

Wholly owned by LGAQ, LGIS may be procured without tenders

Expanded range of services:

• **Advisory Services** across a range of key areas including Asset Management, Project Management, Waste and Water, disaster management etc.

• Solutions to address market failure within the *Energy* industry, with a range of solutions including Geothermal, Solar, Energy from Waste and demand management.

• Fostering and de-risking the introduction of **Innovation** – such as the use of Drones and Smart Technology (Lighting etc.), technical staffing, management tools (assets management & waste)
Reminder – Benefits of Geothermal Energy

- Capacity to substantially **reduce annual energy costs**
- Protects against **future power price rises**
- Proven and reliable technology to **improve supply efficiency and reliability**
- Scalable solution allowing design **flexibility and staging**
- Not weather dependent: **runs 24/7**
- Reduces need to **cool bore water**
- Environmentally sustainable with **no emissions**
- Huge potential for **future revenue generation**
Organic Rankine Cycle Geothermal Energy Plant

- Low temp organic refrigerant can operate with bore temperature as low as 75 deg C
- Increased water temperature = improved efficiency
- Sealed binary system guarantees water supply safety
- Heat removed from water supply
Winton Geothermal Energy Construction

• gTET to supply 2 x 155 kW ORC power plants
  – base load (24 h/day) and peak load (14h/day)

• Marley Flow Control to supply cooling tower
  – galvanised steel – 4 cells double height to reduce footprint

• gTET to integrate the ORC plant and cooling tower

• Council to complete or contract civil works

• Components built off site and to arrive on site by November

• Operation December 2016 – January 2017

• Launch January 2017
gTET Geothermal Power Plant
Marley Cooling Tower
Distribution Network Challenges

• Ergon initially advised options not available:
  – charge for carrying geothermal power (tolling),
  – deduct power generated from power used (virtual net metering)
  – reduced tariffs to account for power supplied (network charges)

• Renting space on Ergon network - available but highly expensive and carries unacceptable risk

• Feed-in tariff - available but not economically viable as sole revenue stream at 4c/kWh initially offered by Ergon
Private Network Solution

Private underground network solution connects major Council assets to power plant

- Low maintenance and reliable distribution
- Retain Ergon connection as back-up and top-up
- Potential to use Ergon assets where Council is the only customer (blue and green lines)
- Economically viable
Potential for Using Ergon Network

- Ergon and DEWS highly motivated to facilitate distribution through existing Ergon network and avoid private network
- Ergon developing a commercial agreement with Council as a short term arrangement – by 30 June 2016
- LGIS and Ergon participating in virtual trial of Virtual Net Metering and Local Generation Network Credits, in support of proposed rule change under consideration by AEMC
- Approval to necessary changes to National Electricity Rules is a long term prospect
- Availability of Ergon assets would improve business cases and potential for renewable power for whole communities
LGIS Geothermal Energy Program

• Winton operational by end 2016
• Concept design studies for Charleville, Longreach, Normanton and Karumba completed – Roma underway
• Feasibility reviews completed or in progress for 6 other towns
• Potential projects for another 8 councils
• Total potential council savings approximately $150M
• Renewable power for all of Winton and Ilfracombe towns – geothermal/solar/battery/diesel
• Ergon developing collaborative agreement with LGIS eg renewable power plants as net energy exporters
Opportunities on the Great Artesian Basin

- DNRM Bore Reports confirm availability of *[artesian water of suitable temperatures and flow rates for geothermal energy throughout Qld]*
- LGIS holds geothermal exploration permits for numerous Qld towns across the GAB
- LGIS in discussion with ARENA for funding to off-set costs and reduce risk for councils currently part of the LGIS geothermal program
Water Temperature Increases With Depth
Solutions for Raising Bore Water Temperature

• Water from current bores less than 80°C in most towns
• Drill to access deeper, hotter aquifers
  – new bores (cost about $330/m plus establishment)
  – extend existing (may not be cost effective)
• Hybrid renewable energy systems
  – solar thermal pre-heating bore water
  – solar PV powered pre-heating bore water
  – solar PV powered chillers for cooling water
• Project specific solutions can be developed
ARENA Contingent Grant for Drilling

- LGIS presented to Australian Renewable Energy Agency (ARENA) on funding to reduce financial risk of bore drilling
- ARENA co-funding would be available where drilling costs exceed budget, to ensure project viability
- Any grants would be available only to councils committed to projects
- Limited funds available – first come first served
- ARENA agreed to fast track applications – no EOI
- Application in progress
Summary

• Winton geothermal plant under construction and due to be operating by 2017
• Ergon very keen to provide short-term solution for distribution to avoid Council building a network
• Availability of Ergon distribution would facilitate other renewable energy projects and provide potential for whole of town power supply
• ARENA interested in co-funding bore drilling for geothermal energy at other towns
Questions?