



## PROJECT TERMINAL EVALUATION

“Low-carbon Development Path: Promoting energy-efficient applications and solar photovoltaic technologies in streets, outdoor areas and public buildings in island communities nationwide (LCDP)”

UNDP ID: 00091623

PIMS # 4969

GEF FOCAL AREA UNDER GEF FIVE: Climate Change

<b>UNDAF/CPAP Outcome(s):</b>	Enhanced capacity of national, Subregional and regional institutions and stakeholders to effectively manage natural resources; build resilience to the adverse impacts of climate change and natural and anthropogenic hazards; improved energy efficiency and use of renewable energy; improved policy, legal, regulatory and institutional frameworks for environmental and energy governance
<b>UNDP Strategic Plan 2014-2017 Primary Outcome:</b>	Growth and development are inclusive and sustainable, incorporating productive capacities that create employment and livelihoods for the poor and excluded
<b>Expected CPAP Output(s):</b>	Output 6: Improved energy efficiency and the removal of barriers to the introduction and transfer of renewable energy technology facilitated
<b>Executing Entity:</b>	United Nations Development Programme (UNDP)
<b>Implementing Entity:</b>	Environmental Coordinating Unit (ECU) (December 2016 to March 2019) Ministry of Environment, Climate Resilience, Disaster Management and Urban Renewal (March 2019 to January 2020) Ministry of Environment, Rural Modernization and Kalinago Upliftment (January 2020 to March 2021)

### STRATEGIC PROGRAM OF GEF FIVE:

Climate Change objective 1: Promote the demonstration, deployment, and transfer of innovative low-carbon technologies

Climate Change Objective 2: Promote market transformation for energy efficiency in industry and the building sector

### IMPLEMENTING AGENCIES:

United Nations Development Programme, Environmental Coordinating Unit (ECU) (December 2016 to March 2019), Ministry of Environment, Climate Resilience, Disaster Management and Urban Renewal (March 2019 to January 2020), Ministry of Environment, Rural Modernization and Kalinago Upliftment (January 2020 to March 2021). This NIM project was approved for a duration of 48 months by the GEF, starting in December 2016 and finalizing in November 2020. After a project extension approval, the new project closing date is March 2021.

REGION: CARIBBEAN  
COUNTRY: DOMINICA

Evaluation conducted by:  
Mrs. Stephanie Hodge (International consultant)  
From January 13, 2020 – March 15, 2021  
Report submitted June 10, 2021

- **Evaluation team members**

The evaluation was conducted by Stephanie Hodge, an independent consultant based in New York, USA.

- **Acknowledgments**

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## I. ACRONYMS AND ABBREVIATIONS

Acronym	Meaning
AA	Administrative Assistant
APR	Annual Progress Report
BAU	Business-as-usual
CARICOM	Caribbean Community
CCCCC	Caribbean Community Climate Change Center
CCTF	Climate Change Trust Fund
CEIS	Caribbean Energy Information System
CHENACT	Caribbean Hotel Energy Efficiency Action Program
CHENACT-AP	CHENACT Action-Advanced Programme
CPAP	Country Programme Action Plan
CREDP	Caribbean Renewable Energy Development Programme
CROSQ	Caribbean Regional Organization for Standards and Quality
CTA	Chief Technical Advisor
DRR	Disaster Risk Response
DoCCENRM	Department of Climate Change, Environment and Natural Resources Management
DOMLEC	Dominica Electric Company Limited
EC	Eastern Caribbean
ECERA	Eastern Caribbean Energy Regulatory Authority
ECU	Environmental Coordinating Unit
EE	Energy Efficiency
EIAs	Environmental Impact Assessments
EOP	End of Project
ESIA	Environmental and social impact assessment
EPC	Energy Performance Contract (EPC)
EU	European Union
FIT	Feed-in tariff
FY	Fiscal year
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gases
GHI	Global horizontal irradiance
GIZ	German Agency for International Cooperation
GoCD	Government of the Commonwealth of Dominica
GJ	Gigajoules
GWh	Gigawatt-hour
IDB	Inter-American Development Bank
IEA	International Energy Agency
INC	Initial National Communication
IPP	Independent power producers
IRC	Independent Regulatory Commission
IRE	Intermittent renewable energy

Acronym	Meaning
IRENA	International Renewable Energy Agency
KWh	Kilowatt hours
LAC	Latin American Caribbean Regional Center
M&E	Monitoring and Evaluation
MEPS	minimum energy performance standards
MJ	Megajoules
MoF	Ministry of Finance
MoHE	Ministry of Health and Environment
MoTEE	Ministry of Trade, Energy and Employment
MW	Megawatt
MWh	Megawatt – hour
MV	Medium voltage
NAMA	Nationally appropriate mitigation actions
NEP	National Energy Policy
NGOs	Non-Government Organizations
NPD	National Project Director
NPM	National Project Manager
NREL	National Renewable Energy Laboratory
NSEP	National Sustainable Energy Plan
OECS	Organization of Eastern Caribbean States
PIR	Project Implementation Report
PMU	Project Management Unit
PPA	Power purchase agreement
ProDoc	UNDP Project Document
PSC	Project Steering Committee
PV	Photovoltaic
RE	Renewable energy
RET	Renewable energy technology
SIDS-DOCK	Small Island Developing States – Island Energy for Island Life
SNC	Second National Communication
TJ	Tera joules
TNC	Third National Communication
TOC	Theory of Change
TOE	Tons of oil equivalent
ToR	Terms of Reference
UNDP	United Nations Development Programme
UNDAF	United Nations Development Assistance Framework
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

## II. EXECUTIVE SUMMARY

- **Project Summary Table**

Project Details		Project Milestones	
Project Title	Low-Carbon Development Path (LCDP) Project: Promoting energy efficient applications and solar photovoltaic technologies in streets, outdoor areas and public buildings in island communities nationwide	PIF Approval Date:	Jun 12, 2014
UNDP Project ID (PIMS #):	4969	CEO Endorsement Date (FSP) / Approval date (MSP):	Jan 12, 2016
GEF Project ID:	5686	ProDoc Signature Date:	Dec 1, 2016
UNDP Atlas Business Unit, Award ID, Project ID:	00082947 / 91623	Date Project Manager hired:	2017
Country/Countries:	Dominica	Inception Workshop Date:	May 22, 2018
Region:	Latin America and the Caribbean (LAC)	Mid-Term Review Completion Date:	N/A
Focal Area:	Climate Change – Mitigation	Terminal Evaluation Completion date:	June 2021
GEF Operational Programme or Strategic Priorities/Objectives:	1.5.1 Solutions adopted to achieve universal access to clean, affordable and sustainable energy  2.5.1 Solutions developed, financed and applied at scale for energy efficiency and transformation to clean energy	Planned Operational Closure Date:	June 16 2021

	and zero-carbon development, for poverty eradication and structural transformation		
Trust Fund:	GEFTF		
Implementing Partner (GEF Executing Entity):	United Nations Development Programme (UNDP)		
NGOs/CBOs involvement:	n/a		
Private sector involvement:	Energy Management Services (EMS) Ltd.		
Geospatial coordinates of project sites:	[Coordinates are available in the annual PIRs]		
Financial Information			
PDF/PPG	at approval (US\$M)	at PDF/PPG completion (US\$M)	
GEF PDF/PPG grants for project preparation	\$100,000	100,000	
Co-financing for project preparation	0	0	
Project	at CEO Endorsement (US\$M)	at TE (US\$M)	
[1] UNDP contribution:	\$1,600,000	450,000	
[2] Government:	\$ 6,800,000	\$95,926.10	
[3] Other multi-/bi-laterals:	0	0	
[4] Private Sector:	\$540,000	0	
[5] NGOs:	0	0	
[6] Total co-financing [1 + 2 + 3 + 4 + 5]:	8,940,000	\$545,926.1	
[7] Total GEF funding:	\$ 1,726,484	\$1,283,488	
[8] Total Project Funding [6 + 7]	\$10,626,484	\$1,829,414.1	

- **Project Description (brief)**

The objective of the project was the removal of the policy, technical and financial barriers to energy-efficient applications and solar photovoltaic technologies in Dominica's streets, outdoor areas and public buildings nationwide, initially targeting up to 5 communities including Dubique, Boetica, Roseau, Portsmouth, for further scale up. It was envisioned that this would be achieved through the following outcomes: (i) improved knowledge, awareness and institutional capacity on EE applications and solar PV through demonstrations of their deployment in Dominica; (ii) the uptake of EE applications and solar PV technology promoted through adoption of new institutional arrangements, and policy and enforcement measures; and (iii) scaled-up EE applications and RET investments through the implementation of newly proposed financial and institutional mechanisms. RE and EE Projects will lead to cumulative direct and direct post-project GHG emission reductions of 100,899 CO<sub>2</sub> eq.

The LCDP intended to achieve this through three (3) Main Components:

- Component 1: Institutional and technical knowledge, awareness and capacity for EE applications and renewable energy technologies (RETs)
  - Component 2: Policy measures and enforcement of EE applications and RETs
  - Component 3: Financing options and mechanisms for EE applications and RET diffusion.
- **Evaluation Rating Table<sup>1</sup>:**

For ease of reference, individual ratings across various areas within the TE report have been consolidated in the table below and is further detailed in the "Findings" section of the report.

Rating descriptions are as follows:

Unable to Assess (U/A): available information does not allow an assessment

1 = Highly Unsatisfactory (HU): severe shortcomings

2 = Unsatisfactory (U): substantially below expectations and/or major shortcomings

3 = Moderately Unsatisfactory (MU): somewhat below expectations and/or significant shortcomings

4 = Moderately Satisfactory (MS): more or less meets expectations and/or some shortcomings

5 = Satisfactory (S): meets expectations and/or no or minor shortcomings

6 = Highly Satisfactory (HS): exceeds expectations and/or no shortcomings

1. Monitoring & Evaluation (M&E)	Rating	
M&E design at entry	MS	The Project document stipulated project monitoring protocols for M&E activities. While monitoring was generally conducted as per the project plan, it was adapted due to the operating challenges experienced. Using the original indicator framework, an adaptive accelerated project strategy was employed.
M&E Plan Implementation	MU	<p>While the Project Log Frame (Project Results Framework) and ProDoc provided the basic performance and impact indicators for monitoring along with their corresponding means of verification, there had been a need for the adaptation of the framework and the development of an adaptive management plan. Despite this, the log frame indicators remained unchanged and were not Specific, Measurable, Achievable Realistic and Timely (SMART). This would have been detected if the project held a Mid Term Review and is a lesson learned as technical projects utilization of the monitoring mechanism (inclusive of monitoring tools) in the GEF project is key for programme monitoring and guiding implementation.</p> <p>Changes were necessary as various indicators were seen as ‘aspirational’ rather than realistic which significantly impacted not only benchmarks but the results overall against project targets. Additionally, key tracking tools were not used or updated and the mechanisms for GEF project monitoring and adapting were not used to their full potential. For example, the MTR was not employed for course correction and the inception period was lacking UNDP/GEF RTA input and guidance. The project coordination unit (PCU) and the Regional Technical Advisor were fully engaged in adaptive management from 2018 onwards. The PC, working within the Environmental Coordinating Unit (ECU) and subsequently, the broader Ministry of Environment (MOE) (after the ECU was dissolved) provided day-to-day monitoring and limited technical oversight, procurement and execution support.</p> <p>Although the UNDP had been providing technical and fiduciary oversight, program monitoring and spot-checking, stakeholders expressed that the UNDP could have been more proactive and the MCO could have done more to support the PC to move the project in the early stages through its oversight role, given the opportunities to oversee the governance through the country GEF partnership agreement.</p>



Overall Quality of M&E	MU	Under the NIM agreement, and in light of the challenging operational and contextual issues identified (the two distinct phases of implementation with different IPs), UNDP has provided considerable monitoring support to the project in the face of an uncondusive implementing environment. After a three-year late start, the UNDP supported adaptive management and focused on delivering a distributed system to the country and ensuring that it was commissioned and ready. However, it must be noted that this was a government implemented project, therefore, the government had full responsibilities to ensure agreements were upheld and the environment was supported for implementation.
2. Implementing Agency (IA) Implementation & Executing Agency (EA) Execution	Rating	
Quality of UNDP Implementation/Oversight	MS	<p>The focus of the adapted project accelerated plan has been the quality PVS installations to showcase and to support government utilization of the data for future scale-up and/or decision making. It was assumed that the context was ready for institutional strengthening, however, this was not the case. It was through UNDP's perseverance and continued support of implementation that resulted a medium satisfactory rating in a very challenging context.</p> <p>Under the NIM plus execution agreement, in light of the implementing and contextual issues identified and the two distinct phases with two different implementing partners (IP) and level of support, the UNDP RTA has provided considerable monitoring support the project in the face of the early uncondusive implementing environment. After a three-year delay in full scale implementation, the UNDP RTA supported an accelerated risk mitigation plan and refocused for a delivery of a distributed system to the country and ensured that it was commissioned and ready for handover. There were procurement issues on both the UNDP side and the government procedures side. Stakeholders expressed that such intense procurement support to various country GEF project contexts may not have been cost-effective for back-office support. The support to HR procurement from the country office was also slow. A key factor in this delay was the involvement of Cabinet in all the decisions on project recruitment.</p> <p>Although UNDP provided considerable support to the NIM project, and as the issues became compounded and complex, stakeholders expressed that UNDP MCO might have acted earlier to intervene on the uncondusive IP operating context. UNDP struggled to support the government to find a way to move the project forward and even brought aboard support from a similar Barbados project for feasibility.</p> <p>In retrospect, the additional support provided included an assessment to identify the bottlenecks in context, identify linkages and help in adaptive management. The GEF MTR, also a means to adapt in such circumstances, was not used. The project also experienced many delays with consultant ToRs; consequently. The lack of staff became an insurmountable problem and for such a technical project.</p> <p>Additionally, Dominica had been in an emergency situation with Hurricane Maria, and as such the attention of the government and staff was focused on this recovery work during early implementation.</p> <p>UNDP had an execution support to procurement agreement. Stakeholders say that if there were an early procurement plan in place at design or inception, the question of scheduling and spending budget (and prioritizing work) would not have emerged. The UNDP support to procurement was anticipated as a key to push the project quickly, however, it went slowly despite this. In this case, there are lessons on procurement planning especially on complex technical works. If the UNDP procurement was able to obtain the plan at start, deliverables might have been manageable.</p> <p>A lesson is to provide such a plan during the project design and inception to avoid bottlenecks and to schedule and review the market for the vendors in a timely way. Additionally, a plan is usually needed to ascertain the complexity and/or the timing of the support for efficiency and reduction of delays. The MCO has many country offices to serve and many GEF projects. Early procurement planning, especially for complex thematic projects, i.e., renewable energy installations, low-carbon recruitment, EPC contracts, is necessary. Having a procurement plan especially for technically complex projects attached to NIM plus agreements can help for smooth support. A noted observation was that Procurement officers do not necessarily have the thematic technical specialization and such analysis is necessary to support their work with vendors and markets.</p>

Quality of Implementing Partner Execution	MS	The project was implemented in two phases: one with no IP support and the second phase with effective IP support. The main lesson is that the government did not take ownership at the start. It took three years to correct the problem. The context has shifted in 2018 with a change of IP and Hurricane Maria in 2017. This project was uniquely positioned for more linkage to the Maria recovery and building back better but missed the opportunity under those challenging operating conditions. There are key messages for economic development for instance, the work is strategic for Dominica's continued economic recovery. The main challenge is how to take forward the results and scale up. The project has provided a first experience on how to manage a distributed system and the selection of sites with thoughtfully considered vulnerable and at-risk populations.
Overall quality of Implementation/Execution	MU	The coordination and UNDP support team began implementation under enabling conditions in 2018 post-spot-check and transfer of the implementing partner from the ECU to MOE. The RTA, PC and PSC vetted an acceleration strategy focused installation of solar and efficient technologies (as a pilot study for policy and scale-up). The former project coordinator had singlehandedly (in absence of a full complement of staff) managed to oversee the feasibility work despite the constraints in the early implementing context (the project was not a priority for counterpart implementation). Building on the UNDPs ongoing emergency recovery work, a technical group to oversee the installation sites selection was developed. The UNDP RTA played an instrumental role in ensuring the sites were developed on the critical basis of linkages to emergency efficiency, energy-economic security, and energy in recovery and building back better.
3. Assessment of Outcomes	Rating	
Relevance	HS	<p>This project was highly relevant to Dominica as outlined in the ProDoc and Terms of Reference for the project. The Low Carbon Development Project (LCDP) complements the ongoing efforts of the government to assure a more sustainable Energy Sector.</p> <p>The Project conforms to the policies and plans drafted in Dominica that demonstrate the GoCD's recognition of the serious issue of high energy costs including:</p> <ul style="list-style-type: none"> <li>• <i>The National Low Carbon Climate Resilience Strategy 2012-2020 (LCCRS)</i> as detailed in Paras 52 to 56;</li> <li>• <i>Draft National Energy Policy (NEP) for Dominica, 2014</i> that promotes the development and utilization of indigenous sources of energy to generate and supply electricity at the lowest possible cost as detailed on Para 59;</li> <li>• <i>The "Draft" National Sustainable Energy Plan (NSEP) of 2014</i> are the measures supporting the NEP as detailed on Para 60.</li> </ul> <p>The high relevance was evident through the main objective of the removal of the policy, technical and financial barriers to energy-efficient applications and solar photovoltaic technologies in Dominica's streets, outdoor areas and public buildings nationwide for further scale up. The project does relate to the GEF Climate Focal Area and has been designed to deliver global environmental benefits in line with international climate change objectives.</p>
Effectiveness	MS	<p>This project was adapted significantly to focus within an enabled environment, however, sufficient time to execute the project deliverables was not realized due to a third national emergency COVID 19. The acceleration plan has been on the technical and logistical delivery of the solar installations to showcase and inform government decision making for future scale-up and policy. The context and the three disaster events presented enormous challenges and had contributed to the delay in progress with the original plan, especially with regards to the institutional enabling environment. The stakeholder engagement has thus been the main project contribution. It is only at this point, based on the interviewees, that the implementing context including with a new government and a post-disaster context, that the country is ready for the full intention of this project i.e., scaling and institutional development work to support the transition to a low-carbon society including by scaling and further showcasing IRE and EE in business contracts i.e., private sector and market creation. Additionally, through UNDP's perseverance and continuing support of the national implementation through a challenging context, the initiative has supported a now open policy window (recently opened) for the institutional and governance work around moving toward a low-carbon development society.</p> <p>Under the NIM+ modality, the responsibility for procurement was with the Government IP. Given the delays faced with implementation that were further compounded with the impact of Hurricane Maria, in 2017, significant support to the</p>

		<p>project was provided by utilising UNDP procurement processes. Navigating this process however led to additional delays. While these lessons learned were not integrated into project planning through the lifecycle in a timely fashion, the importance of coordination with focal points and also strengthening/managing more effectively the IP/government and UNDP relationship are key and can be transferred to future project design phases.</p> <p>The actual project products (solar and EE infrastructure installments) delivered are turnkey, and with some training, the solar and EE installations are robust and can be maintained by the users, and government with additional training. One aspect for maximum utility and policy level scale-up, however, is the relationship with the DOMESCO and whether the company and government, in terms of the policy, will enable the users to be producers of energy and get credits.</p>
Efficiency	MS	<p>A key area examined to determine efficiency, was assessing whether the project adjusted dynamically to reflect changing national priorities during implementation to ensure it remained relevant. As mentioned, in the phase of implementation (discussed above) , the RTA supported the project coordinator to develop a risk mitigation strategy and acceleration plan in 2018. The acceleration plan, was reviewed by the TE evaluator and found to be robust and reasonable. The acceleration plan had aimed to streamline the overall work plan and focus the remaining work on quality “hardware installation” - a priority for the government.</p> <p>Based on the operational and logistical issues encountered including the slow procurement of the solar installations and then the impacts on travel and procurement related to the COVID 19 pandemic, the work was implemented in the last two quarters of the project. The acceleration plan, installations, training and policy lessons from the demonstration will not be delivered by project end.</p> <p>Examining UNDP support, the level of implementation support provided by UNDP was continuous and in keeping with the implementation modality and any related agreements.</p> <p>Regarding whether the M&amp;E plan had been well-formulated, the project has not delivered according to the original work plan and indicator framework. The country was not ready for the catalytic work of the project and a systems approach to low carbon development.</p>
Overall Project Outcome Rating	MS	<p><b>Outcome:</b> The removal of the policy, technical and financial barriers to energy-efficient applications and solar photovoltaic technologies in Dominica’s streets, outdoor areas and public buildings nationwide, initially targeting up to 5 communities including Dubuc, Boetica, Roseau, Portsmouth, for further scale-up.</p> <ul style="list-style-type: none"> <li>• Indicators Cumulative direct and total post-project direct CO2 emission reductions resulting from the project support for outdoor EE lighting and solar PV pilot installations and investments in tonnes CO2 (Not yet measured )</li> <li>• Total MWh of renewable energy generated by EOP (Not yet measured)</li> <li>• Total MWh of energy saved from the installation of LED lights (Not yet measured)</li> <li>• % reduction in electricity costs in public buildings from RE and EE measures by EOP (Not yet measured)</li> <li>• % of households and commercial establishments experiencing lower electricity costs from EE and RE installations by EOP (Not yet measured)</li> </ul> <p>Dominica wants to be climate-smart by 2030; with this objective in mind, the project's basic work involved considerable stakeholder engagement and demonstrated support for this policy objective. Solar PV played an important part, especially in economic development and energy independence, risk reduction, women’s economic empowerment, poverty reduction, and efficiency -streetlights, among other areas. Going forward, the results of these activities should be utilised to inform policy and scale-up. Key questions which follow, therefore, are “what must be done to make it a reality?” and “How can the project pivot to utilize opportunities of policy momentum post-recovery?”</p> <p>There was a missed opportunity to accelerate the policy objective by better linking to the ongoing recovery efforts and showcasing the benefits of this technology on women’s economic empowerment and for disaster resilience.</p> <p>In terms of readiness for the institutional “readiness” for scale up, this project has contributed to the broader low carbon society outcome goal under and (since 2018) implementing context but also shown the need for sustained institutional and coordination capacity for energy and renewable energy. The installments are turnkey and demonstrate to government the benefits. In terms of trying to accomplish the removal of the capacity, cost and legal barriers at the</p>

		government level in four years, it was overly ambitious of the project to try to do everything! Focus was needed to inform the strategies and policies that must exist. With the high turnover of government and the dissolution of the ECU, the sustainability mechanism (institutional infrastructure for coordination) has been taken out of the implementing picture however, the environmental bill is now currently and firmly on the table (and was supported by this project) and this is critical for sustaining the results of this project which has wetted the appetite for a strong coordination function in the ministry.
4. Sustainability	Rating	
Financial sustainability	ML	<p>Stakeholders explained that further private sector and public engagement is required for the actual solar installments and system to work and for the broader contribution of this pilot to a low-carbon society. However, the barriers at the government level remain; the policy and stakeholder engagement for the experiment is needed, and this requires some discussion on net metering policy.</p> <p>GoCD's lack of knowledge of the impact of higher levels of IRE penetration on its grid, constrained its ability to regulate the IRE ceiling and determine its maximum low-carbon potential and do strategic planning for a greater share of RE in the Dominican energy market. The system needs to be monitored and data for financing the scaling produced.</p>
Socio-political sustainability	ML	<p>The cross-cutting design includes the potential for policy linkages to related issues including gender, poverty reduction, women's economic empowerment and, disaster risk reduction. This emphasizes the need for these messages to be discussed and integrated for future policy development and scale up.</p> <p>Several lessons were apparent; one lesson was design-related, and the need was to focus on implementing through and with disadvantaged communities as well to collaborate with these stakeholders in an inclusive manner on design and other key areas. The appreciation of the nexus between energy and sustainable human development is an opportunity for UNDP to garner more optimal results. The link to recovery is another area that the project had demonstrated good linkages in building back better. The gaps in implementation to fully engage other stakeholders on these areas were evident and the consultant tried to access the information but was challenged to do assessment as the activities supporting women and economically disadvantaged groups did not proceed according to the project's original plan.</p> <p>Scale-up strategy, targeting and related work are needed for scaling and follow-up. There is a unique opportunity for designing a system that serves all stakeholders in Dominica including the vulnerable, the marginalized and least served. A lesson is the importance of working with vulnerable communities living and depending on technologies to assess the cost savings and household income benefits in the design. The project had developed the criteria for sites, mapped the infrastructure and brought in technical assistance, however this occurred at a late stage. Consequently, there were no on-the-ground projects to demonstrate the effectiveness of these interventions or assess the beneficial impact on DRR, communities, infrastructure, natural resources, and ecosystem services. This is a lesson learned, as well-designed community-level engagement-type demonstration projects were crucial for the uptake of practice.</p>
Institutional framework and governance sustainability	ML	The instalments showcase several types of Energy demonstration systems, and in terms of trying to accomplish the removal of the capacity, cost, and legal barriers at the government level, it was overly ambitious of the project to try to do everything! The focus was needed to inform the strategies and policies. Further stakeholder engagement is needed, including some discussion with the DOMESCO on a net metering policy. The utility company has been installing solar energy at their own expense. Electricity is injected into the public grid, and the amount used is removed from the bill, thereby the public becomes both producers and clients. While there is a resistance to IRE, the penetration of solar power is inevitable as it is the most cost-effective way to generate electricity. As "Classic oil or gas" is on the way out, institutional capacity should be in place along with recognition of the capacities that can be informed by the data that this work can generate.
Environmental sustainability	ML	As this is an environmentally supportive project, policies and the enabling environment for RETs and EE area offers great entry points for moving towards a low-carbon and more sustainable development pathway. The inputs provided to the government have been supportive to grow the enabling environment of green Dominica in line with its agenda to be carbon neutral.

		<p>The CTA has provided recommendations for the establishment of a Department of Environment and made a presentation to the Minister and Senior Technical Advisor of the Ministry of Environment on these recommendations, however these re the beginning of secession that will need to be continued and scale. The establishment of the Department of Environment is a critical part of the Environment Bill, which was completed in the fourth quarter of 2020. The bill was submitted to the Attorney General's Chambers and in 2019, the Cabinet formed an inter-ministerial committee to review the Environment Bill.</p> <p>One limitation in the path to the establishment of the Department of Environment has been the cabinet decision to the names of persons to serve on the inter-ministerial committee rather than listing only the positions. This has posed a challenge as periodically positions may become (and have become vacant), however, a Cabinet Paper was drafted to rectify these issues and has been submitted to the PS. It is envisioned that this will help to move the review process forward to be able to establish the Department of Environment.</p>
Overall Likelihood of Sustainability	ML	Stakeholders reported consensus that by the end of this project, the project adapted plan and concrete installments agreed have been procured and delivered with a monitoring and maintenance plan, and with potential for sustainability, when handed over.

### Details on Evaluative Criteria

The outputs and work under the project are fully assessed in the final review of activities again the indicators and targets on page 55 of this report.

Criteria	TE validated Results update
Project Strategy	<p>Stakeholders share a consensus the project was overambitious (for context) and the indicators and theory of change were not SMART or well designed. The design was overly aspirational with a combined focus on IRE, Financing, and EE and energy performance contract to be implemented in a dynamic risk prone natural disaster context in four years. Stakeholder asked given the dynamic and low development context, whether it possible to explore this reality in a meaningful way in such a short period.</p> <p>In general, the overall intention of the GEF additionality and strategy was to <i>catalyze and increase the appetite for EE and IRE</i> in the energy mix. For the theory of change TOC, the basic argument was to experiment with installation in communities, thereby creating a way to reduce the use of diesel which could inform policy. The energy mix could be achieved by building on the environment and appetite for other renewables: geothermal power, small wind turbines in the ocean, and/or solar.</p> <p>Generally, the project was to make a minor contribution to the overall goal and was designed on the assumption of an enabling environment and will for capacity building. However, it would require more than 5 years to complete this project as it was designed. Stakeholders explained that the project concept needed to be implemented and adapted as a focused pilot or a technological experiment to inform the IRE policy and overall institutional enabling environment. A design suited to focus on strengthening the enabling environment, the policy, and cross-cutting issues would make the best case for policy from the experiment.</p> <p>Post implementation at TE, knowledgeable stakeholders stated that the potential scale-up (see scale-up discussion below) will require some discussion on the net metering policy. Additionally, component three focused on the exploration of the financial system including designing and seed funding a trust fund to scale up. This was an overly ambitious scale up idea and could have been another project. The GEF additionality, however, is intended to <i>catalyze and build capacity</i> within the existing enabling environment see ProDoc page 32 for incremental reasoning of the grant. The design of the trust fund and the use of GEF funds to fulfill it was also not appropriate. GEF resource cannot be used to seed fund.</p>

Criteria	TE validated Results update
	<p>The Terminal Evaluation determined that at the design stage, UNDP did not have a regional RTA to consult on energy projects. GEF resources need this technical oversight, and this became apparent when the RTA joined.</p>
<p><b>Outcome 1:</b> Improved knowledge, awareness and institutional capacity on EE applications and solar PV through demonstrations of their deployment in Dominica</p> <ul style="list-style-type: none"> <li>• Number of studies for selected EE applications and RETs to be piloted through an EPC arrangement.</li> <li>• Number of pilot installation of EE applications and RE technologies with and without battery storage carried out.</li> <li>• Combined installed capacity of “scaled-up investment” through CCTF in RE and EE applications targeting vulnerable groups e.g., low-income female-headed households.</li> <li>• Number of electrical technicians and EE/RE equipment installation personnel trained in best practices for the installation of various EE applications and various EE technologies.</li> </ul>	<p>Installations (See full report on the status of installations in the Annex 12)</p> <p>The UNDP supported the preliminary feasibility studies by bringing in Barbados support, which provided a good foundation. The final sites and estimates were produced by UNDP engineers with government technocrats.</p> <p>As at the time of this evaluation, the systems had been installed and have potential to produce data. These include 7 buildings (6 with solar PV and LED lights, and 1 with LED lights and WiFi thermostats) with differences noted between sites. The accelerated installation has in fact, used 5 sites from the original plan, including one indigenous site. One is a government building in the center of the capital. There is one primary school, two secondary schools, a home for destitute elderly persons, and emergency operations center, and one off-grid indigenous resource center. The Terminal Evaluation deduced that data needs to be generated from the system to inform the upscaling. Software for monitoring the system is included in the procurement package. These are described under the results section of this report.</p> <p>The Terminal Evaluation determined in discussion with technical consultants attached to the project that the actual products delivered are turnkey, and with some training, the installations are robust and can be maintained by the users. One aspect for maximum utility and policy level scale-up, however, is the relationship with the energy company and whether the company and government, in terms of policy, will enable the users to be producers of energy and get credits.</p>
<p><b>Outcome 2:</b> Uptake of EE applications and solar PV technology is promoted through adoption of new institutional arrangements and policy and enforcement measures.</p> <ul style="list-style-type: none"> <li>• Number of draft strategic plans and institutional arrangements developed that are gender-responsive and are informed by relevant gender-based research, analysis and advocacy.</li> <li>• Number of RE and EE technologies with mandatory MEPS by Year 2</li> <li>• Number of Moher officers involved with the enforcement of MEPS and green building codes by EOP</li> </ul>	<p>This was a NIM project; the implementing content changed from the design stage and the governance and institutional capacity building work was not implemented as planned. The project work plan was adapted through a risk mitigation strategy in 2018 and was refocused on the instalment of solar energy works. The implementation was a learning by doing experiment with the project coordinator sitting with the ECU, and now the MOE. Regardless, this was useful as soft policy support and for creating the interest in having a focal point for the continued Low Carbon transition.</p> <p>The project recruitments were late in the process with most of the technical and governance staff coming on board in 2020. These key positions were revised and hired as consultancies, however, this took place late in the project period (2020). These consultants worked together on key deliverables concerning the installations and delivery of a distributed system across the installments, however there was little time for government to learn from the exercise, build internal capacity. This also impacted the government's ability to use the data coming from the system to make a strong case for policy i.e. coordination capacity for continued work on energy as part of a low carbon pathway in the country.</p> <p>From the beginning of the project implementation, the design assumption of the learning links to the World Bank recovery institutional development work at ECU was incorrect, therefore the combined contribution to the sustained coordination capacity for energy and renewable energy were negligible. At the end, the institutional capacity for coordination of energy and environment in the country was weakened (the ECU was dissolved). The experience has shown that there should be existing capacity (and environment) to build capacity; presently the major challenge is the sustainability and the coordination capacity link for the handover and continued learning from and scale-up of the system.</p> <p>The Evaluator interviewed the PS and determined that there are several key areas the project results can expound upon, including the work of the government to support the development</p>



Criteria	TE validated Results update
	<p>of the geothermal. There may also be room to augment the DOMECSO capacity for solar energy as part of the mix. The fact that the government removed the import duties on renewable energy products is a showcase of will. The downside of the project implementation has been the low engagement of key stakeholders and the absence of a capacity-building strategy from the beginning. The project needs to develop a compelling road map for future implementation towards low-carbon and to scale up the work.</p> <p>The project was able to perform capacity building activities in 2021, including:</p> <ul style="list-style-type: none"> <li>• Training on CARICOM Regional Energy Efficiency Building Code, done in collaboration with the Dominica Bureau of Standards and CARICOM Regional Organization for Standards and Quality (This also included a 'train-the-trainers' component)</li> <li>• Virtual Workshop on Opportunities, Risks and Policies</li> <li>• Virtual Workshop on Good Practices in Solar PV Installation</li> <li>• Virtual Workshop on Financing Models for Solar PV and Energy Efficiency Interventions</li> <li>• Installation of solar lights at the Botanic Gardens as scaled-up action</li> </ul>
<p><b>Outcome 3:</b> Scaled-up EE applications and RET investments through implementation of newly proposed financial and institutional mechanisms</p> <p>Cumulative number of commercial establishments and households accessing financial assistance from the CCTF by EOP. There will be emphasis on promoting economic opportunities for women and vulnerable groups e.g., low-income female-headed households</p> <p>Annual MWh of EE and RE measures planned or installed by EOP (based on combined total of 591 kW installed capacity during project period)</p> <p>Number of technicians who are employed in the installation and maintenance of EE and RE equipment by EOP</p>	<p>The project had completed enabling work under this component; however, the work has not yet been fully evaluated for scaling up. Financial analysis and support for the scale up of the EE and RET was a key expected outcome for the project and part of the plan. Under the Environment Bill, there are plans to establish the CCTF. Though there has been little progress in reviewing the bill to start the process of approval, the time and current capacity to execute the CCTF was insufficient, which means that funds allocated to this activity (to conduct RE and EE interventions through the CCTF) would not be spent in time.</p> <p>This work is progressing with the support of the CTA but in the form of policy recommendations and training to official and relevant stakeholders. This will be implemented post TE (the last month of the project). A proposal was made by the PC to consolidate the funds for PV installations and CCTF and use this combined amount to procure all the solar PV modules for all 6 sites.</p> <p>This project recruited an Energy Finance expert who in addition to the EPC contract, has provided recommendations for the establishment of the Climate Change Trust Fund. The main deliverables of this expert were the following:</p> <ul style="list-style-type: none"> <li>• Develop the Inception Report and Work Plan (done),</li> <li>• Conduct a feasibility study of financial mechanisms for scaling up RE investments based on the findings and provide recommendations for EPC and/or other viable arrangements (done),</li> <li>• Develop and deliver a training program to support EPC pilot participants (Feb 2021),</li> <li>• Prepare an Energy Performance Contract (EPC) template (draft completed; the training will be done first to allow completing this if the training leads to any changes to be made).</li> </ul>
<p><b>Impact</b></p>	<p>Relevant stakeholders interviewed are of the opinion that a greater impact from the installments can be derived provided that there is an exit plan with a monitoring framework to take data from the system. A replication/ scale-up plan is needed to inform decisions i.e. to replicate in all public government buildings as well as to grow buy-in from the public and uptake of solar as part of the energy mix. Relevant implementing stakeholders stated that monitoring and reviewing the data coming from the system is key for policy-related sustainability and scale. The installments as part of a distributed system must show cost-effectiveness for the electricity supply and cost benefits and the need for private sector engagement in terms of their perceived losses, i.e., Independent Power Producers and local consumers who choose solar roof-top installations. Relevant stakeholders say the project must showcase resilient systems to deliver an adequate energy mix for optimal reasons. The data produced from the RE systems have not</p>

Criteria	TE validated Results update
	been firmly reviewed. The energy output from the RE systems will require continued monitoring to adequately inform decision-making.
<b>Outcome 4:</b> low-carbon development is sustained through effective monitoring and evaluation <ul style="list-style-type: none"> <li>Number of monthly reports submitted by EOP</li> <li>Number of completed final evaluations completed by EOP</li> </ul>	<p>This output was dealing with the capabilities and institutional arrangements that were envisioned to be in place in order to monitor the data output provides following the successful implementation of the renewable and energy efficiency initiatives. It was never realized and the institutional arrangement for monitoring a low carbon society was in fact weakened with the dissolution of the ECU with no replacement for coordination and monitoring.</p>
<b>Project Implementation and Adaptive Management</b>	<p>The project log frame was not effectively adapted and used as a monitoring tool. Many interrelated factors have impacted the effectiveness, implementation, and delivery of the project as highlighted above. As a result, mostly due to the lack of early Implementing Partner (IP) support to the project, the overall expected “transformative” level results have been sub-optimal; however, TE deduced that an acceleration plan was sensibly established in the face of an uncondusive operating environment and the project has made a modest and concrete input to this outcome goal. Specifically, the IP was changed due to financial irregularities and had not been supportive of concept from the outset.</p> <p>The RTA advised on focusing design on the delivery of the system and an acceleration plan, which reduced and focused the work plan to the installments. Although the UNDP provided technical oversight and execution support to NIM daily, in the future this will change, including loss of adaptive management support.</p> <p>UNDP RTA took a strategic decision on the adaptive management of key activities under enabling conditions as an attempt to recover results in the time frame. The adaptations set the priorities, such as what was technically realistic to achieve. While the project team finally added technical staff for liaison with the government on the technical implementation and systems governance issues, it was a late input and was further disrupted by COVID 19. The RTA visited the regional hub in 2017, however, the 2017 disaster interrupted the first mission. Subsequently, a second visit took place in 2018 and had been instrumental in developing the accelerated delivery strategy.</p> <p>The operating enabling context had also changed (election and transition of project counterparts), and a new, more committed PS arrived in 2019. During the COVID 19 crisis, the project applied for an extension of 6 months until 31 May, however, was only granted and extension to March 24.</p>

## • Summary (Conclusions, Lessons and Recommendations)

### CONCLUSIONS

The project is highly relevant to the Dominica sustainable economic development context. Based on interviews with high-level government stakeholders (who are also very supportive of the work), this project is more relevant than ever to the development agenda. These stakeholders also expressed their need for the hard data and policy recommendations from the IRE and EE experiment on how it works, how it will be maintained, and the cost and benefits for policy purposes.

