

Global Geothermal Development Plan Roundtable

Dominica Geothermal Resource Development Programme

Presented by:

Lucien Blackmoore
Permanent Secretary
Ministry of Public Works, Energy and Ports
Commonwealth of Dominica

Hosted by:

Ministry of Foreign Affairs and World Bank/ESMAP
The Hague, Netherlands
19-20 November 2013

11/11/2013 15:44

Drilling Operation on Lily Valley Site

Commonwealth of Dominica

- **Coat of Arms:**



Apres Bondie, C'est Le Ter (After God is the Earth)

- **Anthem:** *Isle of Beauty, Isle of Splendour*
- **Flag:**



Located in the lesser Antilles



Global Geothermal Development Plan
Roundtable - Dominica's Experience



Global Geothermal Development Plan
 Roundtable - Dominica's Experience

Background

- **Geographic**
 - **750** km² (290 sq. miles)
 - Situated within Eastern Caribbean
 - Mountainous and rugged landmass
 - Fertile soils, abundant rainfall and lush vegetation
- **Socio-economic**
 - Population of **71,263** (2011 census)
 - GDP of **\$479.6** USD (2012)
 - Life expectancy of **77.6** yrs
 - Health Index of **0.908**
 - Human Development Index (HDI) of **0.745**

- **Natural Environment**
- High incidence of tall, rugged mountains
- Abundance of rainfall, rivers, lakes, waterfalls, hot springs
- Vast igneous rock formation
- Very active geothermal-volcanic activity
 - Home to the 2nd largest boiling lake in the world



- Rich flora and fauna
- Plentiful aquatic and marine aquatic life

- **Electricity Snapshot**
- Installed capacity: **26.7 MW**
 - **20.1 MW Diesel**
 - **6.6 MW Hydro**
- Total Energy Produced: **100.5 GWh**
 - **64% Diesel**
 - **36% Hydro**
- System Peak Demand: **17.2 MW**
- No. of Subscribers: **34,391**
- Unit Cost of Power: **\$0.41 USD/kWh**
- The Avg. Household Consumption, monthly: **100 kWh**
- Amount spent on fuel imports: **\$19,494,595 USD** (\$51,660,677 XCD)



“The Nature Isle of the Caribbean”

Unspoiled natural beauty

Global Geothermal Development Plan
Roundtable - Dominica's Experience

Lush, pristine and green rainforest



Global Geothermal Development Plan
Roundtable - Dominica's Experience

Setting the Stage for Geothermal Energy Development

- **Creating the enabling environment for advancing of the energy sector.**
 - Liberalizing of the Electricity Industry
 - Legislative
 - Regulatory
 - Institutional
 - Political

Liberalizing of the Electricity Industry

- Legislative
 - The Electricity Supply Act 10 of 2006
 - Geothermal Resource Development Bill
- Regulatory
 - Establishment of the Independent Regulatory Commission (IRC)
 - Environmental And Planning Regulations for Renewable Energy (drafted in 2010)

- Environmental and Planning Regulations for Renewable Energy

- **Objective of these Regulations**

- To allow the development of renewable energy resources while **safeguarding** the natural environment, physical environment and the **public welfare** of the Commonwealth of Dominica.

Liberalizing of the Electricity Industry

- **Institutional**

1. Final revised draft National Energy Policy for Cabinet's endorsement
2. Final revised draft Sustainable Energy Plan for Cabinet's endorsement
3. Establishment of the Geothermal Project Management Unit (GPMU)
4. Award of Technical Assistance consultancy on geothermal expertise to support GPMU
5. Establishment of Geothermal Advisory Committee to provide technical support on related public development matter
6. Appointment of Project Steering Committee to provide technical direction to the PMU on contract administration
7. Appointment of a Geothermal Deal Team
8. Appointment of Geothermal Technical Committee to provide technical advisory support to Cabinet Sub-committee to Geothermal Policy
9. MoU with the World Bank to provide support (institutional, technical) to the geothermal initiative
10. Consultancy for reviewing the legal and regulatory framework for RE
11. Providing of specialized geothermal energy training for local professionals – 8 persons already trained (El Salvador and USA)

Liberalizing of the Electricity Industry

- **Political**

- Bilateral Agreements with the Regional Councils of Guadeloupe and Martinique as well as French Territories agencies for Environmental, Minerals, Geological and Energy – INTERREG III & IV
- Cabinet Sub-committee on Geothermal Policy
- MoU with the Clinton Climate Initiative to provide advisory support on technical, financial, legal

Why Geothermal?

