OCTA

PROGRESS OF OCTS ON THEIR TRANSITION TO SUSTAINABLE ENERGY

FINAL REPORT, 6 MARCH 2020





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OCTAssociation

ASSOCIATION OF THE OVERSEAS COUNTRIES AND TERRITORIES OF THE EUROPEAN UNION

PAYS ET TERRITOIRES D'OUTRE-MER

LANDEN EN GEBIEDEN OVERZEE

OVERSØISKE LANDE OG TERRITORIERS

COWI

This report has been prepared for the Secretariat of the Overseas Countries and Territories Association which is co-funded by the European Union. The findings, interpretations and conclusions expressed in this document are those of the author alone and should in no way be taken to reflect the views of the European Commission or the Overseas Countries and Territories.

EXECUTIVE SUMMARY

As a background document for OCTA activities linked to the energy transition processes and, by extent, related to the European Green Deal, OCTA has decided to commission this study, which is an update of the QuickScan questionnaire from May 2016. The study will also focus on best practices in the sustainable energy transition underway in the Overseas Countries and Territories (OCTs) and will contain an analysis of progresses made by OCTs in the implementation of their Sustainable Energy Roadmap signed in 2015 (See annex D).

This report is based on qualitative data collected through a questionnaire. The QuickScan (QS) is a questionnaire originally developed by IRENA within their SIDS Lighthouse initiative: It assesses the readiness to deploy renewable energy within the energy sector and it is meant as a tool allowing governments and development partners to prioritize the areas of support towards accelerated renewable energy deployment. The purpose of this questionnaire is to gather information from OCTs about how they are progressing in their sustainable energy transition, and how their progress is compared to 2016. The questions in the questionnaire were categorised by seven elements:

- Element 1: Institutional framework
- Element 2: Knowledge base
- Element 3: Transition planning
- Element 4: Project financing
- Element 5: Project deployment
- Element 6: Capacity building
- Element 7: Regional and international co-operation

Besides these elements, the questionnaire was complemented with two new sections: A section on best practices in the sustainable energy transition in an island setting, and an additional set of questions in order to measure the progress of OCTs regarding the implementation of the 2015 Sustainable Energy Roadmap. Focus areas here were: 1) Specific networking and collaboration, 2) Energy efficiency, 3) Buildings and transports, 4) Business, and 5) Legal.

Generally, the results show that from 2016 to 2020, there is an overall improvement in QS score and RE share. The average RE share is almost doubled (from 9% to 17.7%) and there is an increase of 11% on the average QS score (from 74 to 81), which indicate that collectively, the OCTs are underway in their renewable energy (RE) transition.

Chapter 5 presents the progress of OCTs with regards to the five priority areas that are part of the Sustainable Energy Roadmap. This roadmap was adopted at the first Summit of OCTs Energy Ministers in Brussels and aims at facilitating the path towards lowering fossil fuel dependency and increasing energy efficiency (EE) in OCTs.

For the first priority area - *Specific networking and collaboration* – the general recommendation is to continue and to further elaborate on specific networking and collaboration, and in particular, to focus on the identification of relevant cooperation programmes, initiatives, opportunities and network forums, where they can share examples, experiences, lessons learnt, challenges and other obstacles.

In the second priority - *Energy efficiency* - most OCTs have already demonstrated to put some actions in place towards the development of EE. This was either done through technical solutions, or via the implementation of regulation and the set-up of standards. The level of maturity of the OCTs towards EE is quite widespread, which gives room for improvement for the majority of the OCTs.

In specific, actions should be undertaken by the OCTs to further define measures at the regional level to support EE (covering the industry, buildings, services, products, etc.). An appropriate policy framework should therefore be adopted. Further to that, a monitoring system should be defined that regularly assesses the share of RE and the impact on EE of the implemented measures.

The actions in the third priority area - *Buildings and transports* - are diverse and included mainly initiatives to facilitate the electrification of the transport sector. In general, most of the actions that are being implemented can be divided into tax measures, technological solutions, and policy development. To facilitate initiatives towards an increased sustainability in buildings and the transport sector, it is recommended to include such objectives in a dedicated institutional framework. A deep-dive analysis should be performed by the relevant OCTs to understand what measures can be adopted (i.e. what is feasible with the current financial and human resources and support). Also, international cooperation and institutional capacity building can support this priority.

