Introduction

- **Dominica:**
  - Known as "The Nature Island of the Caribbean" due to its abundant plant and animal life, extensive park system, volcanic peaks, lava craters, the largest boiling lake in the world, waterfalls, rivers, and lakes.
  - Blessed with abundant natural resources and significant potential for economic and social development.
  - Has a population of approximately 70,000.
  - Size of island is about 750 square kilometres.
  - Dominica faces significant challenges regarding its development.
Introduction continued

- Economy is predominantly agriculturally based - high level of dependence on bananas;

- Dominica’s economy has suffered due to market access problems.

- Increasing dependence on tourism (nature/eco-tourism) and services (financial; ICT; etc.).

- Dominica requires reliable and cost-effective types of infrastructure, and especially in energy.

- Electricity and transport sectors represent considerable challenges for Dominica.
Dominica has no natural petroleum resources.

Small local market; therefore high cost electricity and fuel – economies of scale issues.

Reliability and efficiency of the current electric system and public transportation is extremely limited.

However, Dominica possesses considerable natural resources to:

- provide for its energy security with a combination of renewable energy technologies – hydro, wind, biomass, geothermal, and solar – and increased energy efficiency; and
- generate foreign exchange earnings.
Use of clean renewable energy and energy efficiency technologies will enhance opportunities for investment in the tourism sector.

These technologies will also benefit development initiatives in agriculture, industry, commerce, government services and residential accommodation.

Dominica’s Medium Term Economic Strategy states that major investments in electricity generation and distribution are necessary to facilitate the requirements for the further diversification of the economy.

Dominica can demonstrate the viability of sustainable energy systems to other island nations – especially SIDS.
Electricity Services

✓ Customer base for electricity services comprises domestic (46%), commercial including government (41%), hotel (8%), industrial (3%), lighting and street lighting (2%).

✓ Dominica Electricity Services Ltd. (DOMLEC) is the only licenced provider of electricity.

✓ DOMLEC is owned by US firm WRB (51%); The Dominica Social Security owns 20%; Local corporate and private citizens own the remaining 29%. 
Electricity Services  continued

✓ Currently, diesel generators fuelled by imported oil, and hydropower plants generate Dominica’s electric power.

✓ DOMLEC operates two diesel plants (Fond Cole and Portsmouth) – 16.03 MW, and three hydropower facilities (Laudat, Trafalgar and Padu) – 6.42 MW

✓ Total: 22.45 MW

✓ Thermal generation (diesel) has grown modestly.

✓ Recent installation of 3 medium speed generators with a maximum of 4.38MW of electricity at the Fond Cole power station – replacement of old, unreliable and inefficient generator.

✓ Cost of electricity in Dominica has risen significantly in recent years and is subject to world oil prices – dependence on diesel generators.
Electricity Services continued

- Residential customers pay approximately EC$0.70/kWh (US$0.26) for the first 50kWh and EC$0.81/kWh (US$0.30) for additional kWh.
- Fuel surcharge is calculated monthly and added as a per cost to the total consumption.
- Dominica has the highest electricity tariffs in the Eastern Caribbean - a source of concern and protest among many residents.
- Aged and poor quality electricity distribution lines – causes high line losses – upwards of 10-14% - which is charged to the electricity consumer!
- Slow economic growth over the last few years resulted in a very slow growth in electricity demand (cost conscious households and businesses; minimal new investment in tourism, manufacturing, agri-business), and therefore little or no investment in additional generation or systems upgrade.
### Fuel Surcharge: EC cents per Kwh

