



Project evaluation: summary report

Caribbean Renewable Energy Development Programme (CREDP)

Project no.:	2008.2063.9
CRS Purpose Code:	23110 Energy policy and administrative management
Project objective:	Improved political, regulatory and institutional framework conditions, and the development of specialist technological and economic competencies are favourable to investment in RE/EE within the Caribbean region.
Project term:	February 2003 to March 2016; term of the evaluated module: April 2008 to March 2016
Project volume:	EUR 11,150,000; commission value of the evaluated module: EUR 8,950,000
Commissioning party:	German Federal Ministry for Economic Cooperation and Development (BMZ)
Lead executing agency:	Secretariat of the Caribbean Community (CARICOM)
Implementing organisations (in the partner country):	National energy ministries, power supply companies, development banks and standardisation offices in selected CARICOM member states, the Caribbean Development Bank (CDB), training institutions and the Organisation of East Caribbean States (OECS)
Other participating development organisations:	German Federal Foreign Office, European Union (EU), Austrian Development Agency
Target groups:	Private households (a total of 17 million people) in the Caribbean region, as well as commercial and industrial energy users in selected CARICOM member states in the Caribbean region.

Project description

The Caribbean Community (CARICOM) comprises a total of 15 very heterogeneous member states (Antigua and Barbuda, the Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Lucia, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Suriname, and Trinidad and Tobago). Apart from Haiti, electrification rates in the CARICOM member states range between 80 and 100% (2015). However, power supply depends heavily on fossil fuels, with oil-based fuels accounting for more than 90% of commercial energy consumption. With the exception of Trinidad and Tobago, one of the world's largest exporters of natural gas, all the Caribbean countries are net importers of petroleum products. The region's trade balance and internal economy are therefore highly susceptible to price fluctuations in the international petroleum market. For instance, the CARICOM member states spent almost US\$10 billion on oil imports in 2008, i.e. more than 5% of their gross domestic product. As petroleum products (particularly diesel) account for a large share of the generation capacity, the cost of generating electricity – in some cases more than US\$0.4 per kilowatt hour

(kWh) – is comparatively high, as are the specific greenhouse gas emissions. Carbon dioxide emissions per kWh of power generated are 30–40% higher than the average for Western Europe. Yet in absolute numbers, the CARICOM member states contribute very little to global greenhouse gas emissions (largely unchanged at 0.2% in the last few years, and only 0.06% without Trinidad and Tobago, the main emitter). Even though the region’s geological and topographic conditions are conducive for wind, solar, hydropower, and geothermal energy, its potential is virtually untapped. During the entire course of the project, from 2003 to 2015, the energy consumption covered by renewable energy (RE) remained unchanged at 2%. The situation is similar with regard to the potential for energy efficiency (EE). It is estimated that energy consumption could be reduced by 33% by 2027. As the individual countries in the region are not particularly attractive as investment locations because of the limited market capacity, the CARICOM states have decided to adopt a regional approach to developing RE/EE capacities. In 1998 the CARICOM states agreed on the Caribbean Renewable Energy Development Programme (CREDP), which was launched in 2002 with the support of the United Nations Development Programme (UNDP).

As of 2003, CREDP has been supported by a TC measure of the same name, initiated by GIZ on behalf of BMZ. The objective of the evaluated module (April 2008 to March 2016) is to improve the political, regulatory and institutional framework conditions, and develop specialist technological and economic competencies with the aim of promoting investment in RE/EE in the Caribbean region. The original design of the project envisaged a multi-level approach along the following four fields of activity: 1) Improving the legal and political environment for RE/EE at regional and national level; 2) Planning and implementing RE and EE pilot projects; 3) Promoting RE/EE training programmes at regional educational establishments; and 4) Strengthening the RE/EE advisory services provided by regional organisations. The underlying results logic was based on the assumption that improvements in the advisory services offered by the CARICOM Secretariat Energy Unit, combined with the expanded range of training courses at regional educational establishments, would improve the legal and political environment at national and regional level. At the same time, efforts to strengthen the Caribbean Electric Utility Services Corporation along with the provision of tender documents and information will enable investors to plan and implement RE/EE projects. A more conducive legal and political environment and an increase in technical and economic capacities will in turn boost investments in RE/EE technologies and contribute to energy security, to environmentally sustainable power supply, and to economic development in the Caribbean. This underlying results logic has been gradually adapted as a consequence of additional cofinancing and an increase in the fund value. Apart from adapting individual intervention packages, the introduction of EE standards for selected household appliances was taken up as a new field of activity. In response to the sluggish implementation of the planned RE/EE projects the focus of CREDP shifted more to funding mechanisms for RE/EE with the last term extension and fund top-up in 2014. Capacity development for financing institutions to enable them to assess and award loans for investments in RE/EE was taken up as a new field of activity. In addition, CREDP focused on the national level in order to complement the new project Renewable Energy and Energy Efficiency Technical Assistance (REETA, PN 2010.2262.3); the provision of advisory services for regional educational establishments and for the CARICOM Secretariat Energy Unit was handed over to REETA.