The private sector in the fourth priority area – *Business* - showed to be quite active. Progress was noted in relation to the number of investments, the received tax incentives / tariffs and in the number of initiatives to create general awareness to business and the population. To raise further awareness, studies could be further conducted, and as described for the first priority area, OCTs should continue to elaborate on specific networking and collaborations, which may allow businesses to further flourish on their islands. To keep businesses active and increase further investments, it is recommended for the OCTs to provide, where feasible, incentives such as tax incentives for equipment, or local tax exemptions to businesses that adopt measures towards EE and RE.

The progress on the fifth priority area - *Legal* – is quite scarce. There are a few OCTs who have set up a legal framework or introduced a multi-annual energy programme, however, this priority area is by far the least developed. Considering the legal framework were reported not to be well-established yet across the OCTs, it is strongly recommended to take measures towards the establishment of an enabling legal and regulatory framework that could support higher uptakes of RE generation. This can be done as part of the institutional framework, but, is also an important factor to be considered while actively seeking accessible international cooperation to support such policy development and institutional capacity building.

The best practices in chapter 6 provides information from within the OCTs and shares relevant lessons learnt. From these best practices, a general outline of barriers for RE development can be extracted. Not all barriers apply to all OCTs, but most OCTs face several of the challenges as the barriers pertains especially to RE transition on islands. The barriers are listed here as a reminder of the unique nature of the challenges that OCTs face in their RE transition, but also, it serves as a tool of reflection, as this chapter highlights several initiatives that OCTs have taken which shows how the barriers for RE development can be overcome:

- OCTs are isolated and not connected to mainland grids
- OCTs experience seasonal spikes in energy consumption (mostly due to tourism)
- RE provides an intermittent supply of energy (no possibility to sell surplus energy or to buy energy from external sources in instances of insufficient local supply)
- There is a lack of institutional framework and legislation to attract private investors
- There is a gap between RE targets and implementation efforts
- Utility monopoly (low chance for market development in private companies)
- OCTs lack knowledge on the market potential of RE
- OCTs lack technical expertise
- There is often limited space for RE development
- RE projects require a high initial investment

- Due to the population sizes of the OCTs, there are low economies of scale
- High cost of delivering equipment and limited availability of relevant infrastructure to facilitate RE development
- Harsh environments for hardware (humidity, erosion, natural weather extremes)

The overall study results demonstrated that:

- An institutional framework is useful for RE deployment and in particular requires the OCTs to set-up an energy transition plan with specific targets, a RE transition roadmap, and strategic objectives with binding targets. It was noted however that the institutional framework can only be truly successful when it not only focuses on the policies, but focuses on pragmatic ways to implement the defined measures;

- A reliable knowledge base is an important pre-requisite for the transition towards RE. Hence, the benefits of such knowledge base can only be fully exploited when there are sufficient data collection and analysis capacities, while ensuring transparency and availability to the data. In most cases, OCTs are already conducting relevant studies in the field of RE and EE towards that end;

- Local utility firms play a key role in transition planning. Coordination mechanisms should be set up between the government and the local utility firms;

- Some OCTs reported to have difficulties in relation to financing international programs, or obtaining public funding for the private sectors, which limits the further development of RE projects. OCTs should therefore progressively facilitate different forms of investments and favour private investments as a way to increase their shares of RE. In most cases, where OCTs were granted private investments, a higher share of RE was noted. The positive impacts from involving utility in RE projects, through for example Power Purchase Parities (PPPs), could therefore be further looked into;

- OCTs also visibly benefit from previous and new partnerships and exchanges with other OCTs. Targeted capacity building seemed to play a key role in the successful transition towards RE and was noted to have a positive impact on knowledge-creation and the long-term sustainability of the RE projects. Moreover, most OCTs stressed the importance of capacity building and expressed the need for support in this area from OCTA (on both policy and technical matters);

- OCTs further stressed the need to have appropriate conditions to deploy RE projects, and that these are essential for its success (e.g. may avoid project delays, and may help to remove administrative burdens);

- A positive correlation was found between the population size of the OCT and the level of development of the element, being, the larger the population of the OCT, the more developed the elements were. For example, the highest shares for RE were noted in for example in Greenland, Curaçao, French Polynesia, and Aruba. All islands with a larger population size. This is potentially due to the fact that these islands can benefit from economies of scale, may attract more investments and have wider capacities in terms of their knowledge base and general technical local capacities.