- **Proven confirmation** of the quality and extent of the resource – **Brown field stage**
- Sterling opportunity to produce **much cheaper** and **affordable electricity**
- Strong potential as **net exporter** for RE
- Energy security and regional harmony
- Creation of regional energy hub
- Reduced use of fossil fuels
- Strong contribution to the reduction of GHG's
- Positive impact on Climate change effects

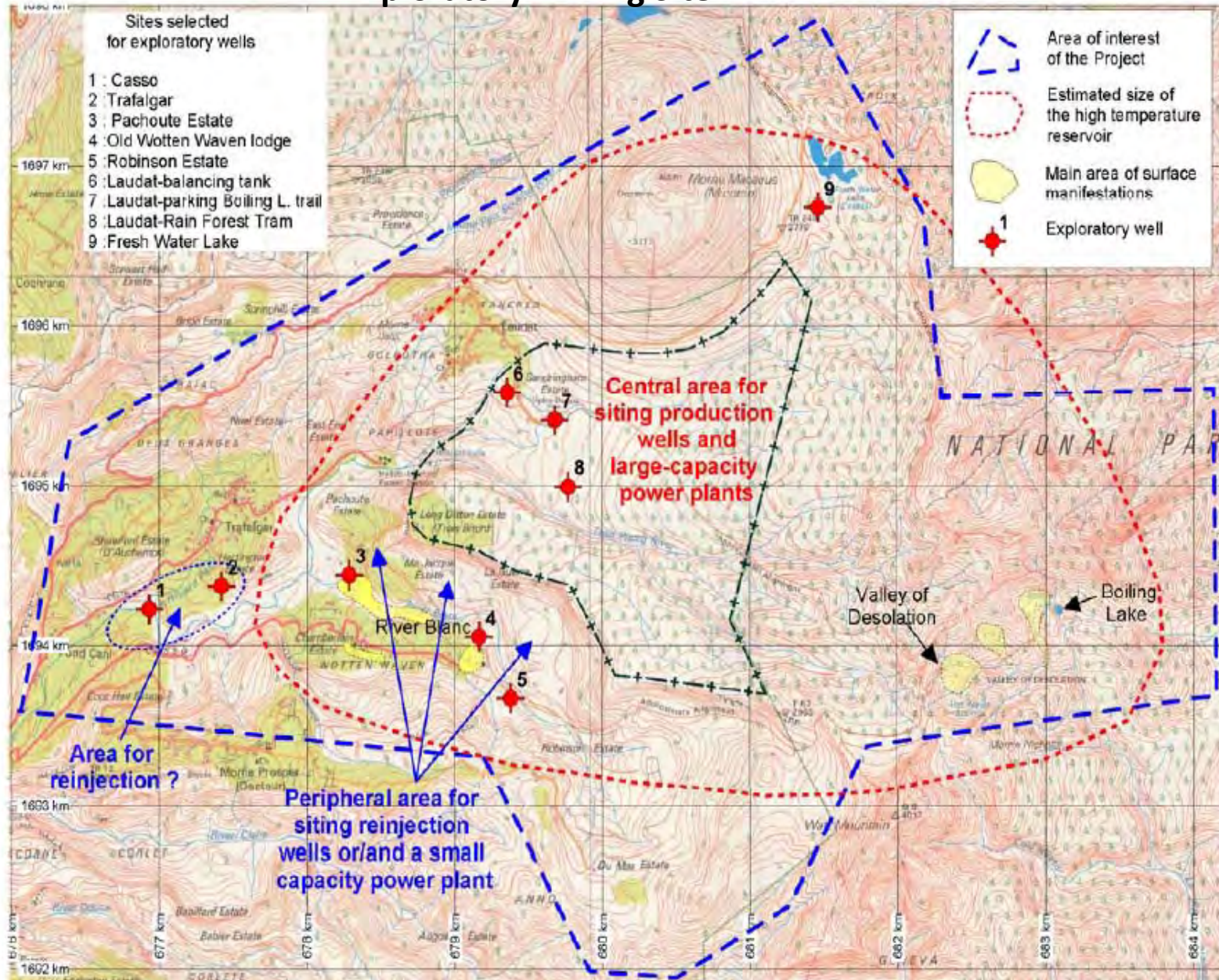
• **Why Geothermal.....**

- Geothermal resource development is a national priority for the Government of Dominica
 - it is an essential pillar to the country's Growth and Social Protection Strategy (GSPS).
- Through the GSPS, Government has declared that the country's social prosperity and poverty reduction goals shall be attained from sustained economic growth.
- Getting a handle on the high cost of electricity is essential for improving our comparative advantage and business competitiveness as well as the lives of ordinary citizens.

How We Have Gotten Here

- 1969 - potential identified in a UNDP report
- 1974 - Geothermal Energy Act
- 1980's - The French Bureau of Geological and Mining Research (**BRGM**) Studies revealed several zones worth exploring
- 2003 - GEF/UNEP/OAS major studies established:
 1. 120 MW geothermal potential in Wotten Waven area
 2. the feasibility of a submarine transmission line with Guadeloupe and Martinique
- 2008 - 2009
 - Surface Reconnaissance and Prefeasibility Study (EU-INTERREG III-B) confirmed the Wotten Waven resource potential and recommended exploratory drilling **to prove the resource**
- 2012 - Three (3) exploratory wells successfully drilled and tested, confirming the quality and extent of a 120MW commercially viable geothermal resource
- Nov. 5th 2013 – Commencement of drilling of two (2) full-size wells production wells

Exploratory Drilling Site



Dominica's Geothermal Energy Potential

- Full-size wells as 1st phase of production stage:
 - One for extraction (Laudat) – 1,500 metres
 - Other for reinjection (Lilly Valley) – 1,200 metres
- Related contracts with service providers:
 - Drilling services
 - Iceland Drilling Company
 - Well Testing and Environmental Monitoring
 - Iceland Geosurvey (ISOR)
 - Drilling and Well Testing Supervision