The implementing context was difficult. UNDP’s support to execution and cross-sectoral engagement can be commended despite the issues with procurement and the sub-optimal delivery in monetary terms.



UNDP's support was preserved in the face of national contextual challenges and the perseverance and continued support was recognized by most interviewees.

The idea of Dominica moving towards a low-carbon pathway and become a sustainable nature island is high on the policy agenda. The results of this project can be linked to the Environment Bill currently being circulated that will precede the next environmental and energy coordination unit.

In terms of delivery, the project was clearly implemented in two phases with two Implementing partners. The first period was in the absence of an enabling environment and with a lack of counterpart support. The second period was post spot check and counterpart changes and had clear implementing support. Unfortunately, the project deliverables related to its acceleration plan of 2018 (specific to governance and learning aspects) were not fully executed due in part to COVID-19. While the team had been successful in installing the solar demonstration and EE equipment, much more was needed in terms of the governance and education work for the transformative results expected.

The adaptation and thrust to focus during the second period on the installation of the system was a critical adaptive decision by the RTA and PC involving oversight. The TE found that in terms of the original design, even with the high relevance, the design was overambitious for the timeframe. The IRE EE topic and strategy were overambitious with a project document that was trying to execute several deliverables.

Additionally, a key lesson for a protracted emergency context is to adapt and make programmatic linkages to the recovery work and to document these changes. At end, the installation for demonstration was fully achieved. The criteria for the site selection demonstrated the cross-cutting linkages between energy, environment, and recovery and has potential for scaling this project. The challenge is to finalize and vet the installation and to package the results for policy and for the work on institutional scale-up.

The main lesson is that the government did not take ownership at the start. The context had shifted; going forward, UNDP and the PC can aim to do this with the handover. This project is positioned for recovery and building back better. There are key messages for economic development for instance as the work is strategic for Dominica's continued economic recovery. The main challenge is how to scale up given that the project has provided a first experience on how to manage a distributed system and the selection of sites that thoughtfully considered vulnerable populations. There is need for further stakeholder engagement in how the system's works.

As a next step, UNDP can hand over the results to the government. The Terminal Evaluation determined in discussion with technical consultants attached to the project that the actual products delivered are turnkey, and with some training, the installations are robust and can be maintained by the users. One aspect for maximum utility and policy level scale-up, however, is the relationship with the energy company and whether the company and government, in terms of policy, will enable the users to be producers of energy and get credits.

In terms of support to implementation as NIM plus, UNDP *did* help and intervene but in retrospect could have acted earlier when it became clear there was no IP support for this project in the ECU. Additionally, when UNDP brought in added support from a similar Barbados project for feasibility, they might have used that support also to identify links and help in the adaptive management connected with the system's governance aspects.

As for project monitoring, when monitoring complex technical project like this, there needed to have been robust M&E, using the MTR whenever possible. Reports were prepared by consultants and the

government had asked UNDP for payment, as per the cash advance NIM modality. It is important to note that while the UNDP does not have to directly review products (this is the role of the PM and IP), for this project, the PM was under UNDP contract and was not capable of technically reviewing the work at the onset. Also, the project needed a CTA from the outset which is a lesson learned.

The critical learning has been how the project can pivot now to continue to take opportunities of policy momentum post-recovery. This is a central recovery/energy link lesson. Many stakeholders say there was a missed opportunity to accelerate by linking to the recovery efforts better.

The project implementation approach demonstrated the lesson on the PSC role and the role of technical groups. Technical working groups are useful to give a more integrated perspective on implementation. The follow-up policy recommendation needs a deeper analysis of the cost benefits, i.e., what kind of data came from this experiment and what can be salvaged to do something useful for policy and decision-making.

A key recommendation by several interviewees was to focus the handover around the data coming from the MRV system. Additionally, an exit strategy is needed, and it should give a clear understanding of the cost benefits and the gaps in the institutional arrangements to carry the coordination of this work forward. A key opportunity is for UNDP to support the government in its efforts to build institutional capacity for the environmental department to coordinate this work and others. The exit strategy needs to show the donor landscape, the costs and benefits and how the scale up involved the utility companies. Private sector stakeholders need to be engaged in the dialogue on the cost and benefit of the net metering policy. Also, analysis is needed to show when geothermal power will come on stream. It needs to look at the solar market and the role it plays in the scale-up. The follow up will need massive input of resources to support the government build human resource capacity to transform the country into a climate resilient island.

## LESSON LEARNED

Criteria Design	Priorities of Country	Policy advocacy and more direct links to agreed post-2015 related national Energy Efficiency policy frameworks, i.e., SDGs and Agenda 2030, Sendai Agreement 2015, Paris Agreement 2015, Biodiversity, etc. in design strategies can support contribution to country's commitments.
	Project Capacity Development and Learning Approach	<p>Interviewees shared a consensus that the PMU learning, cooperation, and a project learning approach was enabled by a dynamic and flexible PC who responded well to' emerging demands in line with the shifting policy and institutional landscape. Policy and planning are time-bound, and relationship processes often have very short windows of opportunity for engagement; therefore, this was excellent feedback.</p> <p>Utilizing the flexibility and the relationship with high-level government officials inherent within the program, the PC, the RTA (from 2018),national implementing partners and the relationships built with counterparts in the Ministry of Environment, enabled the mobilization of support for project processes on short notice when the project began to take off in 2019 (see PSC #5). High level Government Stakeholders appreciated the PMs ability to respond to immediate needs and opportunities. However, some stakeholders involved in implementation generally reported that the project approach was lacking national strategies for sustaining cross-sectoral work and for institutional sustainability (especially by strategically involving investment and infrastructure budgeting community, i.e., MOF and Private Sector, in the coordination and learning activities). These gaps were attributed to design issues.</p> <p>The government needed to bring in service and goods, but encountered barriers with procurement and speed. UNDP on the other hand required a plan for complex procurements upfront in design.</p>
	Cross-cutting areas needed in the Results Plan	The project design had many assumptions around the cross-cutting areas including monitoring results and pilot installations and work with risk reduction, vulnerable and communities, enabling environment, staffing, coordination, monitoring, and policy learning goals. These elements required more elaborate strategies and

	and Indicator framework.	design: livelihoods, cost benefit analysis, national coordination institutional goals, sharing partner networking goals. In addition to a cross-cutting component, the performance monitoring would have benefited from SMART indicators and theory of change on EE policy learning and institutional capacity building.
	Monitoring and evaluation changes and turnovers	<p>As this was a complex and technical project, there was a need for robust Monitoring and Evaluation, including a Mid Term Evaluation. While projects under 2 million can forgo an MTR, that is a minimum standard, not the recommended standard. An MTR is a good mechanism to help monitor and implement a course correction. The project reports were prepared for consultants and government, requiring payment which required review locally. This was not an easy process and the communication was not clear on standard operating procedure related to this technical vetting. Therefore, both the government's M&amp;E system and UNDPs monitoring required strengthening. UNDP extra technical support also needed to be costed and with robust planning support during project design and implementation. If milestone setting is inadequate, it prevents the ability to course correct. Standard Operating Procedures were required for various stages.</p> <p>Another central lesson learned on design was that pilots like this should be held up as models for promoting the systems approaches to energy resilience work. However, the project had a lower PMC size than what is allowed by GEF rules (10% of project budget). A lesson learned is that the project required the full PMC budget to structure robust M&amp;E procedures.</p>
	Implementing GEF Project	There was no proper cost recovery for UNDP. The real cost of support to execution needed to have been incorporated into the design from the onset. What is the way to deliver quality products that make economic sense for UNDP? Proper cost estimates are required for programming support in design. For instance, what is the value UNDP brings to the table and is the resource sufficient and as well as the level of readiness for implementation does it make financial sense? As it is a business model, UNDP is supporting them in an area and in their history and experience, they are operating GEF projects at a loss.
	Monitoring	The project design did not have a realistic view of the existing capacity and enabling environment for implementation. The lesson to deal with uncertainty post design i.e. of a reoccurring natural disaster, the lag between the counterpart design and implementing partner issues is adaptive management. The importance of the UNDP GEF RTA's early monitoring role became apparent for monitoring the use of the resources, i.e., for instance the idea of a seeded trust fund was ill advised. In addition, during implementation, a lesson learned was that GEF resources cannot be used for direct health systems but building energy system for health buildings post recovery for resilience was possible.
<b>Implementation</b>		
	Implementation and Delivery	The early enabling environment issues, processing delays and unexpected financing shortfalls adversely impacted implementation. The collective efforts of UNDP, government agencies, and the PCU in applying adaptive management allowed the program to overcome issues concerning moving the project outside of its contextual institutional barriers. In the end, this did impede the delivery of key outputs, but implementing partner and UNDP learned they could have taken more proactive actions, especially in designing and monitoring/managing the program. For future implementation, UNDP might take a more proactive role in implementation and governance of NIM projects and including its unit responsible for safeguards and poverty alleviation. Monitoring on part of the government and UNDP was weak. This aspect is critical and need to be addressed in design and follow through. How to deal with procurement services need a frank discussion.
	Knowledge building (Effective-ness)	Under the program, the PMs focus on sharing of information and good practices was active and beneficial. Stakeholders provided examples of many useful soft policy and knowledge interventions from the PCU. The project has created a base for a learning platform to promote cooperation in EE resilience, and low-carbon technologies.
	Stakeholder engagement	Broad stakeholder engagement was crucial for achieving the program's goal of low carbon development. In fact, the program's capacity development and approach were about implementation through partnerships. However, engaging with other sectors, development partners, NGOS and the Private Sector was a challenge. Additionally, efforts to mainstream environmental considerations into government budgets and investments were difficult. Other sectors tended to view the environment sector and its related safeguards as impediments to their developmental activities rather than as a means of providing more sustainable benefits. The PM aligned the procurement activities to promote sustainability and inclusiveness. However, engaging on procurement for learning with the other sectors was challenging due both to project scale and size and because formal EE planning processes and mandates were still evolving.
	Administration and procurement	The NIM plus implementation and procurement was reported as being constrained by events in the context outside the control of the UNDP and project but also as cumbersome and slow for UNDP and government procurement modalities. Based on context, the country decision was to procure through UNDP and engage the

		unit in Denmark to manage the tenders. This action had been expected to increase implementation efficiency by significantly reducing the procurement packages. This also impacted on the value-added of having a close learning arrangement with UNDP procurement and government procurement including making the case for safeguards and approaches to infrastructure investment and poverty and livelihood work; this is a lesson for the future. UNDP Denmark has provided execution support using DPC (direct project costs) approved in design.
	Partnerships	UNDP comparative advantage is the trusting relations with the Ministries of Environment. To achieve the results expected, a broader mobilization of partnership and stakeholder participation was required. Going forward, UNDP can leverage the EE experience and link and/or expand to other DONOR investment activities. Also, the generation and use of program knowledge products should be maximized, especially among UNDP and development partners. To ensure program sustainability, resources from the private sector could have been explored. The potential for catalyzing such partnerships is strong.
	Procurement	More holistic approach is needed for procuring goods and services and to ensure technical quality assurance as this was noted as problematic for the government. If the government is implementing the GEF project, potential gaps in procurement must be clear in the design stage so as not to hinder delivery and to ensure there are checks and balances made in project design. There was also the need for effective government procurement to bring things in i.e. GEF procurement. The minister will be constrained in the vision to build capacity for a resilient Nature Protected Island due to issues caused by policies related to procurement and weak environmental coordination human resources.
	Adaptive Management	<p>Within a challenging emergency context, there was also a missed opportunity to link the activities to the ongoing recovery efforts when this opportunity arose. Repurposing GEF funds for recovery support from Hurricanes Irma and Maria - as per GEF policies- was not allowed.</p> <p>Additionally, an implementing lesson was that while UNDP <i>did</i> monitor and work to change the dynamics of implementation, i.e., a spot check on ECU, interviewees say the action was slow and UNDP/GEF could have acted on the challenges with the IP earlier. For instance, the mechanisms are available in the GEF project-monitoring process such as the inception period. It is there to reassess design including context before the start of implementation and to enable oversight and intervention of partners such as the higher UNDP focal point in-country. The Terminal Evaluation determined UNDP made significant efforts to move implementation, for instance, through orchestrating extra support the feasibility of the technical installations. It was evident as UNDP brought on support from a similar Barbados project, engineers without borders—i.e., for sites and feasibility. Stakeholders also say more could have been done to use persuasive help identify links and gaps in the institutional implementation arrangement, consider the policy issues, and support the adaptive management.</p>
	Project Management	This project was not fully staffed until 2019; however, implementation was ongoing through the efforts of an effective project coordinator. The UNDP RTA intervention that took place through an acceleration strategy and a focus on hardware delivery at a late stage was a good lesson learned. Another lesson learned was to hold regular informal and formal briefing by the PM to policy and decision-makers. Such briefings contain information about the cost-effectiveness and benefit evidence-based policy.
	Oversight/Project Steering Committee	<p>The lesson is to include on the Steering Committee, the highest-level partners possible (GEF, UNDP, Country Focal Point to Dominica) to oversee the project agreement. This lowers the risk of context issues such as those that occurred early with implementation partner. Actions and decisions can be made, however, there should be follow-through or accountability.</p> <p>Another key lesson learned was about the value of bringing in cross-sectional technical groups to support work planning. Technical working groups are useful and support for integration perspective and national monitoring on implementation.</p>
	Efficiency	Another key lesson is loss of efficiencies with so many GEF project happening at same time in country with cross-cutting areas, including training and monitoring. it would be more efficient for all GEF projects to be housed in one unit. A related lesson is that for the national government, having the GEF projects contained in one unit can support efficiencies and resource for cross-cutting work on capacity development, monitoring and procurement liaison.
	Procurement and Execution support	UNDP had an execution support to procurement agreement. Stakeholders explained that if there were an early procurement plan in place at design or inception, the question of scheduling and spending budget (and prioritizing work) would not have emerged. The UNDP support to procurement was anticipated as a key to push the project quickly, but it went slowly despite this. In this case, there are lessons on procurement planning especially on complex technical works. If the UNDP procurement was able to obtain the plan at start, things might have been

		manageable. A lesson is to provide such a plan during the project design and inception to avoid bottlenecks and to schedule and review the market for the vendors in a timely way. Additionally, a plan is usually needed to ascertain the complexity and/or the timing of the support for efficiency and reduction of delays. MCO has many country offices to serve and many GEF projects. Early procurement planning, especially for complex thematic project, i.e., renewable energy installations, low-carbon recruitment, EPC contracts, is necessary. Having a procurement plan especially for technically complex projects like this attached to NIM plus agreements is critical for smooth support. (Procurement officers do not necessarily have the thematic technical specialization and such analysis is necessary to support their work with vendors and markets.)
<b>Results</b>		
	Replication/ catalyzing/ scaling up	The project interventions to date have focused mainly on installation of EE hardware. According to stakeholders, the hardware focus in the theory of change should have been the last inputs and only 15 %. For instance, the other 80 % of work plan agreed in ProDoc was intended to be learning activities for changing mindsets and for influencing policy for low-carbon development and should have been started from the beginning. This includes work on capacity building, knowledge sharing, and propagating energy efficiency as policy. The expectation per ProDoc and design concept was that that project would be instituted as a learning program linked to the EE smart investment processes. It was, however, unclear how this project demonstration, mainstreaming and links to the national capacity building was to be monitored, linked with the capacity development (knowledge work) and reported for results. This aspect needed to be stronger in the project design and reporting framework with clear results around mainstreaming and standardizing national investment assessment processes: The IRE and EE mainstreaming was central to success as stated. For stakeholders to mainstream safeguards as well as conduct the EE program was the intent. Both are thus central to project results as an important work programme. To be salient, more work on the casual linkages and results pathways or mainstreaming IRE is needed in the design and so is framework for monitoring the expected results.
	Institutional capacity building at the national and regional level	The implementation has yielded several key lessons concerning project and government ‘readiness’ for capacity development, which needed a strong focus including a fully fleshed-out strategy that could be monitored. Institutional capacities and general holistic capacity building targets needed to be mapped in context and strategies developed during the design at all levels including strategies for national, and subnational results (organizationally, individually, and institutionally). As capacity-building project and technical assistance, activities aimed at developing tools and approaches for integrated environmental assessment, planning, and management was needed. It was also crucial to promote their uptake by strengthening enabling policy alongside the technical and institutional capacity building. The experience demonstrated that targeted awareness-raising and capacity building are needed to encourage uptake of new tools and approaches. Certain areas, i.e., institutional capacity building for intersectoral cooperation at national needed more project design work for the results to be salient. This is an important lesson learned.
	Capacity building	<p>In the second phase under enabling conditions, the ECU coordination function was dissolved. The Project Coordinator was often asked to do other ministerial work. In terms of the inception, there was a world bank project ongoing with existing ECU staff. In this context HR capacity building became problematic. In the future, if the government wants to be nature island and climate resilient (low carbon) they will need to build a human resource development plan and a commitment to executing that plan with sufficient resources.</p> <p>UNDP can help coordinate an influx of resources for institutional and human capacity planning for a resilience island. UNDP can also scope donors for massive influx of capacity need to build capacity now as the GEF project will not be enough to facilitate that. Potential donors could include Canada (DFID); through this collaboration, the challenge for energy independence, resilience, and the value of nature can be made clear. It is important to note, however, that the institutional setup for this vision will require extensive resources. This is an opportunity for UNDP – positioned for institutional development work and for coordination of donors to get a massive influx of capacity, not small GEF projects. There is a need to pursue larger donors with a good plan for building institutional capacity for resilience and low carbon.</p>
	Handover	A key lesson for handover is that training for the users on the maintenance of buildings is provided. Monitoring the installments is key for sustainability and scale. What kind of data is coming from these experiments as is stated by the technicians attached to the project? Can all the installments be evaluated for scale? Technology will work with the resilience system delivering the best energy. The installments should be handed over with a clear monitoring plan for the system to support the sustainably. Software for monitoring was included in the package. Newly trained users should have the software for monitoring. Trainers should ensure that energy output is monitored for design-making. Spending the remaining funds to match the original objectives must be the significant focus of closing out.

	Monitoring and Adaptive Management	A central lesson for monitoring is adaptive management and rethinking GEF /UNDP tools for documenting decisions around adapting the original plan when the design is no longer relevant due to the complexity experienced by protracted disaster and operating environment. For instance, the log frame for this project was no longer relevant by 2018 and so in lieu of the acceleration strategy and MTR could have been a way to make note of the adaptation along the line of an adapted throat of change. This is a question for UNDP and GEF to answer as the project document had become a straitjacket that was no longer useful for results and for rating results.
	Consultations with stakeholders	A key results lesson on the topic of renewable energy is that while the project was set in the ECU in MOE, there was a need to revisit the implementing partner arrangement early. Stakeholders say that perhaps the better actual counterpart was in another ministry or semi-governmental energy agency. Stakeholders generally agree that this arrangement could have been rethought during early implementation given the context.

## Recommendations

**Recommendations Table**

Rec #	TE Recommendation	Entity Responsible	Time frame
	Category 1: Resources and Positioning	UNDP/GOV	2021
	Key recommendation: UNDP and Government might work together to undertake a resourcing scanning for the operationalization of the new Environment Bill and establishment of the Dept of Environment to create the enabling environment for coordination and continued IRE and Energy solutions for Low Carbon Society work. Government can develop an Energy Smart campaign for the public, starting with schools.		
	Category 2: Solar and EE- Installation and Handover	UNDP /PC	2021
	Key recommendation: For the solar installation, the Government can work with the organization which does solar PV training to have a regular training conducted (Solar Energy International; Green Solutions Inc; CROSOQ)  UNDP and PC can continue to provide support on the development of the MRV Coordination Mechanism, and the Gender Mainstreaming Roadmap (proposal developed by PC as part of the updating of the NDC)		
	Category 3: Public Awareness and Communications	GOV	2021
	<i>Key recommendation:</i> Develop a website for all things related to this project work on renewable energy and energy efficiency, to ensure the public and government have ready access to all project stated deliverables and information (i.e. <a href="https://www.thegef.org/project/low-carbon-development-path-promoting-energy-efficient-applications-and-solar-photovoltaic">https://www.thegef.org/project/low-carbon-development-path-promoting-energy-efficient-applications-and-solar-photovoltaic</a> ). The links and benefits of energy to sustainable low-carbon development, emergency and recovery back better made through this project should be further documented.  UNDP can support a knowledge dissemination strategy and host a launch event in line with the governments stated inter in becoming a carbon-neutral society.		

Rec #	TE Recommendation Entity Responsible	Time frame	
	Category 5: Policy Handover And Exit Strategy	UNDP/PC/GOV	2021
	<p><i>Key recommendations:</i></p> <p>5.1. A new Energy Policy was approved by Cabinet in 2021. Follow up on the development of a plan to develop feasible plan for its implementation. In relation to this continue to provide support linked to the establishment of a Dept of Environment with strong coordination function for energy.</p> <p>5.2. For optimal sustainability and scale-up, conduct an end review of the installments and provide policy and technical recommendations for policy and sustainability as well as step by step methods for monitoring the data coming from the system for future government decision-making. The project installments are only now reaching the stage at which a deeper analysis of the systems function and data for cost-effectiveness as well as the lesson for institutional follow-up per the broader goal of supporting low-carbon development can be made. The cost benefits, the broader governance including the need or sustainability education and policy around scaling the IRE work across the island, remain. The installation and work with schools and health for instance has been great place to start a greater island focus on education for sustainable development.</p> <p>5.3. At the final TE, it was not clear what data is available and what is useful for decision-making (refer to the technical analysis of what has been installed and do a policy analysis including on the institutional support needs for monitoring). In this regard, an exit strategy might be developed with a focus on the cost, maintenance, and basic scale of the institutional needs and opportunities for coordination and scale up of the installations to carry this work forward. The remaining funds must be returned to GEF.</p>		



## 1. INTRODUCTION

### 1.1. Purpose of the evaluation

As a requirement for all GEF UNDP medium- and full-sized projects, the TE evaluation and report will assess the achievement of project results against what was expected to be achieved and draw lessons that can both improve the sustainability of benefits from this project and future projects with similar objectives and aid in the overall enhancement of UNDP programming. The TE report promotes accountability and transparency and assesses the extent of project accomplishments. The TE results are to be used by the Commissioning Unit, Donor, implementing partner and stakeholders to strengthen funding decisions, improve the design and implementation practices and maximize positive social impact. TE results will be used to increase knowledge and understanding of the benefits and challenges of development programmes and projects intended for the enhancement of human development as per the UNDP evaluation criteria, thus fitting in with the Commissioning Unit's Evaluation plan. The TE is important in determining the completeness of the project and whether the activities and indicators identified during project development justly reflected the project objectives. The assessment will also provide some guidance on how requests for project extensions could be fairly correlated to the time granted.

### 1.2. Scope & Methodology

#### Scope

Based on the evaluation ToR, the TE was expected to assess project performance against expectations set out in the project's Logical Framework/Results Framework (see ToR, Annex 1). The TE has assessed the results according to the criteria outlined in the Guidance for TEs of UNDP-supported GEF-financed Projects ([http://web.undp.org/evaluation/guideline/documents/GEF/TE\\_GuidanceforUNDP-supportedGEF-financedProjects.pdf](http://web.undp.org/evaluation/guideline/documents/GEF/TE_GuidanceforUNDP-supportedGEF-financedProjects.pdf)). The TE report thus presents the achievement of project results against expected results and draws lessons that can both improve the sustainability of benefits from this project and future projects with similar objectives and aid in the overall enhancement of UNDP programming. The TE report was to contribute to accountability and transparency and assess the extent of project accomplishments. This TE report provides evidence-based information that is credible, reliable and useful. Additionally, the TE team was expected to conduct field missions, to Roseau, More Ratchet, St. Joseph, Portsmouth, San Sauveur, and St. Cyr in Kalinago Territory, however, the mission was restricted to validation online with credible stakeholders, according to the global restrictions to safety (due to COVID 19 Pandemic) including the following project sites:

- The Dominica Infirmary
- Morne Ratchet Emergency Resource Center
- Isaiah Thomas Secondary School
- Portsmouth Secondary School
- San Sauveur Primary School
- St. Cyr Community Resource Centre
- Financial Center.

The specific design and methodology for the TE emerged from consultations between the TE team and the above-mentioned parties regarding what is appropriate and feasible for meeting the TE purpose and objectives and answering the evaluation questions, given limitations of budget, time and data (see phases



below). The TE has used gender-responsive methodologies and tools and ensures that gender equality and women's empowerment, as well as other cross-cutting issues and SDGs, are incorporated into the TE report.

### ***EVALUATION CRITERIA AND INDICATOR FRAMEWORK (FOR THE DATA COLLECTION AND THE ANALYSIS)***

This evaluation has thus essentially asked and answered the questions “What are we doing, how are we doing it and what can we do better?” “The intended results were to inform the learning generated from the work program against the objective based on the targets and indicators put forth. Strategic questions were developed concerning the results of the hardware and distributed energy system installed and how much that contributed to the outcome. Sustainability and scale-up were central to the orientation of the questions posed at TE given the issues with the protracted emergency context and operational environment disclosed during the desk review. The evaluation also focused on learning to generate lessons for future project implementation, coordination management and concerning the energy topic—pilot-assessments, technical support and decision-making arrangements.

In line with the above-stated aims and expectation of the evaluation and criteria, the evaluator thus technically led the evaluation guided by a reference group (see list attached), including the inception work, development of a refined evaluation matrix design and guidance for implementation and coordination of online consults and inputs linked to assess the project's stated outcomes and indicator framework (original project document).

The evaluation analyses focused on the level of achievement of project results at the level of outcome, making use of the project results framework and theory of change, implementation processes and contextual factors, establishing as much as possible causal linkages guided by the evaluation criteria and questions. The evaluation was conducted in line with UNDP Monitoring and Evaluation Policy for evaluation.

The evaluation approach will follow tasks and phases as per the ToR, Annex 1.

The evaluation was theory- and principle-based, following the GEF and UNDP guidelines as well as international standards and criteria and guidelines of the OECD-DAC: relevance, efficiency, effectiveness, sustainability and lesson learned (guidelines/standards for evaluating development and humanitarian projects).<sup>1</sup> It has employed a range of qualitative and quantitative methodologies. It was participatory, ensuring the inclusion of all relevant stakeholders' perspectives. The evaluator aimed to make an unbiased, objective, evidence-based assessment of the project's stated achievements/results.

The evaluation specialist was externally recruited to provide technical leadership and objectivity for a useful, balanced and forward-oriented terminal evaluation. The evaluation consultant was responsible for the conduct and the overall implementation across four phases: inception report writing/framework development, research, data collection, data analysis and then a final report writing process.

The standard GEF evaluation criteria guided the development of the evaluation matrix and questionnaire (Annex 6) for assessing the project results and performance. These findings were augmented by a set of strategic questions developed as the inception study progressed as outlined below. The partnership efficacy and project performance assessment were based on actual results.

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<sup>1</sup> Terminal Evaluations Guidelines attached.

## Strategic Evaluation Question Topics:

- The technical rigor of the energy installments including questions about the feasibility and criteria for the site selection process;
- The governance aspects and whether cost-benefit analysis has been carried out to influence policy;
- The project management's use of adaptive management and the required GEF monitoring protocols;
- The protracted emergency context;
- The enabling environment and local government support for the project implementation;
- Sustainability and usefulness of the distributed energy system installed;
- National Implementation and UNDP support to NIM including execution services such as procurement processes, capacity building and policy advocacy.
- Knowledge sharing, the project's policy learning and public educational mindset change goals and what is needed in this regard to finalizing, scaling up and maintaining the technical installments and IRE works with quality.

## EVALUATION PHASES

### Desk Phase

The first phase (January 2021) included an inception period to confirm the client's and the consultant's understanding of the ToR and the main task to undertake an in-depth desk study of the results framework and develop a set of core evaluation questions and tools for gathering data.<sup>2</sup> This step included obtaining expert and evaluation stakeholder agreement on methods and drafting of the appropriate evaluation framework and matrix (using the correct questions to guide implementation). In addition to the utilization of GEF criteria in this assessment, the standard OECD DAC criteria of efficiency, effectiveness, relevance and sustainability were also used. The evaluation considered that the targets and indicators were smart and logical and sought an assessment of the capacity development baseline and targets. It also considered whether a capacity assessment and baseline had been adequately established. The consultant developed a survey tool in line with the GEF evaluation question matrix (Annex 4). A drop box folder for key documentation was also created and shared. This phase included scrutiny of the theory of change and including a critique of the design indicators and targets.

### Data Collection

The second phase (February 2021) mission to Dominica was restricted due to the COVID-19 pandemic. For this evaluation, the data collection was done online. Information gathering included interviews with UNDP, country partners, project beneficiaries, implementing partners, and others online.<sup>3</sup> Snowballing (identifying key informants from others involved in the interview process) was used. A paper-based survey was sent with the initial request for interviews geared to high-level officials who delegated the interviews to those who participated across sectors and levels. The questionnaire was disseminated to those involved in the implementation and aimed to collect data on the program-level implementation goals and to solicit key insights as a forward-looking process.

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<sup>2</sup> The phase involves confirming the key evaluation questions (see a draft sample matrix attached) with the evaluation managers.

<sup>3</sup> The ToR is the starting point.

The second phase (February) included conducting interviews (see the list of interviewees in Annex 2) and disseminating a questionnaire/survey (see Annex 4, tools). The evaluation collected primary and secondary data from a representative group of stakeholders including Regional and National Project Management Units, other participating agencies, government agencies and financing partners. Groups interviewed were from the private sector, NGO/CSOs, civil society and other implementing partners.

Generally, targeting and snowballing were applied to select key informants and interviewees. One-to-one interviews were conducted by Zoom or telephone, and Skype with key government and UNDP stakeholders to national implementing staff. A summary of discussions was compiled by the evaluator for coding and analyzing themes. The evaluator transcribed and coded all notes throughout the process.

The data collection phase intended to confirm whether the project had met its expected results against indicator targets. The process included gathering lessons from stakeholders involved in the implementation for future planning. The consultations were mixed, collecting data through a survey, focus groups, questionnaires, teams and a review of the reports and case studies. The orientation of questions was dynamic and tested the reconstructed theory of change.

### **Analysis and Synthesis Phase**

The analysis included validation of all the data collected against the indicator targets and theory of change. This phase included coding the results and conducting a study of the trends based on the perceptions and experiences of the stakeholders interviewed. The preliminary results were reported to the reference group. A draft evaluation report was provided to the reference group and key partners to gather their feedback. Finally, the evaluation results were initially presented to governments, donors and other stakeholders.

### **Dissemination Phase**

The final stage (February 2020) included efforts to finalize the inputs and edit. It further required incorporating the comments received from those surveyed or information submitted via questionnaire. The evaluator then incorporated all final comments and results and developed an audit trail.

### **Ethics**

This evaluation was conducted in accordance with the principles outlined in the United Nations Evaluation Group (UNEG) 'Ethic Guidelines for Evaluations'. It must also be stated that this evaluation has been impartial, independent and rigorous and throughout this research, the rights and confidentiality of persons interviewed has been protected. Finally, a signed Code of Conduct Form is included in the Annex 6 of this report.

### **Limitations**

The evaluation process was limited to online communication with the exclusion of travel, in-person observation and site validation visits due to COVID-19 travel restrictions as discussed above. Prior to the COVID-19 pandemic, there would be international travel to visit the government and UNDP offices and to the project sites to interview stakeholders and to validate results. However, this evaluation was conducted virtually through digital surveys and discussions with key resource persons (see Annex 2) and was heavily supported by UNDP. The evaluator employed a longer desk study and embarked on close consultative work with the UNDP implementing teams to compile information in a user-friendly manner to offset these

limitations. As the evaluation progressed, the evaluator maintained the flexibility participant selection through the utilization of snowballing to identify key informants.

COVID-19 aside, the inability to travel during this period, prevented the gathering of key insights on the ground. This included insights and interpretation by external consultants involved in assessing key technical areas such as IRE EPC.

### **1.3. Structure of the evaluation report**

This TE Report follows the structure set out in the ToR and comprises the Executive Summary; Section 1, Introduction to the TR; Section 2, Project Description and Background; Section 3, Findings; Section 4, Conclusions and Recommendations. The bulk of the information on the TR status of the project is presented in Sections 3 and 4.

## **2. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT**

### **2.1. Project start and duration**

This project was approved for a duration of 48 months by the GEF, commencing in December 2016 with the expectation of being concluded in December 2020. The project requested a six-month extension but was granted three months. After a three-month project extension approval, the new project closing date is March 2021.

The key project milestones included:

- Project Signing: December 1 2016
- Inception Meeting: May 22, 2018
- Acceleration plan approved: December 2019
- Extension Request: December 2020 to March 4, 2021
- Final Terminal Evaluation Report –June 15 2021.