CONTENTS

APPENDICES

LIST OF ABBREVIATIONS

ARES	Aruba Renewable Energy Strategy
AC	Air Conditioning
ACE	Agency for Energy in New Caledonia
ADEME	French Environment & Energy Management Agency
AFD	French Development Agency
ARENA	Arctic Remote Energy Networks Academy
BESS	Battery-Based Energy Storage System
CARILEC	Caribbean Electric Utilities Services Corporation
CDB	Caribbean Development Bank
CDP	Carbon Disclosure Project
CRE	Commission de régulation de l'énergie (Wallis et Futuna)
CREF	Caribbean Renewable Energy Forum
DH	District Heating
DK	Denmark
EDF	European Development Fund
EE	Energy Efficiency
EIA	Espace-Info Enérgie
EMS	Energy Management System
FR	France
HFCs	Hydrofluorocarbons
HP	Heat production
IMF	International Monetary Fund
IPP	Independent Power Producer
IRENA	International Renewable Energy Agency
IRP	Integrated Resource Plan
KPI	Key Performance Indicator
NL	The Netherlands
NREL	National Renewable Energy Laboratory
O&M	Operations and Maintenance
OCTA	Overseas Countries and Territories Association
OCTs	Overseas Countries and Territories
OOCUR	Organisation of Caribbean Utility Regulators
PCREEE	Pacific Centre for Renewable Energy and Energy Efficiency
PIE	Energy Info Point (Point Info Enérgie)
PPA	Power Purchase Agreement
PPP	Public/Private Partnership
PV	Photovoltaic
QS	Quick Scan (Questionnaire)
RE	Renewable Energy
RES	Renewable Energy Sources
RNETS	Resilient National Energy Strategy
RO	Reserve osmosis
SDG	Sustainable Development Goals
SE4All	Sustainable Energy for All
SIDS	Small Islands Developing States
SISSTEM	Science, Technology, Engineering and Mathematics
SPC	The Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Program
STENC	Energy Transition Scheme of New Caledonia
STUCO	St. Eustatius Electric Utility
SWAC	Sea Water Air Conditioning
UK	United Kingdom
UNDP	United Nations Development Programme

Legend

Colour used in main report to indicate OCT is related to:

The Netherlands

The United Kingdom

France

Denmark

Colour used presenting questionnaire data

Highest score in questionnaire (3)

Medium score in questionnaire (2)

Lowest score in questionnaire (1)

No answer given in questionnaire (1)

1 INTRODUCTION

Clean energy for islands is a topic that has gained momentum within EU in the last years. In May 2017 the European Commission, together with 14 Member States, signed the "Political Declaration on Clean Energy For EU Islands"[1] under the Maltese Presidency. Before taking presidency of the Council of the European Union, Tomislav Ćorić spoke on the Islands Forum on European islands' clean energy on November 2019. Mr. Ćorić mentioned that "Alongside clean energy for islands […] we also plan to focus on transitioning to clean energy, which will include activities and measures for the reduction of harmful emissions and the development of a low-carbon economy, in line with a just energy transition".[2]

As it has held the rotating Presidency of the Council of the European Union since 1 January 2020, Croatia wishes to focus on reducing emissions in the field of energy, concentrating in particular on the potential role of islands as a driving force in the transition to clean energy. In order to take advantage of the potential of islands, the Presidency will thus work towards the adoption of the long-term framework provided for in the political declaration of 18 May 2017 on clean energy for islands of the EU.[3]

The European Commission presented its long-term strategic vision for climate neutrality by 2050 "A Clean Planet for All" on November 2018. The European Green Deal is a recent important testimony of this development aiming towards climate neutrality in 2050, and so are the 2030 EU climate targets. This transition will affect many sectors, and will require a more integrated analysis and planning. For Overseas Countries and Territories (OCTs) to keep up, it is essential to look beyond the wisdom of conventional solutions, and think out of the box.

