Potential Energy Efficiency Tasks for the Dominican Republic

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Proposed Partnership with the Dominican Republic to Advance Private Sector Investment in Energy Efficiency

**Overall objective:** Mobilize private sector investment in clean energy in the DR, focusing on EE with large commercial and industry (non hotel sector), to be achieved through:

1. Partnering with public & private industrial groups to jointly further shared initiatives to promote EE deployment
2. Improving the understanding among financial institutions of the opportunities for investing in energy efficiency
3. In-country capacity building among companies to understand the business case for energy efficiency investments
4. Match-making project pipelines with financial institutions
Partnerships

**MEM:** Assist, develop, and update energy efficiency standards and recommend regulatory changes to incentivize these initiatives’ adoption.
- Suggest aggregated purchasing agreements and partnerships with manufacturers to drive energy efficiency products to market.
- Ban low efficiency products in the market. Create a minimum energy efficiency standard.

**Financial Institutions:** Fundación Popular, ECORED, BPD, Inter-American Development Bank (IABD) etc.
- Support creation, development and quality control of energy efficiency projects for various project sizes.
- Support aggregated project financing model.

**Industry Groups:** AIRD, ECORED
- Support development of energy audits and project proposals
Building Energy Audits

Overview:
• Detailed building and campus energy audits focused on identifying:
  - Energy Conservation Measures (ECMs)
  - Water Conservation Measures (WCMs)
  - Renewable Energy Measures (REMs)
• ASHRAE Level 2 audits with energy modeling component and renewable energy screening
• Prioritization of ECMs, WCMs, and REMs
• Deep energy retrofit analysis

NREL’s Core Capabilities:
• Technical understanding of buildings systems and their interactions
  - Vast experience in the hotel sector
• Field experience with wide array of building systems
• Spot metering and Measurement & Verification (M&V) expertise
Building Energy Modeling Component of Energy Audits

Overview:
• Detailed building energy modeling for any building type
• Advanced energy modeling techniques:
  - Natural ventilation
  - Advanced HVAC systems
  - Daylighting

NREL’s Modelling Tools:
• OpenStudio
• eQUEST
• BEopt
Energy Resilience Component of Energy Audits

Overview:
• Ensure energy resiliency in face of natural disasters and man made threats
• Identify gaps/flaws/interdependencies in energy systems
• Evaluate technical solutions
• Probabilistic modeling to provide clear understanding of risks

NREL’s Core Capabilities:
• Understanding how EE/RE can provide added energy assurance
• Engagement with agencies, utilities, stakeholders

Image:
San Juan, Puerto Rico After Hurricane Maria

Graph:
RE resiliency value
\[= \$100 \text{/kWh} \int_{0}^{2.1 \text{ days}} \, 155 \text{ kW} \]
\[= \$781,200 \]
**Proposed Energy Audit Work**

- **Identify clients and local auditors**
  - Identify local energy auditors & Energy Service Companies (ESCOs) to collaborate with NREL
  - Identify hotels with highest savings potential

- **ASHRAE 2 energy audits**
  - Travel to buildings
  - Kickoff meeting
  - Collaborative building audits between NREL and local auditors/ESCOs
  - Identify ECMs, WCMs, and REMs
  - Exit-meeting to review initial findings

- **Create calibrated building energy models**
  - Create energy models based on information collected during audits
  - Calibrate energy models to within 5% of actual utility bills

- **Analysis**
  - Use energy models to analyze ECMs
  - Use simulation tools to analyze WCMs and REMs
  - Use REopt Lite to analyze energy resilience

- **Report out results**
  - Provide a PowerPoint and report of findings
  - Hold conference calls to go over results with site staff
  - Make process replicable for future energy audits in DR
Energy Audit Trainings

Overview:
• Providing *weeklong* training on energy efficiency (EE) & renewable energy (RE) technologies and conducting energy audits
• Trainings consist of mix of classroom presentations, hands-on auditing, and analysis
• Trainings have been translated and given in foreign languages (e.g., Spanish, French)

NREL’s Core Capabilities:
• Building energy audit training
• Tailored trainings to meet site specific needs
• Renewable energy site assessment training
### Summary of Past NREL Energy Audit Trainings that Relate to the DR

<table>
<thead>
<tr>
<th>Training Location</th>
<th>Island Trainings</th>
<th>Trainings Focusing on Hotel Industry</th>
<th>Trainings in a Foreign Language</th>
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<tbody>
<tr>
<td>1.) Barbados</td>
<td>★★★</td>
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<td>2.) Cape Verde</td>
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<td>3.) Costa Rica</td>
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<td>4.) Gabon</td>
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<td>5.) Hawaii</td>
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<td>6.) Jamaica</td>
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<td>7.) Japan</td>
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<td>8.) Marshall Islands</td>
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<td>9.) Palau</td>
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<td>10.) St. Lucia</td>
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<td>11.) Puerto Rico</td>
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<td>12.) Trinidad &amp; Tobago</td>
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<tr>
<td>13.) U.S. Virgin Islands</td>
<td>★★</td>
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<td>★★</td>
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</tbody>
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Photos: Jimmy Salasovich, NREL
Proposed Energy Audit Training Work

- Identify list of attendees for energy audit training
  - Identify target audience(s)
  - Determine location of training
  - Prepare training booklets and materials in both Spanish and English

- Conduct weeklong energy audit training
  - Conduct weeklong energy audit training in Spanish and English
  - Tailor training to meet needs specific to Dominican Republic

- Loop training back into energy audits task
  - Have attendees collaborate with actual audits of hotel sector
  - Provide attendees final energy audit reports and PowerPoints that can be used as templates
Technology Demonstration

Overview:
• Field demonstration of emerging EE/RE technologies to evaluate for large scale deployment
• 3rd party verification of energy and cost savings
• Evaluate technical, economic, and ease-of-deployment characteristics

NREL’s Core Capabilities:
• Technology agnostic, yet deep expertise across the spectrum
• Onsite M&V experience
• Understanding EE equipment deployment process

Photo: Jesse Dean, NREL
Proposed Technology Demonstration Work

- Identify emerging technologies suitable for DR
  - Identify emerging technologies suitable for DR based on the information collected during energy screenings and select audits
  - Identify buildings where technologies can be installed

- Develop M&V Plan
  - Develop detailed measurement & verification (M&V) plan for emerging technologies to be installed

- Install the emerging technologies & metering
  - Install emerging technologies and metering required based on M&V plan
  - Collect long-term interval data

- Analyze the performance
  - Use long-term interval data to analyze performance

- Report out results & roll out the emerging technologies
  - Provide PowerPoint and report of findings
  - Hold conference calls to go over results with site staff
  - Roll out emerging technologies to suitable buildings in DR
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