## **DEVELOPMENT CONTEXT**

### **Energy Situation in Dominica (From Project Document 2014)**

Despite several efforts in recent years to promote renewable energy technologies (RETs), Dominica, like many other Caribbean countries, is still largely dependent on fossil fuel as its main source of energy for power generation and other applications. Currently, the country imports in the range of 900–1,000 barrels of oil daily for energy generation and other applications. Power generation represents the main use of imported fossil fuels (50%), followed by transport (33%). Dominica's current electric power generation comes from diesel generators fueled by imported oil (71%), hydropower (27.4%) and other renewables (i.e., wind at 225 kW at Rosalie Bay Resort and 290kW of solar in Roseau). Dominica does not have any domestic sources of fossil fuels. Like other CARICOM countries, fluctuations in the import price of oil have posed challenges for Dominica, notably when oil reached a high of US \$ 145 per barrel in 2008. In 2011, Dominica spent US\$ 41 million on oil imports, representing 20% of its GDP.

The Ministry of Trade, Energy and Employment (MoTEE) provides oversight of the development of energy generation projects in Dominica including the development of geothermal resources, an activity that currently dominates the country's energy sector. As a result, efforts to reduce the carbon footprint of the country's energy sector have also been undertaken by the Prime Minister as well as the Ministry of Health and Environment (MoHE). In 2012, the GoCD issued a "Low-Carbon Climate-Resilience Strategy" (LCCRS) that charts directions for the country to reduce its dependence on fossil fuels for energy.

The Dominica Electric Power Company (DOMLEC), the main utility in Dominica, serves as the main provider of electricity in the country that generates, transmits and distributes electricity to more than 35,000 domestic customers as well as commercial, industrial and public sector customers. DOMLEC is primarily and privately owned by the Canadian firm EMERA Caribbean Renewables with a 51% share. Other shareholders include Dominica Social Security at 20% and local corporate and private citizens with the remaining 29%.

Up to January 1, 2014, DOMLEC's licenses to generate, transmit and distribute electricity were exclusive until the enforcement of the 2006 Electricity Supply Act, which opened the way for the Independent Regulatory Commission (IRC) to license other service providers. Since January 1, 2014, DOMLEC has been operating under two licenses granted by the IRC, the first, a non-exclusive generation license and the second, an exclusive transmission, distribution and supply entity for electricity within Dominica<sup>4</sup>. The most recent information indicates one independent power producer (IPP) with a 225 kW wind turbine at Rosalie Bay.

DOMLEC has a total installed electricity capacity of 23.8 MW with a peak demand of 16.8 MW. There are two operating diesel plants, Fond Cole and Sugar Loaf (Portsmouth), with a combined capacity of 20.0 MW. The three hydropower facilities (Laudat, Trafalgar and Padu) account for 6.72 MW. Its transmission and distribution (T&D) network services the cities of Roseau and Portsmouth as the main load centers with approximately 403 km of 11kV lines and 922 km of 230/400V overhead lines. All generation sources are linked via 11kV interconnectors and, in some instances, via 11Kv distribution feeders. Average system losses for DOMLEC are in the order of 9.5% of net generation, which is added to the electricity cost of the end consumer.<sup>5</sup>

Diesel energy generation in Dominica has not increased dramatically from 2000, ranging from 55.8 GWh 2005 to 76 GWh in 2010 to 64 GWh in 2013. Assuming a grid emissions factor of 1.0 tonnes CO<sub>2</sub> eq/MWh for diesel generators and a population of 71,000, the annual CO<sub>2</sub> emissions per capita in Dominica range from 0.79 tonnes CO<sub>2</sub> eq in 2005 to 1.07 tonnes CO<sub>2</sub> eq in 2010. Slow economic growth has resulted in a sluggish growth in electricity demand as shown in Figure 2.

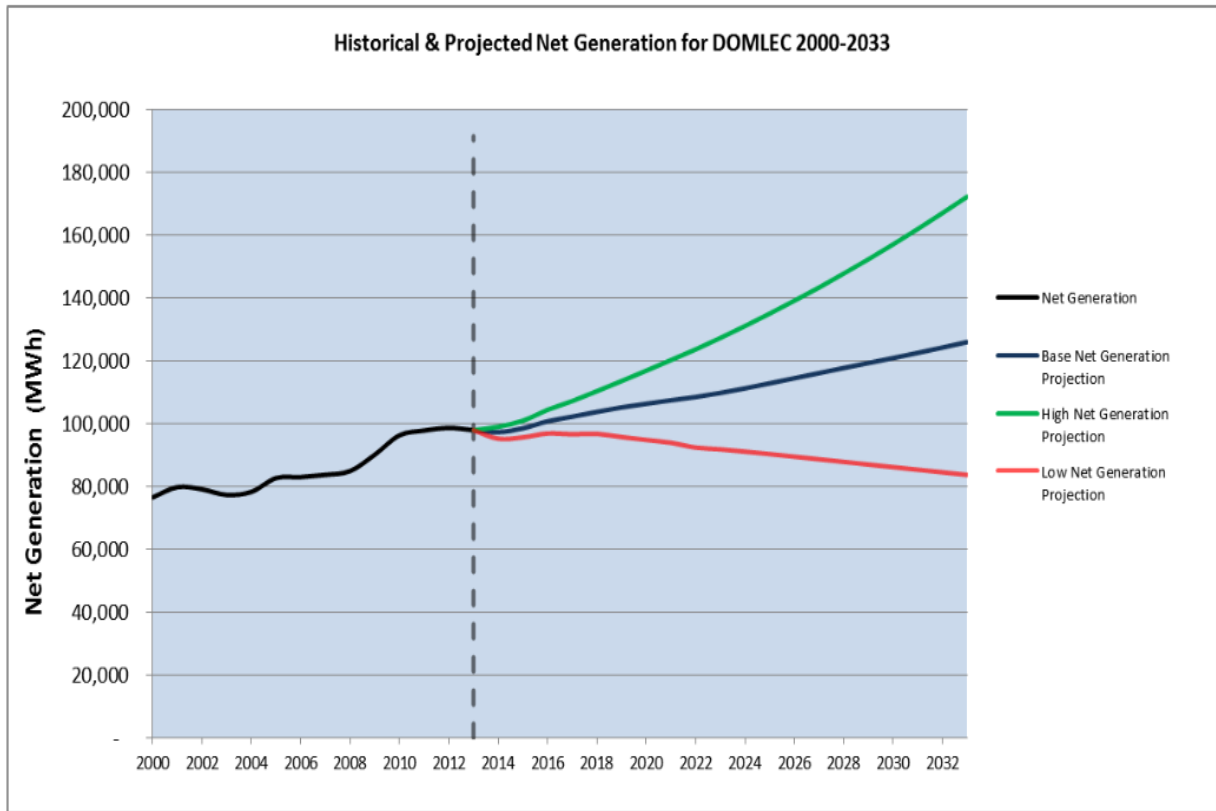
Figure 2: Historical and Projected Energy Generation of DOMLEC<sup>6</sup>

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<sup>4</sup> <http://www.domlec.dm/index.php/our-history>

<sup>5</sup> See pg 15 of DOMLEC Integrated Resource Plan and Related 5-Year Investment Plan, March 2015, available on: [http://www.ircdominica.org/files/downloads/2015/03/DOMLEC\\_IRP-Investment\\_Plan-v2.pdf](http://www.ircdominica.org/files/downloads/2015/03/DOMLEC_IRP-Investment_Plan-v2.pdf)

<sup>6</sup> From DOMLEC 2015 Integrated Resources Plan available on: [http://www.ircdominica.org/files/downloads/2015/03/DOMLEC\\_IRP-Investment\\_Plan-v2.pdf](http://www.ircdominica.org/files/downloads/2015/03/DOMLEC_IRP-Investment_Plan-v2.pdf)



The 2015 decrease in global oil prices has only resulted in a marginal reduction in the cost of electricity in many CARICOM countries including Dominica. The customer base for electric services in Dominica comprises domestic, commercial, hotel, industrial, general and street lighting. Currently, residential customers pay approximately EC\$ 0.74/kWh (USD 0.27) for the first 50kWh and EC \$0.81/kWh (US\$ 0.30 exclusive of fuel surcharge) for additional kWh. A fuel surcharge is calculated monthly and added as a “per cost” to the total consumption which contributes to the high electricity tariffs, which are among the highest in the Eastern Caribbean. As of early 2015, this surcharge was about EC\$ 0.27 (USD 0.10/kWh) resulting in a very high total electricity tariff ranging between US\$ 0.37 and 0.40 per kWh. With the drop in global oil prices in 2015, the reduced fuel surcharge has only reduced these electricity tariffs to the range of US\$ 0.34 to 0.36 per kWh.

#### Renewable Energy Development in Dominica

Dominica has 3 hydropower stations, Trafalgar, Laudat and Padu with a combined installed capacity of 6.72 MW. These stations provide between 25 to 45% of the grid electricity, depending on climatic conditions and the availability of water:

- Trafalgar hydropower station, first developed in 1952 with successive upgrades until 1990 bringing the total installed capacity of the station to 4.48 MW;
- Padu hydropower station, developed in 1967 with an installed capacity of 0.94 MW;
- Laudat Hydropower station developed in 1989 with an installed capacity of 1.3 MW.

All these facilities were developed and are currently maintained and operated by DOMLEC. From 1992 to 2001, DOMLEC expanded its diesel power generation capacity in response to the growing demand for electricity and the inability of the country's expansion of its hydropower capacity to keep pace with this demand. Currently, there is interest in developing smaller hydropower facilities (pico, micro and mini-hydro) as a means of offsetting high electricity costs. The lack of technical expertise and financing mechanisms in Dominica, however, has been a barrier to further hydropower development.

On October 15, 2015, DOMLEC announced that several of its hydropower stations had been severely affected by tropical storm Erica. Out of the installed capacity of 6.6 MW, only 400 kW were in operation. To maintain uninterrupted power supplies to their customers, DOMLEC is now encouraging self-generation of power supplies.<sup>7</sup>

Dominica also has some of the best solar resources as provided in Table 1, where solar insolation values range from 4.8 to 6.8 kWh/m<sup>2</sup>/day. Solar PV installations in Dominica are confined to the areas around the City of Roseau, where there are over 200kW of installed solar PV at various private business property locations. While there is high interest among Dominicans for additional solar PV installations on residential and commercial properties to reduce electricity costs, there are barriers to the adoption of these technologies that constrain the market's potential.

The wind resource in Dominica ranges from 6.3 to 8.8 m/s as shown in Table 1. To date, there is only one wind turbine installation in Dominica at the Rosalie Bay Resort. It comprised a 225 kW wind turbine for self-generation in 2008. Annual energy production is in the order of 596 MWh with surplus generation sold back to DOMLEC's grid. Despite the island's excellent wind potential and several potential wind energy sites along the east coast, the barrier to further development of wind energy in Dominica has been difficulties in acquiring land and small land parcels with unclear ownership. Besides, there are also geographic and transportation challenges related to implementing these wind energy projects along the east coast.

Biomass energy has not been developed due to the lack of waste-to-energy technologies that could economically convert the small amounts of waste available in Dominica. Larger-scale biomass energy projects would not be feasible due to additional costs to transport the biomass waste to a central facility.

Table 1: Solar energy and surface meteorology in Dominica<sup>8</sup>

Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Insolation, kWh/m <sup>2</sup> /day	5.13	5.76	6.35	6.76	6.61	6.43	6.51	6.48	5.92	5.55	4.88	4.76
Clearness, 0 – 1	0.63	0.64	0.64	0.64	0.62	0.60	0.61	0.62	0.59	0.60	0.59	0.61
Temperature, °C	25.49	25.07	25.08	25.46	26.20	26.62	26.65	26.77	26.76	26.64	26.48	26.09
Wind speed, m/s	8.78	8.11	7.63	6.85	7.15	8.05	8.22	7.37	6.47	6.26	7.00	8.09
Precipitation, mm	136	87	93	86	137	185	108	246	250	239	252	176
Wet days, d	18.4	14.2	14.6	13.7	17.0	18.6	20.5	20.4	22.7	19.3	19.0	18.6

<sup>7</sup> Dominica Vibes News of October 15, 2015

<sup>8</sup> From NASA Langley Research Center Atmospheric Science Data Center; New et al. 2002, and also available on <http://www.gaisma.com/en/location/roseau.html>



With its volcanic geology, Dominica's potential for geothermal energy is excellent. Over the past 7 years, the GoCD has been pursuing a programme to explore and develop Dominica's geothermal resources, primarily to generate clean and lower-cost electricity. This has resulted in an initial proposal of a geothermal project in the order of a 10–15 MW power plant. The ongoing work is to determine whether the geothermal resource in Dominica is technically suitable for generating electricity. While the results are encouraging, there is also the potential for the development of 40–50 MW of surplus geothermal energy that could lead to underwater electrical transmission and interconnection to supply neighboring islands of Guadeloupe and Martinique. As of March 2015, the timeline for developing the geothermal resource, however, is uncertain. Also, the complexity of the project raises the risk of further delays in implementation, and no certainty for Dominicans on any relief from high electricity prices.

### Energy Efficiency in Dominica

There have been some piecemeal initiatives to introduce energy-efficient appliances and devices to the Dominican market. This includes a 2006 DOMLEC energy-efficient lighting project with the distribution of 200 compact fluorescent light bulbs (CFLs) to a local community and a total of 5,000 CFLs installed in 2007. In 2014, the Government of China donated to the GoCD with 2,500 LED streetlights to be powered by solar PV. These LED street lights have been installed at targeted locations throughout the city of Roseau and other locations, despite some technical challenges. The GoCD has also supported energy-efficient endeavors by providing tax rebates on LED lighting fixtures and small EE equipment.

There are energy-efficient appliances sold in Dominica, such as refrigerators and air conditioners. The labels of these appliances are not standardized leading to difficulties for consumers in interpreting the labels for energy efficiency and household electricity benefits. Furthermore, most salespersons in appliance retail outlets are not knowledgeable in energy consumption. As such, most consumers are looking to purchase the lowest-cost appliances, not necessarily appliances that are energy efficient.

In the face of high electricity costs, a small number of individual private businesses in Dominica have made EE investments, most notably the two largest hotels in Roseau, to help in offsetting these costs. One of the primary investments consists of central air conditioning that utilizes waste heat. Despite these EE initiatives, their unit energy costs are still in the order of US\$ 0.46/kWh, or US\$ 16.10 per night based on an annual energy consumption rate of 69.1 kWh/m<sup>2</sup>. These businesses and others are still in search of other opportunities to lower their electricity costs and restore their competitiveness in the tourism sector in the Caribbean.

### Gender and Energy in Dominica

While the focus on the green economy has led to several initiatives to improve capacity and develop relevant infrastructure, less has been done to bridge the gap between renewable energy/energy efficiency and supporting sustainable livelihoods for women and girls. The 2014 Gender Assessment<sup>9</sup> noted that women have been notably absent from the development and planning related to low-carbon development. The vulnerability of communities is also undermined when women at the community level are excluded from the planning and decision-making discussions. Moreover, the report concluded that renewable energy would benefit from the introduction of simple technologies for reproductive work (e.g.,

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<sup>9</sup> "Country Gender Assessment – Dominica (Volume 1), Caribbean Development Bank, May 2014



solar stoves, rainwater collection systems), and that the movement toward more substantive infrastructure should be gender-responsive in its approach.

## 2.2. Problems that the project sought to address

The Commonwealth of Dominica has some of the world's highest electricity costs due to its dependence on imported fossil fuels for power generation. Under the country's low-carbon Climate Resilience Strategy (LCCRS) of 2012, the Draft National Sustainable Energy Plan (NSEP), the National Resilience Development Strategy (NRDS) and the recent Sustainable and Renewable Energy Policy (S-REP), the Government of Dominica has outlined some of its plans to assure a more sustainable Energy Sector. The low-carbon Development Project (LCDP) complements these ongoing efforts, with the main objective being *the removal of the policy, technical and financial barriers to energy-efficient applications and solar photovoltaic technologies in Dominica's streets, outdoor areas and public buildings nationwide for further scale-up*. Four main barriers assessed in the ProDoc include the following.

1. Regulatory, policy and legal barriers<sup>ii</sup>: While Dominica has policies, strategies and plans to encourage low-carbon development, there are barriers to its realization including the following:
  - No detailed action plans for the development of RE sources and EE appliances (notwithstanding the action plans in the National Sustainable Energy Plan (NSEP) and the existing detailed plans for geothermal development);
  - Lack of standards for the importation of RE and EE equipment and its installation using best practices;
  - A utility-driven cap on RE development (2.5 MW) that does not address the potential for higher intermittent renewable energy (IRE) penetration to the national grid;
  - No policy on the feed-in tariff to safeguard cost recovery of IPPs feeding into the national grid.
2. Institutional barrier: In Dominica, there are no "energy champions" solely dedicated to the promotion of low-carbon development. This has led to weak institutional arrangements to promote low-carbon approaches:<sup>iii</sup>
  - Ministry of Trade, Energy and Employment (MoTEE) whose energy-related personnel expend significant amounts of time on geothermal development;
  - Ministry of Health and Environment (MoHE) under which its Environmental Coordinating Unit is driving a broad but important climate resilience agenda that includes energy-related climate change actions, which is not considered a core discipline within this ministry;
  - Lack of government capacity to provide focused development of medium-term solutions (as specified in the NSEP) for relief from high energy costs for commercial and residential sectors. To fill in this vacuum, the medium-term solutions for RE development are being led by the privately-owned DOMLEC.

3. Awareness and knowledge barrier<sup>iv</sup>

There is a general lack of awareness and knowledge of the benefits of EE and RE throughout society in Dominica from parliamentarians to the middle class to the private sectors and financial institutions:

- Most politicians and policymakers have had insufficient exposure to policies and programmes from other countries required to develop EE and RE programmes that will reduce household energy costs;
- The financial community does not have sufficient knowledge to assess RE and EE loan risks despite the existence of financial products for eco-friendly technologies;

- Designers and architects in Dominica and the region do not have sufficient knowledge and experience in the design of green buildings including new building designs and retrofits to accommodate RE and EE technologies;
- There is an insufficient number of technicians with the vocational skills to install RE and retrofitting equipment for EE benefits.

The public is aware of the high cost of electricity but not aware of the means of reducing these costs.

#### 4. Market and financial barrier:<sup>v</sup>

There are financial barriers that restrain the public sector from making investments in RE and EE including the following:

- Investments in RE or EE not being factored into public sector capital expenditure or operating budgets;
- The high upfront cost of RE and EE investments that do not have immediate or highly visible benefits notwithstanding their benefits of reducing public sector electricity consumption and reducing electricity bills;
- Renewable energy and energy efficiency are outside of the core expertise area of most public sector entities. EE and RE investments have long-term impacts that require thoughtful evaluation of the financial trade-offs, risks and opportunities. Time-strapped public servants are often constrained by limited budgets for considering RE and EE investments and do not make the necessary time investments for evaluation of RE and EE investments;
- Alternate public sector financing vehicles for RE and EE, such as Energy Performance Contracting and Third-Party Ownership models, have been untested in Dominica.

The two financial barriers that hinder uptake of RE and EE in private households and commercial establishments are:

- The large upfront investment costs; and
- The lack of effective government financial incentives to catalyze these investments.

### 2.3. Pilot Sites

#### Profile of Potential Pilot RE Demonstration Sites – ProDoc 2016

The ProDoc provided a profile of potential sites based on the need to reduce vulnerability and existing activities to promote low-carbon development that might be built upon. The actual sites, however, would be developed based on the technical feasibility activities under project Output 1. This work was to be technically supervised by the chief technical advisor, the low-carbon officer and the project coordinator. The final decision on the sites was made through the technical working group and the project steering committee. The actual implementation and section of sites are discussed in the technical assessment parts of the report.

Salybia, the main community center of the Carib Territory, is located along the eastern shores of Dominica. The Carib Territory has been given autonomy in the management of some community affairs under the Ministry of Kalinago/Carib Affairs as a response to the 2010 Draft Country Poverty Assessment (CPA) report that stated the incidence of poverty in the Carib Territory is high compared to the national level. The Salybia public school is also intended for use as an emergency shelter during hurricanes. With the current use of diesel generation sets for backup power supplies, the school roof can accommodate solar PV installations that would reduce the school's dependence on the diesel generation sets for backup power and reduce its dependence on costly grid power.

Portsmouth is located at the northwestern corner of Dominica with a population of 2,900. Portsmouth intends to become a “green city”<sup>10</sup> based on its modest economic growth with a Japanese-funded fish processing plant and the growth of the Ross University School of Medicine. One of the emergency shelters in Portsmouth is the Roosevelt Douglas Primary School. Measures could be undertaken to improve its capacity as an emergency shelter from a seismic event, tsunami or hurricane event through the installation of solar PV on the rooftops of the school that would not only provide backup power but also electricity to the school, offsetting costly grid electricity costs. Portsmouth also has sites that can serve as run-of-river hydropower plants along the adjacent Indian River and the North River.

The Roosevelt Douglas Primary School is being considered as host to several EE measures including:

- The installation of indoor LED lights in the classrooms;
- The retrofitting of roof vents in the classrooms to provide natural lighting and encourage cross ventilation;
- Replacement of 4 mercury halide light standards on the basketball court with LED lights; and
- Installation of LED lights for the football pitch and proposed sports center (located to the west of the basketball court).

Portsmouth Municipality also has an ongoing “STEM” (science, technology, engineering and math) exchange programme with McGill University, Montreal, Canada, in the areas of technology, engineering and music, among other disciplines. The programme involves the exchange of teachers and other professionals for 6 weeks of training. With Portsmouth’s intentions of transforming into a green city, the STEM programme is being expanded to include technical exchanges including the environment. This would expose Portsmouth professionals to best international practices and examples of green city development, including energy efficiency and renewable energy development.

Dubuc is located on the southern tip of Dominica with a population of 110 and is known as one of the poorest communities in Dominica. In recent times, the economic condition of Dubuc has been given national attention. The GoCD’s Social Investment Fund (SIF) has assisted the fishermen of Dubuc.<sup>11</sup> Dubuc is also set in a unique geographical setting with a small stream flowing through the center of the village. This stream is also used by the villagers for washing and bathing as there is no water supply to the homes. Moreover, some of the homes do not have electricity due to the inability of the residents to pay for the services. The GoCD is seeking to setup renewable energy generation in Dubuc as a means of mitigating poverty in the village. The setup of rooftop solar PV installations and micro hydropower can facilitate development towards this objective.

Boetica is located on the southeastern coast of Dominica with a population of 120. In 2009, the GoCD through an EU-funded component of the SIF provided the Boetica Community Group with technical assistance for income-generating activities in animal husbandry (leading to the supply of meat and poultry products to local supermarkets) and agriculture (leading to the growth of cassava and production of cassava flour). To increase the competitiveness of local income generation activities, the Government has been interested in the installation of some form of renewable energy generation in Boetica.<sup>12</sup> Solar PV installations appear to be the most feasible technology for the community.

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<sup>10</sup> [http://www.nbdominica.com/presentations/pmth\\_devplan.pdf](http://www.nbdominica.com/presentations/pmth_devplan.pdf)

<sup>11</sup> Country Poverty Assessment, Dominica: Reducing Poverty in the Face of Vulnerability, 2010

<sup>12</sup> Country Poverty Assessment, Dominica: Reducing Poverty in the Face of Vulnerability, 2010

Roseau is the largest urban center in Dominica and serves as the capital city for the country with a population of 16,582. There are some GoCD buildings where solar PV can be installed as a means of demonstrating low-carbon development as well as reducing the Government's operational energy costs. This would include the Government headquarters and the Roseau City Council Building. There are also opportunities to reduce the costs of outdoor lighting in Roseau including street lighting along corridors frequented by tourists, and Windsor Park Stadium for sporting events.

#### **2.4. Immediate and development objectives of the project**

This project was designed to initiate and contribute to the lowering of barriers to low-carbon development in Dominica. The main objective of the LCDP Project was the removal of these barriers: policy, knowledge, and technical and financial barriers to energy-efficient applications and the provision of solar photovoltaic technologies in Dominica's streets, outdoor areas and public buildings nationwide. The project initially targeted up to five (5) communities for further scale-up. This was to be achieved through the implementation of three (3) linked components that the LCDP project envisioned would contribute to the fulfilment of the overall objective:

- Component 1: Institutional and technical knowledge, awareness and capacity for EE applications and renewable energy technologies (RETs)
- Component 2: Policy measures and enforcement of EE applications and RETs
- Component 3: Financing options and mechanisms for EE applications and RET diffusion.

#### **2.3. Baseline Indicators established**

In the design phase, it was determined that the objective would be achieved through the removal of systemic barriers, through the following project components:

**Component 1: Institutional and technical knowledge, awareness and capacity for EE applications and RETs:** This component intended to address the barriers associated with the lack of technical knowledge and capacity in Dominica to plan, design, implement, operate and maintain RE/EE projects. The expected outcome from the deliverables of the activities to be conducted under this component was to be improved knowledge, awareness and institutional capacity on EE applications and solar PV through demonstrations of their deployment in Dominica. The outputs from this component aimed to contribute to (a) awareness of policymakers and government personnel with significant roles in low-carbon development; (b) strengthening the capacity of technical and trades personnel from Dominican-based private sector contractors and supply entrepreneurs on low-carbon equipment and installations and (c) raised public awareness of the benefits of EE applications and RE installations.

**Component 2: Policy measures and enforcement of EE applications and RETs.** This component would address gaps in existing policies and standards that have not provided the necessary confidence for investors and donors into low-carbon deployment in the Dominican energy market. The expected outcome from the outputs under this component was the uptake of EE applications and solar PV technology as it was promoted through the adoption of new institutional arrangements and policy and enforcement measures.

**Component 3: Financing options and mechanisms for EE applications and RET diffusion:** This component was to address the financial barriers and the associated lack of financial incentives for EE applications and RE installations in Dominica. The outcome will be scaled-up EE applications and RET investments through the implementation of UNDP Environmental Finance Services (page 42 of newly proposed financial and institutional mechanisms).

**Component 4: Monitoring and Evaluation:** This component contained activities related to monitoring and evaluation of project activities. Through activities in this component, it was envisioned that the ability of the project to be adaptively managed would lead to an outcome of sustained low-carbon development in Dominica during the project period and the increased likelihood of this outcome after the EOP. This component includes conducting the final evaluation.

**Indicators (ProDoc) (See final TE analysis in Section on results below)**

Objectives and Outcomes	Indicators
<b>Overall Objective:</b> The removal of the policy, technical and financial barriers to energy-efficient applications and solar photovoltaic technologies in Dominica's streets, outdoor areas and public buildings nationwide, initially targeting up to 5 communities including Dubuc, Boetica, Roseau, and Portsmouth for further scale-up	Cumulative direct and total post-project direct CO2 emission reductions resulting from the project support for outdoor EE lighting and solar PV pilot installations and investments in tonnes CO2
	Total MWh of renewable energy generated by EOP
	Total MWh of energy saved from the installation of LED lights
	% reduction in electricity costs in public buildings from RE and EE measures by EOP
	% of households and commercial establishments experiencing lower electricity costs from EE and RE installations by EOP
<b>Outcome 1:</b> Improved knowledge, awareness and institutional capacity on EE applications and solar PV through demonstrations of their deployment in Dominica	Number of studies for selected EE applications and RETs to be piloted through an EPC arrangement
	Number of pilot installation of EE applications and RE technologies with and without battery storage carried out.
	Combined installed capacity of "scaled-up investment" through CCTF in RE and EE applications targeting vulnerable groups e.g., low-income female-headed households
	Number of electrical technicians and EE/RE equipment installation personnel trained in best practices for the installation of various EE applications and various EE technologies.
<b>Outcome 2:</b> Uptake of EE applications and solar PV technology is promoted through adoption of new institutional arrangements and policy and enforcement measures	Number of draft strategic plans and institutional arrangements developed that are gender-responsive and informed by relevant gender-based research, analysis and advocacy
	Number of RE and EE technologies with mandatory MEPS by Year 2
	Number of MoHE officers involved with the enforcement of MEPS and green building codes by EOP
<b>Outcome 3:</b> Scaled-up EE applications and RET investments through implementation of newly proposed financial and institutional mechanisms	Cumulative number of commercial establishments and households accessing financial assistance from the CCTF by EOP.
	Annual MWh of EE and RE measures planned or installed by EOP (based on combined total of 591 kW installed capacity during project period)
	Number of technicians who are employed in the installation of EE and RE equipment by EOP
	Number of technicians who are employed in the operations and maintenance of EE and RE equipment by EOP
<b>Outcome 4:</b> low-carbon development is sustained through effective monitoring and evaluation	Number of monthly reports submitted by EOP
	Number of completed final evaluations completed by EOP

## 2.4. Main stakeholders

Stakeholder	Role in the Project
Environmental Coordinating Unit (ECU)	The ECU was the implementing entity, before the responsibility was transferred to the Ministry of Environment in March 2019. It houses the PMU, which is responsible for the day-to-day activities involved in achieving the outputs under each component. The Director of the ECU served as the National Project Director and as the Chairperson of the PSC.
Ministry of Trade, Energy and Employment (MoTEE)	The MoTEE houses the Energy Unit and provides oversight to the Dominica Bureau of Standards. The MoTEE, through its Energy Unit, will serve on the PSC as well as the technical working group to guide developing standards and labeling for RET and EE, give technical advice on equipment under Output 1.2 and 2.3, provide technical assistance on training curricula, provide a communication link between the project and other related projects to ensure synergy. Having developed the draft national sustainable energy plan, it is also able to assist with component 2.2 (action plans).
Independent Regulatory Commission	One of the objectives of the IRC is to support GoCD policy on the supply of electricity for national development. The IRC is therefore able to provide some advice toward achieving component 2 and can guide the project in the process of getting the necessary licenses for electricity generation.
Dominica Electricity Services Ltd. (DOMLEC)	DOMLEC will provide advice on grid stability and integration. Considering DOMLEC's exclusive license for the transmission and distribution of energy, the company will need to provide technical support. DOMLEC has also indicated that it will support activities, such as a street lighting project on the Bayfront (see list of locations in Table 1 above). Due to its experience and current work, DOMLEC will also be able to advise on outcome 1.2
Energy Management Services (EMS) Ltd.	EMS Ltd. is a private energy service company. It will be able to provide advice for components (not online) 1.2 and 2.3 from the private sector vantage point and on overcoming the barriers and risks for establishing an EPC arrangement. They can also provide advice on financing. EMS Ltd. can provide support for developing training curricula, particular for technicians.

## 2.5. Expected Results

### Project Architecture (Also see Log frame)

Component 1: Institutional and technical knowledge, awareness and capacity for Energy Efficient application and Renewable Energy Technologies

This component is intended to address the barriers associated with the lack of technical knowledge and capacity in Dominica to plan, design, implement, operate and maintain Renewable Energy and Energy Efficiency projects.

The following outputs will contribute to the achievement of this outcome:

- Output 1.1: Desk study of selected EE applications and RETs to be piloted through an EPC arrangement. This output comprises activities related to the identification of the most appropriate RETs and EE equipment to be deployed into public buildings and the public realm and installed through an EPC arrangement;
- Output 1.2: Pilot EE applications and RE technologies with battery storage. This output comprises activities for follow-up actions of the desk study of Output 1.1;
- Output 1.3: Knowledge transfer of demonstrated EE applications and RETs. This output comprises activities to improve the knowledge and development of local expertise in the planning,

installation, management and operations of renewable distributed generation systems and EE equipment.

The outputs from this component will contribute to the following:

- a) Awareness of policymakers and government personnel with significant roles in low-carbon development;
- b) Strengthening the capacity of technical and trades personnel from Dominican-based private sector contractors and supply entrepreneurs on low-carbon equipment and installations;
- c) Raised public awareness of the benefits of EE applications and RE installations.

#### Component 2: Policy measures and enforcement of EE applications and RETs

This component aimed to address gaps in existing policies and standards that have not provided the necessary confidence for investors and donors into low-carbon deployment in the Dominica energy market. The expected outcome from the outputs under this component is the uptake of EE applications and solar PV technology, promoted through the adoption of new institutional arrangements and policy and enforcement measures.

The following outputs will contribute to the achievement of this outcome:

- Output 2.1: A strengthened “Department of Climate Change, Environment and Natural Resources Management.” This output comprises activities to strengthen the planned institutional arrangements of the GoCD to provide more focus on low-carbon development.

##### Activities

- Output 2.2: Action plans for implementing low-carbon development. This output comprises activities to develop specific action plans to implement the short- to medium- (less than 10 years) and long-term actions (more than 10 years) in the NSEP that are designed to reduce the predominance of fossil fuels for the generation of electricity and strengthen low-carbon development in Dominica. These are mainly related to the integration of IRE into the national grid.

##### Activities

- Output 2.3: Mandatory minimum energy performance standards (MEPS) for EE and RE products. This output comprises activities that will strengthen GoCD’s ability to regulate the import of RE and EE equipment to international quality and energy generation performance standards and to regulate the installation of RE and EE equipment to ensure adherence to best practices for their installation.

#### Component 3: Financing options and mechanisms for EE applications and RET diffusion

This component would address the financial barriers and the associated lack of financial incentives for EE applications and RE installations in Dominica. The outcome will be scaled-up EE applications and RET investments through implementation of newly proposed financial and institutional mechanisms.

The following outputs will contribute to the achievement of this outcome:

- Output 3.1: **Plans for scaled-up investments in EE products and RETs for specific communities.** This output comprises activities to prepare plans for scaled-up RE and EE installations in various

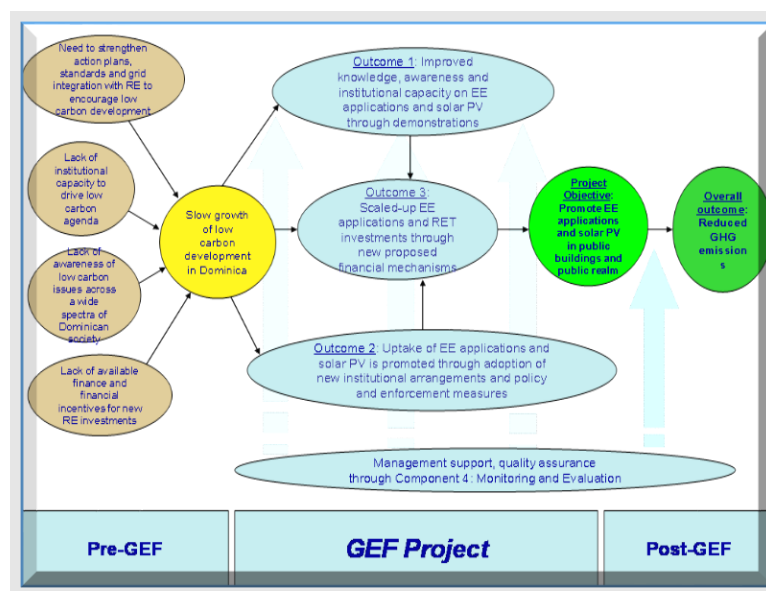


villages and towns throughout Dominica including Portsmouth, Roseau, Dubuc, Boetica and Salybia.

- Output 3.2: **Established “Climate Change Trust Fund (CCTF) Secretariat.”** This output comprises activities that will accelerate the establishment of the CCTF, including assistance to define the utility of the funds for EE products and RE technology diffusion into commercial and residential sectors.
- Output 3.3: **Scaled-up RE and EE installations.** This output comprises activities designed to assist CCTF administrators in the promotion and utility of the CCTF (from Output 3.2) for scaling-up low-carbon development.