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[1] https://ec.europa.eu/energy/sites/ener/files/documents/170505_political_declaration_on_clean_energy_for_eu_islands-_final_version_16_05_20171.pdf

[2] Total Croatia News (2019), Croatia Will Push for Establishment of Energy Union, https://www.total-croatia-news.com/business/39757-energy-union

[3] Europe Daily Bulletin No. 12396 (2019), Islands can be a driving force for energy transition, https://agenceurope.eu/en/bulletin/article/12396/8

OCTs have specific needs and challenges regarding their supply and use of energy. Their geographic situation sets them apart and makes them particularly dependent on the import of natural resources (especially fossil fuel), resulting very often in high local costs. Distribution and storage of energy are other difficulties faced by islands. In the context of increasingly scarce resources, growing energy needs and climate change, it is essential to make OCTs more energy self-reliant notably by transitioning towards renewable energy (RE) sources and technologies.

On 17 June 2015, the 22 members of the Association of Overseas Countries and Territories (OCTA) approved the Sustainable Energy Roadmap for OCTs, aimed towards a significant increase of RE and Energy Efficiency (EE) deployment on their territories. Following this, OCTA joined the International Renewable Energy Agency's (IRENA) Small Islands Developing States (SIDS) Lighthouse Initiative in September 2015.

This latter step brought forward the need to align the level of knowledge about the OCT countries with that of the other participants to the SIDS Lighthouse Initiative: it was jointly agreed to do so using the same tools previously used during IRENA's Lighthouse Quickscan (QS) Analysis, specifically the Lighthouse Quickscan Questionnaire. Based on this, a questionnaire was sent out to all OCTs, which led to the report 'Completion of Lighthouse Quickscan questionnaire' in May 2016 (further on to be referred to as "2016 report"). This was also used as input for the interim report 'SIDS Lighthouses Quickscan' published by IRENA in 2017, which includes the analysis of 18 OCTs.[4]

As a background document for OCTA activities linked to the energy transition processes and, by extent, related to the European Green Deal, OCTA has decided to commission this study, which is an update of the 2016 report. Furthermore, it will also focus on best practices regarding the sustainable energy transition on OCTs and will contain an analysis of progresses made by OCTs in the implementation of their Sustainable Energy Roadmap signed in 2015 (See annex D).

[4] Anguilla, Bermuda, Bonaire, British Virgin Islands, Falkland Islands, French Polynesia, French Southern and Antarctic Lands (TAAF), Montserrat, New Caledonia, Pitcairn Islands, Saba, Saint Barthélemy, Saint Helena, Saint Pierre et Miquelon, Sint Eustatius, Sint Maarten, Turks and Caicos, Wallis et Futuna, IRENA (2017), SIDS Lighthouses Quickscan Interim Report, https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2017/Nov/IRENA_SIDS_Lighthouses_Quickscan_2017.pdf

2 QUICKSCAN QUESTIONNAIRE AND METHODOLOGY

2.1 INTRODUCTION QUESTIONNAIRE

The purpose of the questionnaire is to collect information from OCTs on how they are progressing in their sustainable energy transition. Qualitative data will be collected. The following table presents an overview of the scope of the questionnaire, presenting the five questionnaire sections, as was shared with the OCTs' stakeholders.

Table 2-1 Scope of the Questionnaire

Key electricity system data (Section 1)	Requests the questionnaire participants to provide key data regarding the local electricity system in place.
Seven questionnaire elements (Section 2)	› Element 1: Institutional framework › Element 2: Knowledge base › Element 3: Transition planning › Element 4: Project financing › Element 5: Project deployment › Element 6: Capacity building › Element 7: Regional and international co-operation
References and data request (Section 3)	Requests the questionnaire participants to provide supporting documentation (e.g. electronic copy of documents that can further qualify the need for support and the level of readiness for the transition to a RE-based power system; web links; references to the relevant sections of these documents for each related question)
Best practices / good examples (Section 4 - NEW)	Requests the questionnaire participants to provide any examples they might have on best practices regarding the green energy transition in your island. This can for example be a collaboration, a breakthrough in a project or development, a turn-around, or maybe a lesson learnt that would be helpful to others.
Themes of the additional questions to measure progress on Roadmap (Section 5 - NEW)	› Specific networking and collaboration › Energy efficiency › Buildings and transports › Business › Legal

In close collaboration with OCTA, a stakeholder list with key contacts of each of the 22 OCTs in scope of the study, was drafted. These stakeholders are local energy sector experts, that have been appointed by their government. Hence, they are working as a governmental focal point and have a high level of knowledge of their local energy sector. An official invitation to participate in the questionnaire was further developed in cooperation with OCTA. The invitation contained information about the background of the study, guidance / guidelines to complete the questionnaire, as well as the reasons for the stakeholders to participate.