<table>
<thead>
<tr>
<th>Year</th>
<th>Jan</th>
<th>Feb</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
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<td>2004</td>
<td>15.77</td>
<td>17.60</td>
<td>17.67</td>
<td>15.90</td>
<td>20.09</td>
<td>18.75</td>
<td>20.24</td>
<td>18.51</td>
<td>20.86</td>
<td>22.81</td>
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<td>43.45</td>
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<td>38.23</td>
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<td>2007</td>
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<td>32.67</td>
<td>32.12</td>
<td>41.50</td>
<td>36.43</td>
<td>43.47</td>
<td>46.51</td>
<td>45.34</td>
<td>43.83</td>
<td>41.34</td>
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<td>67.57</td>
<td>67.85</td>
<td>62.93</td>
<td>49.13</td>
<td>46.42</td>
<td>45.15</td>
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<td>2009</td>
<td>25.60</td>
<td>20.59</td>
<td>16.89</td>
<td>20.09</td>
<td>22.54</td>
<td>22.72</td>
<td>25.72</td>
<td>27.0</td>
<td>29.89</td>
<td>27.99</td>
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*Source: Dominica Electricity Services Ltd./Independent Regulatory Commission*
Electricity Services continued

Fuel Surcharge Rate in EC cents per Kwh

Source: Dominica Electricity Services Ltd./Independent Regulatory Commission
Energy Supply through the Years

Source: Dominica Electricity Services Ltd.
## Energy Supply through the Years

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
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</thead>
<tbody>
<tr>
<td>Diesel Fuel Used in Generation</td>
<td></td>
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<td></td>
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<tr>
<td>Quantity in Imperial Gallons</td>
<td>2,620,375</td>
<td>3,207,976</td>
<td>3,368,935</td>
<td>3,850,914</td>
<td>3,915,979</td>
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<tr>
<td>Fuel Efficiency (kWh per Imp. Gal.)</td>
<td>17.4</td>
<td>17.4</td>
<td>17.1</td>
<td>16.7</td>
<td>17.1</td>
</tr>
<tr>
<td>Total Fuel Cost (to DOMLEC)</td>
<td>17,697,755</td>
<td>25,883,551</td>
<td>30,970,742</td>
<td>35,094,796</td>
<td>47,254,920</td>
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<tr>
<td>Total Diesel Imports (Imp. Gal)</td>
<td>5,158,487</td>
<td>5,208,860</td>
<td>5,117,793</td>
<td>8,217,373</td>
<td>6,446,262</td>
</tr>
</tbody>
</table>

*Source: Dominica Electricity Services Ltd./Central Statistical Office, Dominica*
Energy Supply through the Years
Electricity Sales each Year: 1996-2008

Source: Dominica Electricity Services Ltd.
Energy Supply through the Years
Electricity Sales by Sector’s Piece of the Pie in 2008

- Domestic: 46%
- Commercial: 41%
- Hotel: 8%
- Industrial: 3%
- Street Lighting: 2%

Source: Dominica Electricity Services Ltd.
Electricity Services continued...

- The Electricity Supply Act of 2006 abolished the monopoly previously held by DOMLEC.
- The Act also established the IRC to deal with regulatory matters for the generation, transmission, distribution and supply of electricity services.
- IRC involved in review of ESA.
Energy and Transportation

The transportation sector is a concern for Dominica in terms of sustainable energy use.

Issues of:
- Unregulated bus routes;
- Low-efficiency used car imports;
- High fuel consuming vehicles;
- High carbon emissions;
- Traffic congestion in urban areas;
The Government of Dominica has embarked on a programme to explore and develop Dominica’s geothermal resources, primarily for the generation of clean and lower cost electricity.

Dominica signed a financing agreement with the European Commission for 1.5 million Euro, “Preparation of a Geothermal based Cross-Border Electrical Connection in the Caribbean”.

The project will be co-funded by the AFD and the FFEM with an additional €4.0million.

Total available funding is €5.5m (approx. EC$21m).

EIB expressed interest in contributing.
Current Energy Development Programme

- Project is to determine whether the geothermal resource in Dominica is technically suitable for generating electricity. (i.e., proving the resource – test drilling to evaluate steam pressure; heat, acidity; gases, etc.)
- Can lead to underwater electrical transmission and interconnection to supply neighbouring islands of Guadeloupe and Martinique with 40-50 MW of electricity each.
- The project will involve exploratory drilling to characterize the resource;
- Determine the feasibility and long term viability of the investment required; and
- Produce business feasibility and prospectus to invite and encourage investment in the project.
Current Energy Development Programme

- Government responsible to establish and fund the PMU to manage the implementation of the project.
- Structure of the PMU has been determined.
- Budget prepared – approximately 1.424 million EC$ for a three year period.
- Gov’t approved funding to come from EU budgetary support to Gov’t of Dominica.
- Staff recruitment process completed.
- PMU now expected to commence December 2009 or January 2010.
The progress of this EU project depends on the results of initial surface investigations at the Wotten Waven Geothermal Resource area during April to December 2008.