## 2.6. Theory of Change

The GEF /UNDP additionality was stated as to be catalyzing for policy and the strengthening of the enabling environment, financial systems and for the review of the financing for scale-up projects. The document outlined four types of barriers to low-carbon development as follows: regulatory, policy and legal barriers; institutional barrier awareness; knowledge barrier, market; financial barrier:



**Figure 1 Original Theory of Change TOC ProDoc**

The project would remove the barriers mentioned above: institutional, financial and public awareness education, etc., and include pilot installations (an experiment) involving two types of rooftop solar systems: One type is connected to a grid and constitutes a solar hybrid generator and solar cell; the other is off-grid or alone. The idea is to create efficiency and savings in electricity production and use. The project was to be through demonstration and study of the costs, tradeoffs and possibilities of subsidies or a carbon tax. The savings for off-grid would be diesel fuel and recovery of investment.

The theory of change and the project results framework were studied (see results section below for this analysis of results). In terms of the basic findings, the following section provides the key analysis of formulation and design.



The project document provides a basic argument to experiment with IRE and EE installation in communities and to showcase for policy a way to reduce the use of diesel. The energy mix could be achieved by building on the environment and appetite for other renewables: geothermal power, small wind turbines in the ocean, and/or solar. The project would initiate and contribute to the lowering of the barriers to low-carbon development with a strategic entry point and focus on renewable energy (Solar Installation) and energy efficiency. It would do this through demonstration of IRE and EE, institutional strengthening, policy, and feasibility - enabling work (finance, policy study and legal). The basic idea was piloting and installation of PV systems to establish the knowledge, financial and legal supportive environment for scale up. Generally, the project was to make a contribution to the overall Low Carbon Development goal and was designed on the assumption of an institutional and enabling environment and will for capacity building.

### **3. FINDINGS**

#### **3.1. PROJECT DESIGN/FORMULATION**

##### **3.1.1. Analysis of Results Framework - Theory of Change**

Stakeholders generally agree that the project was overambitious (including not enough resources). The results framework was overly aspirational targeting a transformative goal towards low-carbon development path based on inputs across multiple topic areas, including institutional strengthening, IRE, Financing, EE and energy performance contract. It was not possible to explore this reality in a meaningful way. In general, the overall intention of the GEF additionality and strategy should have been to *catalyze and increase the appetite for IRE* in the energy mix in an enabling environment and a readiness situation. To transform to a low-carbon society would require more than 5 years and more resources. Several interviewees explained that the project work plan needed greater focus and a smarter design as a demonstration to inform the IRE policy and overall institutional enabling environment. It required precise scheduling, synchronized with the energy governance, institutional coordination sustainability and training objectives to contribute to the overall goal.

The log frame indicators required SMART-er targets. This was noted especially for institutional capacity, educational and governance aspects, written strategies concerning the roadmap to policy change, and for the sustained institutional capacity aspects. For these, the project might have included clearer KPIs, specifying for whom/what capacity should be built and how this would take place. The performance monitoring was not properly benchmarked with KPIs and expected outputs not linked to a clear theory of change that would impact on the society's goals (i.e., educational). Additionally, the lesson is to scale up responsibly and sustainably. Alternative pathways were needed on how to measure impact beyond the project: pilot to scale and empower the people's awareness with good publicity i.e., social media and other media.

A second issue was that component three focused on the exploration of the IRE, EE financial system including seed funding a trust fund to scale up the Climate Change Trust Fund. The design of the trust fund and the use of GEF funds to fulfill the scale up was however inappropriate. GEF resources should not be used for a seed fund. The evaluator learned that UNDP did not have a regional RTA to consult on energy projects during the design stage. Additionally, the design had ambitious assumptions around the overall operating enabling environment and the timing of legislative processes (for example, the duration of time required for the approval of bills of parliament). For instance, the assumption was that both the

Environment bill and the CCTF trust fund (a fund that the government would set up legally in 2015 and support the project's IRE, EE demonstration goals would (per design) provide funds to catalyze the IRE investments through the CCTF). Subsequently, government would pass the environment bill and establishing a coordination function for energy. Thus, the CCTF was originally to be established, along with a Department of Environment, with the passing of the Environment, Climate Change and Development Bill by 2015. This was partially incorrect - as mentioned the GEF funds should not have been utilized for the trust fund and the policy commitment was unrealistic as the Environment Bill needed a broad review.

It was observed early during implementation that the environment bill was incomplete and therefore could not be reviewed by the project and it was an unrealistic commitment. The review of the environment bill was completed in October 2020 (A major project contribution). The Evaluator learned that by Cabinet instructions, the Bill will be reviewed by an inter-ministerial committee in 2021. The project also provided support to develop recommendations for the roles and institutional structure of the CCTF to aid its establishment when the bill is approved (a second major contribution in 2021 supported by the CTA consultant). The project has provided recommendations for the establishment of the Department of Environment which is positive for the future scale-up.

Thirdly, an issue that affected the implementation throughout was the changed implementing partner between the actual design and inception. The project was designed in 2013 and started in 2016 with a lag between design and implementation. During this period the actual operating context drastically altered, and the project was launched with an unsupportive implementing partner at the ECU.

Fourthly, The project institutional capacity component ( to strengthen the coordination capacity for IRE, EE and Energy) needed ECU support to integrate the training plans with the ongoing capacity building with the World Bank, Disaster Vulnerability Reduction Project (DVRP) on building capacity for emergency response and this did not happen. Accordant to interviewees, these might have been better partners on inception review based on the changed context but this was not picked up. There existed a government focal point for renewable energy outside of ECU MOE as well as a quasi-government company engaged in developing geothermal energy, and both also hold a big stake in the implementation and results. The ECU was thus recognized as a poor counterpart. Stakeholders agree that the management arrangement for implementation according to the project document may not have been right for this project.

Finally, this project had launched in an emergency context (IRMA) in 2015 but the project was not adapted to take into consideration this new emergency context at inception. The government's attention and the staff were focused on the recovery work during early implementation; subsequently with the devastation of Hurricane Maria in 2017, this matter had the government's full attention from the project. The UNDP GEF RTA was not present to advise on the opportunity to adapt the strategies and guide the scheduling during the inception period. The lesson is that the inception is the opportunity to adjust the project strategies within reason in line with the changed reality regardless of when the project was designed.

### **3.1.2. Assumptions and Risks**

As discussed above and below in the adaptive management section, the project was implemented within two distinct operating environments with two different IPs, first with the unsupportive IP at the ECU and then with a new counterpart at the Ministry. Many of the original risk and original assumptions became redundant based on the shifts in the government counterpart organization and with the continuous high

turnover of the higher-level officials. The PC was recognized as a stabilizing constant and this was recognized for the results at the end. As mentioned above the project was ambitious in its design.

Additionally, this was a National Implementation NIM project with UNDP support for programming and procurement activities. The assumption was that the NIM implementation would go smoothly based on government interest and the ECUs capacities to link to this to the work of other sectors, however, this was not the case. . As mentioned, a major assumption was that the capacity-building activities supplied early in the implementation would lead to additional government support will for approvals. The project included for instance, in the design, the establishment and capacity building of a new department within MoHE dedicated to approving and ensuring compliance of RE and EE installations.

Training of its personnel would be focused on the management and administration of requests for RE and EE project approvals funded by the CCTF. This newly created institutional environment would reduce the risk of delays in the approval of RE and EE projects. As discussed above the assumption for this new unit and the government coordination capacity changed radically as the government priorities shifted and then the country was hit by a natural disaster in 2017. The project implementing unit struggled with the lack of institutional vision and support, and the incorrect assumption that the Environment Bill would have been passed enabling government to recruit staff and start the technical procurements for the pilot hardware in year one.

### **3.1.3. Gender Equality and Women's Empowerment**

In terms of gender responsiveness of project design and development, the project document ProDoc includes some analysis but no plan. For instance, “ *Gender and Energy in Dominica*: “While the focus on the green economy has led to several initiatives to improve capacity and develop relevant infrastructure, less has been done to bridge the gap between renewable energy/energy efficiency and supporting sustainable livelihoods for women and girls. The 2014 Gender Assessment<sup>13</sup> noted that women have been notably absent from the development and planning related to low-carbon development. The ProDoc goes on to say the vulnerability of communities is also undermined when women at the community level are excluded from the planning and decision-making discussions. Moreover, the report concluded that renewable energy would benefit from the introduction of simple technologies for reproductive work (e.g., solar stoves, rainwater collection systems) and that the movement toward more substantive infrastructure should be gender-responsive in its approach.

In retrospect, interviewees believe that ideally if demonstrations were implemented with strategies and a clear monitoring plan for gender, it could have been better monitored to support policy level results. The original design include potential for pilot's experiments to working with communities and showcasing how renewable energy and efficiency support women's economic empowerment and the most remote, at-risk, marginalized and vulnerable people. The project did not set up protocols for inclusive work planning for pilots and sites and/or implementing through communities. This is a lesson learned.

### **3.1.4. Social and Environmental Standards (Safeguards)**

The ProDoc did include social safeguards and environmental screening, p. 82. The project received a low-risk rating at start but this quickly changed with the implementing issues experienced. For instance, as a technical pilot, technical personnel involved with the installation of renewable energy and energy-efficient equipment installations are to undergo vocational training supported by the project (Output 1.3)

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<sup>13</sup> “Country Gender Assessment – Dominica (Volume 1), Caribbean Development Bank, May 2014

on best international practices for installation and commissioning. Quality of installations was to be assured by the ESCOs who have a business interest to maximize energy savings on which the ESCO will be remunerated. The quality of installations also includes ensuring all occupational hazards of installations are addressed by the ESCO which will reduce this risk to a “low” rating.” This rating was turned on its head when the context changed. The absence of a technical officer from the beginning moved this to high risk. The UNDP and the PC managed this risk by focusing on the technical aspects of the implementation and bring in UNDP OIMT support for procurement of technical products and MCO support to hire consultants. The project document also focused on the Carib people inclusion and provided this statement as a low risk benchmark. “The Carib peoples approached the project through the Ministry of Kalinga/Carib Affairs on its participation through the installation of solar PV panels on various public buildings. Their willingness to participate indicates there will be no risk for the project to locate its activities within indigenous territory in Dominica.” In the end, the project has provided technical installment at the Carib offices and these inputs are significant with significant potential impacts on their energy independence.

### **3.1.5. Lessons from other relevant projects incorporated into project design**

Based on the project document, there have been some piecemeal initiatives to introduce energy-efficient appliances and devices to the Dominican market. This includes a 2006 DOMLEC energy-efficient lighting project with the distribution of 200 compact fluorescent light bulbs (CFLs) to a local community and a total of 5,000 CFLs installed in 2007. In 2014, the Government of China donated with 2,500 LED streetlights to be powered by solar PV. These LED street lights have been installed at targeted locations throughout the city of Roseau and other locations. The GoCD has also supported energy efficiency endeavors by providing tax rebates on LED lighting fixtures and small EE equipment.

The ProDoc says there are energy-efficient appliances sold in Dominica such as refrigerators and air conditioners. The labels of these appliances are not standardized, leading to difficulties for consumers in interpreting the labels for energy efficiency and household electricity benefits. Furthermore, most salespersons in appliance retail outlets are not knowledgeable in energy consumption. As such, most consumers are looking to purchase the least costly appliances, not necessarily those that are energy efficient.

In the face of high electricity costs, a small number of individual private businesses in Dominica have made their EE investments, most notably the two largest hotels in Roseau, to help offset these costs. One of the primary investments consists of central air conditioning that utilizes waste heat. Despite these EE initiatives, their unit energy costs are still in the order of US\$ 0.46/kWh, or US\$ 16.10 per night based on an annual energy consumption rate of 69.1 kWh/m<sup>2</sup>. These businesses as well as others are still in search of other opportunities to lower their electricity costs and restore their competitiveness in the tourism sector in the Caribbean.

### **3.1.6. Planned stakeholder participation**

The stakeholders identified during the project development phase and the inception phase were examined. Per inception report, the stakeholders were asked to consider the activities and outputs of the project and review the list of stakeholders, suggesting any that may be critical to implementation. The following list was given as the main stakeholders:

- Environmental Coordinating Unit (ECU): functions as the body for all environmental and sustainable development management programmes, projects and activities. The ECU was also the UNFCCC Focal Point;
- Ministry of Trade, Energy and Employment (MoTEE): provides oversight to the development of energy generation project in Dominica;
- Independent Regulatory Commission: has the sole and exclusive authority to regulate all electricity entities subject to the Electricity Act (Act 10 of 2006) and has full power to regulate all licenses regarding all economic and technical aspects of regulation under the Act and regarding the determination of tariff or electricity charges;
- Dominica Electricity Services Ltd. (DOMLEC): main utility for generation, transmission, distribution and sale of electricity;
- Energy Management Services (EMS) Ltd.: Dominica-based energy services company (ESCO) that offers designs, advice and RE and EE installations, including solar PV.

Other key stakeholders:

- Physical Planning Division: the executing arm of the Planning Authority, currently developing building codes;
- Bureau of Standards: the organization that develops, establishes, maintains and promotes standards for improving industrial development, industrial efficiency and promoting the health and safety of consumers as well as protecting the environment, food and food products, the quality of life for the citizenry and the facilitation of trade.

Stakeholders suggested by the Inception Workshop:

- Geothermal Development Company of Dominica
- Ministry of Finance
- Ministry of Planning
- Central Statistics Office
- Cabinet of Ministers
- Communities in which pilots will take place.

In general, the TE found that only a few of the planned stakeholders were ideally involved as part of the anticipated “learning by doing” pilot installation experiment including considering the policy on net metering and implementing the EPC contract in implementation. The dynamics around the implementing and operating environment were not conducive for full stakeholder engagement during early implementation. Private sector and public engagement are most important for results. The PM, however, worked with the project steering committee on a central mechanism for engaging relevant stakeholders for sensitization on the project’s aim. Also, the PC set up a technical working group consisting of Dominica Electricity Services Ltd. (DOMLEC), UNDP, National Renewables focal point and the Independent Regulatory Commission. These stakeholders provided support to develop the criteria for site selection, revised the broad list of sites, assisted in further shortlisting the site list following the pre-installation assessments, and provided a technical eye with the solar PV tender document (in the absence of a Chief Technical Adviser). All stakeholders say critical stakeholder engagement is necessary.

### **3.1.7. Linkages between project and other interventions within the sector**

The project document presented a good situational analysis and baseline and linkages to other interventions in the sector. For instance, according to the ProDoc, Dominica has had several ongoing smaller efforts to address energy efficiency as a means of achieving low-carbon status. This commenced in 2005 with studies conducted by DOMLEC aimed at developing a plan for improving the energy efficiency

of its system. It was envisaged that this intervention would realize tremendous savings in energy, reduced importation of fuel for generation purposes and the amount of energy wasted. With the escalation of oil prices from 2006 to 2008, the GoCD embarked on simple solutions notwithstanding its primary focus on geothermal exploration as a major effort. In 2006, it launched an energy-efficient lighting project with the distribution of 200 compact fluorescent lights (CFLs) to a local community. By 2007, a total of 5,000 CFLs were installed. This effort was then aimed at retrofitting streetlights and public buildings with CFLs and light-emitting diode lights (LEDs) to replace conventional and high-energy consumptive lights. Dominica has an estimated 5,000 streetlight standards.

In 2014, the Government of China assisted to lower the carbon footprint of GoCD's assets through a donation of 2,500 LED streetlamps with solar panels, poles and batteries. By late 2014, an estimated 100 –50W LED streetlight standards were installed on a pilot basis at the traffic circle at Pont Casse and along the Edward Olivier Leblanc Highway between Canefield and Roseau. The performance of these LED street lamps, however, has raised concerns specific to their quality, the illumination the LED lamps provide to the road surface and installation issues related to the location of the lead acid battery at the base of the pole. The batteries were either too exposed to moisture or have been tampered with rendering them dysfunctionality was evident that these installations could not withstand a Category 2 hurricane event.

Also, according to the ProDoc, the idea linked to the Risk Reduction Activities: The NSEP under Action 20.3 stated that “establishing standards for energy efficiency to inform the design, construction and management of buildings in Dominica” will require “implementing building standards and leading by example by ensuring that Government buildings meet or are striving towards meeting standards.” Furthermore, Dominica does not have any formal emergency response programme set up in the event of an extreme storm or seismic event. One of the aspects of formal emergency preparedness and disaster response is to provide emergency shelters and relief centers. These shelters and centers are typically located in public buildings such as schools, community centers, polyclinics and hospitals to provide food and medicine. These public buildings can also serve as focal points for community activities such as town hall meetings, centers for learning and other social purposes. As would be expected during a hurricane or a seismic event, grid power could shut down necessitating the need for backup power supplies for these public buildings.

Finally, the ProDoc pointed out the links to policy action plans for implementing low-carbon development. Many assumptions were made in the design about how the project would link to policy and the institutional-level enabling environment and sustainability, output 2.2. Output 2.2. was referencing work on the integration of IRE into the national grid. With the GoCD expending considerable efforts to develop indigenous geothermal energy generation, there were no certain dates for the development of geothermal energy in Dominica.<sup>14</sup> It was expected that the GoCD, DOMLEC and the World Bank-supported ECERA Project would support these activities and no *GEF assistance was thus said to be required for this output*.

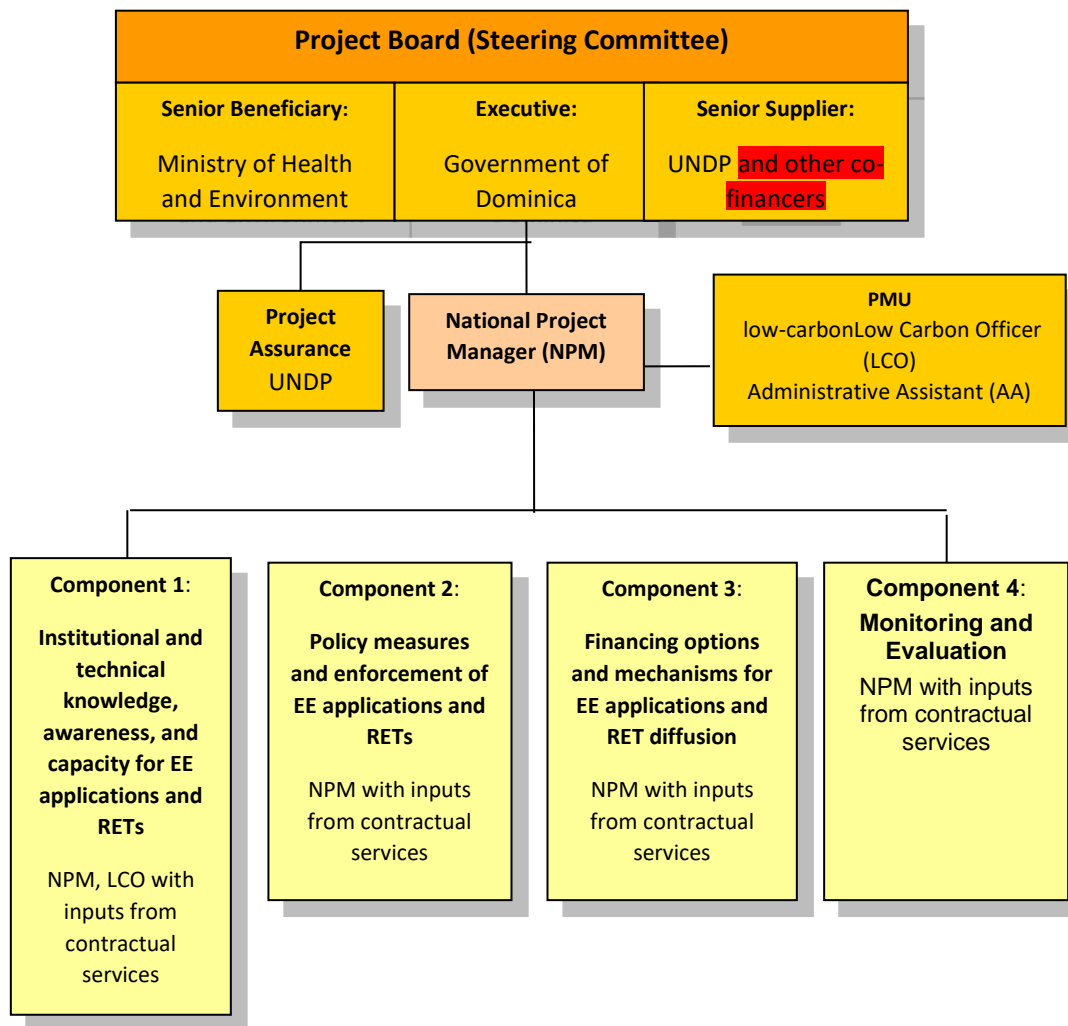
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<sup>14</sup> There were no certain dates presented for geothermal development as of March 3, 2015 during the IRC stakeholder meeting on DOMLEC's 2015 IRP.

## 3.2. PROJECT IMPLEMENTATION

### 3.2.1 Adaptive Management

*Management and oversight arrangements*



The Project Steering Committee (PSC) had oversight of the Project Management Unit (PMU). The PSC consisted of a Chairperson (from the Ministry of Health and Environment) with PSC members from MoHE, MoTEE, MoF, representation from ESCO services in Dominica, UNDP Barbados and the OECS. The primary functions of the PSC was to provide the necessary direction that allows the project to function and achieve its policy and technical objectives and to approve the annual project plans and M&E reports. ).

The NPD was responsible for overall guidance to project management (for all components), including adherence to the Annual Work Plan (AWP), the achievement of planned results as outlined in the ProDoc and the use of UNDP funds through effective management and well-established project review and oversight mechanisms. The NPD would ensure coordination with various ministries and agencies to the project team to coordinate with UNDP, review reports and manage administrative arrangements as



required by the GoCD and UNDP. This included the contribution of office space within the premises of the ECU to personnel in the Project Management Unit (PMU).

This project was executed according to UNDP's National Implementation Modality NIM and per the NIM project management implementation guidelines agreed with UNDP and the Government of Dominica. The Environmental Coordination Unit of the Ministry of Ministry of Environment, Natural Resources and Physical Planning and Fisheries initially assumed the overall responsibility for the achievement of project results as the Implementing Partner. The Implementing Partner was changed to the Ministry with the responsibility to the environment in March 2019, and as such is the Ministry of Environment, Rural Modernization and Kalinago Upliftment.

The project management at the PCU thus employed the use of the project steering committee meetings effectively and created and supported a technical working group to support the NPD, but during early implementation, the NPD was not readily approving the use of the fund for key staff and activities. The Permanent Secretary did not serve as Project Director and/or the PSC Chairperson. The transition added to the delays brought on by the emergency context and UNDP procurement delays. As a result, the project was delayed until the enabling environment became more conducive with an MOE internal transition (dissolution of the ECU) and a change in the project directorship in 2019.

The project steering committee meeting was held annually from the start of November 2016 and was organized well according to stakeholders interviewed. The TE reviewed the minutes which were clear and outlined the key decisions and action points to effectively adapt the project. Based on the TE consultation and review of the PIRs and quarterly reports, the project implementation had just begun to take off and had to overcome challenging institutional obstacles and dynamics when implementation was impacted once again by COVID-19.

Many interrelated factors have affected the effectiveness, implementation and delivery of the project as highlighted above. By final review not much of the original plan was delivered towards the expected outcome level results; however, TE feels an acceleration plan was sensibly established and the results by end reflect this plan. The issue for the broader transformative level results is timing. The project has just begun to deliver, and it is closing at the end of March 2020 with many of the governance aspects not final or tied up to support scale-up.

The RTA's job is to oversee the implementation of the GEF resources. The RTA advised on focusing design on the delivery of the system and an acceleration plan<sup>vi</sup>. The decision was made, according to consults, as little had been delivered by the period of the MTR to evaluate. It was unrealistic to try and accomplish everything at that stage. To mitigate this, the project adapted to key activities under enabling conditions work for optimal results in the time frame. At that late stage mid- term 2018, the team also decided on hiring critical technical consultants (formally these contracts were envisioned as staff) for liaison with the government on technical implementation and systems governance issues. The RTA visited the regional hub in 2017, however, the 2017 disaster interrupted her first mission. The second visit by the RTA in 2018 was instrumental in developing the accelerated delivery strategy. The operating enabling context by then had changed again (election and transition of project counterpart), and a new, more committed PS arrived in 2019. During the COVID crisis, the project applied for an extension of 6 months until 30 March.

History of Actual Work Implementation from Acceleration Strategy Development 2019. (Read this also in conjunction with the result and components analysis on p. below)

In 2019, the PCU with the support of UNDP Barbados and RTA developed an acceleration plan, however this plan was disrupted by COVID-19, the third national emergency context since the project started (Irma, Maria and COVID 19). The acceleration plan included all the infrastructure installments and governance work to be implemented in 2020-2021 March. In 2019, key consultants and technical staff were hired, including the Chief Technical Advisor (CTA), whose work was planned to include at least three (3) country missions, and the low-carbon Officer, whose work included technical site visits.

The COVID19 travel and social distancing restrictions meant that the scope of work and contracts had to be adjusted and the feasibility of several planned actions including the trainings, consultancy work on policy and feasibility, technical oversight including work with the private sector had to be reconsidered. Embattled in the third national emergency in 5 years, government agencies were still entrenched in recovery and COVID 19 emergency response with limited capacities. Some of the major disruptions were highlighted in a COVID-19 survey report carried out to make the case for an extension to the GEF.

The report noted there were disruptions in supply chains; restrictions that preclude procurement of goods and services, main activities for 2020, and the largest procurement was that of the solar panels, LED light bulbs, and other EE equipment. While this could still be done, supply factories and shipping companies were running on limited staffing with preventive protocols and were faced with delays in shipping. Ports were focusing on essential supplies would also delay clearance, and travel restrictions would inhibit international installation teams. The timelines for the procurement estimate completed installation just before the project's end, therefore, these delays had a significant impact on results and technical installation.

Additionally, critical consultations with stakeholders could not take place due to COVID-19: while some of the theoretical modules of the proposed solar PV installation training can be delivered virtually, the practical components had not occurred and are being structured to be conducted with fewer participants in each session, which takes longer. It is also important to note that COVID-19 in-country protocols have been dynamic with frequent changes. An informational video was produced during the TE highlighting the key deliverables of the project which include solar PV installation and energy efficiency interventions and was released early June. This was anticipated to be available beyond End of Project (EOP). The low-carbon Officer and Chief Technical Adviser had delivered a workshop for technical persons on Solar PV Best Practices during the TE in March 2021.

Other in-person training planned for Q2 included the important project training on the CARICOM Regional Energy Efficiency Building Code (CREEBC), which was postponed. This training was to be done as a collaborative effort with the Dominica Bureau of Standards (DBOS) and the CARICOM Regional Organization for Standards and Quality (CROSQ) as part of a regional initiative. Scheduled for June 2020, it was postponed to October 2020 and then to January 2021, due to changing COVID protocols. This training was held as a virtual session for 20 participants from Dominica within the field of architecture, engineering, and construction, from January 11–15, 2021.

The project provided support by procuring hardcopies of the CREEBC for each participant valued at over US\$200 each. Dominica was the only country in the regional initiative with this enhanced support. To maximize project timelines, other relevant online courses were identified with SEI (Solar Energy International) to be offered as capacity-building activities. However, these have not yet been offered, as a more comprehensive course which was being offered as part of a regional initiative with the Caribbean Development Bank and UTECH was identified. There was not enough time to complete these activities

(Also refer to the final status of activities -results framework analysis). The communications activities in terms of public awareness were completely disrupted (further discussed below in the communications section). Nonetheless, it was clear that during the pandemic year 2020, the Government counterparts are unable to focus on the project due to the COVID-19 response efforts. Notably, despite this, a long-awaited Cabinet decision on the sites for the LCDP solar PV interventions was obtained in 2020, allowing the project to proceed with the RFQ for solar PV and EE. These sites are the Dominica Infirmary, Morne Ratchet Emergency Resource Center, Isaiah Thomas Secondary School, Portsmouth Secondary School, St. Cyr Emergency Resource Center, San Sauveur Primary School and The Financial Center (only EE). Additionally, the project team has been waiting for a decision on providing support for the development of the climate change and environment trust fund (CCTF). The CCTF is part of the Environmental Bill that was never passed; however, the Environment Bill is being reviewed by a Cabinet appointed committee.

#### *Communications and Public Awareness – Cross cutting work*

A section on "communications" was included in the acceleration plan in 2018. It was suggested that in the interest of time, the communications activities "be ranked in terms of deliverables and high impact" (PS #5). The original budget was deemed insufficient to execute all the public awareness activities presented. As part of the Communications Awareness and Visibility Plan, items would be developed to provide familiarity with the project as the implementation became more visible. A logo was developed with designs for banners, T-shirts and the Lucas Lightyear Mascot to create a project brand (confirmed at TE). These designs were presented to the steering committee and target groups including the general public and consumers of electrical appliances. The public awareness strategy had planned to use of billboards that display tips for energy efficiency and developing 6 Public Service Announcement videos. COVID 19 completely disrupted the communication and public education work, therefore, it was adapted.

The project incorporated COVID-19 focused messaging into 1-2 videos by demonstrating ways to stay energy-conscious while on lockdown (or possible viral challenge). Other communications activities during COVID involved use of social media and radio. The project moved the Youth Debate to radio as a Youth Discussion. Another activity rethought was the plan to convene the Renewable Energy and Energy Efficiency Expo and Symposium, originally scheduled for September 2020. The project team strategically adapted funds earmarked for this activity for other activities discussed with the PSC. The project will host a handing over ceremony at the end of June 2021 to be held at the Dominica Infirmary.

#### **3.2.2. Stakeholder participation and partnership**

As mentioned, stakeholders were identified during the project development phase. The stakeholder engagement plan as a learning by doing demonstration was completely shattered as the project plan was disrupted by the unwillingness of the implementing partner to cooperate during the early implementation and given the emergency context. As mentioned, the plan was re-configured and stakeholders were only engaged as passive participants during the solar and EE installation process. Stakeholders were broadly consulted around the international and national level consultations during the final year of execution (see the project results table for full details on the actual consultancies that were implemented.)

The dynamics around the implementing and operating environment were not conducive for the full stakeholder engagement envisioned i.e. sustained government sectors in cross sectoral energy planning work, women's and vulnerable groups in the community level and management of the demonstration work, private sector involvement in marketing and value chain work. Despite the low stakeholder engagement, the PC was active in coordination including liaison with the various departments, the public and private sector. The PM worked closely with the project steering committee, a central mechanism for engaging relevant stakeholders. Also, the PC set up a technical working group consisting of Dominica

Electricity Services Ltd. (DOMLEC), UNDP, the National Renewables focal point and the Independent Regulatory Commission. These stakeholders provided support to develop the criteria for site selection, revised the broad list of sites, assisted in further shortlisting the site list following the pre-installation assessments and provided a technical eye with the solar PV tender document (in the absence of a Chief Technical Adviser). All stakeholders say critical broader stakeholder engagement would have been necessary for follow up.

### 3.2.3. Project Finance and Co-finance

Details on co-financing by type/source, the respective agency and planned versus actual expenditure can be found below:

Co-financing (type/source)	UNDP financing (US\$m)		Government (US\$m)		Partner Agency (US\$m)		Total (US\$m)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants			6,800,000	95926.10	1,726,484	1,283,488	8,526,484	1,379,414.1
Loans/Concessions, In-kind support	1,600,000	450,000			540,000	0	2,140,000	450,000
Other								
Totals	1,600,000	450,000	6,800,000	95926.10	2,266,484	1,283,488	10,666,484	1,829,414.1.10

### Confirmed Sources of Co-Financing at TE Stage

Sources of Co-Financing	Name of Cofinancier	Type of Cofinancing	Investment Mobilized	Amount (US\$)
<i>Select one:</i> <ul style="list-style-type: none"> <li>• GEF Agency</li> <li>• Donor Agency</li> <li>• Recipient Country Gov't</li> <li>• Private Sector</li> <li>• Civil Society Organization</li> <li>• Beneficiaries</li> </ul>	UNDP	In-kind	Recurrent Expenditure	450,000

Sources of Co-Financing	Name of Cofinancier	Type of Cofinancing	Investment Mobilized	Amount (US\$)
• <i>Other</i>	<i>Recipient Country Gov't</i>	In-kind	Recurrent Expenditure	95,926.10
Total Co-Financing				545,926.1

For a more detailed picture on the expenditure by outcome across the years of project implementation, please see table below:

### Outcomes and Expenditure Throughout Project Implementation

GEF Outcome/Atlas Activity	Year 1	Year 2	Year 3	Year 4	Total (USD)	Actual Total (USD)
<b>Outcome 1:</b> Raised awareness and increased capacity of government personnel, local entrepreneurs and tradesmen to support the scaled-up development of RE installations in Dominica	359,000	195,000	78,000	34,000	666,000	576,138.27
<b>Outcome 2:</b> Uptake of EE applications and RE technology through promotion and adoption of new institutional arrangements and policy and enforcement measures	89,500	61,500	37,500	1,500	190,000	118,726.74
<b>Outcome 3:</b> Scaled-up EE applications and solar PV technology investments through implementation of financial and institutional mechanisms	1,000	365,000	176,856	177,856	720,712	148,656.30
<b>Outcome 4:</b> Low-carbon development is sustained through effective monitoring and evaluation	12,000	24,000	12,000	20,000	68,000	23,010.45
<b>Project Management Cost</b>						35,808.49
<b>Project Total Advances</b>						3,759.26
<b>GEF Total</b>	482,000	666,200	324,556	253,728	1,726,484	906,099.51
<b>Grand Total</b>	482,000	666,200	324,556	253,728	1,726,484	906,099.51

### 3.2.4. Monitoring and Reporting (MU)

#### *Design at entry*

The ProDoc stipulated project monitoring protocols for M&E activities. Generally, with a technical demonstration involved, there are different types of monitoring inclusive of the indicator framework monitoring, technical monitoring and oversight for the pilots (including gathering data for policy) and day to day monitoring of the stakeholder engagement for the governance and institutional expected results. While monitoring was generally conducted as per the project plan, it was adapted due to the operating

challenges experienced. In 2018, under enabling conditions, the context required an acceleration plan and the project was supported by new IP at the Ministry. The original indicator framework mechanisms for performance monitoring was employed which included adaptive accelerated project strategy.

### *Performance Monitoring*

The Project Log Frame (Project Results Framework) and ProDoc provided the basic performance and impact indicators for monitoring along with their corresponding means of verification. Despite mechanisms in the GEF project for the adaptation of the logical framework and an adaptive management plan, the log frame indicators remained unchanged. The Terminal Evaluation determined that this was influenced by the decision of the project management not to hold an MTR. At the beginning of implementation there was no changes to the indicators, although they were recognized to be aspirational. These actions impacted the usefulness of project. The project was subsequently adapted with an acceleration plan in 2018.

The project management and UNDP kept a risk log, and this was referred to in the PIRs. In the acceleration strategy, a decision was to scale back the scope of the work and focus on the installation of hardware with technical oversight and to establish an MRV plan so that the government can make decisions on the data coming from the system i.e. cost-effectiveness and policy. Such data from this is expected to support the potential scale-up and policies. The project coordination unit used the PIR to report on progress as well as to conduct surveys on implementation throughout. The tracking tools were not used or updated and the mechanism in the project for monitoring has not been used to its full potential.

### *Implementation and adaptive management*

The project financial monitoring was, however, generally conducted following established UNDP and GEF procedures and, in general, a competent project team supported by the UNDP MCO Office (UNDP-MCO) conducted spot checks. Another feature of implementation and adaptive management were the execution of Audits which were conducted on time. The project plan was adapted by the RTA and PC in 2018 under enabling conditions as discussed above.

### *Overall assessment of M&E*

The project coordination unit (PC) focused on technical rigor and was fully engaged in adaptive management with the RTA from 2018 after the project IP changed. The PC was working within the ECU but moved within the broader MOE (ECU was dissolved) and provided day-to-day monitoring and support to policy work. The PC provided technical oversight with consultants and support to all matters of execution and procurement. The UNDP has been providing technical and fiduciary oversight, program monitoring and spot-checking, which are fundamental to the results achieved to date. Stakeholders, as mentioned, share the consensus that the UNDP could have been more proactive and the MCO could have done more to support the PC to move the project, given the opportunities to oversee the governance through the country GEF partnership agreement and to link it to ongoing recovery work and implement partner changes sooner in consultation with the MOF.