The requirements specified in the module objective were appropriate given the conditions at the time of designing the project. The fields of activity that had been further refined were logical and the system boundaries clearly defined, also in terms of demarcating the measure from the new REETA project. Apart from Indicator 4, which measures the demand for advisory services from the CARICOM Secretariat Energy Unit, the quality of the indicators was good for the most part and they were modified only slightly for the purpose of better evaluation (see section on Effectiveness). The development of the RE plants installed and the macroeconomic effect of CO₂ emissions formed the basis for assessing the impact of the TC measure.

Basis for assessment of the OECD-DAC criteria:	Individual and overall rating of the OECD-DAC criteria:
To determine the TC measure’s overall rating, calculate the average of the individual ratings of the five OECD-DAC criteria:	Relevance: 12 points - successful Effectiveness: 12 points - successful Impact: 10 points - rather successful Efficiency: 12 points - successful Sustainability: 10 points - rather successful
14 – 16 points: very successful	Overall, the TC measure is rated rather successful with a total of 11 out of 16 points.
12 – 13 points: successful	
10 – 11 points: rather successful	
8 – 9 points: rather unsatisfactory	
6 – 7 points: unsatisfactory	
4 – 5 points: very unsatisfactory	

Relevance (Are we doing the right thing?)

The project was designed as a measure which does not impact the target group immediately. It aimed to resolve the energy policy challenges facing CARICOM member states. CREDP supported the CARICOM Secretariat Energy Unit and the member states in drawing up a regional energy policy and strategy and the corresponding national development policies in

Saint Vincent and the Grenadines and in Saint Lucia. Beyond that, all the interventions supported by the project for the development of RE/EE sought to implement these regional and national policies and strategies. The thrust of the project was therefore also in harmony with the fundamental BMZ orientation in renewable energies and energy efficiency, the priority area for regional development cooperation, which aims to contribute to more sustainable power generation and consumption in the Caribbean through the development and implementation of regional development policies. The project was also in line with the BMZ sector strategy paper Sustainable Energy for Development and with the Sustainable Development Goals (SDGs), which have been in force internationally since 2015. According to the SDGs, the sustainable generation and use of energy is one of the key conditions for climate mitigation and natural resource conservation. The project contributes in particular to SDG 7.2: By 2030, increase substantially the share of renewable energy in the global energy and to SDG 7.3: By 2030, double the global rate of improvement in energy efficiency. The project is also in harmony with the United Nations Framework Convention on Climate Change (UNFCCC) and with the UN's Sustainable Energy for All initiative.

The relevance of the TC measure is rated successful with 12 points.

Effectiveness (Will we achieve the project's objective?)

Objectives indicator	Target value according to the offer	Current status according to the project evaluation
<p>1. 8 legally binding instruments for the promotion of RE/EE in the CARICOM states have been adopted.</p> <p>Baseline value: 1</p>	<p>8 published instruments (e.g. legislation, regulations and guidelines for quotas, customs or tax exemptions, standards, feed-in tariffs, subsidies, etc.)</p>	<p>7 of the 8 legally binding instruments for the promotion of RE/EE have been adopted. For instance, Dominica passed a new law in 2015 to promote geothermal energy, and power supply companies in 6 CARICOM member states (Antigua and Barbuda, Barbados, Dominica, Grenada, Saint Lucia and Saint Vincent and the Grenadines) have come to an agreement on feed-in tariff regulations. Other instruments were also in an advanced stage of development; with the support of the project, the regional energy policy and strategy of the CARICOM member states were adopted, as were national energy policies in Saint Lucia and in Saint Vincent and the Grenadines.</p>