Table 2-2 Overview of OCTs

DENMARK	› Greenland
THE UNITED KINGDOM	› Anguilla › Bermuda › British Virgin Islands › Cayman Islands › Falkland Islands › Montserrat › Pitcairn Islands › Saint Helena, Ascension and Tristan da Cunha › Turks and Caicos Islands
THE NETHERLANDS	› Aruba › Bonaire › Curaçao › Saba › Sint Eustatius › Sint Maarten
FRANCE	› French Southern and Antarctic Lands › French Polynesia › New Caledonia › Saint Barthélemy › Saint Pierre and Miquelon › Wallis and Futuna

The questionnaire results are the main source of data for this report. This report presents findings on the progress made for six of the elements [5], the progress on the Sustainable Energy Roadmap and highlights best practices. The QS is a tool developed by IRENA to assess the supporting conditions for RE deployment on islands, to monitor deployment progress and to identify areas where targeted assistance can accelerate the transition to RE. The basis of the QS is the questionnaire, which is completed by local energy sector experts appointed by the government. At the same time, this report will also analyse/examine/elaborate on opportunities and barriers for the OCTs' RE transition.

Questionnaire process

The questionnaire was designed for the selected stakeholders to complete the questionnaire questions independently, based on their high level of expertise and knowledge of the local energy sector. The list of relevant contact persons of the 22 OCTs was provided by OCTA to ensure that the correct stakeholders were contacted. The questionnaire was distributed via e-mail on 20 December 2019 in the form of a Word document. By February 7th 2020 a total of 19 OCTs had sent their responses to the questionnaire.

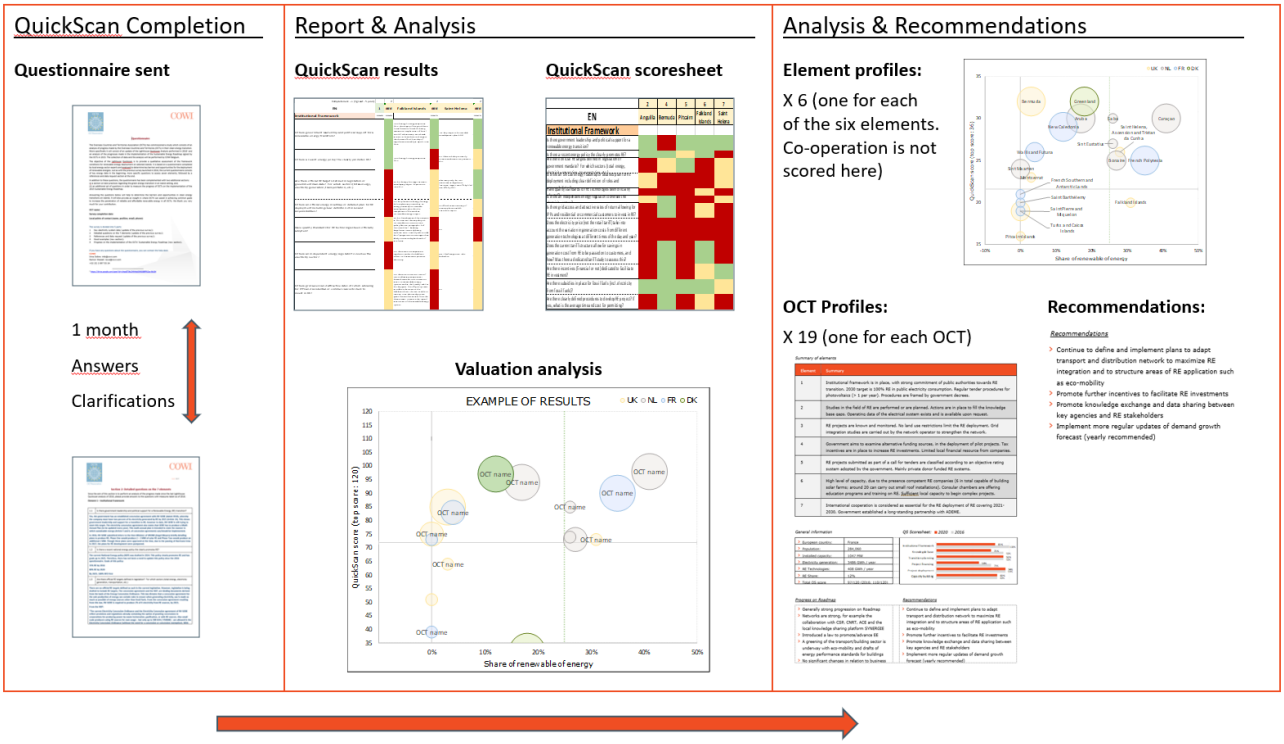
[5] The seventh element, regional and international co-operation, is excluded from the QS results as a scoring this element is not meaningful.