 - Geothermal Resource group (GRG), USA
- As of Nov. 19th drilling depth of 400m on WW-R1
- Average rate of penetration (ROP) is 7.8 m/hr

Exploratory Phase – Well Testing



The Forward Plans

- Transition to Geothermal Development Unit (GDU)
- Advancement of the IRC
- Finalization of the enactment of the Geothermal Resource Development Bill (tabled on March 1, 2013)
- 15 MW SGPP – 1st Phase of Production Stage
- Further Confirmation of the Resource
- Audit and Upgrade of the Transmission Grid

The drilling of two full size production wells began on Nov. 5th:



Contracts with service providers for Well Testing and Drilling Supervision
Also in progress

Production Phase

- Site Access and Drill Pad Preparation works completed in September 2013
- Testing and Environmental Monitoring will be completed by June 2014
- **Environmental and Social Impact Assessment done in 2011 and 2013 :**
 - identify environmental and social impacts and corresponding mitigation measures and EMP representative of available information as the project develops
 - Regular community consultation and stakeholders engagement
 - Important aspect of the project's bankability
 - Reaffirms GoCD's commitment to addressing the social and environmental concerns of its people

The Big Picture

Short term – Domestic Level (Government owned)

- **Develop 15 – 20 MW power plant for domestic consumption**
- **Upgrade of Transmission/ distribution lines for the local grid**
- **Commissioned by end of 2015**

Long-term – Export Plant (PPP)

- **Develop 100 – 120 MW Power Plant for export to Guadeloupe and Martinique**
- **Construction of Submarine Transmission Interconnection to Guadeloupe and Martinique**
- **Commissioned by 2018**

08/30/2013 10:14

Ultimately

Dominica is poised to:

- Continued adoption of desired and sustainable development to;
- *legally, technically, economically, environmentally and socially to confidently move forward with the development of it's geothermal resources to:*
- **Improve the social prosperity and well-being of its people for enhancing the quality of their lives.**

Dominica.....

“The Nature Isle of the Caribbean”

Well on its way to being the:

- **1st carbon-neutral country of the Caribbean.**

Thank you

Global Geothermal Development Plan
Roundtable - Dominica's Experience