### *Technical Monitoring*

The project was highly technical and required a CTA or oversight from the beginning. The original vision was to include a low-carbon officer (hired July 2020) on the PCU staff, who would oversee the pilot's feasibility, oversee the technical demonstration work, support policy and conduct training work around the installations. Of note, the PC did not have a technical background.

In light of the challenges discussed above, the PM set up a loosely defined technical group to support. The UNDP RTA supported the in-country technical monitoring beginning on November 5, 2018 (the point at which an acceleration plan was designed). Based on the acceleration plan, a CTA was hired in July 2020 to support the technical monitoring of the installations.

Engineering (technical) support was needed to tender the documents, select sites, and oversee the design and sites for systems from the inception. The project was not supported (CTA not hired) and the PC convened a technical group made up of key government employees and recruited UNDP recovery Engineering Without Borders to help with the site selection.

While technical monitoring received support from UNDP-GEF RTA, these inputs were implemented late and full implementation begun in 2020 (an acceleration plan was approved in late 2018). Late implementation was further compounded by the COVID 19 pandemic which restricted the travel of the consultants hired. Nonetheless, based on the plan and the decisions, as well as the consultation that was undertaken with stakeholders during TE, the project did have a technical oversight post-acceleration plan with strategies to overcome the overambitious design and late delivery issues based on clear adaptive management and team work.

*Monitoring of the Pilot installation for data was part of the Strategy; project document statement:*

As mentioned, as a technical project demonstration, the design included a data monitoring plan for the pilot installation. Monitoring is key for the decision making for policy and scale-up of the technology demonstration. The Terminal Evaluation determined that the software for the solar monitoring was included in the solar installation package, and the government will need to take this over. As part of the system installation strategy i.e. a setup and implementation of an MRV system (measurement, reporting and verifying) would be established under the ECU by Year 2 to monitor energy savings and GHG reductions from EE applications and RE technologies installed by the ESCO and Government technicians. UNDP is in the process of conducting a training for end users (students) on the capabilities of the software.

However, this did not occur; the low-carbon consultant recruited in 2020 was working on a project-level MRV during the TE in March 2021. This MRV is expected to provide the data and analysis of cost benefits to take forward the demonstrations.

**3.2.5. UNDP implementation/oversight (MS), Implementing partner execution(MS) overall assessment of implementation/oversight and execution (MS)** Under the NIM plus execution agreement, in light of the contextual issues identified and the two phases of implementation with different IPs, UNDP has worked over and above to support the project in the face of the uncondusive implementing environment. The drastic change of the operating as well as a protracted emergency context should have been a red flag for UNDP including for the technical procurement, the HR and the execution support role. After a three-year late start, the UNDP supported adaptive management focused on delivering a distributed system to the country and ensuring that it was commissioned and ready. It was clear from stakeholder interviews that there were procurement issues on both the UNDP side and the government procedures side, however. A key lesson from this is to use adaptive management (and record in narrative those adaptations), to streamline, to reflect on the enabling conditions regularly and to bring in SOPs in the operating agreement.



A lesson for Dominica is that to implement GEF projects efficiently, the mandated approval of cabinet for all HR and procurement (depending on the threshold amount) could be removed/revised as this had been a painstakingly slow process. A more efficient strategy would be to secure an agreement from cabinet on the overall project plan at the outset.

The UNDP MCO has many country offices that procurement must serve and many GEF projects. Stakeholders explained that such intense procurement support to so many country GEF project contexts may not be cost-effective for back-office support. The support to HR procurement from the country office was slow. A key factor was that the Cabinet makes the decisions on all project recruitment. Both issues retarded the implementation.

A key lesson learned from the implementing partner situation is that UNDP went over and above to support the NIM project. Stakeholders explained that UNDP could have acted earlier to intervene in the impossible operating context. An example is that the UNDP brought aboard support from a similar Barbados project for feasibility in absence of a CTA or low carbon development officer. In retrospect, the additional support that was engaged might have done an assessment to identify the bottlenecks in context, identify the appropriate linkages and help in adaptive management. Another observation was that the GEF MTR, is a means to adapt in such circumstances, and was not used. The project experienced many delays due to all the back and forth on the consultant ToRs. The lack of staff became an insurmountable problem.

Additionally, Dominica had been in an emergency situation, and the attention of the government and staff went to this recovery work during early implementation. All these factors provided a good reason for a longer extension, however, under GEF RTA advisement, it was suggested that focus should shift to the installments, cut the project losses and set up a scale-up plan for positioning given the readiness that were apparent.

### **3.2.6. Risk Management and Safeguards**

The risks were discussed in ProDoc and have been discussed in the TOC section above. In this section, the TE focused on the technical rigor of the installations as this is the adopted focus of this project.

#### *Discussion on Site Selection and Technical Risks*

The site assessment criteria were developed by the Technical Working Group (TWG) in 2019. The Terminal Evaluation determined this was guided by the RTA interventions expressing the key interlinkages for site selection and criteria for scaling. The preliminary list of sites was developed considering these criteria: what the building is used for, the frequency of use, if the site is also an emergency shelter, emergency operations center or a community resource center and the number of potential beneficiaries.

The TWG considered whether the site was already a definitive part of another similar project to avoid duplication. Nineteen (19) sites were selected as part of the broad list for preliminary assessments. In May 2019, a preliminary assessment of these sites was done by Engineers without Borders (EWB). EWB conducted technical feasibility assessments to facilitate the short list of sites. EWB assessment considered criteria such as topography, exposure to sunlight, roof condition and obstructions, available land area, access to the DOMLEC grid, three-phase power, grid strength and exposure to sea blast. There was some delay in completing the report for two reasons: 1) delays in getting the electricity utility bills and 2) at times the project needed to wait for the return of engineers who worked on the assessments. New engineers joining EWB had to be briefed on the project. It should also be noted that the work being done

on the LCDP was not the main priority for EWB at the time as the organization was hired to work mainly on another emergency recovery project.

The decision on the site selection finally took place in 2019. The assessment report from EWB allowed the TWG to shorten the broad list enough to allow pre-installation assessments conducted and preliminary designs developed. Reasons why sites were not selected included:

- they were not structurally sound;
- they already had solar PV systems that worked for their requirements;
- other buildings were underutilized; and
- some were privately owned.

In September 2019, pre-installation assessments were conducted on the short list of sites by an engineer from the Barbados-based Disaster Risk and Energy Access Management (DREAM) project with the support of an electrician from the Electrical Division. These assessments helped to estimate the size of the system needed at each site and the cost. Following this, an engineer was recruited to perform structural integrity assessments for each site.

The following table summarizes the designs and tentative costs of the PV systems for each site following the pre-installation assessments:

Name of Location	Average Monthly Electricity Consumption(kWp)	Size of PV System (kWp)	Type of Inverter	Size of Storage (kWh)	Estimated Cost of PV System (USD)
Dominica Infirmary (To be funded by Project)	4,100	30	Grid	None	\$90,000
Morne Rachel EOC (To be funded by Project)	N/A (Information is not available because this is a new building)	4.0	Hybrid	20	\$28,000
St. Cyr Resource Center (To be funded by Project)	N/A (Information is not available as this building is not connected to the grid)	7.5	Off-grid	55	\$64,000
San Sauveur Primary School	578	6.0	Hybrid	30	\$42,000
Isaiah Thomas Secondary School	3542	25.0	Hybrid	210	\$175,000
Portsmouth Secondary School	967	12.0	Hybrid	60.0	\$84,000

The Dominica Infirmary currently has a generator that may be replaced with a new Genset (generator) which can be hooked up to the solar PV system to save on fuel consumption. If the infirmary has battery storage, the cost would increase to \$220,000.00 rather than the current quotation of \$90,000.00. Based on this cost, no storage was provided at this location. St. Cyr Community Resource Center will remain off-grid as this building is currently off-grid.

The PSC requested that justification be sought for the reason for the storage size of 210 kWh at the Isaiah Thomas Secondary School (ITSS) since the school does not remain open in the evening and would not necessarily need such a large store. The ITSS was clarified to consume more electricity than the other sites because there are multiple buildings on the school compound. The administration buildings will be targeted as there is a critical load in this area. The administrative block is the location of the computer lab, offices and other classrooms.

The objective was for each site to have lights and internet connectivity at each site in case of emergency.

### 3.3. PROJECT RESULTS

#### 3.3.1. Progress towards Results (MS)<sup>15</sup>

The following assessment of the indicators provides the final analysis and shows the actual delivery of consultancies. The following two sections 3.3.1.- 3.3.2 should be read together i.e. component one analysis is linked to the status at TE in this table.

Outcome	Rating	Indicator	Baseline	Target	Status at TE	Progress/ Challenges
<b>Overall Objective:</b> The removal of the policy, technical and financial barriers to energy-efficient applications and solar photovoltaic technologies in Dominica's streets, outdoor areas and public buildings nationwide, initially targeting up to 5 communities including Dubuc, Boetica, Roseau, and Portsmouth for further scale-up	MS	Cumulative direct and total post-project direct CO2 emission reductions resulting from the project support for outdoor EE lighting and solar PV pilot installations and investments in tonnes CO2	0	889 to 5192 tCO <sub>2</sub> eq	<p>Seven (7) sites were approved for intervention by Cabinet Decision in 2020. Six (6) of these were approved for Solar PV Installations and Energy Efficient lighting, while one (1) was approved for Energy Efficiency only where fluorescent bulbs were changed to LED light tubes and regular thermostats were replaced with Wi-Fi thermostats.</p> <p>The six (6) sites for Solar PV installations and LED lighting are:</p> <p>i. Dominica Infirmary (a home for elderly persons unable to care for themselves)- 30.2kWp grid-connected Solar PV System with 30kW generator for back-up</p> <p>ii. Morne Ratchet Emergency Operations Centre (which serves three communities)- 5.3kWp grid-connected Solar PV System with battery storage</p> <p>iii. St. Cyr Community Resource Centre (A Community Resource Center in the Kalinago Community which also serves as the Emergency Operations Center, Office of the Kalinago Office and Office of Kalinago Affairs) 7.8kWp Solar PV system with</p>	<p>Results: <b>Not Met</b> 0; Percentage: 0%</p> <p>Although results have not yet been received, the estimate of the result is 544 Tones CO2 eq. This is based on estimates for CO2 emission reduction given that data is not yet available from the project. This includes 485 tones CO2 eq Energy Efficiency and 59 tones CO2 eq from Renewable Energy.</p>

<sup>15</sup> This has been based on adapted strategy and in absence of MTR and CTA/Constant RTA oversight for duration of project .

					<p>battery storage. This system is not grid-connected, but has a hybrid inverter, and can therefore be connected to the grid should the need arise. This system is ground-mounted. A fence has been built around the modules (solar panels).</p> <p>iv. San Sauveur Primary School (Primary school from grade K to 6, which is also listed as an emergency shelter) 10.6kWp grid-connected Solar PV System with battery storage.</p> <p>v. Isaiah Thomas Secondary School (a secondary school from Form 1 to 5, which is also listed as an emergency shelter) 30.2kWp grid-connected Solar PV System with battery storage on the admin block on the campus.</p> <p>vi. Portsmouth Secondary School (a secondary school from Form 1 to 5, which is also listed as an emergency shelter) 12.1kWp grid-connected Solar PV System with battery storage on administration block of the campus.</p> <p>A total of 94.2kWp of renewable energy has been installed. Bulbs have been replaced at all these sites. (947 bulbs). Estimates for CO2 Emission reduction are noted in the results within this table.</p> <p>All the installations are completed. Electrical inspections by the Electrical Division have been completed at 5 of the sites. Diagnostic testing is to be completed by the utility, DOMLEC. This is needed for a solar PV generation license to be issued for each site.</p> <p>At the seventh (7<sup>th</sup>) site, the Financial Center, where only energy efficiency is being done in terms of lighting, over 3000 bulbs have been changed. The work is ongoing to complete the change of bulbs. Each lighting unit has four (4) 2' fluorescent tubes. The change to LED light tubes has led to about a 70% decrease in power consumption by lighting, with each unit going from 158.2W to 48W. By EOP approximately 2200 more bulbs</p>	
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					will be changed in the remaining areas of the Financial Center. This building is six (6) floors tall and houses many Ministries, Departments, Regional and International Agencies and the Office of the Prime Minister.	
		Total MWh of renewable energy generated by EOP	0	683 MWh	<p>Due to the late start of the installations, it is difficult to get a series of measurements. The installations can be monitored remotely and will continue to be monitored post-project.</p> <p>A total of 94.2Kwp of RE has been installed.</p> <p>However, using the following formula, Estimated Annual Energy Generated = Capacity of System (kWp) x 4.2 Sunshine Hours x 360 days, 142,430.4kWh is estimated to be generated annually. We use 360 days instead of the full year for any maintenance or very overcast days.</p>	<p>Results: 142 MWh; percentage: 21%</p> <p>It should be noted, however, that the latest figure from the tracking tool providing the cumulative results for technology lifetime as follows:</p> <ul style="list-style-type: none"> <li>• 3358.99 MWh intervention RE/EE for Lifetime</li> <li>• 1029.6 MWh lifetime energy saved Energy Efficiency</li> </ul>
		Total MWh of energy saved from the installation of LED lights	0	14.3 MWh	Bulbs have been installed at Lot7. Financial Centre and at each site. The data, however, has not yet been received.	<p>Results: Not <b>Met</b>, percentage= 0%. However, estimates from the tracking tool place this at 3,372,700 Million Joule/ 1029.6 MWh.</p> <p>Although the bulbs have been installed, no data is currently available for usage.</p>
		% reduction in electricity costs in public buildings from RE and EE measures by EOP	0	10	<p>This has not yet been measured in all the buildings as the utility has to conduct diagnostic tests on grid-connected sites.</p> <p>However, savings observed at the Financial Center, with the replacement of fluorescent lights with LED lights, show a reduced difference of 6% between January 2020 and January 2021.</p> <p>Interventions at the other sites, which are all public sites are expected to be much higher, considering they have on-grid solar PV systems.</p>	<p>Results: 6% at Financial Center; Partially <b>Met</b></p> <p>Percentage: %</p> <p>The systems have not been handed over to date. Therefore no data has been collected; data collection is anticipated aft the end of project (July- August 2021)</p>
		% of households and	0	1	All the installations done are at public sector sites	Results:0; Percentage 0%

		commercial establishments experiencing lower electricity costs from EE and RE installations by EOP				
<b>Outcome 1:</b> Improved knowledge, awareness and institutional capacity on EE applications and solar PV through demonstrations of their deployment in Dominica	MS	Number of studies for selected EE applications and RETs to be piloted through an EPC arrangement	0	1	<p>The Energy Finance Expert has done a financial feasibility study and developed and presented a model for EPC to key members of the Ministry of Environment, Rural Modernization and Kalinago Upliftment (the Minister, Senior Technical Advisor and the Acting Permanent Secretary).</p> <p>Draft EPC templates have been done.</p> <p>A virtual workshop was held on Friday, March 19, 2021 focusing on Financing Models for Solar PV and Energy Efficiency for public sector members. Some banking institutions and private sector companies which conduct RE and EE have been invited to participate as well.</p>	Results: 1; Percentage: 100%
		Number of pilot installation of EE applications and RE technologies with and without battery storage carried out.	0	23 solar PV (2.6 KWh each) installations with battery and 60 grid-tied solar PV installations with 50% of installations directly benefitting vulnerable communities	<p>The project has installed solar PV and EE lighting at six (6) cabinet-approved sites and EE interventions at 1 site.</p> <p>1 site is grid-tied only</p> <p>4 are grid-tied with battery storage</p> <p>1 is off-grid with battery storage</p> <p>A total of 94.2Kwp of RE has been installed.</p> <p>In terms of vulnerable communities, one site is in the Kalinago community, which is a community of the indigenous Kalinago people. Another site, the Dominica Infirmary, serves derelict elderly persons who would not be able to get nutritional or medical care otherwise. The facility houses about 96 residents and serves daily walk-ins.</p>	<p>Result: 6 <b>Fully Met</b></p> <p>The project did installations in public areas. 2.6kW pilot demonstration installations at public areas would not have made much difference in energy savings.</p>
		Combined installed capacity of "scaled-up"	0	365 kW of RE installations (PV and	<p>The project recognizes that the CCTF is a very important component, and therefore will provide support to aid its establishment.</p>	<p>Results: <b>Not Met 0</b></p> <p>Percentage: 0%</p>

		investment” through CCTF in RE and EE applications targeting vulnerable groups e.g., low-income female-headed households		hydropower) and EE installations (mostly EE lighting)		<p>One of the assumptions made in the project document was that the Climate Change Trust Fund (CCTF) would have been established in 2015, before the start of the LCDP project.</p> <p>The CCTF would have been established as part of the approval of an Environment Bill. This Bill has not yet been approved.</p>
		Number of electrical technicians and EE/RE equipment installation personnel trained in best practices for the installation of various EE applications and various EE technologies.	0	60 persons trained with at least 50% of those receiving training being female.	The LCO and CTA held training on Best Practices for the installation of various RE and EE technologies. This training was held on March 17. There were 27 individuals of which 7 were female. 5 people were trained at the Kalinago territory on maintenance of Solar PV Plant, 3 were female. 9 people were trained at the Dominican Infirmary, 6 were female, 6 people were trained at Portsmouth Secondary School on the maintenance of PV Plant, 2 were female, and 10 people were trained at Morne Rchette EOC, 5 were female. We had a total of 57 people trained in installation and maintenance, with about 40% of those trained females. There are three additional sites where training will be held for maintenance and best practice, taking our number to 60. We expect this target to be met.	<p>Results: <b>Not Met 0</b></p> <p>Percentage: 0%</p> <p>Partially met: 40%</p>
<b>Outcome 2:</b> Uptake of EE applications and solar PV technology is promoted through adoption of new institutional arrangements and policy and enforcement measures	MU	Number of draft strategic plans and institutional arrangements developed that are gender-responsive and informed by relevant gender-based research, analysis and advocacy	0	1	<p>Recommendations for the institutional arrangements for the Department of Environment have been drafted by the CTA and presented to the ministry.</p> <p>Considering the time left on the LCDP, in 2020, the project added a proposal for the development of a Gender Mainstreaming Roadmap to be developed as part of Dominica’s updated NDCs (nationally determined contributions). The project has been providing support to this endeavor, which will be completed by the end of Q1 2021</p>	<p>Results: 1 Partially Met Draft submitted</p> <p>Percentage: 60%</p> <p>Like the CCTF, the Environment Department would have been established as part of the approval of an Environment Bill. This Bill has not yet been approved.</p> <p>There was an assumption in the project document that this would have been done before the start of the LCDP.</p>



		Number of RE and EE technologies with mandatory MEPS by Year 2	0	3	<p>As part of Regional Standards Development work, in 2017 all the Member States of C agreed to adopt five (5) IEC Standards as National Standards to achieve harmonization across the region. These standards were: specifications for household refrigerating appliance (IEC 62552 Parts 1, 2, and 3: 2015), self-ballasted compact fluorescent lamps (IEC 60969:2016), and self-ballasted LED lamps (IEC 62612:2013).</p> <p>In 2018, CROSOQ developed three (3) Energy Efficiency (EE) labeling requirements at a Regional level. These are EE Labeling for Refrigerating Appliances (CRS 57: 2018), Compact Fluorescent Lamps and Light Emitting Diode Lamps (CRS 58: 2018) and Air Conditioners (CRS 59: 2018).</p> <p>These standards have since been nationalized, and Dominica is in the process of adopting all eight (8) standards as Dominica National Standards.</p> <p>Post-project, follow-up will continue the adoption of these standards, and related projects.</p>	<p>Result: 0</p> <p>Percentage: 0%</p> <p>Another assumption that seemed to have been made by the project document is the method in which standards are adopted</p>
		Number of MoHE officers involved with the enforcement of MEPS and green building codes by EOP		6, with 50% female	<p>Dominica has adopted the CARICOM Regional Energy Efficient Building Code (CREEBC). Training on this code was done in 2021 with the CARICOM Regional Organization for Standards and Quality, and the Dominica Bureau of Standards. The project provided hard copies of the code to the 20 Dominican participants (18 Male- 2 Female). Two of the trainees are now CREEBC trainers, who can now assist in building further capacity in Dominica.</p>	<p>Result: 20 persons trained</p> <p>2 females; 18 males</p> <p>Percentage: 100%</p>
<b>Outcome 3:</b> Scaled-up EE applications and RET investments through implementation of newly proposed financial and institutional mechanisms.	MU	Cumulative number of commercial establishments and households accessing financial assistance from the CCTF by EOP.	0	10	<p>This is currently at baseline level as there is no CCTF to be used for accessing financial assistance at present.</p>	<p>Result: Not Met</p> <p>0</p> <p>Percentage: 0%</p>

		Annual MWh of EE and RE measures planned or installed by EOP (based on combined total of 591 kW installed capacity during project period)	0	1778  *Based on MWh generated of RE and EE (1748 MWh) and LED lighting (30MWh)	Interventions amount to 136076 kWh or 136 MWh per year solar, 171.6 MWh Energy Efficiency per year	(302 MWh)  Intervention amounts to 307.6 MWh of solar and energy efficiency measures per year
		Number of technicians who are employed in the installation of EE and RE equipment by EOP	0	20 Installation jobs, with 50% female	40, (13 women)	Installations will be done by a local partner working with the LTA. 40 people were employed in the installations, among which about 33% were women).
		Number of technicians who are employed in the operations and maintenance of EE and RE equipment by EOP	0	60 O&M jobs, with 50% female	16  62 people were trained in the maintenance of system at each site, including 25 female. However they were not employed, they were trained in basic maintenance	62 people were trained in the maintenance of system at each site, including 25 female. However they were not employed, they were trained in basic maintenance
<b>Outcome 4:</b> low-carbon development is sustained through effective monitoring and evaluation	MS	Number of monthly reports submitted by EOP	0	45	12 quarterly reports submitted	Result: Partially Met. 12  Percentage: 18%  Reports were done quarterly due to slow progress of implementation. Weekly reports were submitted to implemented partner from Q3 2020.
		Number of completed final evaluations completed by EOP	0	1	1	Result: 1  Percentage: 100%  Terminal Evaluation

## **COMPONENT 1: INSTITUTIONAL AND TECHNICAL KNOWLEDGE, AWARENESS AND CAPACITY FOR EE APPLICATIONS AND RETS:**

Output 1.1: Desk study of selected EE applications and RETs to be piloted through an EPC arrangement

**Output 1.2: Pilot EE applications and RE technologies with battery storage**

Output 1.3: Knowledge transfer of demonstrated EE applications and RETs

As highlighted the project began the acceleration plan with a focus on the pilot installations in 2018 post-spot check and transfer of the implementing partner from the ECU to MOE. The RTA vetted acceleration strategy focused on the solar system installation (as a pilot study for policy and for scale-up potential). The project coordinator oversaw the feasibility work by building on ongoing recovery work and developing a technical group to oversee the site section. The evaluator learned that the UNDP RTA played an instrumental role in ensuring the sites were developed on the criteria and linkages to emergency efficiency, energy-economic security, energy in recovery and building back better.

### **Results -Status of Installations, also see advisory commentary in Annex 12.**

In the absence of technical staff hired to guide the project as planned (no Low carbon development officer or CTA) the UNDP supported the preliminary feasibility studies by bringing in Barbados support and capitalizing on in-country recovery work of Engineers without Borders and government technical staff from key departments in 2018. The actual sites agreed include 7 schools and 7 buildings. The ongoing installation has used 5 sites from the original plan, including one indigenous site. Site one is a government building in the center of the capital. There are two primary schools, two secondary schools and one off-grid indigenous community center. See full results per the quantities indicators set in the assessment framework above showing data generated. The evaluator learned the software for continued monitoring the system has been included in the procurement package for the installments. The project will need to conduct some training to support sustainability in this regard.

### **Pilot Demonstrations Solar PV Installations delivered include:**

#### **Morne Ratchet Emergency Resource Center**

5.3kWp Grid-Connected Solar PV System  
15 Polycrystalline Solar PV modules at 355W each  
20kWh Lithium-Ion Battery Bank  
5W Hybrid Inverter

#### **The Dominica Infirmary**

30.2kWp Grid-Connected Solar PV System  
85 Polycrystalline Solar PV modules at 355W each  
30kW Back-up Diesel Generator  
On-Grid Inverter

#### **St. Cyr Community Resource Center**

7.8kWp Off-Grid Ground Mounted Solar PV System  
22 Polycrystalline Solar PV modules at 355W each  
50kWh Lithium-Ion Battery Bank  
7.5W Hybrid Inverter

### **San Sauveur Primary School**

10.6kWp Grid-Connected Solar PV System  
30 Polycrystalline Solar PV modules at 355W each  
40kWh Lithium-Ion Battery Bank  
10W Hybrid Inverter

### **Isaiah Thomas Secondary School (on admin block)**

30.2kWp Grid-Connected Solar PV System  
85 Polycrystalline Solar PV modules at 355W each  
210kWh Lithium-Ion Battery Bank  
30W Hybrid Inverter

### **Portsmouth Secondary School (on admin block)**

12.1kWp Grid-Connected Solar PV System  
34 Polycrystalline Solar PV modules at 355W each  
60kWh Lithium-Ion Battery Bank  
10W Hybrid Inverter

Using the following formula, Estimated Annual Energy Generated = Capacity of System (94.2kWp) x 4.2 Sunshine Hours x 360 days, **142,430.4kWh is estimated to be generated annually**. The project use 360 days instead of the full year for any maintenance or very overcast days.

The systems installed can be monitored wirelessly for maintenance purposes. This will also allow monitoring the amount of energy being generated, the amount being used and Greenhouse gas emissions reductions. This could help set a precedent for reporting against Sustainable Development Goals.

Solar generation license applications were submitted to the Independent Regulatory Commission. The licenses are required for grid-connected solar PV systems. The Electrical Division had granted Inspection Certificates for the sites, which would allow DOMLEC (the energy company involved) to proceed with conducting their diagnostic tests. However, the utility required that there be an external lock-out switch at each site. These have been installed, and following the requirements from the utility, the electrical division had to conduct the electrical inspections again.

Signage is being developed for each site.

### **Energy Efficiency**

In addition to the solar PV installations, the project also engaged in Energy Efficiency activities, changing fluorescent light bulbs to LED light tubes at each of the pilot demonstration sites.

Fluorescent light tubes were changed to LED light tubes at the Financial Centre as well. This caused a reduction from each 4-bulb unit using about 158.2 watts to using 48 watts while 5500 lamps were changed. This work remains ongoing and is expected to be completed by June 30 2021.

The thermostats for the HVAC systems are being changed to Wi-Fi thermostats to be able to provide better control and monitoring of the system. AC accounts for the highest consumption of energy in the building. Wi-Fi thermostats were "low-hanging fruit" for demonstrating energy efficiency.

### **Capacity Building**

In January, the project provided support to the Dominica Bureau of Standards in the training of 20 persons on the CARICOM Regional Energy Efficiency Building Code. This was an intensive week-long course. Two

persons out of these 20 will be trainers of this course. All course participants received a hard copy of the Code, which is worth approximately EC\$ 581.

A virtual workshop was held on March 3, 2021, on “Opportunities, Risks and Policies for a Low-carbon Transition.” There was a total of 19 participants (5 female) from across various sectors of government. This workshop was conducted by the Chief Technical Adviser (CTA)-consultant hired in 2020.

End-users selected by the site managers were trained on basic operations and maintenance on-site. Thirteen people will be trained, including 3 women.

Two virtual workshops were held:

- March 17: Good Practices in Solar PV Installations (for technical persons)
- March 19: Financing Models of Solar PV and Energy Efficiency applications (with a focus on Energy Performance (presented conducted/workshop held)

The installations undergone at Isaiah Thomas Secondary School, a school site were also discussed. At this site during the evaluation period the government discussed the connection and operation with DOMLEC electric company as the equipment was not fully functioning at that time. The management of the school however was confident that a way forward to facilitate the connection would be agreed upon.

An issue that emerged surrounded the transformers as they were found to be incorrect for the installation. A three-phase wiring process was required for three transformers post-disaster; this issue was corrected in June 2021. The schools or instance had been built back using a phase one wiring after the hurricane. The numerous benefits of having the panels on the roof at the school were presented and are as follows:

- The school is grateful, and the overall mood is good;
- The experience was smooth, and the first discussion of installments took place in less than a year and a half. The process was well managed and did not disrupt the activities within the school;
- Stakeholders interviewed explained the parents and teachers were pleased as it changes the ethos of the school and demonstrates the science and human achievement. The installations were also viewed as good for education and creating a green progressive movement in society. It is very valuable to the schools since schooling can continue in disaster situations. These installations also ensured that online learning is feasible with solar power in disasters; this is especially appreciated as the curriculum includes science education and promotes progress. Once the installations are completed, this school can become a champion for other schools. This will reduce the purportedly high government costs. If off-grid, the system will make school energy independent.

Suggestions:

- Put a reinforcement on the door that stores batteries and equipment, so they don't get stolen; and
- Provide some training on maintaining and upkeep.

Barriers:

The greatest scale-up issue (which was discussed during the TE), was possibly the cost to the electric company as it is a business and may need a new business model for offsetting the loss of profit. The project hired a consultant to discuss the energy performance contract including providing recommendations about this agreement; the advice was shared. For further specifics on data and results in the assessment of project indicators, please refer to the table above.

## **COMPONENT 2: POLICY MEASURES AND ENFORCEMENT OF EE APPLICATIONS AND RETS.**

Output 2.1: A strengthened “Department of Climate Change, Environment and Natural Resources Management”

Output 2.2: Action plans for implementing low-carbon development

Output 2.3: Mandatory minimum energy performance standards (MEPS) for EE and RE products

This outcome work was initially assumed to be inherently linked to the ongoing capacity strengthening project of the World Bank on institutional strengthening of the ECU. The project has hired a CTA, a low-carbon officer, and a Financial Consultant in 2020, but these recruitments were late in the process and not with the supportive enabling environment that was anticipated i.e. Environment Bill passed, and a Trust Fund established in 2015. These technical and governance staff were on boarded in 2020 which was very late. The deliverables/products of these consultancies have been delivered. The government was generally pleased with all the consultations that took place in 2020 -2021 (see results and indicator framework above) but government were not technically overseeing these deliverables due to lack of capacity and were expecting some technical inputs by UNDP. In fact, as per the expected results, there was little time to make a strong case for policy for the scale up as many of the installation were still being installed. The TE provided recommendation in this regard. The consultancy ToRs are attached in Annex 1 for future reference.

The assumption of links to World Bank recovery institutional development work at ECU was incorrect and was negligible. The experience has shown that there should be existing capacity (and environment) to build capacity, for now the challenge is the link for handover and scale-up.

### **COMPONENT 3: FINANCING OPTIONS AND MECHANISMS FOR EE APPLICATIONS AND RET DIFFUSION:**

Output 3.1: Plans for scaled-up investments in EE products and RETs for specific communities

Output 3.2: Established “Climate Change Trust Fund Secretariat”

Output 3.3: Scaled-up RE and EE installations

As mentioned, there was a false assumption of the early passing of the Environment Bill, and there was a plan to establish the CCTF with seed funds from this GEF grant. There was also insufficient funds in the budget for the solar installations. There has been little progress in reviewing the bill to start the process of CCTF approval, the time and capacity to execute the CCTF was also insufficient, and the funds allocated to this activity (to conduct RE and EE interventions through the CCTF) were inappropriate and so shifted to fully fund the solar installations. A proposal was made by the PC and approved by the PSC and project director, to consolidate the funds for PV installations and CCTF and use the full amount to procure all the solar PV modules for all 6 sites. The amount consolidated included the allocated in Component 1 for the Solar PV installations (275K) to the amount allocated in Component 3 (250k) and allowed a total budget of \$525K for procuring solar PV for 6 sites. The PSC agreed to consolidate the funds in this way. With the funds being consolidated, the PSC agreed that any tenders should be for all sites at once. This will also save time and costs associated with shipping as now items can be bulked.

The project will pay for a certain agreed-upon percentage, and the government will enter an EPC arrangement with the supplier to pay the balance over time. Recommendations were also provided for the establishment of the Climate Change Trust Fund. That work was progressed with the support of the CTA consultant in 2020 who had authored policy recommendations and provided training to official and relevant stakeholder’s implemented post-TE in March 2021.

This project recruited also an Energy Finance expert who supported the recommendations for the establishment of the Climate Change Trust Fund. His main deliverables included the following:

- Develop the Inception Report and Work Plan (done);

- Conduct a feasibility study of financial mechanisms for scaling up RE investments based on the findings and provide recommendations for EPC and/or other viable arrangements (done);
- Develop and deliver a training program to support EPC pilot participants (February 2021);
- Prepare an Energy Performance Contract (EPC) template (draft completed; the training will be done first to allow completing this if the training leads to any changes to be made).

The financial consultant drafted the energy performance contract. This was an agreement between the government and the DOMLAC the energy service provider company. The contract and the linked policy areas within the contract were focused on net metering. DOMLEC is a quasi-government agency and delivers state and public goods. The evaluator learned during TE that the following items were outstanding for this EPC work to become a reality in context:

- Presentation of the EPC model;
- Financing it (value: contractual value to stakeholders and institutions);
- Looking at what the regional economy is telling us: Island states are successful in rolling out trust fund models in the region through donors and an enabling landscape i.e., IEA, GCF, EPC and think tanks.

The consultant provided recommendations on the Climate Change Trust Fund as this work is related. A lesson for this consultancy was that COVID-19 aside, without being on the ground, degrees of understanding get lost. This important work deals with the more aspirational aspect of the transformative expected results, the institutional setup and the enabling environment for scale-up. The work on the institutional setup and governance will require more exchange and dialogue. This work needs much more engagement with the local and regional stakeholders to be salient and relevant in context. Based on what is done with the EPC contract and the MOE, the important thing to happen now is more work to solidify the groundwork, including provide a landscape view of the donor community with GCF accreditation and donor mapping. The EPC contract is only one part at the level of government work on enabling environment. The uptake and results will require public and private sector buy-in. It must also take into consideration how it will help the end-users. This project (testimony to UNDP) has been through a challenging start and begun the dialogues need for an excellent natural and organic evolutionary process to a private-public partnership because of the engagement. This work should be continued and supported.

### **3.3.2. Relevance (HS)**

This project is highly relevant to Dominica; as outlined in the ProDoc and Terms of Reference for the project, the Low Carbon Development Project (LCDP) complements the ongoing efforts of the government to assure a more sustainable Energy Sector. This is evident through the main objective of the removal of the policy, technical and financial barriers to energy-efficient applications and solar photovoltaic technologies in Dominica's streets, outdoor areas and public buildings nationwide for further scale up. The project does relate to the GEF Climate Focal Area and has been designed to deliver global environmental benefits in line with international climate change objectives.

Regarding the necessary legislation and government intervention already underway and in alignment with the project's objective and main components, Dominica had ratified the UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol on March 21, 1994. In 2015, Dominica committed to the SDGs and Agenda 2030, the Paris agreement, and the 2015 Sendai Framework. Also, at the time of the project inception, Dominica had promulgated or is drafting legislation to activate initiatives that would contribute to the removal of barriers to low-carbon development including:



- The Climate Change, Environment and Natural Resources Bill 2013 (draft) that contains provisions under Clause 48 for the development of renewable energy by the “Ministry responsible for Energy ... in collaboration with the Department of Environment, Climate Change and Development, other Ministries, statutory authorities, civil society organizations and the private sector, as appropriate.” This includes reviewing current energy supply mixes to determine how the contribution of renewable energy systems and technologies could be increased in an economically efficient manner;
- Draft environmental and planning regulations for renewable energy, 2010. This includes regulations and standards for the planning and preparation of environmental impact assessments (EIAs) for renewable energy developments;
- The Electricity Supply Bill, Dominica, 2006 that, among other issues, promotes solar PV for street lighting and in public buildings.