2.2 QUICKSCAN METHODOLOGY

The methodology for the analysis and presentation of the questionnaire results follows the methodology established in the 2016 report, as shown in figure 2-1. Duplicating the methodology ensures comparable results, allowing for the study results to show the continued progression of the OCTs' energy transition. This current study expands the 2016 methodology by adding two new sections to the questionnaire (See Table 2-1), in order to assess how the OCTs' energy transition aligns with the Sustainable Energy Roadmap.

Element 7 (regional and international co-operation) is disregarded in the OCTs total QS score, as the questions are not relevant to describe the OCTs' efforts and progress in their RE transition. Consequently, the results from the 2016 report has been adjusted accordingly, to ensure comparable results.

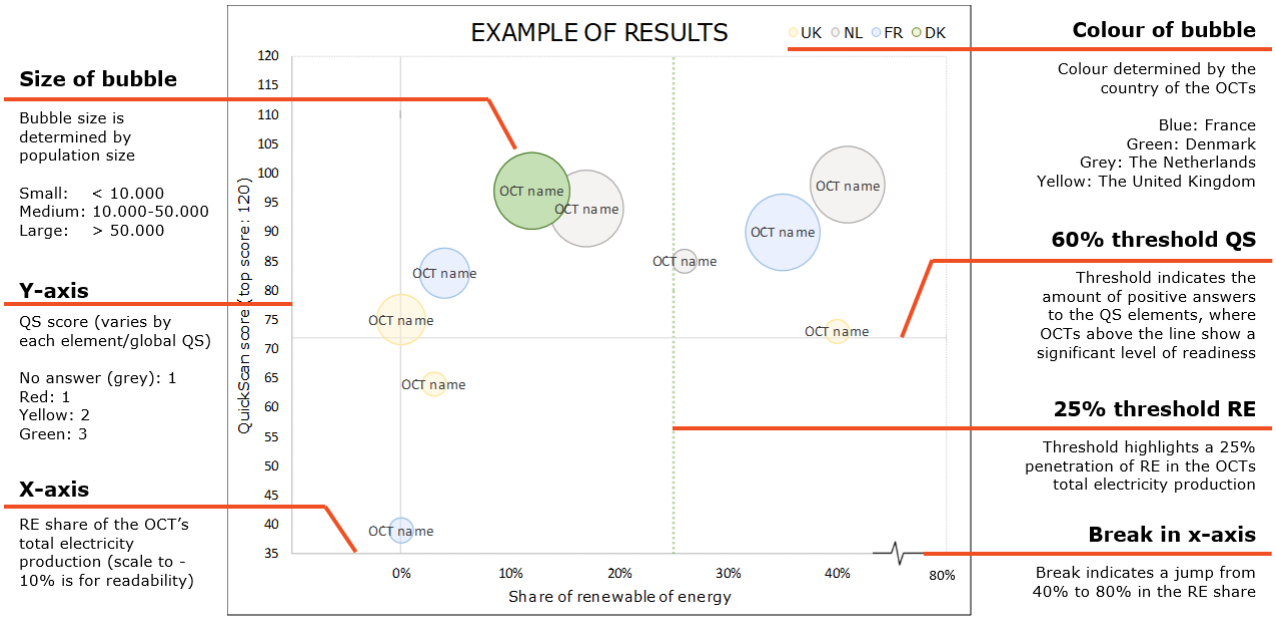
Figure 2-1 Methodology for the analysis of the questionnaire results



