

A SUMMARY OF GEOTHERMAL DEVELOPMENT IN VANUATU

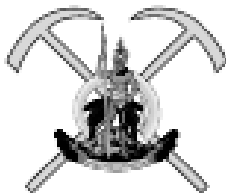
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Vanuatu



Outline

- Vanuatu Renewable Energy Brief
- World Bank/ Castle Rock Report (Vanuatu: Efate Geothermal Power and Island-Ring Grid Development Framework)
- Takara Geothermal Licensing
- Desk Top and internal research - 2016
- Legislative review
- Challenges



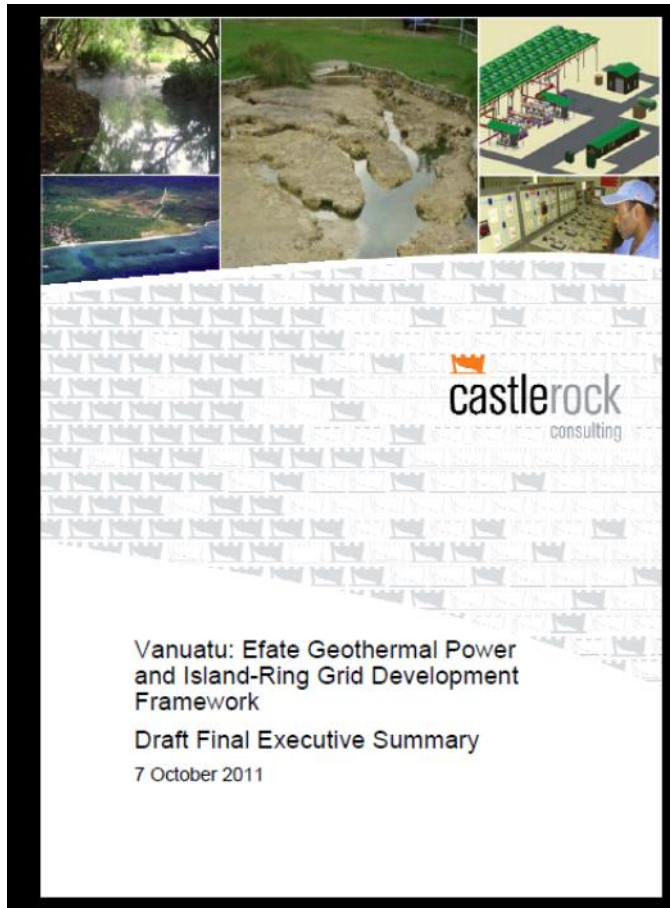
Vanuatu Renewable Energy Brief

- By the end of 2012 renewable energy reached 4.4MW out of 31.5MW for the 4 concession areas
- By January 2013, mixing of copra oil and diesel contributed to a cumulated 29.5% for renewable energy.
- Takara Geothermal energy is anticipated to produce 8 MW if successful.



Pre-Feasibility study of Efate Geothermal power plant and Island ring grid development program

(World Bank/ Castle Rock consulting) – April – October 2011

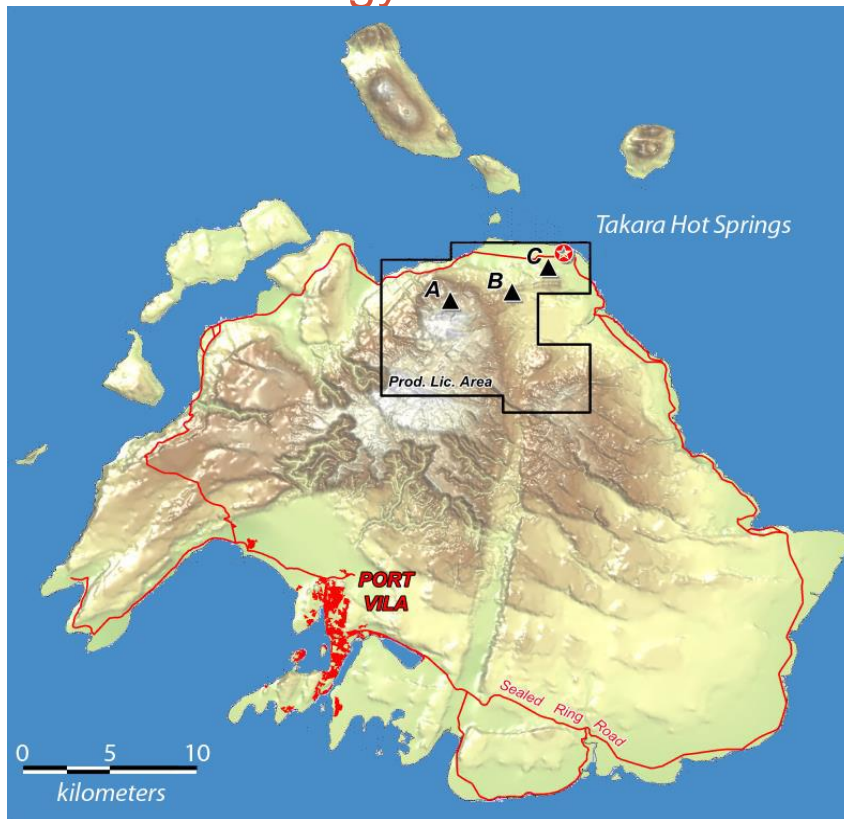


- Takara Geothermal project should **be prioritised above diesel, coconut oil or other solar or wind energy**
- Further exploration is required (With support from the Government)
- The project will rely on private sector due to substantial investment requirements and the highly specialised nature of geothermal developments
- PPP mechanisms to maximise benefits.
- Establishment of a Geothermal Taskforce committee.



Takara Geothermal License

Kuth Energy License Area



Source: www.Kuthenergy.com/vanuatu

- Surface Temperature and water chemistry survey conducted
- Geo-physics survey conducted and 3 drill targets identified
- Drilling Environment Impact Assessment completed and approved on January 2015
- Slim hole drilling yet to be conducted.



Desk Top & Geothermal internal research for 2016

Geothermal and Volcanic features where hydrothermal systems are likely to exist – (By priority)

Island	Number of Geothermal and volcanic features
1. Efate	21
2. Tanna	12
3. Vanua Lava	15
4. Pentecost	2
5. Tongoa	2
Ambrym	8
Ambae	1
Emau	1
Gaua	10
Lopevi	3
Santo	1

Total project costs include logistics estimation

Field Logistics	Cost
flights for 2	500,000
accommodation (tent/bungalow)	100,000
disposables	100,000
sampling equipment	
sample bottles (+ preparation)	41,174
sample prep	10,000
Field test kit	76,874
sample analysis	
upper estimate	930,987.50
lower estimate	561,864.31
Shipping	
equipment + analysis shipping	250000
lower total estimate (act labs)	1,639,912.31
Upper total estimate (NZGAL)	2,009,035.5



Geothermal Energy Act NO. 6 OF 1987

Legislative review

- Custom owner benefits
- Downstream consideration in the legislation
- The need to have stronger Environment Consideration
- Legislate the establishment of the Geothermal advisory committee (institutional framework)



Challenges/ Opportunities

- Land Disputes
- Limited internal capacity
- Funding to conduct exploratory work



Thank yu tumas