<p>2. 13 investment projects in RE plants or in EE measures in the CARICOM member states have been implemented.</p> <p>Baseline value: 0</p> <p><i>Original indicator: 18 investment projects in RE plants and in EE measures in the CARICOM member states have been implemented.</i></p> <p><i>Baseline value: 5</i></p>	<p>13 new investment projects under construction or already built.</p> <p><i>Original target value: 18 new investment projects under construction or already built.</i></p>	<p>Instead of the 13 new investment projects in RE plants or EE measures that had been targeted, at the time of the evaluation 15 had already been achieved with project support (e.g. advice during preliminary investigations, measuring potential, planning, feasibility study or invitation to tender). The 12 RE plants are for photovoltaics, wind and hydroelectric power and have a total capacity of 9.3 MW. The 3 EE measures included projects for energy-efficient street lighting in Saint Lucia and in Saint Vincent and the Grenadines as well as one measure for hot water collectors in Saint Lucia. It should be emphasised that 6 of the 15 investment projects were funded by the project, primarily through cofinancing with the Austrian Development Agency.</p>
<p>3. 5 financial institutions award loans for RE/EE investments in the CARICOM member states</p> <p>Baseline value: 0</p>	<p>5 financial institutions have approved or have already awarded loans</p>	<p>1 loan from CDB had been approved and another loan commitment made by the Saint Lucia Development Bank had been prepared.</p>
<p>4. <i>There is an increase in demand for advisory services from the CARICOM Secretariat Energy Unit.¹</i></p> <p><i>Baseline value: 0</i></p>	<p><i>There are 6 enquiries</i></p>	<p><i>There were 43 written enquiries.</i></p>
<p>5. 3 RE/EE modules, e.g. photovoltaics, solar thermal energy, wind power, economical energy use, etc. have been integrated into the curricula of training institutions (technical colleges, universities, etc.).</p> <p>Baseline value: 0</p>	<p>3 RE/EE modules have been integrated into the curricula</p>	<p>4 modules had been integrated into the curricula of training institutions. A total of 136 students to date have attended the 2 modules on photovoltaics being offered at the technical colleges in Grenada and in Saint Vincent and the Grenadines. No figures were available of the number of students participating in the 2 RE modules, which had been integrated into the curricula of the University of Technology, Jamaica and the University of the West Indies.</p>
<p>6. In 3 OECS countries, EE standards for selected electrical appliances have been submitted to decision-makers for approval.</p> <p>Baseline value: 0</p>	<p>In 3 OECS countries EE standards have been submitted for approval</p>	<p>Regional EE standards for CFLs and LEDs were ready for approval for all 15 CARICOM member states. The CARICOM member states are expected to adopt the standards on 9 November 2015.</p>

¹Indicator 4 does not meet SMART criteria. In other words, it is not specific, measurable, attainable, relevant and/or time-bound. The indicator could not be modified during the project evaluation and has therefore not been included in the review.

The evaluation team comes to the conclusion that objectives indicator 1 will probably be *partly* achieved, indicator 2 *completely* achieved, indicator 3 *partly* achieved, indicator 5 *completely* achieved and indicator 6 *completely* achieved by the end of the project/ programme.

The effectiveness of the TC measure is rated successful with 12 points.

Overarching development results (impact) (Are we contributing to the achievement of overarching development results?)

The RE capacity installed in the CARICOM member states (excluding Haiti and Montserrat) has increased from 250 MW or approximately 7.4% of total installed capacity (1998) to 423 MW or about 8.4% of total capacity (2015). The increase can be largely attributed to technologies and countries where the project has not been active (e.g. biomass in Guyana and hydropower in Belize). In the 9 CARICOM member states specifically supported by the project, the RE capacity installed increased from 225 MW (1998) to 335 MW (2015). Although RE plants with a capacity of 9.3 MW installed by the project accounted for only a fraction of the RE capacity installed between 1998 and 2015, the project has helped develop RE capacity in the Caribbean, primarily through its support for the regional energy policy and strategy and for instruments designed to encourage investment. Thanks to its consistent, long-term presence in the Caribbean, the project has also contributed significantly to the exploitation of the RE potential in the CARICOM member states. Even though the potential for RE, which at 8.4% of the total capacity installed in the CARICOM member states is by no means exhausted, it is to be assumed that the positive developments in RE capacity, which are already apparent, will be significantly strengthened in the coming years, one of the reasons being the falling cost of related technologies.

As RE now accounts for only slightly more of the total installed capacity, 8.4% (2015) against 7.4% (1998), it is not yet possible to establish a reduction in CO₂ emissions in the Caribbean. Given the growth in population and the resultant increase in energy consumption, CO₂ emissions have in fact risen from 384 million tonnes (1998) to 691 million tonnes (2011) in the CARICOM member states. Nevertheless, it is to be assumed that the increase in RE capacities fuelled by the project, together with the assumption that EE will increase with more widespread use of RE, will arrest rising CO₂ emissions in the long term.