The results are presented as shown in Figure 2-2. Each OCT is plotted on a scatter plot containing the following information:

- X-axis: The share of renewable energy in the overall electricity generation;
- Y-axis: The QuickScan score. Either the total QS score, or the score for each of the six elements;
- Size of the bubble: Refers to the population size;
- Colour of the bubble: Indicative of the OCT country;
- 60% threshold QS: If an OCT has a score higher than 60% of the maximum score in the questionnaire it shows a significant level of readiness (see section under "questionnaire" for an explanation of the score); and
- 25% threshold RE: Shows the threshold for OCTs reaching a RE share of 25%.

Figure 2-2 Illustration of the presentation of the results



Questionnaire

The answers provided by the local experts in the questionnaire were assumed to be correct and to reflect the current situation of each OCT. Nevertheless, questionnaire findings were validated by the study team through:

- Verification of the received / referenced relevant official documents and sources; and
- Mapping and cross checks were performed with the IRENA report;[6] and
- Follow-up communication with the relevant local experts in case of conflicting or missing data.

Upon receipt, the questionnaires were analysed by the study team. It is designed as such that each question can be scored 1-3, according to the level of development in the area of inquiry, as indicated by the answer. If an OCT indicates that the area of inquiry is not developed, it receives a score of 1 (coloured red in the QS scoresheet in appendix C). The maximum score is 3 (coloured green) which is given to answers that indicate that the area of inquiry is well-developed. If it's in between, it will receive a score of 2 (yellow). No answer results in a score of 1 (grey).

[6] IRENA (2019), Renewable Energy Statistics 2019, The International Renewable Energy Agency, Abu Dhabi, https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Jul/IRENA_Renewable_energy_statistics_2019.pdf

The summed-up value of these is the QS score. This score can then be translated in a percentage. A scoresheet with 100% indicates for example that the OCT is fully ready to plan, finance, deploy and operate the appropriate RE projects on their island, as needed for a transition to RE.

Best practices

Section 4, the good examples and best practices, contains a selection of relevant best practice regarding the sustainable energy transition in the islands. These for example refer to collaborations, breakthroughs in specific projects or developments, etc. After a short introduction of the setting, lessons learnt will be provided.

Progress on Sustainable Energy Roadmap

Section 5 in the questionnaire refers to the 'Progress on the implementation of the OCTs' Sustainable Energy Roadmap. Considering this section mainly reports on the current status of the OCTs, it was determined that the responses of this section are not suitable to be scored. Therefore, for each of the five identified priority areas under this section, a general overview is presented.

Appendix B: Synthesis per OCT

The report contains an appendix with a synthesis per OCT. For each OCT, a similar set of information is provided as compared to the 2016 study. There are however a few changes in how data is presented, partly to show the progress on the roadmap, and partly to give a better presentation how the OCTs improved compared to 2016. A more detailed description of this is given in the table below.

Figure 2-3 Differences "Synthesis per OCT" in report 2016 and 2020 (marked in bold where not similar)

Synthesis per OCT 2016	Synthesis per OCT 2020
Summary overview for each of the seven elements	Summary overview for each of the seven elements
Overview of general and key data	Overview of general and key data
QS scoresheet: overview of score on each question, colour visible, but not readable	**QS scoresheet: overview on the QS score for each of the six elements where the score for 2016 is compared to 2020. A 80% score means that the OCT had a score of 80% compared to the maximum possible score in that element.**
Highlights	**Progress on Roadmap: summary of the most important steps made.**
Recommendations	Recommendations

Whereas the study aimed to conduct the assessment of the questionnaire responses and the scoring in a similar fashion as compared to the 2016 report, it has to be pointed out that the grading relies on an assessment of qualitative data, and hence depends to a certain extent on the interpretation of the assessor, and the response provided by the questionnaire respondent. To illustrate: For some instances, the scoring provided in this study compared to the previous study would show that a 'negative' change occurred. The island Aruba, for example, indicated to have lower official energy targets for 2020 as compared to 2016. Another example is the Falkland Islands, where there is no tariff structure in place, to pass saved RE generation costs on to their customers, whereas this was indicated to be the case in 2016. Where a score is dramatically different from last time, if there is an explanation for this, it will be given.