It was also determined that other key baseline enabling activities are the National Energy Policy (NEP) for Dominica, 2014 and the supporting National Sustainable Energy Plan (NSEP). The policy objective is to promote the utilization of indigenous sources of energy to produce and supply electricity at the lowest possible cost. The policy provides:

- Conditions to facilitate the exploitation of Dominica’s vast geothermal potential to the extent that Dominica becomes a net exporter of electricity and to develop cheaper energy through using other RE technologies;
- Encouragement of the installation of solar PV technology was economically viable, on all new public sector buildings, commercial buildings, and residences, particularly buildings that could benefit from those systems in the event of service outages;
- Measures to promote energy efficiency in all electricity consuming sectors, as well as in the production of electricity;
- Recognition that fossil fuels will be a source of energy for a long time and addressing issues related to bulk storage, fuel quality and supply.

The NEP was a target for project-supported revisions (Component 1 and 2) to account for rapidly maturing RE technologies and their applications as well as to add disincentives to the use of fossil fuels in circumstances where renewable energy technologies could have been used. Similarly, the policy needs to address and promote incentives for the use of RE in applications such as appliances and small modular systems for domestic use. The ProDoc says “To support the National Energy Policy, the NSEP lays out some actions to be taken concerning a wide range of renewable energy technologies including solar PV and implementing pilot projects targeting government buildings.<sup>16</sup> The NSEP also outlines and addresses several extant and critical issues relating to the importation and use of fossil fuels in the country’s energy sector. The goal of the NSEP is to promote all the components of sustainable energy in tandem with other policy, legal and regulatory instruments.”

At startup, Dominica had policies, acts and regulations to address sustainable energy issues; these included:

- Draft environmental and planning regulations for renewable energy, April 9, 2010: These include regulations and standards for the planning and preparation of environmental impact assessments EIAs for renewable energy developments;
- National Geothermal Resource Act (NGRA), 2014: The Act sets out the legal conditions for the development, exploration and use of geothermal resources in Dominica. The Act does not include

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<sup>16</sup> <http://www.cipore.org/wp-content/uploads/downloads/2014/04/FINAL-SEP-Final-Draft-Commonwealth-of-Dominica-140415.pdf>

geothermal field rules that are necessary to establish the environmental conditions that govern the exploration of the geothermal resource. The Act does, however, state that “the Minister may make Regulations respecting anything that the Minister considers necessary or expedient for the administration or enforcement of this Act.” Secondary laws and regulations in the context of geothermal exploration still need to be formulated under the NGRA. These should be based *inter alia* on international best practices adapted to the Dominican environment and account for any relevant preliminary work undertaken. These regulations should also support an enabling investment environment for geothermal development in Dominica that would attract further investment. This would include issues related to licensing and concessions, environment issues, health and safety, power purchase agreements and pricing and governance;

- Electricity Supply Bill, Dominica, 2006: Among other issues, this bill proposed to promote solar PV for street lighting and in public buildings. The bill, however, does not address the status of the grid to accommodate IRE inputs. As such, the bill did not provide the necessary information on the issuance of licenses for power generation and supply of electricity to the grid as well as setting limits and targets.

The issue of counterpart ownership is discussed above in full detail under project design analysis.

### **3.3.3. Effectiveness (MS)**

Specifically examining whether the project achieved its Outcome and Output objectives, this was achieved to a degree; the project has contributed to the renewable energy infrastructure based on an adaptive plan which will come to fruition in the future (government and private sector). This is contingent on stakeholder engagement and government ownership and utilization of key data points.

The full status of the project’s delivery and actual results is provided in assessment of the indicator framework above as well as sections on design (overambitious), adaptive management and project performance. This project was adapted significantly to focus on an enabled environment, however, due to the COVID 19 pandemic impacted the timeline for implementation. As mentioned, the focus for delivery post-acceleration plan has been on the Solar and EE demonstration, specifically, the technical and logistical delivery of the solar installations to showcase and support the government in informed decision making for future scale-up and policy.

As highlighted in the design section, at that stage, the project assumption was built on readiness (and the government project counterpart’s willingness), the Environment Bill passing in 2015- and some capacity for the institutional strengthening, however, this was not the case. Both the early implementing context and the dynamic natural and health disaster events had presented enormous challenges and contributed to the out of sync work planning, the delay in progress with the original HR plan and procurements, especially with regards to establishing the institutional capacity (to be augmented as part of the project plan in year one and a seeded trust fund for the scale up plan) i.e. undertaking a trust fund to fund the low-carbon solar project demonstration interventions and engage the private sector and communities in a granting process .

The government’s engagement and tangible deliverables has thus been the main project contribution. It is only at this point, based on the interviewees, that the implementing context including with a new government and a post-disaster context, is ready for the full intention of this project i.e., broader stakeholder engagement, scaling and institutional development work to support the transition to a low-carbon society including by scaling and further showcasing IRE and EE in business contracts i.e., private

sector and market creation. Additionally, through UNDP's perseverance and continuing support of the national implementation through a challenging context, the initiative has supported a now open policy window (recently opened) for the institutional and governance work around moving toward a low-carbon development society.

In terms of the lessons learned, the project effectiveness (keeping to the project plan) was affected by both the lack of IP support and slow reactions of government but also impacted by the slow reaction of UNDP in their oversight role to take up action based on the red flags that emerged early in the process. For instance, the project coordination unit was initially supported by the government counterpart at the start. At that point, UNDP and the PC might have lobbied through the UNDP country focal point for changes to the counterpart arrangements. The project effectiveness was further delayed by UNDP slow procurement even after a change in IP and an acceleration plan was agreed (government transitioned in 2018). This was further affected by the protracted natural disaster events and a UNDP spot check with resultant changes in counterpart and then COVID-19. While these lessons learned were not integrated into project planning through the lifecycle in a timely fashion, the importance of coordination with focal points and also strengthening/managing more effectively the IP/government and UNDP relationship are key and can be transferred to future project design phases.

The actual project products (solar and EE infrastructure installments- see results in project indicator framework analysis's section above) delivered are turnkey, and with some training, the installations are robust and can be maintained by the users, and government with additional training. One aspect for maximum utility and policy level scale-up, however, is the relationship with DOMLAC and whether the company and government, in terms of the policy, will enable the users to be producers of energy and get credits.

#### **3.3.4. Efficiency (MS)**

A key area examined to determine efficiency, was assessing whether the project adjusted dynamically to reflect changing national priorities during implementation to ensure it remained relevant. As mentioned, in the second more conducive phase of implementation (discussed above –change of IP in 2018), the RTA and PC supported the project coordinator in developing an acceleration plan in 2018. This was instead of a mid-term evaluation as there had been no tangible results at that point.

In terms of the acceleration plan, it was reviewed and found it to be reasonable. The decision was to streamline work and focus on quality “solar and EE installations” - a priority for the government. The assumption was that UNDP procurement, including scheduling of key inputs, the installation and low-carbon technical support and oversight work, the CTA and the numerous local consultants, would be well-coordinated and work together with the PC. COVID-19 affected these consultancies as envisioned, and the ‘readiness’ and scaling, governance work was finalized online for the most part. In this sense, interviewees say degrees of understanding were lost, logistical issues with the procurement of the installation occurred and the pilots could not be installed quickly as assumed by the acceleration plan. This meant that the work was only being implemented in the last two quarters of the project acceleration plan, and many of the training and policy lessons from the demonstration would risk not being delivered by project end. The TE consultant was hired while much of this work was being finalized. The consultant needed multiple conversations to ensure an assessment of the technical rigor, which has been confirmed. However, several key things were not finalized at the end of the TE, so they will need careful follow-up by

the government and UNDP to ensure that the project demonstration lessons are translated into policy messages with evidence for the government to take forward (See recommendations).

Examining UNDP support, the level of implementation support provided by UNDP was continuous but inadequate and in keeping with the implementation modality and any related agreements. The procurement support was slow and the UNDP did not use the mechanism in the GEF project for adapting to the un conducive context. Another area examined was the capacity of the executing institution; the capacities of the executing institution(s) and counterparts for the project were reviewed when it was designed, but the context had changed significantly when the project began implementation.

Regarding whether the M&E plan had been well-formulated, the project has not been delivered according to the original plan. The country was not ready for a systems approach to low carbon development. This project has managed to create discussion about the need for institutional coordination and continuing to scale up the work in policy and with resourcing.

### **3.3.5. Country ownership**

Per ProDoc, as mentioned under the relevance section above, Dominica has promulgated or is drafting legislation to activate initiatives that contribute to the removal of barriers to low-carbon development including the following:

*The Climate Change, Environment and Natural Resources Bill 2013 (Draft)*: This contains provisions under Clause 48 for the development of renewable energy by the “Ministry responsible for Energy ... in collaboration with the Department of Environment, Climate Change and Development, other Ministries, statutory authorities, civil society organizations and the private sector, as appropriate.” This includes a review of current energy supply mixes to determine how the contribution of renewable energy systems and technologies could be increased in an economically efficient manner.

*Draft environmental and planning regulations for renewable energy, 2010*: This includes regulations and standards for the planning and preparation of environmental impact assessments (EIAs) for renewable energy developments.

*The Electricity Supply Bill, Dominica, 2006*: that amongst other issues, promotes solar PV for street lighting and in public buildings.

While the project is a priority and relevant, during implementation, the government ownership at the start was weak to the factors discussed. The current situation has changed and the ownership is high. During interview the government official interviewed expressed the high interest in taking forward the result of the project.

### **3.3.6. (Gender) Mainstreaming**

ProDoc: The choice of pilot project sites was to be guided by national priorities to create equitable opportunities for women, youth and marginalized groups with 20% off the price of LED light installations for various indoor and outdoor applications focusing on women’s support. Only a small part of two indicators had been focused on gender according to key stakeholders interviewed. In this regard, the actual installments did not pilot or hang the installation in local communities outside of being placed in public buildings. The project was focused on building code and public sector “work,” but a key aspect of the aspirational work will require how to leverage buy-in from the community.

For phase two, more thought is needed to the cross-cutting areas and how to benefit and engage women and local communities in the work around installation and on demand and uptake. This transformative aspect needs clear monitoring, targeting and strategies to provide linkages between the output focus on

women's and women's benefits. One aspect was barrier work, capacity and awareness, and through barrier work on public awareness and education, the project is focusing on women more directly. See the communication section above.

### **3.3.7. Cross-cutting areas**

The evaluation questioned the project design and the opportunities for this during the implementation, for instance, to use the lessons and learning to successfully mainstream linked priorities such as resilience, poverty alleviation, good environmental governance, prevention and better recovery from natural disasters and women's empowerment. The project included cross-cutting design work on these links with gender, poverty reduction, women's economic empowerment and disaster risk reduction to be showcased for future policy and scale-up; however, the plan changed with the context and disasters. Several lessons were apparent in this regard. Certainly, the adapted project outcomes have the potential to contribute as relevant to better preparations to cope with disasters or mitigate risk, and/or address climate change mitigation and adaptation. Also, the project topic transformation to a low-carbon society with an energy mix including solar and renewables will support greater resilience, particularly for women's empowerment in times of disaster.

A design-related issue that emerged was the need for the demonstration strategies to focus much more on the installation of the pilot demonstration and showcasing the work's benefits to the marginalized, the poor and women's empowerment and disadvantaged communities. The project demonstration could have been designed to showcase the cost benefits. The appreciation of the nexus between energy and sustainable human development is a great opportunity for UNDP and the government to garner greater results in this regard. The messaging and scale-up should quantify the benefits of these issues. The link to recovery is another area where the project demonstrated good linkages in terms of building back better, but it did not quantify or use this as an opportunity to sell the project. The gaps in implementation to fully engage other stakeholders in these areas are evident. The consultant tried to access the information but was challenged to assess the activities supporting women and disadvantaged economic groups that did not proceed according to the project's original plan.

### **3.3.8. GEF additionality**

According to the project document, this project would be complimentary and catalyzing in that it would initially provide valuable assistance for policy and strategic planning gaps and provide funds and technical assistance for Dominican efforts to promote and develop renewable energy in Dominica. This is linked to the co-financing (also refer to the co-financing section above that show the levels of co-financing that was not forthcoming). As such, it required that the NPD, in close collaboration with the project's PC, would chart and implement the activities of this project toward its objective of catalyzing RE development in Dominica. The project would outsource key technical assistance such as the grid stability assessments and mitigation measures, undertake strategic planning for RE expansion and quality control for solar PV and other RE installations. The objective of the LCDP Project is the removal of the policy, technical and financial barriers to energy-efficient applications and solar photovoltaic technologies in Dominica's streets, outdoor areas and public buildings nationwide, initially targeting up to 5 communities including Dubuc, Boetica, Roseau and Portsmouth, for further scale-up. This was to be achieved through the implementation of 3 components. See the GEF alternative below (from project document).

Table 1 From Project Document

Component	BAU/Baseline scenario	GEF Alternative
1. Institutional and technical knowledge, awareness and capacity for EE applications and RETs	<p>The GoCD are recipients of grants for various RE technologies including:</p> <ul style="list-style-type: none"> <li>The supply and installation of 2,500 solar PV street lighting standards from the Government of China;</li> <li>Support from SIDS-DOCK on EE lighting for public buildings;</li> </ul> <p>Further demonstrations of low carbon technologies in public buildings are limited by lack of knowledge of government personnel to access low carbon technologies, the pre-occupation of their energy-related personnel with the development of geothermal energy, and the lack of encouragement to add RE to the grid (based on the DOMLEC-driven limit to IRE inputs into the national grid at 10% of peak annual demand or equivalent to 2.5 MW of installed RE capacity).</p> <p>GoCD and DOMLEC have requested technical assistance from the World Bank to study the impacts of increasing IRE into the grid, preparing plans for grid upgrades, and the updating of the grid code, leading to the possibility of an increased IRE ceiling.</p>	<p>On the basis that the IRE into the national grid can be increased above 10%, the Project will support:</p> <ul style="list-style-type: none"> <li>Detailed studies of RE technologies that can be successfully demonstrated in Dominica;</li> <li>Demonstration of solar PV and EE technology installations for a number of public buildings and public areas to be selected by the GoCD up to a capacity of 580.8 kW for a number of GoCD building sites, to be implemented under a pilot EPC arrangement;</li> <li>Use of these pilots as a means of raising awareness and knowledge of RETs and EE equipment for a wide range of stakeholders including parliamentarians to RE technical persons and the general public;</li> <li>Setup and implementation of an MRV system to monitor energy savings and GHG reductions from RE and EE installations;</li> <li>Vocational training on best international practices for installations and maintenance of RE equipment.</li> </ul>
<b>USD 1,966,000</b>	<b>USD 1,300,000</b>	<b>USD 666,000</b>
2. Policy measures and enforcement of EE applications and RE technologies	<p>Recent strategies, plans and policies such as the LCCRS, NSEP and the NEP have been adopted. This has not led to a significant rise in the uptake on RE and EE applications. Current enforcement measures are weak with insufficient incentives and government support to implement low carbon development. In addition, there are a lack of regulations and standards for the import, sale and installation of quality RE and EE equipment.</p>	<p>The Project will support:</p> <ul style="list-style-type: none"> <li>Capacity building of a new department within MoHE to support climate change and low carbon development in Dominica that responds to the action plans required to implement the LCCRS;</li> <li>Assistance to implement low carbon action plans including identification resources required for low carbon development;</li> <li>Setting of minimum energy performance standards (MEPS) for standards and labelling (S&amp;L) of RE and EE equipment import, sale and installation;</li> <li>Setup and implementing of enforcement regime for MEPS.</li> </ul>
<b>USD 690,000</b>	<b>USD 540,000</b>	<b>USD 190,000</b>
3. Financing options and mechanisms for EE applications and RET diffusion	<p>Government agencies, municipalities and community groups are all interested in RE (particularly in solar PV) as a means of reducing high electricity costs. Only two private sector companies have managed to attain IPP status with 515 kW of RE installations, and DOMLEC has a 10% ceiling (2.5 MW) of IRE inputs into the national grid, thereby stifling any further low carbon development in Dominica.</p> <p>The GoCD have waived VAT on a number of selected EE appliances. This has not resulted in significant uptake in EE appliances in Dominica.</p>	<p>The Project will support:</p> <ul style="list-style-type: none"> <li>Plans for scaled-up investments in EE products and RETs for specific communities and using the lessons learned from the pilot installations from Component 1;</li> <li>Technical assistance to establish a "Climate Change Trust Fund" (CCTF) as specified under the LCCRS to assist proponents in implementing RE and EE installations;</li> <li>Seed financing for CCTF to catalyze development of RE and EE projects;</li> <li>Technical assistance to promote and administer CCTF for scale-up of low carbon development.</li> </ul>
<b>USD 7,970,484</b>	<b>USD 7,100,000 (incl. PMC)</b>	<b>USD 870,484 (incl. PMC and M&amp;E)</b>
<b>USD 10,626,484</b>	<b>USD 8,940,000 (incl. PMC)</b>	<b>USD 1,726,484 (incl. PMC)</b>



### 3.3.9. Replication: Scale-up

According to stakeholders, the overall original project focus on the hardware and installments was in fact a smaller input when it came to share of the budget. For instance, 80% of the work plan in the original project document plan was intended to promote learning activities to strengthen institutional capacity, change mindsets and influence policy for low-carbon development. However, that work needed to be started from the beginning, for instance, work on capacity building, knowledge sharing, and propagating low-carbon development and energy efficiency in society and policy. The expectation per design concept was that the project would be replicated as a scale-up program linked to the IRI and EE smart investment processes. It was however unclear how this project demonstration and mainstreaming and links to the national capacity building was to be monitored, linked with the capacity development (knowledge work) and reported for results.

See the impact section for scale-up feedback below.

## 4. PROGRESS TO IMPACT

By the end date (March 2021) the planned installments were technically robust but required a firm maintenance and monitoring plan and policy recommendations on hand over. The impact towards a low carbon society will come from continued monitoring and support for coordination. The institutional arrangement needs resourcing coordination support as a priority linked to the new Environment bill that outlines a role for Energy coordination. With regards to impact, the project support has been limited. The installations however are there and the software for monitoring was included in the package. In addition, key people have been trained. The energy output can continue to be monitored for decision-making and policy.

The installments as a distributed system already show cost-effectiveness for the electricity supply and its cost benefits and the need for private sector engagement in terms of perceived losses i.e., Independent producers of power on the company grid. Relevant stakeholders explained the project results should showcase the resilience and system to deliver the best energy mix for the best reasons. A Cost benefits analysis is provided below in terms of the data coming from the system (Anticipated payback from them). (Also see indicator framework results above).

Power Systems were installed at six sites around the island. Four systems are under 15kW COVID, including one off-grid system. Two 30kW COVID systems, installed at the Dominica Infirmary and Isaiah Thomas Secondary School (ITSS), utilized diesel backup at the Infirmary and battery backup at ITSS. Lightbulbs at all the facilities were upgraded to more energy-efficient LED lights.

Dominica Infirmary with diesel backup

Description	Cost US dollars
Capital Cost	\$36,554.64
Levelized Cost of Energy	\$0.12/kWh
Operating Cost	\$3,362/yr
PV Production per year	45,339 kWh/yr



#### Isaiah Thomas Secondary School with battery backup

Description	Cost US dollars
Capital Cost	\$129,229.85
Levelized Cost of Energy	\$0.39/kWh
Operating Cost	\$7,091/yr
PV Production per year	42,592 kWh/yr

#### Technical observations (from the Low Carbon System- Technical Advisor to Project Evaluation):

All systems installed on the project have a practical application on an island and can be examined independently for scalability. From the above data, however, the 30kW system installed at the Infirmary is the most cost-effective and resulted in a significantly reduced *Cost of Energy of \$0.12 per kWh*. PV Systems with diesel backup require a robust grid to remain viable, and this project demonstrates that systems can be designed to use few or no batteries in our service territory.

Based on the Energy Plan (S-REP) for Dominica, the proposed geothermal project will result in a more advanced electric grid and therefore make PV more viable on Dominica, removing the need for expensive, environmentally dangerous batteries, while diversifying the generation mix.

Municipal roof-top spaces are immediately available for solar deployment on Island. These systems can be scaled and integrated, utilizing smart grid technology.

#### Further recommendations:

- Government rebate on port charges and solar equipment purchase;
- Electrical Division to inspect all installations before system turn-on to reduce harmonics
- Implement a policy to take advantage of Net Metering with grid-interactive battery-less PV systems;
- Study new business model for a utility company with PV/fuel subsidy.

## 5. SUSTAINABILITY

### • Financial resources (MU)

Stakeholders explained that more donor, private sector and public engagement is required for the system to work and for the broader resourcing contribution to a low-carbon society. The barriers at the government level must be removed. A policy for the pilot experiment is needed, and this requires some discussion on the net metering policy. The utility company is installing solar energy at its own expense. Private sector involvement has been low. In the private sector, there should be a business model for the utility company. Assessment of cost of energy types in terms of cost and impacts with wave, underwater, plants in the ocean, geothermal and solar; wind power is promising as well. The project has had excellent results with 30 kW of power at the Dominica infirmary. Net metering is the key barrier in the cost of the system meaning to have the DomESCO allow the people to be producers. What UNDP delivered was a turnkey operation. The installations work as soon as they are installed. Replacing fuel with solar power is not a one-on-one cost replacement. A subsidy is necessary. The service fee will be reduced. Solar power has a place in the energy mix.

In terms of financing and the overall cost benefit analysis - much more stakeholder and government engagement is needed including some discussion with the private sector on a net metering policy. The

utility company is installing solar energy at their own expense. Electricity is injected into the public grid, and the amount used gets subtracted from the bill. *The public becomes both producers and clients.* While there is a resistance to IRE, the penetration of solar power is inevitable. It is the cheapest way to generate electricity. Classic oil or gas is on the way out. Institutional capacity should be in place along with recognition of the capacities that can be informed by the data that this work can generate.

- **Socioeconomic (MU)**

The cross-cutting design work and linkages of the project to include gender, poverty reduction, women's economic empowerment and disaster risk reduction needs to be showcased for future policy linkages and scale-up potential. Several lessons were apparent in this regard; one was design-related and the need to focus on implementing through and with disadvantaged communities and to design and plan work with them in an inclusive manner. The appreciation of the nexus between energy and sustainable human development is an opportunity for UNDP to garner greater results. The link to recovery is another area where the project had demonstrated good linkages in terms of building back better. The gaps in implementation to fully engage other stakeholders in these areas are evident, and the consultant tried to access the information but was challenged to assess the activities supporting women and disadvantaged groups that did not proceed according to the project's original plan.

- **Institutional framework and governance (MU)**

In terms of institutional "readiness" for capacity building, the TE determined that, based on learning from the stakeholder engagement, this project has contributed to the outcome goal under a new (since 2018) implementing context and has expressed the need for institutional and coordination capacity for energy and renewable energy. The installments show several types of demonstration systems that showcased the benefits to government. In attempting to accomplish the removal of the capacity, cost and legal barriers at the government level in four years, it was overly ambitious of the project to try to do everything! Focus was needed to inform the strategies and policies that must exist for the experiment and this takes time. With the high turnover of government and the dissolution of the ECU, the hanger for the capacity building has been taken out of the implementing picture however, the environmental bill is now currently and firmly on the table (and was supported by this project) and this is critical for sustaining the results of this project which has wetted the appetite for a strong coordination function in the ministry.

- **Environmental (ML)**

This is an environmentally supportive project. IRE is linked to a low-carbon pathway. The inputs provided to the government have been supportive to grow the enabling environment of green Dominica in line with its agenda to be carbon neutral. The CTA has provided recommendations for the establishment of a department of environment and made a presentation to the Minister and Senior Technical Advisor of the Ministry of Environment on these recommendations in recent months; however, these beginning discussions need to be continued and scaled. Using the entry point of energy, this project was aspirational, and support should be continued. The establishment of the Department of Environment is a critical part of the Environment Bill, which was completed in the fourth quarter of 2020. The bill was submitted to the Attorney General's Chambers. In 2019, the Cabinet formed an inter-ministerial committee to review the Environment Bill. Instead of job positions, the cabinet decision listed the names of persons to serve on the committee, some of whom are no longer in those positions. A Cabinet Paper was drafted to rectify this issue. It was submitted to the PS. This will help to move the review process forward to be able to establish the Department of Environment.

## **6. CONCLUSIONS**

### **6.1. Comprehensive and balanced statements (evidence-based and connected to the TE's findings) that highlight the strengths, weaknesses and results of the project.**

The project is highly relevant to the Dominica sustainable economic development context. Based on the interviews with the high-level government stakeholders (who are also very supportive of the work), this work is more relevant than ever to the development agenda. These stakeholders also expressed their need for the hard data and policy recommendations from the IRE and EE experiment on how it works, how it will be maintained, and the cost and benefits for policy purposes.

The implementing context was difficult. UNDP's support to execution and cross-sectoral engagement can be commended despite the issues with procurement and the low delivery in monetary terms. UNDP's support was preserved in the face of national contextual challenges and the perseverance and continued support was recognized by the high-level officials. The need for technical support to help Dominica move towards a low-carbon pathway and become a sustainable nature island is high on the policy agenda. The work going forward needs to be linked to the Environment Bill currently being circulated and will precede the next environmental coordination unit.

In terms of implementation context, the project was clearly implemented in two phases. The first period was in the absence of enabling environment, and with a lack of counterpart support and a second period –post spot check and counterpart changes - with clear implementing support. Unfortunately, the project ran out of time and in part an issue due to COVID-19, to do all it intended to do in its acceleration plan (2018) in terms of the governance and learning aspects. That while the team have been successful to install the solar demonstration and EE equipment, much more is needed in term of the governance and education work for the transformative results expected.

The adaptation and thrust to focus during the second period on the installation of the system was a critical adaptive decision by the RTA and PM involving oversight. The TE found that in terms of the original design, even with the high relevance, the design was overambitious for the timeframe. The IRE EE topic and strategy were overambitious with a project document that was trying to do everything.

Additionally, a key lesson for a protracted emergency context is to adapt and make programmatic linkages to the recovery work but to document these changes. At end the installation for demonstration was fully achieved. The criteria for the site selection demonstrate the cross-cutting linkages between energy, environment, and recovery has potential for scaling this project. The challenge is to finalize and vet the installation and to package the results for policy and for the work on institutional scale-up.

The main lesson is that the government did not take ownership at the start. The context has shifted and now UNDP and PM can aim to do this with the handover. This project is positioned for recovery and building back better. There are key messages for economic development for instance, the work is strategic for Dominica's continued economic recovery. The main challenge is how to scale up, the project has provided a first experience on how to manage a distributed system and the selection of sites that thoughtfully considered vulnerable populations. There is need for more stakeholder engagement in how the system's works.

UNDP can hand over the results to the government. On handover, it will be important to ensure a description of the benefits, gaps, and governance. This may need consideration of the institutional arrangement for scale-up and management.

In terms of support to implementation as NIM plus, UNDP *did* help and intervene but in retrospect could have acted earlier when it became clear there was no IP support for this project in the ECU. Additionally, when UNDP brought in added support from a similar Barbados project for feasibility, they might have used that support also to identify links and help in the adaptive management connected with the system's governance aspects.

The project monitoring is a lesson learned. For monitoring complex technical project like this, there needed to have been robust M&E, using the MTR whenever possible. Reports were prepared by consultants and government asked UNDP for payment, as per cash advance NIM modality UNDP does not have to directly review products, this is the role of the PC and IP. However, the PC was under UNDP contract and was not capable for technical reviewing the work at the onset. The project needed a CTA from the inception and close monitoring by the GEF RTAs engaged. This is a key lesson learned.

The critical learning has been how the project can pivot now to continue to take opportunities of policy momentum post-recovery. This is a central recovery/energy link lesson. Many stakeholders say there was a missed opportunity to accelerate by linking to the recovery efforts better.

The project implementation approach demonstrated the lesson on the PSC role and the role of technical groups. Technical working groups are useful to give a more integrated perspective on implementation. The follow-up policy recommendation needs a deeper analysis of the cost benefits, i.e., what kind of data came from this experiment and what can be salvaged to do something useful for policy and decision-making.

A key recommendation by several interviewees was to focus the handover around the data coming from the system and the MVR system. Additionally, an exit strategy is needed, and it should give a clear understanding of the cost benefits and the gaps in the institutional arrangements to carry the coordination of this work forward. A key opportunity is for UNDP to support the government in its efforts to build institutional capacity for the environmental department to coordinate this work and others. The exit strategy needs to show the donor landscape, the costs and benefits and how the scale up involved the utility companies. Private sector stakeholders need to be engaged in the dialogue on the cost and benefit of the net metering policy. Also, analysis is needed to show when geothermal power will come on stream. It needs to look at the solar market and the role it plays in the scale-up. The follow up will need massive input of resources to support the government build human resource capacity to transform the country into a climate resilient island.

## **7. Recommendations**

### **7.1. Actions to follow up or reinforce initial benefits from the project**

For optimal sustainability and scale-up, the UNDP project can conduct an end review of the installments and provide technical recommendations for policy and sustainability as well as step-by-step methods for monitoring the data coming from the system for future government decision-making. The project installments are only now reaching the stage at which a deeper analysis can be made of the systems function and data for cost-effectiveness as well as the lesson for institutional follow-up per the broader goal of supporting low-carbon development. The cost benefits, the broader governance including the need for sustainability education and policy around scaling the IRE work across the island, remain. The installation and work with schools and health, for instance, have been a great place to start a greater island focus on education for sustainable development.

In terms of the experiment, the main questions at TE were the current relevance of the topic, what data is now available and what from this project is useful for decision-making (see technical analysis of what has been installed and policy analysis in institutional sustainability above). What are the most effective data coming from the installments for handover and government, including data from them for government and emergency company decisions? Additionally, in terms of IRE and reform, how can the information be packaged for critics with central responsibility and policy decision-making? While the project included the MRV, this can be part of the training and packaging for government to monitor and to inform policy and scale-up. This system and its installment need monitoring by the government, which must be educated on this aspect. These governance issues were not included as part of the LTA installment. It is advised to engage the CTA LCO to develop a policy piece that includes the follow-up steps and the basis for policy and decision-making in an easy-to-use handover note including the cost to continue and maintain the equipment installed.

## **7.2. Proposals for future directions underlining main objectives**

In this regard, an exit strategy can be refined with a focus on the cost, maintenance and basic scale of the institutional needs and opportunities to carry this work forward. With the remaining project funds, it is necessary to strengthen sustainability. The links and benefits of energy to sustainable low-carbon development, emergency and recovery back better have been made through this project and need to be further documented. It will be important for UNDP to support a knowledge dissemination strategy and host a launch event in line with the government's stated interest in becoming a carbon-neutral society. A good and notable adaptation was with the critical RTA support facilitating the procurement and indirectly influencing the criteria for the site selection that allowed the link of this project IRE between recovery and energy security. At the handover, there should be Goode messaging around these linkages, a description of the benefits, gaps and need for good governance to sustain the results and scale-up. For future institutional capacity development and coordination work, the preserving role of UNDP must be considered. At the project end, it must be determined whether the CTA can do this position and institutional scanning work within the scope of the current ToR. For UNDP positioning, there must be consideration of the current relevance and demand, identifying where there is traction for financing the scale-up with the donor community in the country and regionally. The government's focus on geothermal energy was central to the enabling environment assumptions. Energy and distributed systems are part of this interest. The benefits of IR-supplied electricity to risky and rural areas (poverty risk reduction) are key for DRR, gender and equity as cross-cutting areas. These key messages need to be further backed with evidence.

## **8. Lessons Learned**

### **8.1. Best and worst practices in addressing issues relating to relevance, performance and success**

#### *DESIGN/CONTEXT*

Two issues became apparent as key lessons: acting fast to change the unconducive implementing context and handling an inappropriate design. The GEF additionality is to catalyze, inform and build on the existing enabling environment. The importance of having an RTA for the GEF energy project became apparent for the use of the retraces i.e., the trust fund. The question is how the project can pivot to take opportunities of policy momentum post-recovery. Central recovery energy lessons included a missed opportunity to accelerate and change the agenda by better linking to the ongoing recovery efforts. The design of a seeded

trust fund was inappropriate. Another lesson learned was about GEF catalyzing. These GEF resources cannot be used for health systems.

#### IMPLEMENTATION

While UNDP *did* monitor and work to change the dynamics of implementation i.e., with a spot check on ECU, interviewees say it could have acted earlier. For instance, the mechanisms are available in the GEF project-monitoring process such as the inception period. It is there to reassess design including context before the start of implementation and to enable oversight and intervention of partners such as the higher UNDP focal point in-country. The Terminal Evaluation determined that UNDP made significant efforts to move implementation, for instance, through orchestrating extra support for the feasibility of the technical installations. It was evident as UNDP brought on support from a similar Barbados project, Engineers Without Borders for sites and feasibility. Stakeholders also say more could have been done to use persuasive help to identify links and gaps in the institutional implementation arrangement, consider the policy issues and support the adaptive management. The UNDP office could have been more proactive, for instance, while there was ongoing recovery. This could have presented opportunities rather than being a hindrance.

Another key lesson learned was about the important role of the PSC and the value of having cross-sectional technical groups. Technical working groups are useful and support an integration perspective and national monitoring on implementation. A key project management lesson is that projects are made of teams and teams are people. Good people create the dynamics for the implementation. This project was not staffed until 2019. The UNDP RTA intervention that took place through an acceleration strategy and the focus on hardware delivery at a late stage was a good lesson learned.

Regarding the efficiency and effect of procurement and execution support, UNDP had execution support to procurement agreement. Stakeholders say that perhaps if there were a procurement plan in place at design or inception, the question of the scheduling and spending budget would not have emerged. The UNDP support to procurement was anticipated to push the project quickly, but it went slowly despite this. In this case, there are lessons on procurement planning, especially on complex technical works. If the UNDP procurement was able to obtain the plan at the start, things might have been manageable. A lesson is to provide such a plan during the project design and inception to avoid bottlenecks and to schedule and review the market for the vendors in a timely way. Lesson: Procurement support may be called on to help countries deliver in a timely way. A plan is usually needed to ascertain the complexity and/or the timing of the support for efficiency and reduction of delays. MCO has many country offices to serve and many GEF projects. Early procurement planning, especially for a complex thematic project, renewable energy installations, low-carbon recruitment and EPC contracts are necessary. A related lesson is that having a procurement plan, especially for technically complex projects like this, attached to NIM plus agreements is critical for planning support. (Procurement officers do not necessarily have the thematic technical specialization, and this analysis is necessary to support their work with vendors and markets.)

Stakeholders questioned whether it would have been more proactive for UNDP to accelerate delivery linked to this recovery, i.e., no electricity, resilience work, rural work, and poverty linkages. The stakeholders agree that the UNDP office could have been more proactive. While the recovery took the IP attention away from the project, opportunities also presented themselves.

The government stakeholders suggest there may be efficiencies with GEF cross-cutting areas, including monitoring, for all GEF projects to be in one unit.

A key lesson emerged about oversight and the project steering committee. It is important to include the highest-level possible partner on the PSC to supervise the project agreement between UNDP, the GEF and

the government. This lowers the risk of context issues such as those that occurred early in implementation. Actions and decisions can be made, but there should be follow-through or accountability. A related lesson is that for the national government, having the GEF projects contained in one unit can support efficiencies and resources for cross-cutting work on capacity development, monitoring and procurement liaison.

A critical lesson for NIM plus is that there should be an ongoing and regular informal and formal briefing by the Pc to policy- and decision-makers regarding a key lesson. It should contain as much information about the cost-effectiveness and benefits as possible for evidence-based policy. Lesson: Proper policy briefing to the PS and Minister was noted as a key lesson for implementing policy-level results. Briefings should contain as much information regarding the cost-effectiveness, benefits and subsidies, etc., as possible for evidence-based policy. UNDP got 30 km for execution services. In the future, UNDP support will not be possible.