The project has made a substantial contribution to the broad scale of the impact. The regional energy policies, strategies and EE standards that have been developed with the support of the project provide guidelines for all CARICOM member states. Furthermore, care was taken when developing individual products, e.g. the framework for a law on RE, or tender documents for wind turbines, to ensure that the products could be used in several countries. The demonstration projects developed by the measure have also proved to be replicable. The project on energy-efficient road lighting in Saint Vincent and the Grenadines has already been replicated in Saint Lucia. The idea of setting up a regional energy agency, which was proposed by the project, was taken up by the Austrian Development Agency and the United Nations Industrial Development Organization (UNIDO), and the Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE) was founded in October 2015.

The impact of the TC measure is rated rather successful with 10 points.

Efficiency (Are the objectives being achieved cost-effectively?)

By exploiting synergies with other TC measures and by assigning more national and regional experts, the project was able to implement the objectives with a comparatively cost-effective and adequate body of staff. Partner contributions were included during implementation to the extent possible. As the resources at their disposal vary greatly, power supply companies and the development banks contributed more than the ministries or the authorities.

The project generated extensive synergy effects with other donors. For example, with cofinancing from the Austrian Development Agency, the European Union (EU) and the Federal Foreign Office, among others, the targeted result in the area of RE/EE investment projects could be increased by eight projects and the introduction of EE standards included as an additional result. Thanks to the coordination with the Inter-American Development Bank, the number of energy audits carried out in hotels could be increased from 15 to a total of 45, which, in turn, significantly boosted the contribution to EE in the hotel sector. In order to avoid inefficiency, the project also terminated its support for the Caribbean Electric Utility Services Corporation (CARILEC) when the Inter-American Development Bank started advising CARILEC in 2009. Individual products that had been developed by the project were also adopted and continued to be used by other donors. For example, the International Renewable Energy Agency (IRENA) used the feasibility study on wind power, produced by CREDP, as a basis for further studies on network stability and on RE conditions in Antigua and Barbuda.

Even though the project actively sought and achieved cooperation with power supply companies, it was unable to enter into any integrated development partnerships with the private sector. Coordination with the American foundations that have stepped up their operations in the region in the last three years also proved to be a major challenge. Some of the partner institutions felt they were unable to cope with the large number of donors and projects given their extremely limited capacities.

The efficiency of the TC measure is rated successful with 12 points.

Sustainability (Are the positive results durable?)

For the most part, the project's exit strategy provided for a gradual handover of the fields of activity pursued by CREDP to the partners and to the new project REETA. Thus the fields of activity Advising the CARICOM Secretariat Energy Unit and Advising training institutions were handed over to REETA in 2014. The measures on EE standards that were cofinanced by the EU were completed in 2014 and the products handed over to the implementing partners. Furthermore, no new RE/EE investment projects or promotion instruments have been initiated since 2014 and the project has instead focused on completing and financing ongoing measures.

Some of the products and approaches developed with the support of the project have already been institutionalised in the partner system. The annual Energy Week launched by the project is already being independently coordinated by the CARICOM Secretariat's Energy Unit and is being financed and implemented by the CARICOM member states. In addition, the personnel employed by the energy departments that have been newly established or restructured since 2008 (e.g. Energy Unit of the CARICOM Secretariat or of OECS) are increasingly self-financed. Despite the progress made, the financial and human capacities of the individual energy departments at regional, sub-regional and national level are still extremely limited and the departments therefore continue to depend on external support. For example, the national standardisation bureaus do not have the financial resources required for the future operation of the laboratories, which have been set up with project support, for the testing of CFLs and refrigerators. The OECS Sustainable Energy Unit also lacks the resources required for it to use and continue to develop the products for EE standards that have been handed over to it (information, publicity materials and campaigns, import agreements with the customs authorities, agreements with retailers, etc.). In dialogue with the EU and the CDB, the TC measure tries to ensure that these measures continue to be supported from their programmes. The implementing organisations were unable to gather any extensive experience in managing an entire project cycle, as the number of RE/EE projects implemented with the support of the project is comparatively low in individual CARICOM member countries.

However, the fact that the financing and promotion instruments for RE/EE in the Caribbean are inadequate is particularly critical for the future development of RE/EE capacities. The lack not only of legal security but also of a conducive lending environment continues to be a major barrier to private investment. Potential risk factors, which can influence the long-term sustainability of the results, were not fully considered by the project. Price trends for RE plants have a positive effect. Falling prices and increasing economic viability result in the private sector developing its own momentum.

The sustainability of the TC measure is rated rather successful with 10 points.

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Registered offices
Bonn and Eschborn

Friedrich-Ebert-Allee 40
53113 Bonn, Germany
T +49 228 44 60 0
F +49 228 44 60 1766

Dag-Hammarskjöld-Weg 1–5
65760 Eschborn, Germany
T +49 61 96 790
F +49 6196 791115

E info@giz.de
I www.giz.de