Geochemical, geophysical, and geological surveys done.

Project included legal and institutional analysis; economic analysis, preliminary designs and costings…

This "Géothermie Caraïbe" project is the preliminary phase to the more EU and AFD funded initiative for the Wotten Waven resource evaluation.

Cost approximately €1.162m.

Tests of the resource were conducted under a TPA between Dominica, Guadeloupe, and Martinique, and ADEME and BRGM partly funded under the EU’s INTERREG IIIB programme.
Current Energy Development Programme

✓ The INTERREG phase focused on key points which will ensure the success of the project from a technical, administrative and legal point of view.

✓ This project had four (4) main objectives:-

  • To validate the information in the OAS studies carried out in 2005;
  • To make a preliminary analysis of the environmental impact of the proposed project;
  • To make a preliminary analysis of the legal and institutional framework of the project; and
  • To revise and update the economic assessment of the project.

✓ Will lead to implementation of next phase including test drilling.

✓ Report and results of the investigations under the INTERREG IIIB submitted in August of 2009.

✓ Results appear to be favourable and encouraging.
Current Energy Development Programme

Some of the results:

✓ Temperature of Wotten Waven Geothermal Resource in excess of 300 degrees Fahrenheit.

✓ Production cost per kWh for a 120 Mega Watt geothermal plant is estimated at US$0.06.

✓ Estimated investment is US$430-450 million.

✓ Road access to the sites needs to be addressed.
The EU funded project (the next phase) is divided into two (2) principal Activities.

Activity I will:
- Deal with the final characterization of the Geothermal Power Production potential that will specify the power production areas;
- Undertake an investment prospectus for the proposed development, and
- Undertake test drilling in those specific areas.

Activity II will:
- Support the establishment of the PMU, and
- Provide TA in respect of:
  - Policy;
  - Environment;
  - Regulation;
  - Communication and public relations, and
  - Monitoring.
- Will include advice on PPA with existing and potential electricity distributor.
The TA consultancy is expected to deliver the following results:

- Detailed geophysical studies in potential production areas.
- Characterization of the geothermal resource.
- Compilation of an investment mobilization prospectus.
- Detailed study of electrical conditions, sea bed conditions, and offshore links.
- Network operation study and optimization with geothermal production.
- Socio-economic cost-benefit analysis.
- Assistance to the PMU in Energy Policy, environmental and regulatory issues.
- Assistance to the PMU in the preparation of commercial development; i.e., PPP, PPA, IPP, etc.
- Effective communications and Public Relations activities regarding the project.
- Effective project evaluation and monitoring.
Current Energy Development Programme

The Project intends to:

1. Sell at least 40 MW of electricity each to Guadeloupe and Martinique.
2. Reserve about 20 MW of electricity generated for Dominica.
3. Begin production of geothermal energy (electricity) within 5 years.
4. Reduce the cost of electricity produced in Dominica from US$0.27/KWh to US$0.06/KWh, before fuel surcharge…
Dominica is also moving speedily to:

- Review the Electricity Supply Act (ESA) of 2006; - CREDP/GTZ
- Prepare Regulations for the ESA; - CREDP/GTZ
- Draft Alternative Energy Legislation and Regulations; - World Bank
- Articulate its National Energy Policy and Road Map - OAS; and
- Prepare a Sustainable Energy Plan; - CARICOM, the OAS, and the GTZ.
Current Energy Development Programme
National Energy Policy

The National Energy Policy will articulate government’s position with regards to the governance of the energy sector, and shall provide guidance on areas such as:

✓ Regulation;
✓ Legal Aspects;
✓ Pricing and taxation;
✓ Safety and Industry Standards;
✓ Power expansion planning/development;
✓ Public-Private Partnerships/Engagements;
✓ Trading and Export;
✓ Capacity Building;
Current Energy Development Programme
National Energy Policy continued...