#### *RESULTS*

For results, a key lesson for the project was that the government did not take early ownership. This needs to be addressed in the GEF/UNDP handover for sustainability. The questions to be answered by this experiment needs to be put in policy and maintenance terms.

A central lesson learned on design is that pilots like this should be held up as models for promoting the systems approaches to energy resilience work. A key results lesson on the topic of renewable energy is that while the project was set in the ECU in MOE, there was a need to revisit the implementing partner arrangement early. Stakeholders say that Dominica energy is represented by another agency on the steering committee. Stakeholders generally agree that this arrangement could have been rethought during early implementation given the context and natural counterpart.

A key lesson for handover is that some training for the users on the maintenance of buildings is needed. Monitoring the installments is key for sustainability and scale. What kind of data is coming from these experiments as is stated by the technicians attached to the project? Can all the installments be evaluated for scale? Technology will work with the resilience system delivering the best energy. The installments can now be handed over but with a clear monitoring plan for the system to support the sustainably and hand-over. Software for monitoring is included in the package. Newly trained users should have the software for monitoring. Trainers should ensure that energy output is monitored for design-making. Spending the final money well should be a significant focus.



## ANNEXES

### 1. ToR - Terminal Evaluation Terms of Reference (ToR) Template for UNDP-supported GEF-financed projects

*Template 1 - formatted for attachment to the [UNDP Procurement website](#)*

#### 1. INTRODUCTION

In accordance with UNDP and GEF M&E policies and procedures, all full- and medium-sized UNDP-supported GEF-financed projects are required to undergo a Terminal Evaluation (TE) at the end of the project. This Terms of Reference (ToR) sets out the expectations for the TE of the medium-sized project titled Low Carbon Development Path (LCDP) project (PIMS 4969) implemented through the United Nations Development Programme Barbados and the OECS (Executing Agency) and the Ministry of Environment, Rural Modernization and Kalinago Upliftment (Implementing Partner). The project started on the December 1st, 2016 and is in its 4th year of implementation. The TE process must follow the guidance outlined in the document 'Guidance for Conducting Terminal Evaluations of UNDP-Supported, GEF-Financed Projects' ([http://web.undp.org/evaluation/guideline/documents/GEF/TE\\_GuidanceforUNDP-supportedGEF-financedProjects.pdf](http://web.undp.org/evaluation/guideline/documents/GEF/TE_GuidanceforUNDP-supportedGEF-financedProjects.pdf)).

#### 2. PROJECT BACKGROUND AND CONTEXT

The Commonwealth of Dominica has some of the world's highest electricity costs due to its dependence on imported fossil fuels for power generation.

Under the country's Low Carbon Climate Resilience Strategy (LCCRS) of 2012, the Draft National Sustainable Energy Plan (NSEP), the National Resilience Development Strategy (NRDS) and the recent Sustainable and Renewable Energy Policy (S-REP), the Government of Dominica has outlined some of its plans to assure a more sustainable Energy Sector.

The Low Carbon Development Project (LCDP) complements these ongoing efforts, with the main objective being the removal of the policy, technical and financial barriers to energy-efficient applications and solar

photovoltaic technologies in Dominica's streets, outdoor areas and public buildings nationwide for further scale up.

The LCDP hopes to achieve this object through three (3) Main Components:

- Component 1: Institutional and technical knowledge, awareness and capacity for EE applications and renewable energy technologies (RETs)
- Component 2: Policy measures and enforcement of EE applications and RETs
- Component 3: Financing options and mechanisms for EE applications and RET diffusion

These objectives will be achieved through the removal of systemic barriers, through the following project components:

**Component 1: Institutional and technical knowledge, awareness and capacity for EE applications and RETs:** This component is intended to address the barriers associated with the lack of technical knowledge and capacity in Dominica to plan, design, implement, operate and maintain RE/EE projects. The expected outcome from the deliverables of the activities to be conducted under this component is improved knowledge, awareness and institutional capacity on EE applications and solar PV through demonstrations of their deployment in Dominica. The outputs from this component will contribute to: (a) awareness of policymakers and government personnel with significant roles in low carbon development; (b) strengthening the capacity of technical and trades personnel from Dominican-based private sector contractors and supply entrepreneurs on low carbon equipment and installations; and (c) raised public awareness of the benefits of EE applications and RE installations

**Component 2: Policy measures and enforcement of EE applications and RETs.** This component would address gaps in existing policies and standards that have not provided the necessary confidence for investors and donors into low carbon deployment in the Dominican energy market. The expected outcome from the outputs under this component is the uptake of EE applications and solar PV technology is promoted through adoption of new institutional arrangements, and policy and enforcement measures.

**Component 3: Financing options and mechanisms for EE applications and RET diffusion:** This component will address the financial barriers and the associated lack of financial incentives for EE applications and RE installations in Dominica. The outcome will be scaled-up EE applications and RET investments through implementation UNDP Environmental Finance Services Page 42 of newly proposed financial and institutional mechanisms.

**Component 4: Monitoring and Evaluation:** This component will contain activities related to monitoring and evaluation of Project activities. Through activities in this component, the ability of the Project to be adaptively managed will lead to an outcome of sustained low carbon development in Dominica during the Project period, and the increased likelihood of this outcome after the EOP. This component includes conducting the final evaluation.

<b>Project Title:</b>	Low Carbon Development Path (LCDP) Project: Promoting energy efficient applications
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	and solar photovoltaic technologies in streets, outdoor areas and public buildings in island communities nationwide			
GEF Project ID:			<u>at endorsement</u> (Million US\$)	<u>at completion</u> (Million US\$)
UNDP Project ID:	00091623	GEF financing:	\$ 1,726,484	\$ 1,726,484
Country:	Dominica	IA/EA own:	\$ 1,600,000	\$ 1,600,000
Region:	Latin America & the Caribbean	Government:	\$ 6,800,000	\$ 6,800,00
Focal Area:	Climate Change - Mitigation	Other:	\$ 540,000	\$ 540,000
FA Objectives, (OP/SP):	<p>1.5.1 Solutions adopted to achieve universal access to clean, affordable and sustainable energy</p> <p>2.5.1 Solutions developed, financed and applied at scale for energy efficiency and transformation to clean energy and zero-carbon development, for poverty eradication and structural transformation</p>	Total co-financing:	\$ 8,940,000	\$ 8,940,000
Executing Agency:	United Nations Development Program (UNDP)	Total Project Cost:	\$ 10,666,484	\$ 10,666,484
Other Partners involved:	Ministry of Environment, Rural Modernization and Kalinago Upliftment	ProDoc Signature (date project began):		December 1, 2016
		(Operational) Closing Date:	Proposed: 24 December 2020	Actual: 24 March 2021 (date extended)

In terms of project delivery, implementation has been quite slow in meeting planned targets as scheduled. The LCDP project was designed as a four-year project. Following a late project start, and delays caused by Hurricane Maria in 2017, challenges with the initial project implementing partner, changes in and within

the newly appointed project implementation partner, and then COVID-19, the project sought a no-cost extension to be able to conduct all the project activities needed to adequately meet project objectives. The project sought a 6-month extension; a bit less than 4 months was granted.

The world is currently facing the COVID-19 pandemic which affected people everywhere and brought a halt to global and local economic activity and transport systems, as well as unprecedented disruptions to daily life that undercut the societal fabric of opportunities for human interaction<sup>[1]</sup>. In order to ensure the well-being and safety of UNDP's staff and contractors, as well as to ensure no harm is done to partners, communities and interlocutors, the implementation of this TE shall be undertaken virtually, according to item "Evaluation Approach and Method" of this TOR.

### **3. TE PURPOSE**

The TE report will assess the achievement of project results against what was expected to be achieved and draw lessons that can both improve the sustainability of benefits from this project, future projects with similar objectives, and aid in the overall enhancement of UNDP programming. The TE report promotes accountability and transparency and assesses the extent of project accomplishments.

The TE will also be important in determining completeness of the project, and if the activities and indicators identified during project development justly reflected the project objectives. It could also provide some guidance on how request for project extensions could be fairly correlated to time granted.

*(Expand on the above text to clearly explain why the TE is being conducted, who will use or act on the TE results and how they will use or act on the results. The TE purpose should explain why the TE is being conducted at this time and how the TE fits within the Commissioning Unit's evaluation plan.)*

### **4. TE APPROACH & METHODOLOGY**

The TE report must provide evidence-based information that is credible, reliable and useful.

The TE Consultant will review all relevant sources of information including documents prepared during the preparation phase (i.e. PIF, UNDP Initiation Plan, UNDP Social and Environmental Screening Procedure/SESP) the Project Document, project reports including annual PIRs, project budget revisions, lesson learned reports, national strategic and legal documents, and any other materials that the team considers useful for this evidence-based evaluation. The TE Consultant will review the baseline and midterm GEF focal area Core

Indicators/Tracking Tools submitted to the GEF at the CEO endorsement and midterm stages and the terminal Core Indicators/Tracking Tools.

The TE Consultant is expected to follow a participatory and consultative approach ensuring close engagement with the Project Team, government counterparts (the GEF Operational Focal Point), Implementing Partners, the UNDP Country Office(s), the Regional Technical Advisor, direct beneficiaries and other stakeholders.

Engagement of stakeholders is vital to a successful TE. Stakeholder involvement should include interviews with stakeholders who have project responsibilities, including but not limited to organizations and persons listed in Table A below; executing agencies, senior officials and task team/component leaders, key experts and consultants in the subject area, Project Board, project beneficiaries, academia, local government and CSOs, etc.

*Table A: List of Individuals/ Institutions*

<b>Name</b>	<b>Agency/Department</b>
Mr. Mohammad Nadgee	Programme Manager, Sustainable Solutions and Energy
Ms. Kimisha Thomas	National Project Coordinator (LCDP)
Ms. Elizabeth Robinson	Project Associate (LCDP)
Ms. Mandra Fagan	Permanent Secretary, Ministry of Environment, Rural Modernization and Kalinago Upliftment
Ms. Careen Prevost	Former Permanent Secretary, Ministry of Environment
Ms. Ludmilla Diniz	Regional Technical Adviser
Mr. Luis Ruiz	Head, Dominica Project Office
Mr. Rafael Robillard	UNDP Denmark
Mr. Paul Hattle	Chief Technical Adviser (LCDP)
Mr. Dexter Newton	Low Carbon Officer
Mr. Jason LaCorbiniere	UNDP, Monitoring and Evaluation
Anderson Parillon	UNDP Focal Point for Dominica
Culver Lawrence	Financial Centre
Annie St. Luce	Dominica Infirmary
Francis Julien	Morne Rachet Emergency Operations Center
Lorenzo Sanford	St. Cyr Community Resource Center
Merlyn Rolle	San Sauveur Primary School
Ms Roberts (Vice Principal)	Isaiah Thomas Secondary School
Ronald Austrie	Portsmouth Secondary School

The specific design and methodology for the TE should emerge from consultations between the TE Consultant and the above-mentioned parties regarding what is appropriate and feasible for meeting the TE purpose and objectives and answering the evaluation questions, given limitations of budget, time and data. The TE

Consultant must use gender-responsive methodologies and tools and ensure that gender equality and women's empowerment, as well as other cross-cutting issues and SDGs are incorporated into the TE report.

The final methodological approach including interview schedule, field visits and data to be used in the evaluation must be clearly outlined in the TE Inception Report and be fully discussed and agreed between UNDP, stakeholders and the TE Consultant. **The Inception Report must be a product of a Virtual Mission.**

*(Note: The TOR should retain enough flexibility for the evaluation team to determine the best methods and tools for collecting and analysing data. For example, the TOR might suggest using questionnaires, field visits and interviews, but the evaluation Consultant should be able to revise the approach in consultation with the evaluation manager and key stakeholders. These changes in approach should be agreed and reflected clearly in the TE Inception Report.)*

The final report must describe the full TE approach taken and the rationale for the approach making explicit the underlying assumptions, challenges, strengths and weaknesses about the methods and approach of the evaluation.

## 5. DETAILED SCOPE OF THE TE

The TE will assess project performance against expectations set out in the project's Logical Framework/Results Framework (see ToR Annex A). The TE will assess results according to the criteria outlined in the Guidance for TEs of UNDP-supported GEF-financed Projects ([http://web.undp.org/evaluation/guideline/documents/GEF/TE\\_GuidanceforUNDP-supportedGEF-financedProjects.pdf](http://web.undp.org/evaluation/guideline/documents/GEF/TE_GuidanceforUNDP-supportedGEF-financedProjects.pdf)). *(The scope of the TE should detail and include aspects of the project to be covered by the TE, such as the time frame, and the primary issues of concern to users that the TE needs to address.*

The Findings section of the TE report will cover the topics listed below. A full outline of the TE report's content is provided in ToR Annex C.

The asterisk "(\*)" indicates criteria for which a rating is required.

### Findings

#### i. Project Design/Formulation

- National priorities and country driven-ness
- Theory of Change
- Gender equality and women's empowerment
- Social and Environmental Standards (Safeguards)
- Analysis of Results Framework: project logic and strategy, indicators
- Assumptions and Risks
- Lessons from other relevant projects (e.g. same focal area) incorporated into project design
- Planned stakeholder participation
- Linkages between project and other interventions within the sector
- Management arrangements

#### ii. Project Implementation

- Adaptive management (changes to the project design and project outputs during implementation)
- Actual stakeholder participation and partnership arrangements
- Project Finance and Co-finance
- Monitoring & Evaluation: design at entry (\*), implementation (\*), and overall assessment of M&E (\*)
- Implementing Agency (UNDP) (\*) and Executing Agency (\*), overall project oversight/implementation and execution (\*)
- Risk Management, including Social and Environmental Standards (Safeguards)

### iii. Project Results

- Assess the achievement of outcomes against indicators by reporting on the level of progress for each objective and outcome indicator at the time of the TE and noting final achievements
- Relevance (\*), Effectiveness (\*), Efficiency (\*) and overall project outcome (\*)
- Sustainability: financial (\*), socio-political (\*), institutional framework and governance (\*), environmental (\*), overall likelihood of sustainability (\*)
- Country ownership
- Gender equality and women's empowerment
- Cross-cutting issues (poverty alleviation, improved governance, climate change mitigation and adaptation, disaster prevention and recovery, human rights, capacity development, South-South cooperation, knowledge management, volunteerism, etc., as relevant)
- GEF Additionality
- Catalytic Role / Replication Effect
- Progress to impact

### Main Findings, Conclusions, Recommendations and Lessons Learned

- The TE Consultant will include a summary of the main findings of the TE report. Findings should be presented as statements of fact that are based on analysis of the data.
- The section on conclusions will be written in light of the findings. Conclusions should be comprehensive and balanced statements that are well substantiated by evidence and logically connected to the TE findings. They should highlight the strengths, weaknesses and results of the project, respond to key evaluation questions and provide insights into the identification of and/or solutions to important problems or issues pertinent to project beneficiaries, UNDP and the GEF, including issues in relation to gender equality and women's empowerment.
- Recommendations should provide concrete, practical, feasible and targeted recommendations directed to the intended users of the evaluation about what actions to take and decisions to make. The recommendations should be specifically supported by the evidence and linked to the findings and conclusions around key questions addressed by the evaluation.
- The TE report should also include lessons that can be taken from the evaluation, including best practices in addressing issues relating to relevance, performance and success that can provide



knowledge gained from the particular circumstance (programmatic and evaluation methods used, partnerships, financial leveraging, etc.) that are applicable to other GEF and UNDP interventions. When possible, the TE Consultant should include examples of good practices in project design and implementation.

- It is important for the conclusions, recommendations and lessons learned of the TE report to incorporate gender equality and empowerment of women.

The TE report will include an Evaluation Ratings Table, as shown below:

**ToR Table 2: Evaluation Ratings Table for *Low Carbon Development Pathway (LCDP)***

Monitoring & Evaluation (M&E)	Rating <sup>21</sup>
M&E design at entry	
M&E Plan Implementation	
Overall Quality of M&E	
Implementation & Execution	Rating
Quality of UNDP Implementation/Oversight	
Quality of Implementing Partner Execution	
Overall quality of Implementation/Execution	
Assessment of Outcomes	Rating
Relevance	
Effectiveness	
Efficiency	
Overall Project Outcome Rating	
Sustainability	Rating
Financial resources	
Socio-political/economic	
Institutional framework and governance	
Environmental	
Overall Likelihood of Sustainability	

## 6. TIMEFRAME

The total duration of the TE will be approximately *25 working days* over a time period of *9 weeks* starting on 15 January 2021. The tentative TE timeframe is as follows:

Timeframe	Activity
27 December 2020	Application closes
8 January 2021	Selection of TE Consultant
15 January 2021	Preparation period for TE Consultant (handover of documentation)
22 January 2021- 4 days	Document review and preparation of TE Inception Report. The Inception Report must be a product of a Virtual Mission.
29 January 2021- 2 days	Finalization and Validation of TE Inception Report; latest start of TE mission
12 February 2021- 10 days	TE Virtual mission: stakeholder meetings, interviews, etc.
15 February 2021	Wrap-up meeting & presentation of initial findings; earliest end of TE virtual mission

22 February 2021- 5 days	Preparation of draft TE report
24 February 2021	Circulation of draft TE report for comments
5 March 2021	Incorporation of comments on draft TE report into Audit Trail & finalization of TE report
12 March 2021	Preparation and Issuance of Management Response
17 March 2021	Expected date of full TE completion

## 7. TE DELIVERABLES

#	Deliverable	Description	Timing	Responsibilities
1	TE Inception Report	TE Consultant clarifies objectives, methodology and timing of the TE	No later than 2 weeks before the TE mission: January 22, 2021	TE Consultant submits Inception Report to Commissioning Unit and project management. The Inception Report must be a product of a Virtual Mission.
2	Presentation	Initial Findings	End of TE mission: February 12, 2021	TE Consultant presents to Commissioning Unit and project management
3	Draft TE Report	Full draft report ( <i>using guidelines on report content in ToR Annex C</i> ) with annexes	Within 3 weeks of end of TE mission: February 22, 2021	TE Consultant submits to Commissioning Unit; reviewed by RTA, Project Coordinating Unit, GEF OFP
5	Final TE Report* + Audit Trail	Revised final report and TE Audit trail in which the TE details how all received comments have (and have not) been addressed in the final TE report ( <i>See template in ToR Annex H</i> )	Within 1 week of receiving comments on draft report: <i>March 17, 2021</i>	TE Consultant submits both documents to the Commissioning Unit

\*All final TE reports will be quality assessed by the UNDP Independent Evaluation Office (IEO). Details of the IEO's quality assessment of decentralized evaluations can be found in Section 6 of the UNDP Evaluation Guidelines.<sup>[3](#)</sup>

## 8. TE ARRANGEMENTS

The principal responsibility for managing the TE resides with the Commissioning Unit. The Commissioning Unit for this project's TE is UNDP Barbados & the Eastern Caribbean. The Commissioning Unit and Project Team will support the implementation of remote/visual meetings over the period of the TE.

*(in the case of single-country projects, the Commissioning Unit is the UNDP Country Office. In the case of regional projects and jointly-implemented projects, typically the principal responsibility for managing the TE resides with the country or agency or regional coordination body – please confirm with the RTA in the region – that is receiving the larger portion of GEF financing. For global projects, the Commissioning Unit can be the Nature, Climate and Energy Vertical Fund Directorate or the lead UNDP Country Office.)*

The Project Team will be responsible for liaising with the TE Consultant to provide all relevant documents, set up stakeholder interviews, and arrange field visits.

## 9. TE CONSULTANT

One International Consultant will conduct the TE – *the consultant will have experience and exposure to projects and evaluations*. The consultant will *be responsible for the overall design and writing of the Inception Report<sup>[4]</sup>, Draft and Final TE reports, and serve as the main liaison between the Commissioning Unit and the TE Consultant. She/he will assess emerging trends with respect to regulatory frameworks, budget allocations, capacity building, work with the Project Team in developing the TE itinerary.*

The evaluator cannot have participated in the project preparation, formulation and/or implementation (including the writing of the project document), must not have conducted this project's Mid-Term Review and should not have a conflict of interest with the project's related activities.

The selection of evaluators will be aimed at maximizing the overall qualities in the following areas:

### CRITERIA

#### Education

- Master's degree in *Environmental Management/ Science or Engineering* or other closely related field;

#### Experience

- Relevant experience with results-based management evaluation methodologies;
- Experience applying SMART indicators and reconstructing or validating baseline scenarios;
- Competence in adaptive management, as applied to *Climate Change*
- Experience in evaluating projects;
- Experience working in *the Caribbean Region*;
- Experience in relevant technical areas for at least *10 years*;
- Demonstrated understanding of issues related to gender and *Climate Change*; experience in gender responsive evaluation and analysis;
- Excellent communication skills;
- Demonstrable analytical skills;
- Project evaluation/review experience within United Nations system will be considered an asset.

#### Language

- Fluency in written and spoken English.

## 10. EVALUATOR ETHICS

The TE Consultant will be held to the highest ethical standards and is required to sign a code of conduct upon acceptance of the assignment. This evaluation will be conducted in accordance with the principles outlined in the UNEG 'Ethical Guidelines for Evaluation'. The evaluator must safeguard the rights and confidentiality of information providers, interviewees and stakeholders through measures to ensure compliance with legal and other relevant codes governing collection of data and reporting on data. The evaluator must also ensure security of collected information before and after the evaluation and protocols to ensure anonymity and confidentiality of sources of information where that is expected. The information knowledge and data gathered in the evaluation process must also be solely used for the evaluation and not for other uses without the express authorization of UNDP and partners.

## 11. PAYMENT SCHEDULE

- 20% payment upon satisfactory delivery of the final TE Inception Report and approval by the Commissioning Unit
- 40% payment upon satisfactory delivery of the draft TE report to the Commissioning Unit
- 40% payment upon satisfactory delivery of the final TE report and approval by the Commissioning Unit and RTA (via signatures on the TE Report Clearance Form) and delivery of completed TE Audit Trail

Criteria for issuing the final payment of 40%<sup>[5]</sup>:

- The final TE report includes all requirements outlined in the TE TOR and is in accordance with the TE guidance.
- The final TE report is clearly written, logically organized, and is specific for this project (i.e. text has not been cut & pasted from other TE reports).
- The Audit Trail includes responses to and justification for each comment listed.

## 12. APPLICATION PROCESS<sup>[6]</sup>

Recommended Presentation of Proposal:

- Letter of Confirmation of Interest and Availability** using the [template<sup>\[7\]</sup>](#) provided by UNDP;
- CV** and a **Personal History Form** ([P11 form<sup>\[8\]</sup>](#));
- Brief description **of approach to work/technical proposal** of why the individual considers him/herself as the most suitable for the assignment, and a proposed methodology on how they will approach and complete the assignment; (max 1 page)
- Financial Proposal** that indicates the all-inclusive fixed total contract price and all other costs related to a virtual consultation, supported by a breakdown of costs, as per template attached to the [Letter of Confirmation of Interest template](#). If an applicant is employed by an organization/company/institution, and he/she expects his/her employer to charge a management fee in the process of releasing him/her to UNDP under Reimbursable Loan Agreement (RLA), the

applicant must indicate at this point, and ensure that all such costs are duly incorporated in the financial proposal submitted to UNDP.

All application materials should be submitted to the address (insert mailing address) in a sealed envelope indicating the following reference “Consultant for Terminal Evaluation of *Low Carbon Development Path (LCDP) project*” or by email at the following address ONLY: **(insert email address)** by 5:00PM UTC-4 on December 27, 2020. Incomplete applications will be excluded from further consideration.

**Criteria for Evaluation of Proposal:** Only those applications which are responsive and compliant will be evaluated. Offers will be evaluated according to the Combined Scoring method – where the educational background and experience on similar assignments will be weighted at 70% and the price proposal will weigh as 30% of the total scoring. The applicant receiving the Highest Combined Score that has also accepted UNDP’s General Terms and Conditions will be awarded the contract.

### 13. TOR ANNEXES

- ToR Annex A: Project Logical/Results Framework
- ToR Annex B: Project Information Package to be reviewed by TE Consultant
- ToR Annex C: Content of the TE report
- ToR Annex D: Evaluation Criteria Matrix template
- ToR Annex E: UNEG Code of Conduct for Evaluators
- ToR Annex F: TE Rating Scales
- ToR Annex G: TE Report Clearance Form
- ToR Annex H: TE Audit Trail

<sup>[1]</sup> Guidance Note: Good practices during COVID-19. OECD/DAC and IEO/UNDP, April 2020

<sup>[2]</sup> Outcomes, Effectiveness, Efficiency, M&E, Implementation/Oversight & Execution, Relevance are rated on a 6-point scale: 6=Highly Satisfactory (HS), 5=Satisfactory (S), 4=Moderately Satisfactory (MS), 3=Moderately Unsatisfactory (MU), 2=Unsatisfactory (U), 1=Highly Unsatisfactory (HU). Sustainability is rated on a 4-point scale: 4=Likely (L), 3=Moderately Likely (ML), 2=Moderately Unlikely (MU), 1=Unlikely (U)

<sup>[3]</sup> Access at: <http://web.undp.org/evaluation/guideline/section-6.shtml>

<sup>[4]</sup> The Inception Report must be a product of a Virtual Mission.

<sup>[5]</sup> The Commissioning Unit is obligated to issue payments to the TE team as soon as the terms under the ToR are fulfilled. If there is an ongoing discussion regarding the quality and completeness of the final deliverables that cannot be resolved between the Commissioning Unit and the TE team, the Regional M&E Advisor and Vertical Fund Directorate will be consulted. If needed, the Commissioning Unit’s senior management, Procurement Services Unit and Legal Support Office will be notified as well so that a decision can be made about whether or not to withhold payment of any amounts that may be due to the evaluator(s), suspend or terminate the contract and/or remove the individual contractor from any applicable rosters. See the UNDP Individual Contract Policy for further details:

[https://popp.undp.org/\\_layouts/15/WopiFrame.aspx?sourcedoc=/UNDP\\_POPP\\_DOCUMENT\\_LIBRARY/Public/PSU\\_Individual%20Contract\\_Individual%20Contract%20Policy.docx&action=default](https://popp.undp.org/_layouts/15/WopiFrame.aspx?sourcedoc=/UNDP_POPP_DOCUMENT_LIBRARY/Public/PSU_Individual%20Contract_Individual%20Contract%20Policy.docx&action=default)

<sup>[6]</sup> Engagement of evaluators should be done in line with guidelines for hiring consultants in the POPP  
<https://popp.undp.org/SitePages/POPPRoot.aspx>

<sup>[7]</sup><https://intranet.undp.org/unit/bom/psu/Support%20documents%20on%20IC%20Guidelines/Template%20for%20Confirmation%20of%20Interest%20and%20Submission%20of%20Financial%20Proposal.docx>

## 2. LIST OF PERSONS INTERVIEWED

*Table B: List of Individuals/ Institutions Interviewed*

Name	Agency/Department
Mr. Mohammad Nagdee	Cluster Head, Sustainable Solutions, Energy and Climate Change
Ms. Kimisha Thomas	National Project Coordinator (LCDP)
Ms. Elizabeth Robinson	Project Associate (LCDP)
Ms. Mandra Fagan	Permanent Secretary, Ministry of Environment, Rural Modernization and Kalinago Upliftment
Ms. Careen Prevost	Former Permanent Secretary, Ministry of Environment
Ms. Ludmilla Diniz	Regional Technical Adviser
Mr. Luis Ruiz	Head, Dominica Project Office
Mr. Rafael Robillard	UNDP Denmark
Mr. Paul Hattle	Chief Technical Adviser (LCDP)
Mr. Dexter Newton	low-carbon Officer
Mr. Jason LaCorbinere	UNDP, Monitoring and Evaluation
Anderson Parillon	UNDP Focal Point for Dominica
Culver Lawrence	Financial Centre
Annie St. Luce	Dominica Infirmary
Francis Julien	Morne Rachet Emergency Operations Center
Lorenzo Sanford	St. Cyr Community Resource Center
Merlyn Rolle	San Sauveur Primary School
Ms Roberts (Vice Principal)	Isaiah Thomas Secondary School
Ronald Austrie	Portsmouth Secondary School

### 3. LIST OF DOCUMENTS REVIEWED

1	Project Identification Form (PIF)
2	UNDP Initiation Plan
3	Final UNDP-GEF Project Document with all annexes
4	CEO Endorsement Request
5	UNDP Social and Environmental Screening Procedure (SESP) and associated management plans (if any)
6	Inception Workshop Report
7	Mid-Term Review report and management response to MTR recommendations
8	All Project Implementation Reports (PIRs)
9	Progress reports (quarterly, semi-annual or annual, with associated workplans and financial reports)
10	Oversight mission reports
11	Minutes of Project Board Meetings and of other meetings (i.e. Project Appraisal Committee meetings)
12	GEF Tracking Tools (from CEO Endorsement, midterm and terminal stages)
13	GEF/LDCF/SCCF Core Indicators (from PIF, CEO Endorsement, midterm and terminal stages); for GEF-6 and GEF-7 projects only
14	Financial data, including actual expenditures by project outcome, including management costs, and including documentation of any significant budget revisions
15	Co-financing data with expected and actual contributions broken down by type of co-financing, source, and whether the contribution is considered as investment mobilized or recurring expenditures
16	Audit reports and Spot Checks
17	Electronic copies of project outputs (booklets, manuals, technical reports, articles, etc.)
18	Sample of project communications materials
19	Summary list of formal meetings, workshops, etc. held, with date, location, topic, and number of participants
20	Any relevant socio-economic monitoring data, such as average incomes / employment levels of stakeholders in the target area, change in revenue related to project activities
21	List of contracts and procurement items over ~US\$5,000 (i.e. organizations or companies contracted for project outputs, etc., except in cases of confidential information)
22	List of related projects/initiatives contributing to project objectives approved/started after GEF project approval (i.e. any leveraged or “catalytic” results)



23	Data on relevant project website activity – e.g. number of unique visitors per month, number of page views, etc. over relevant time period, if available
24	UNDP Country Programme Document (CPD)
25	List/map of project sites, highlighting suggested visits
26	List and contact details for project staff, key project stakeholders, including Project Board members, RTA, Project Team members, and other partners to be consulted
27	Project deliverables that provide documentary evidence of achievement towards project outcomes
28	COVID Mitigation Actions
	<i>Additional documents, as required</i>

#### 4. EVALUATION QUESTION MATRIX

Evaluative Criteria Questions	Indicators	Sources	Methodology
<b>Relevance: How does the project relate to the main objectives of the GEF focal area, and to the environment and development priorities at the local, regional and national levels?</b>			
Does the project relate to the GEF Climate Change focal area and has it been designed to deliver global environmental benefits in line with relevant international climate change objectives?	The project includes the relevant GEF outcomes, outputs and indicators The project makes explicit links with global climate action goals	Project Document GEF 5 Focal Area Strategies PIF	Desk Review of Documents
Is the project aligned to National development objectives, broadly, and to national energy transition priorities specifically?	The project design includes explicit links (indicators, outputs, outcomes) to the national development policy/national energy policies.	Project Document National development strategies, energy policies, Nationally Determined Contributions, etc. PIF	Desk Review of Documents
Is the project relevant to stated regional development objectives as defined by CARICOM, OECS and other regional frameworks?	Explicit links are made within the project to regional development policies, action plans and associated initiatives	Project Document PIF	Desk Review of Documents
Is the project's Theory of Change relevant to addressing the development challenge(s) identified?	The Theory of Change clearly indicates how project interventions and projected results will contribute to the reduction of the three major barriers to low carbon development (Policy, institutional/technical capacity and financial)	Project Document PIF	Desk Review of Documents

Does the project directly and adequately address the needs of beneficiaries at local and regional levels?	The Theory of Change clearly identifies beneficiary groups and defines how their capabilities will be enhanced by the project.	Project Document PIF	Desk Review of Documents
Is the project's results framework relevant to the development challenges and are results at the appropriate level?	The project results framework adequately measures impact The project indicators are SMART Indicator baselines are clearly defined and populated and milestones and targets are The results framework is comprehensive and demonstrates systematic links to the theory of change	Project Document PIF	Desk Review of Documents
Is the project appropriately aligned with relevant UN system priorities, including thematic objectives at the national/regional and international levels?	The project's results framework includes relevant thematic outcomes and indicators from the UNDP Strategic Plan, the UNDAF, UNDP CPD and other relevant corporate objectives	Project Document UNDP CPD, UNDAF, SP	Desk Review of Documents
Have the relevant stakeholders been adequately identified and have their views, needs and rights been considered during design and implementation?	The stakeholder mapping and associated engagement plan includes all relevant stakeholders and appropriate modalities for engagement. Planning and implementation have been participatory and inclusive	Stakeholder mapping/engagement plan and reporting Quarterly Reports Annual Reports (PIR) Stakeholder Consultation Reports	Desk Review of Documents Stakeholder Interviews
Have the interventions of the project been adequately considered in the context of other development activities being undertaken in the same or related thematic area?	A Partnership framework has been developed that incorporates parallel initiatives, key partners and identifies complementarities	Project Document Quarterly Reports Annual Reports (PIR) Stakeholder mapping/engagement plan and reporting	Desk Review of Documents Stakeholder Interviews
Have relevant lessons learned from previous projects informed the design, implementation, risk management and monitoring of the project?	Lessons learned are explicitly identified and integrated into all aspects of the Project Document	Project Document PIF	Desk Review of Documents
Did the project design adequately identify, assess and design appropriate mitigation actions for the potential social	The SES checklist was completed appropriately and all reasonable risks were identified with appropriate	Project Document SES Annex	Desk Review of Documents

and environmental risks posed by its interventions?	impact and probability ratings and risk mitigation measures specified		
<b>Effectiveness: To what extent have the expected outcomes and objectives of the project been achieved?</b>			
Has the project achieved its output and outcome level objectives?	The project has met or exceeded the output and outcome indicator end-of-project targets	Quarterly Reports Annual Reports (PIR) Monitoring Reports Beneficiary testimony Site visit/field reports Pilot Data Analysis/Reports	Desk Review of Documents Interviews with project staff, stakeholders and beneficiaries Site visits
Were lessons learned captured and integrated into project planning and decision-making?	Lessons learned have been captured periodically and/or at project end	Steering Committee Meeting Minutes Quarterly Reports Annual Reports (PIR)	Desk Review of Documents Interviews with project staff, stakeholders and beneficiaries
How well were risks (including those identified in the Social and Environmental Screening (SES) Checklist), assumptions and impact drivers being managed?	A clearly defined risk identification, categorization and mitigation strategy (updated risk log in ATLAS)	ATLAS Risk Log M&E Reports	Desk Review of Documents • Interviews with project staff, stakeholders and beneficiaries
How were risks related to COVID19 managed?	COVID-related risks were defined against project activities with mitigating actions proposed	PME COVID-updated	Desk Review of Documents Interviews with project staff, stakeholders and beneficiaries
Were relevant counterparts from government and civil society involved in project implementation, including as part of the project steering committee?	The steering committee participation included representatives from key institutions in Government	Steering Committee Meeting Minutes	Interviews with project staff, stakeholders and beneficiaries
Has the project contributed directly to any changes in legislation or policy in line with the project's objectives?	Draft legislation has been developed or enacted to catalyse the reduction of barriers to the increased penetration of renewable energy/energy efficient technologies	Draft legislation Policy Documents Action/Implementation Plans	Desk Review of Documents
Is there evidence that the project outcomes have	The project has directly contributed to reductions in	Quarterly Reports Annual Reports (PIR)	Desk Review of Documents

contributed to better preparations to cope with natural disasters?	one or more vulnerabilities associated with natural disasters	Stakeholder/beneficiary testimony	Interviews with project staff, stakeholders and beneficiaries
Has the project carefully considered the thematic issues related to human rights? In particular, has the project sought to and actively pursued equality of access to clean energy services and opportunities for women and men (i.e. project team composition, gender-related aspects of pollution impacts, stakeholder outreach to women's groups, etc.)	A gender mainstreaming plan was completed The project results framework has incorporated gender equality considerations, as relevant. Multi-dimensional poverty reduction is an explicit objective The project prioritized the most vulnerable as key beneficiaries	Gender Mainstreaming Plan Project Document Stakeholder analysis and engagement plan	Desk Review of Documents
<b>Efficiency: Was the project implemented efficiently, in-line with international and national norms and standards?</b>			
Did the project adjust dynamically to reflect changing national priorities/external evaluations during implementation to ensure it remained relevant?	The project demonstrated adaptive management and changes were integrated into project planning and implementation through adjustments to annual work plans, budgets and activities Changes to AWP/Budget were made based on mid-term or other external evaluation Any changes to the project's planned activities were approved by the Steering Committee Any substantive changes (outcome-level changes) approved by the Steering Committee and donor, as required	Annual Work Plans Steering Committee Meeting Reports Quarterly Reports Annual Reports (PIR) Stakeholder/beneficiary testimony Revised Project Results Framework	Desk Review of Documents Interviews with project staff, stakeholders and beneficiaries
To what extent were the Project results delivered with the greatest value for money?	Value for money analyses, requests for information, market surveys and other market intelligence were undertaken for key procurements. Procurement is done on a competitive basis, where relevant.	VFM, RFI, Market Surveys Procurement Evaluation Documents	Desk Review of Documents Interviews with project staff and government stakeholders
Was co-financing adequately estimated during project design (sources, type, value,	Co-financing was realized in keeping with original estimates	Annual Work Plans Steering Committee Meeting Reports	Desk Review of Documents

relevance), tracked during implementation and what were the reasons for any differences between expected and realised co-financing?	Co-financing was tracked continuously throughout the project lifecycle and deviations identified and alternative sources identified Co-financiers were actively engaged throughout project implementation	Quarterly Reports Annual Reports (PIR)	Interviews with project staff, stakeholders and beneficiaries
Was the level of implementation support provided by UNDP adequate and in keeping with the implementation modality and any related agreements (i.e. LOA)?	Technical support to the Executing Agency and project team were timely and of acceptable quality. Management inputs and processes, including budgeting and procurement, were adequate	LOA (s)/Cooperation Agreement(s) UNDP project support documents (emails, procurement/recruitment documents) Quarterly Reports Annual Reports (PIR)	Desk Review of Documents Interviews with project staff, UNDP personnel
Have the capacities of the executing institution(s) and counterparts been properly considered when the project was designed?	An ex-ante analysis was undertaken of the internal control framework and internal capacities of the IP An ex-ante capacity analysis was undertaken of key partners with explicit responsibilities for implementation of project funds The cash transfer modality and implementation modality appropriately reflected the findings of any ex-ante analyses	HACT Assessment(s) Capacity Assessments	Desk Review of Documents
Has the M&E plan been well-formulated, and has it served as an effective tool to support project implementation.	The M&E plan has an adequate budget and was adequately funded The logical framework was used during implementation as a management and M&E tool There was compliance with the financial and narrative reporting requirements (timeliness and quality) Monitoring and reporting has been at both the activity and results levels	Project Document M&E Plan AWPs FACE forms Quarterly Narrative Reports Site visit reports	Desk Review of Documents Interviews with project staff and government stakeholders
Has the project adequately used relevant national systems (procurement, recruitment, payments) for project	Use of national systems was in keeping with relevant national requirements and internal control frameworks	Procurement/Recruitment reports FACE forms CDRs	Desk Review of Documents Interviews with project staff and

implementation possible?	where Management of financial resources has been in line with accounting best practice Management of project assets has been in line with accounting best practice		government stakeholders
Were financial audit/spot check findings adequately addressed and relevant changes made to improve financial management?	Appropriate management responses and associated actions were taken in response to audit/spot check findings. Successive audits demonstrated improvements in financial management practices	Project Audit Reports	Desk Review of Documents
<b>Sustainability: To what extent are there financial, institutional, social-economic, and/or environmental risks to sustaining long-term project results?</b>			
Are there financial risks that may jeopardize the sustainability of project outcomes?	The exit strategy includes explicit interventions to ensure financial sustainability of relevant activities	Project Exit Strategy Risk Log	Desk Review of Documents
Do the legal frameworks, policies, and governance structures and processes within which the project operates pose risks that may jeopardize sustainability of project benefits?	The exit strategy identifies relevant socio-political risks and includes explicit interventions to mitigate same	Project Exit Strategy Risk Log	Desk Review of Documents
Have key stakeholders identified their interest in project benefits beyond project-end and accepted responsibility for ensuring that project benefits continue to flow?	Key stakeholders are assigned specific, agreed roles and responsibilities outlined in the exit strategy MOU(s) exist for on-going monitoring, maintenance and oversight of phased down or phased over activities	Project Exit Strategy Risk Log MOU(s)	Desk Review of Documents
Are there ongoing activities that may pose an environmental threat to the sustainability of project outcomes?	The exit strategy identifies relevant environmental risks and includes explicit interventions to mitigate same	Project Exit Strategy Risk Log	Desk Review of Documents
<b>Impact: Are there indications that the project has contributed to, or enabled progress toward, reduced environmental stress and/or improved ecological status?</b>			
Are there verifiable improvements in ecological status, or reductions in ecological stress that can be	The project has contributed directly to improved ecological conditions, including through reduced GHG emissions for energy	Quarterly Reports Annual Reports (PIR) Monitoring Reports Pilot Data Analysis/Reports	Desk Review of Documents Site visits

linked directly to project interventions?	generation transportation	and		
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## 5. QUESTIONNAIRE USED

### Project Formulation, Design and Strategies/Relevance

#### Formulation

- How does this project contribute to the national, regional, and international priorities?
- What any significant national, regional, and international directives and policy/laws are (include any since project signing) to which the project contributes?
- Describe details about the national policy and enabling context: SDGs, CC, DRR (2015), Oceans, etc.

#### Design

- Were you involved in the project design? Who was? Where are they now? Has the context changed? What are your thoughts on the project design? How might it have been improved?
- Were the project's rationale and logical framework smart, and as the theory of change in line with the actual problems at the national level and sub-regional level?

#### Strategies

- Did the project have a clear theory of change? Did you understand the strategies in the document and how these would lead to results? Why or why not? Was it logical? Was there a good baseline?
- What were the main national drivers for joining and developing this project?
- Were the expected results clear to all stakeholders? How?
- Do you think the outputs link to the expected outcomes? Why or why not?
- Has the causal pathway to results been clear and concise?
- Any lessons learned?

### Project Implementation and Management: Effectiveness and Efficiency

#### Project implementation: capacity-building approach and adaptive management

- What was the role of the PSC in guiding this project to results? Was it useful for deciding on work plans and implementation strategies? Why or why not?? How were the work plans developed and rolled out? Who was there? Who was not there that should have been?
- Did you have a technical committee? How did that work out?
- What was the capacity building approach taken nationally? Please provide details of the approaches for training, learning, knowledge sharing, and policy advocacy. Did you have a



- CB strategies and strong stakeholder analysis?
- How many CB workshops did the project have? List them. Were they useful? Why?
- How many consultancies have been implemented? What were they? If you could do the project over what would you drop? And add?
- What has been the policy level results of this project?

#### Management and Oversight Arrangements

- Describe the project management and implementation and oversight arrangements, i.e. where are you situated in gov, how many staff have you hired since the start, how much remuneration? Any challenges to report concerning staffing? Any lesson learned?
- How did UNDP support to NIM work? How did UNDP support YOU? Any challenges? Describe how the project was coordinated daily at the national level? Any lessons learned?
- How often did the RTA visit? What were the results of those visits?
- How did UNDP Barbados help you monitor this project? Was it effective?
- Did you have gender results plan what was it? How would you do this if you could do it again?

#### Work Planning

- Did UNDP support work planning – how? Did the RTA support work planning? Barbados? How?
- How did you facilitate intersectoral national work planning?
- How did you present the ongoing implementation of this project to PSC meetings and policy level persons? Was this effective? Why or why not?

#### Finance and Co –Finance

- How was the project finances monitored? Provide all details?
- Did you track cofinancing why or why not? Provide the table.
- Please provide the overall expenditure per outcome per year in chart and tables for the report?
- Provide a breakdown of expenditure by the outcome and by year until the end of the project.

#### Project-level Monitoring and Evaluation systems

- Describe the monitoring and evaluation system since the beginning of the project? What are the lessons learned?
- How technical aspects of this project were monitor and facilitated by the project. Describe this with evidence? Dates and corrections made if any?

#### Other factors influencing Results

- What were the other factors influencing this project implementation?
- Did the project management, oversight, and work planning arrangements work out? Why or why not?
- What was human resources and organizational set-up?
- How did you do work planning at the national level? Describe the process.
- What were the day-to-day coordination, reporting, and monitoring mechanisms? To whom did you report? When? How? Did this system work? Why or why not?
- What was the role of the project secretariat in results monitoring, oversight, and management?
- How did management employ adaptive management at the national and sub-regional levels?

Can you provide a few examples?

- Any lesson learned?

#### Governance and oversight

- What were the main mechanisms for coordination and oversight? i.e., UNDP, RTA, meetings with the director of the department, project boards, and national workshops?
- How many steering committee meetings have there been? Who attended and when? Were these meetings useful? Why or Why not?
- Any lesson learned?

#### Synergies

- Did the project support synergies with ongoing related regional or national projects and initiatives? How? Why or why not?
- What were the related projects?
- Any lesson learned?

#### Technical inputs

- Did the project, project management, GEF support implementation of consultancies, provide you with sufficient technical support to enable the implementation of new approaches and tools? How? Why or why not? Any lesson learned?
- Why CTA delayed and what was that role? Has it been useful for monitoring support? How? How can it be improved? Lesson?

#### Partnerships

- Who were your regional and national implementing partners? List them?
- Did you have a good analysis and plan?
- Did other partnerships evolve? Did the original partnership strategy play out? Why or why not?
- What was the UNDP's role in the implementation and or comparative advantage-value added?
- What was the added value of the UNDP involvement? What was the added value of the Regional GEF involvement?
- Did the UNDP knowledge platform support the project implementation and results? How? Why or why not?
- What might be improved?
- How this to be sustained and what was the intention for sustaining the UNDP support in the first place?

#### Financial management and co-financing results

- Did the government commit all expected co-financing? Why or why not? Please provide this number and include all the in-kind and cash resources.
- Provide the final national project expenditure by the outcome and by year.

#### Other factors influencing implementation

- Provide YOUR comments on factors: communications, knowledge management, capacity building approach, technical monitoring and inputs and support, coordination mechanisms, policy level expected results.

## Project Results, Performance, Effectiveness

- Did the project reach all its goals, expected outcomes,? Why or why not. Were areas easy to do than others –why?
- Which national and regional outcomes and targets were most difficult to meet? Why?
- Which national and regional outcomes and targets were the easiest to achieve? Why?
- Are any of the national project targets outstanding? Why?
- What might have been done differently to meet all targets and goals? Why
- What do you think are the project's greatest results? At the sub-regional level, at the national level?
- How did you facilitate collaboration between sectors in project activities, iGive examples?

## Communication and KM

- How did you use communication in this project as an enabler for results? Did you have a plan and staff?For policy and learning results?
- Do you think there are any unintended consequences and unexpected results of this project's work?
- What is the value added of inter-project level collaboration?
- Any lessons learned?

## Monitoring and Evaluation

- Describe the monitoring and evaluation systems at the national level? How did you monitor and report your project results?
- DID YOU HAVE A GENDER MAINSTREAMING AND OR SAFEGUARDS PLAN?
- What were the internal project results reporting mechanisms? How often did you discuss national-level results internally and where?
- How YOU monitor the capacity development work of the project? (i.e., evidence of program-level assessments)
- Any lessons learned?

## Sustainability

- What is the likelihood of project sustainability?
- Economic sustainability
- Political sustainability
- Environmental sustainability
- Social sustainability

## Lesson learned and next steps

- What do you think are the main lessons learned to date based on the following?
  - Design
  - Management and Implementation Approach
  - Finance
  - Results

## Results

- What are the next steps? What are your recommendations to share in the TER?

## 6. EVALUATION CONSULTANT AGREEMENT FORM

### Evaluators:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's rights not to engage. Evaluators must respect people's right to provide information in confidence and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners, and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact during the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate, and fair written and/or oral presentation of study imitations, findings, and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

### Evaluation Consultant Agreement Form<sup>17</sup>

#### Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: \_\_\_\_\_

Name of Consultancy Organization (where relevant): \_\_\_\_\_

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

<sup>17</sup>[www.unevaluation.org/unegcodeofconduct](http://www.unevaluation.org/unegcodeofconduct)

Signed at *place* on *date*

Signature: \_\_\_\_\_

## 7. REPORT CLEARANCE FORM

Evaluation Report Reviewed and Cleared by

UNDP Country Office

Name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

UNDP GEF RTA

Name: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**8. ANNEXED IN A SEPARATE FILE: TE AUDIT TRAIL**

**9. ANNEXED IN A SEPARATE FILE: TERMINAL GEF TRACKING TOOLS, IF APPLICABLE**

## 10. PROJECT RISK MATRIX

Risk	Level of Risk	Mitigating Actions
Lower oil prices reduce government urgency on embracing RE and EE	<u>Low</u>	The Project is assisting GoCD in preparing action plans for the LCCRS and in implementing RE and EE installations in Dominica. This will provide the GoCD with required resources, targets and timelines to implement low-carbon development, and thereby reducing the risk that the GoCD reduces its urgency of low-carbon or RE and EE development in Dominica.
Delays in RE and EE project approvals due to lack of government capacity	<u>Moderate</u>	The Project will assist GoCD in the setup, establishment and capacity building of the DoCCENRM, a department within MoHE dedicated to approving and ensuring compliance of RE and EE installations. Training of DoCCENRM personnel will be focused on the management and administration of requests for RE and EE project approvals funded by the CCTF. This will work towards reducing the risk of delays in the approval of RE and EE projects through the DoCCENRM
Insufficient capital available to finance the CCTF	<u>Low</u>	The Project will provide seed financing for the CCTF that will be utilized for catalyzing RE and EE project development. The Project will also assist in the setup, administration and effective management of the CCTF. The successful development of RE and EE projects from the CCTF will increase the likelihood of other donors and financiers providing additional capital to the CCTF.
*high degree of uncertainty in the timeframe of the government recruitment process	<u>High</u>	<p>Note: Procedures have changed a bit since the project document was developed. All project consultants recruited must be approved by Cabinet. However, these may not be urgent and may be deferred repeatedly.</p> <p>Mitigating Action 1: Inform the permanent secretary and/or the administrative officer of the Ministry, of the recruitment at every step of the recruitment, so that he/she is aware of the process being used. The better informed they are, the easier it may be for them to expedite the approval, and they can explain the importance to the Cabinet.</p> <p>Mitigating Action 2: Considering the project implantation modality is a NIM, UNDP may be able to provide support with recruitment of specific consultants.</p>
*Insufficient human capacity and resources at the Energy Unit, and other critical agencies	<u>Moderate</u>	<p>Note: The Energy Unit is a major stakeholder and one of the main sources of data needed. However, the unit is currently severely understaffed and may not have the time and resources to assist in compiling data or providing guidance and technical advice.</p> <p>Mitigating Action: Establish technical working groups to bring together common stakeholders to advise on different components</p>

## 11. STATUS OF INSTALLATIONS

- **LCDP Status Update**

Name of Location	Average Monthly Electricity Consumption(kWh)	Size of PV System (kWp)	Estimated amount of Annual Energy Generated in KWh**	Type of Inverter	Size of Storage (kWh)	Estimated Annual CO <sub>2</sub> Savings (TCO <sub>2</sub> /yr)  *Grid Emission Factor	Status of Installation  (As of Feb 9, 2021)	Electrical Division Status	DOMLEC Diagnostic Testing Status	Commissioning by Installers Status
Dominica Infirmary	4,100	30	45,000	Grid	None	21.1	Installations complete	Inspection completed and Certificate Received	Not yet scheduled	Not yet scheduled
Morne Ratchet EOC	N/A (Information is not available because this is a new building)	4.0	6,000	Hybrid	20	2.8	Installations complete	Inspection completed and Certificate Received	Not yet scheduled	Not yet scheduled
St. Cyr Resource Center	N/A (Information is not available as this building is not connected to the grid) This site was only recently connected to the utility	7.5	11,000	Off-grid but can go on-grid	55	5.2	Installations about 90% complete (battery storage, solar modules, inverters, etc., installed; some wiring to be completed	Inspection to be scheduled	Not yet scheduled	Not yet scheduled



San Sauveur Primary School	578	6.0	9,000	Hybrid	30	4.2	Installations about 80% complete (battery storage, inverters, etc., installed; some wiring to be completed ; modules to be installed	Inspection to be scheduled	Not yet scheduled	Not yet scheduled
Isaiah Thomas Secondary School	3542	25.0	37,000	Hybrid	210	17.4	Installation complete. However, there seems to be an issue with the transformer being three phase, while the wiring is single phase but looks like three phase	Inspection completed and Certificate Not yet Received	Not yet scheduled	Not yet scheduled
Portsmouth Secondary School	967	12.0	18,000	Hybrid	60.0	8.4	Installation complete	Inspection completed and Certificate Not yet Received	Not yet scheduled	Not yet scheduled

- \*0.4711 tCO<sub>2</sub>/MWh
- \*\*Estimated Annual Energy Generated = Capacity of System (kWp) x 4.2 Sunshine Hours x 360 days
- NB. We use 360 days instead of the full year for any maintenance or very overcast days

## 12. SUMMARY OF TECHNICAL INSTALLATION

### Summary Technical Installation

#### *Low-carbon Development Path*

Power Systems were installed at six sites around the island. Four systems are under 15kW COVID, including one off-grid system. Two 30kW COVID systems, installed at the Dominica Infirmary and Isaiah Thomas Secondary School (ITSS), utilized diesel backup at the Infirmary and battery backup at ITSS. Lightbulbs at all the facilities were upgraded to more energy-efficient LED lights.

#### **Dominica Infirmary with diesel backup**

Description	Cost US dollars
Capital Cost	\$36,554.64
Levelized Cost of Energy	\$0.12/kWh
Operating Cost	\$3,362/yr
PV Production per year	45,339 kWh/yr

#### **Isaiah Thomas Secondary School with battery backup**

Description	Cost US dollars
Capital Cost	\$129,229.85
Levelized Cost of Energy	\$0.39/kWh
Operating Cost	\$7,091/yr
PV Production per year	42,592 kWh/yr

#### **Technical observation:**

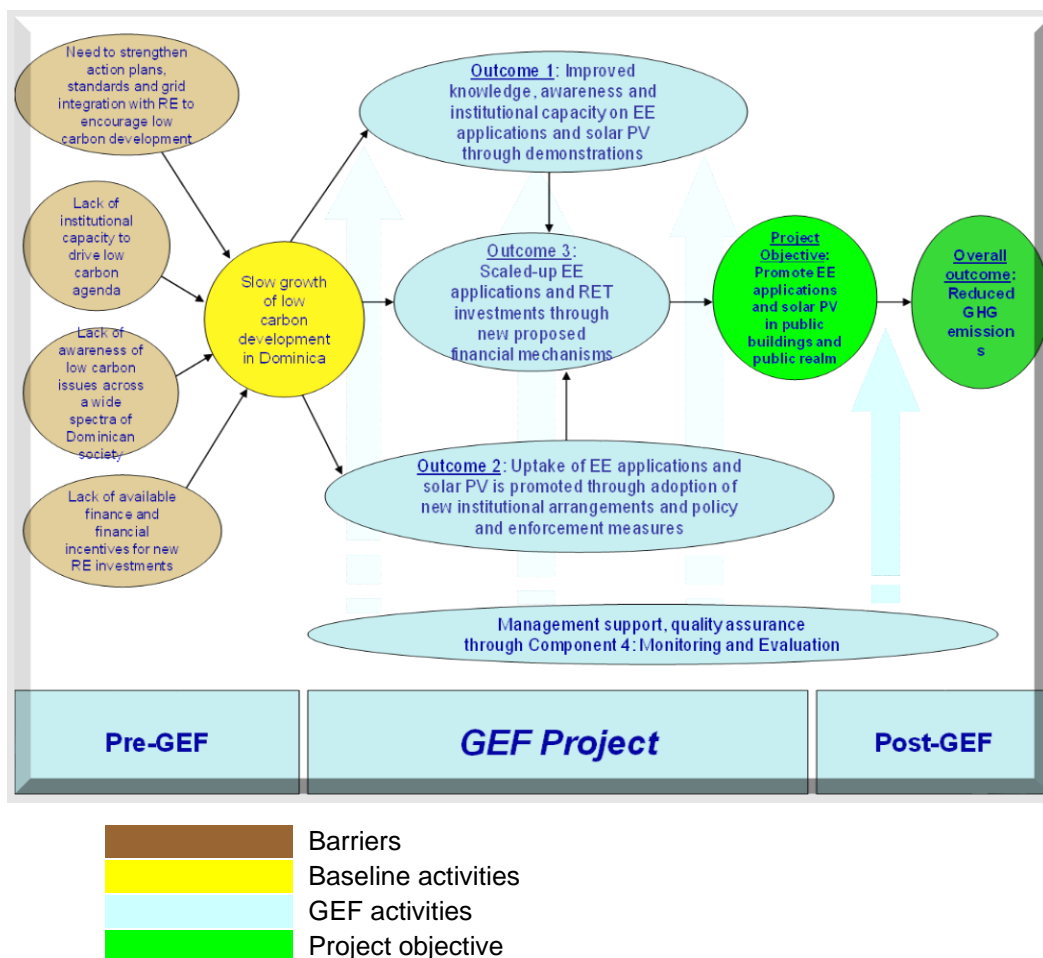
All systems installed on the project have a practical application on an island and can be examined independently for scalability. From the above data, however, the 30kW system installed at the Infirmary is the most cost-effective and resulted in a significantly reduced *Cost of Energy of \$0.12 per kWh*. PV Systems with diesel backup require a robust grid to remain viable, and this project demonstrates that systems can be designed to use few or no batteries in our service territory.

Based on the Energy Plan (S-REP) for Dominica, the proposed geothermal project will result in a more advanced electric grid and therefore make PV more viable on Dominica, removing the need for expensive, environmentally dangerous batteries, while diversifying the generation mix.

Municipal roof-top spaces are immediately available for solar deployment on Island. These systems can be scaled and integrated, utilizing smart grid technology.

#### Further recommendations:

- Government rebate on port charges and solar equipment purchase;
- Electrical Division to inspect all installations before system turn-on to reduce harmonics
- Implement a policy to take advantage of Net Metering with grid-interactive battery-less PV systems;
- Study new business model for a utility company with PV/fuel subsidy.





## Major Decisions

	Date	Major Decisions
Steering Committee Meeting 5	March 5 2021	<ul style="list-style-type: none"> <li>Procurement notices for the MEPS and Policy consultancy are to go out this month (upon review with UNDP Procurement)</li> <li>PSC Agreed that the Financial Centre be added to PV solar project</li> <li>PSC agreed to combine funds of CCTF and solar PV project to meet costs for all sites rather than depending on government to meet 80% of costs.</li> </ul>

		<ul style="list-style-type: none"> <li>• The project can provide institutional support by providing recommendations for the framework for CCTF. Some resources can be allocated to this initiative.</li> <li>• The Work Plan is approved in principle</li> <li>• Amended work plan is to be circulated</li> <li>• Project Extension Request should be developed</li> </ul>
Steering Committee Meeting 4	March 8 2019	<ul style="list-style-type: none"> <li>• Ministry of Environment confirmed as the new Implementing Partner</li> <li>• Public Steering Committee Chair and National Project Director is Permanent Secretary Environment</li> <li>• AWP agreed upon, with changes recommended</li> <li>• Recruitment of Chief Technical Officer and Administrative Assistant to be concluded before end of April 2019</li> <li>• Technical Working Group to review site list within the next two weeks</li> </ul>
Steering Committee Meeting 3	April 18 2018	<ul style="list-style-type: none"> <li>• PSC agrees to have TWG set up for developing site assessment criteria and shortlisting the sites</li> <li>• PSC agrees that LCO recruitment process follows the same method as the CTA (shortlist developed by AA, NPC, NPD, shortlist evaluated by a panel)</li> <li>• PSC agrees the shortlist should consist of 5 candidates; 3 National and 2 Non-national</li> <li>• PSC agrees that priority should be given to national for the LCO position</li> <li>• However, should none of the nationals be qualified for the post, the best non-nationals will be selected</li> <li>• UNDP will develop a monitoring and implementation support programme/sustainability plan for the project</li> <li>• A TWG will be set up for developing preliminary site assessment criteria</li> <li>• Briefing package/note will be developed for the LCDP project, for Ministers</li> </ul>
Steering Committee Meeting 2	November 23 2017	<ul style="list-style-type: none"> <li>• 2018 Annual Workplan was agreed upon</li> <li>• The PSC agreed for the Chief Technical Adviser and the low-carbon Officer to be recruited through processes of the Government of the Commonwealth of Dominica (GoCD), with the understanding that: <ul style="list-style-type: none"> <li>(i) This may affect the overall timeline of the AWP, as it is not guaranteed that the Cabinet approval process may be completed in accordance with the workplan</li> <li>(ii) UNDP has tabled an offer to conduct the recruitment process utilizing their procedures for procurement of services</li> </ul> </li> <li>• The National Project Director will develop and submit a Cabinet Paper for recruitment by next week</li> </ul>

		<ul style="list-style-type: none"> <li>The broad list of sites will be amended pending information from Mr. Fadelle re the Caribbean Development Bank Energy Audits project. A selection criteria will be developed to select among the long-list of sites.</li> <li>The Project Coordinator will aim to find out from Mr. Dexter Francis if Green Building Codes are being incorporated in the renovation of the Princess Margaret Hospital</li> <li>The Short list of sites for intervention will be sent to the PSC after site assessments are complete</li> <li>Suggestion to leverage the ongoing project and that the project could contribute directly to the installation of RE at that site.</li> <li>The PSC agreed to allow a complete purchase of EE and RE Technology with battery storage on at least one site.</li> </ul>
Steering Committee Meeting 1	April 13, 2017	<ul style="list-style-type: none"> <li>PSC Meetings will be held twice per year</li> <li>There was consensus from the PSC that Clinton Climate Initiative can be used to provide pro bono technical support for some project activities</li> <li>It was agreed that there will be a 10% threshold for the movement of funds between budget lines</li> </ul>

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Ratings for Effectiveness, Efficiency, Overall Project Outcome Rating, M&E, IA & EA Execution: 6. Highly Satisfactory (HS): no shortcomings 5. Satisfactory (S): minor shortcomings 4. Moderately Satisfactory (MS): moderate shortcomings 3. Moderately Unsatisfactory (MU): significant shortcomings 2. Unsatisfactory (U): major shortcomings 1. Highly Unsatisfactory (HU): severe shortcomings	Sustainability ratings: 4. Likely (L): negligible risks to sustainability 3. Moderately Likely (ML): moderate risks 2. Moderately Unlikely (MU): significant risks 1. Unlikely (U): severe risks	Relevance ratings: 2. Relevant (R) 1. Not relevant (NR)
Additional ratings where relevant: Not Applicable (N/A) Unable to Assess (U/A)		

<sup>ii</sup> Under the country's low-carbonLow Carbon Climate Resilience Strategy (LCCRS) of 2012<sup>ii</sup> and its NSEP, there is no detailed sustainable energy action plan that would allow policy makers to define the pace of

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RE development in terms of annual installed capacity. The lack of such a detailed plan is somewhat attributable to the shifting of significant GoCD resources towards geothermal energy development and associated uncertainties of implementation dates. Consequently As a consequence, the GoCD has not provided sufficient attention to development of medium-term low- carbon solutions that would include RE and EE installations other than on geothermal developments. The availability of such a plan would assist policymakers and programme implementers in framing supportive government policies to encourage RE and EE development, determine resources and personnel required for implementation, the expected costs of RE and EE-related equipment (i.e., solar-PV equipment, hydropower equipment, LEDs, EE white appliances etc.) required and the potential employment generation for local youth and other local skilled vocational trades.

Due to the size of the Dominican market, there has historically been a low volume of sales of electrical equipment. As such, no standards for imported electrical equipment have been developed with the Dominican Bureau of Standards, and as a result, retail sales of imported appliances have not focused on the energy performance of these appliances and RE equipment. While energy efficient white appliances are available in Dominica, most consumers continue to be focused on the purchase of least-cost appliances and equipment, and not minimum life-cycle costs of the appliance or equipment.

The GoCD are not aware of the impact of various levels of IRE inputs into the national grid. As such, DOMLEC has set their IRE limits of 10% of installed capacity of 2.5 MW; this limit assumes that no investments are made into the grid to upgrade its capacity to absorb more than 2.5 MW. GoCD's lack of knowledge of the impact of higher levels of IRE penetration on its grid constrains its ability to regulate the IRE ceiling and determine its maximum low- carbon potential and strategic planning for a greater share of RE in the Dominican energy market. The lack of a firm date for geothermal energy development only exacerbates this issue.

While the 2006 Electricity Act allows DOMLEC to purchase electricity from IPPs, there are no set tariff rates for various forms of RE such as for new solar PV, wind and hydropower installations. Without formulae to set feed-in tariffs for RE, new IPPs have no guarantees for cost recovery of developmental costs and RE equipment that generally make RE investments riskier than most conventional energy projects. Notwithstanding the DOMLEC 10% ceiling for RE, this is a smaller but significant barrier to further interest in developing RE projects in Dominica.

<sup>iii</sup> The lack of institutional capacity to drive the low- carbon agenda is evident given that the country's primary energy advisors in MoTEE are expending significant efforts with the country's geothermal energy developments. Due to the uncertainties of the geothermal development dates, discussions on medium-term solutions towards lower electricity costs were dominated by DOMLEC, a privately-held utility, and the IRC, the regulatory agency responsible for the determination of fair electricity tariffs. While the IRC should lead in the medium-term discussions on lower electricity costs, it does not have the capacity to perform as such. By default, the IRC does take much of its advice from DOMLEC due to DOMLEC's experience in the energy sector, and there is a lack of energy advisors to the GoCD that are external to DOMLEC. Moreover, DOMLEC does not have incentives to maximize low- carbon development as it would need to assume much of the development costs for studies to improve the efficiency of its grid system and business plans for other forms of RE. More recently, however, in 2015, there have been discussions at IRC public meetings regarding the IRE ceiling to the national grid. As such, the IRC needs to strengthen



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its capacity and be exposed to more diverse sources of energy-related technical advice that would improve its status as an *independent* regulatory agency.

With over 4 years of drilling tests, the MoTEE has expended considerable effort in quantifying the country's geothermal resource and determining the phased development of the project. There is a broad perception that the geothermal project in the medium-term will lead to lower energy costs as well as generate reductions in energy-related GHG emissions. Instead, there has not been much discussion of the following:

The strategies and costs to upgrade the 11 kV transmission line from the geothermal plants (located to the east of Roseau) to electricity customers to the north in Portsmouth. The cost of an upgraded transmission line will not necessarily lead to reduced electricity costs to DOMLEC customers;

The necessity of spinning reserve from existing diesel generation sets to ensure reliability of the electricity supply even with a geothermal project. DOMLEC's spinning reserve policy sets the spinning reserve needing to "exceed the dispatched unit with the largest output amounts to a minimum of 3.0 MW". As such, energy-related GHG reductions may not be as significant. Furthermore, fuel surcharges will still be added to the cost of electricity to the consumer, further adding to the argument that the geothermal project will not necessarily result in lower electricity costs to DOMLEC customers, most notably in the medium-term;

Development of more diverse indigenous sources of renewable energy that could provide relief from high electricity costs to DOMLEC customers in the short to medium term. While the LCCRS and NSEP state the need and broad plans for low- carbon development, there has been little, or no public discussion initiated from the public sector on the actions needed for responding to the measures outlined in the LCCRS and the NSEP.

<sup>iv</sup> There are 30 parliamentarians in Dominica, out of which there has not yet been the emergence of any "environmental" champions. While several a number of them are aware of high electricity costs and are keen to formulate policy actions to reduce these costs, they appear more aware of geothermal energy development and its association with low- carbon development in the medium-term. They are not fully aware of existing policies, laws and regulations that encourage low- carbon development for the energy sector such as the LCCRS and the NSEP.

Given the lack of history in the Dominican financial sector in financing RE and EE projects, there is insufficient knowledge of risk profiling of such projects in Dominica. Despite the existence of financial products for eco-friendly equipment, uptake of these products has been poor. Moreover, all RE and EE projects that do exist in Dominica have been financed by the proponent.

The lack of green buildings in Dominica is an indication that local architects and designers have not had any exposure to green building codes or standards. No such codes exist in Dominica, and local stakeholders have pointed out that new building designs do not fully take into consideration measures to reduce lighting and air conditioning costs. This would include the installation of larger windows that take advantage of prevailing winds that could serve as cross- ventilation for rooms instead of air conditioning, and maximize the use of sunlight to reduce demand for electric lighting.

Service providers for the installation of electric appliances and RE equipment have expressed a certain level of frustration over the lack of sufficient technicians with knowledge for such installations. While

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there are approximately 3 private entities in Dominica who provide such services with around 2 to 3 technicians (some full time and some part time), they all expressed reservations on expanding their business due to the a very small pool of qualified vocational personnel.

MostThe majority of Dominicans are aware of high energy costs but are not aware of the means of reducing these costs. A small sampling of people purchasing a refrigerator or other costly white appliances indicated that they were purchasing the lowest cost appliance, and not the ones that had better energy consumption ratings. Sales personnel at these retail outlets were also not able to converse on energy consumptive issues on the products they were selling. Many Dominicans are aware of the benefits of solar PV on their electricity costs. However, they are not aware of the effort required to design and install solar PV panels, nor have they had access to marketing of solar PV by private solar PV companies that would increase their RE knowledge. This lack of public awareness depresses the demand for RE and EE-related products and services.

<sup>v</sup> The upfront investment cost of purchasing RE and making EE building retrofits is either prohibitive for many potential customers or requires them to secure debt financing. Since the lending market for RE and EE is relatively young in Dominica, many financial institutions lack a full understanding of the risks, opportunities, and paybacks of investments. This leads to the structuring of lending terms that are not optimally structured for RE and EE investments. This can lead to high interest rates, collateral requirements or short tenors which lead many consumers to decide that a loan is not worthwhile. This situation proves especially challenging for the lowest income groups who lack access to finance and where savings in electricity costs could be especially beneficial.

Dominica has a well-established financial sector that includes national and indigenous banks, credit unions and international banks which provide debt financing to the residential, commercial and industrial sectors. To date, however, lending for RE and EE investments has been limited leading to the following characterizations of the lending market:

- The lending window available through Dominica's largest bank, AIDBank, is largely unknown;
- The lending market for RE and EE investments has been slowly growing but is hindered by the perception that rapid changes in technology will lead to rapid obsolescence of financed technologies;
- MostThe majority of Dominicans and lending managers are not aware of the benefits and paybacks of such investments;
- Financing institutions consider the RE and EE industries to be in their nascent stages and are wary of the quality and ability of equipment to provide the returns described by their suppliers<sup>v</sup>; and
- The lack of a government-backed financial mechanism that would assist in lowering the cost of RE and EE installations and increase financial and economic incentives for low- carbon diffusion.

The cost of installed solar PV in Dominica is in the range of USD 3.00 per watt to USD 5.50 per watt with a battery storage system. Assuming that a 2.5 kW installation is required for each household, a USD 7,500 investment would be required which may be difficult to finance for many a large number of households in Dominica<sup>v</sup>.

<sup>vi</sup> Although the UNDP provided technical oversight and execution support to NIM daily, in the future this will change, including the loss of adaptive management support