The National Energy Policy will look at:
✓ Self Generation;
✓ Independent Power Production;
✓ Net Metering;
✓ Development of indigenous sources of renewable energy – *geothermal; hydro; solar; wind; biomass*...
✓ Service standards;
✓ Tariffs;
✓ Energy Efficiency;
✓ Environmental Aspects;
✓ Universal access to electricity;
Current Energy Development Programme

Goals of the Sustainable Energy Plan

The Sustainable Energy Plan will, together with the National Energy Policy:

- Lay out a **strategy** by which the energy production and use in Dominica may be transformed, becoming more economically and environmentally sustainable, while enhancing the electricity generation mix.

- Ensure the existence of adequate energy supplies at affordable rates to sustain economic development, while meeting current and projected power demand.

- Provide for stable, reliable, and affordable electricity supplies for all customers.

- Reduce the cost of electricity for consumers.
Current Energy Development Programme
Goals of the Sustainable Energy Plan continued...

- Enhance the security of energy supply and use for all sectors of the economy.
- Allow reasonable incomes for businesses engaged in the local energy sector, while attracting international investment where appropriate – tourism; manufacturing; agro-processing...
- Creation of new job opportunities for Dominicans.
- Promote energy efficiency and conservation at all levels of the economy in order to achieve optimum economic use of renewable and non-renewable sources of energy.
Current Energy Development Programme

Goals of the Sustainable Energy Plan continued...

- Protect the local and global environment by maximizing the use of renewable-energy and energy-efficiency alternatives where viable. This is especially relevant in Dominica as much of the renewable energy generation may take place in nature preserves or rain forest areas. It is essential that this be done in a manner that does not threaten biodiversity, forestation levels, and other environmental aspects.

- Promote the generation of income through energy exports produced from renewable energy sources (esp. geothermal resources).

- Contribute to improving the Balance of Payments accounts for Dominica.
Other planned and proposed initiatives include:

- Undertake supplementary electricity generating plant of 7.5sa MW with financial assistance from the Gov’t of Venezuela as a short term energy security measure, and to safeguard against power failure, blackouts, etc.
- Preparing an Electricity System Development Study and Electricity Generation Plan for the country;
- Studies to identify sites for NEW hydro power plants;
- Geothermal Resource assessment in the north of Dominica;
- Undertake Energy Audit of Gov’t facilities and street lights;
- Encourage use of solar hot water systems in homes and hotel sector;
Current Energy Development Programme
Other Initiatives

Government issued a Geothermal Resource Licence to West Indies Power Ltd. in July 2008 to: Explore and exploit the geothermal energy resource in Soufriere resource area in the south of Dominica.

- Initial investigations started, with encouraging results.
- EIA undertaken. Submission of Report pending.
- Pursuing access to privately owned lands in the resource area required for drilling and production of geothermal energy.
- Plan to begin test drilling as soon as possible (2010).
- Plan is to produce 15MW of electricity in the first instance for sale to existing electricity distributor as an IPP under a PPA.
- Ministry of PUEP, and the government of Dominica in general, is providing full support and facilitation to WIP, in accordance with the terms of the Licence…
Outstanding Matters

1. Scientific review and evaluation of reports of Interreg IIIB funded studies carried out under the TPA between Dominica, Guadeloupe, Martinique, ADEME, and BRGM.
2. Recruitment of staff and implementation of PMU for Geothermal Energy Project.
3. Need for a comprehensive strategy and approach to implementing host of TA activities and programmes for both RE and EE, in the context of sustainable development.
4. Need for TA to review and validate other project and renewable energy resource evaluation reports available and pending.
5. Need for TA to evaluate geothermal energy resource in north of the island.
6. Need for TA to assess the potential for hydro power from the Matthieau Dam ("Miracle Lake").
7. Need for TA to undertake national electricity system generation study and generation plan - USTDA considering similar support to DOMLEC.
8. TA to undertake Energy Audit of Government facilities and street lights.
9. EE audits in tourism/hotel sector including cost reduction measures; use of solar power – hot water; AC; refrigeration, etc.
Energy Development Programme for Dominica

Thank You.