3 KEY DATA OCTS

19 OCTs returned a completed questionnaire and provided further clarifications where necessary. Three OCTs did not provide any answer within the given timeframe (Anguilla, British Virgin Islands, and the Cayman Islands). The list of the participating OCTs and respective data is shown in Table 2-2. There are two OCTs that did provide data, where they didn't in 2016: Greenland and Curaçao. Greenland is the best scoring island in terms of RE share, followed by Sint Eustatius, Curaçao, French Polynesia, Saba, Bonaire, Falkland Islands and Saint Helena, Ascension and Tristan da Cunha. A more detailed analysis is given in chapter 4.

Table 3-1 Key data for all OCTs [7]

OCT	Country	Population (2019) [8]	Size (km²)	Generation capacity (MW)	Electrical production (GWh/yr)	RE Electrical production (GWh/yr)	Share of RE (%)
Greenland	DK	56,025	2,166,000	135.1	501.0	419.0	83.5%
French Polynesia	FR	277,679	4,167	372.3	689.0	201.0	29.2%
French Southern and Antarctic Lands	FR	150	507,747	3.2	3.6	0.0	0.1%
New Caledonia	FR	284,060	18,275	1,046.6	3,485.9	407.9	11.7%
Saint Barthélemy	FR	9,816	25	34.2	117.7	0.0	0.0%
Saint Pierre and Miquelon	FR	5,849	242	26.2	55.2	0.0	0.0%
Wallis and Futuna	FR	11,661	142	8.8	20.2	0.9	4.3%
Aruba	NL	105,845	180	290	957.9	163.8	17.1%
Bonaire	NL	19,549	294	18.4	120.6	32.4	26.9%
Curaçao	NL	159,849	444	256.5	654.4	196.3	30.0%
Saba	NL	2,155	13	6.3	9.3	2.4	25.6%
Sint Eustatius	NL	3,348	21	2.5	14.9	6.3	42.1%
Sint Maarten	NL	41,486	42	57.0	274.5	0.0	0.0%
Anguilla	UK	14,731	91	Data not provided			
Bermuda	UK	63,968	54	174.3	628.7	18.9	3.0%
British Virgin Islands	UK	29,802	151	Data not provided			
Cayman Islands	UK	64,174	264	Data not provided			
Falkland Islands	UK	3,234	12,173	8.6	17.6	5.5	31.2%
Montserrat	UK	4,993	102	7.2	14.5	0.4	3.0%
Pitcairn Islands	UK	55	47	0.5	-	0.0	0.0%
Saint Helena, Ascension and Tristan da Cunha	UK	6,035	122	9.2	11.0	3.1	27.9%
Turks and Caicos Islands	UK	37,665	948	91.0	251.0	1.0	0.4%
TOTAL		**1,201,129**	**2,711,544**	**2,548**	**7,827**	**1,459**	**17.7%**

[7] The colour coding in the table matches with the colours as presented in the graphs in chapter 4.

[8] Worldometer + The World Bank, Countries in the world by population (2018), https://www.worldometers.info/world-population/population-by-country/ / https://data.worldbank.org/indicator/SP.POP.TOTL

4 RESULTS

The results will firstly be presented at a global level through **the global QS result** (see chapter 4.1). Results are further presented for **the six elements part of the QS**[9] (from chapter 4.2 and onwards, being, institutional framework; knowledge base; transition planning; project financing; project deployment, and capacity building). For each element, highlights for several OCTs are singled out and briefly discussed. These are further used as an example and to elaborate on potential success stories or possible pitfalls. Detailed syntheses per OCT with highlights and recommendations are presented in Appendix B.

The results on **the progress on the sustainable energy roadmap** are presented in Chapter 5.

4.1 GLOBAL QUICKSCAN RESULT

The global QS overview as shown in the following figure shows an interesting trend: Before one can increase the share of RE, OCTs must build a strong framework in each of the elements. Development of a strong framework will not guarantee a natural progression into a higher RE level, since this is dependent on many other factors as well. For example, is the topography suitable for RE projects? How well developed is tourism? What are the energy needs? But in general, the results show that a stronger framework creates a better environment for RE development.

OCT clusters

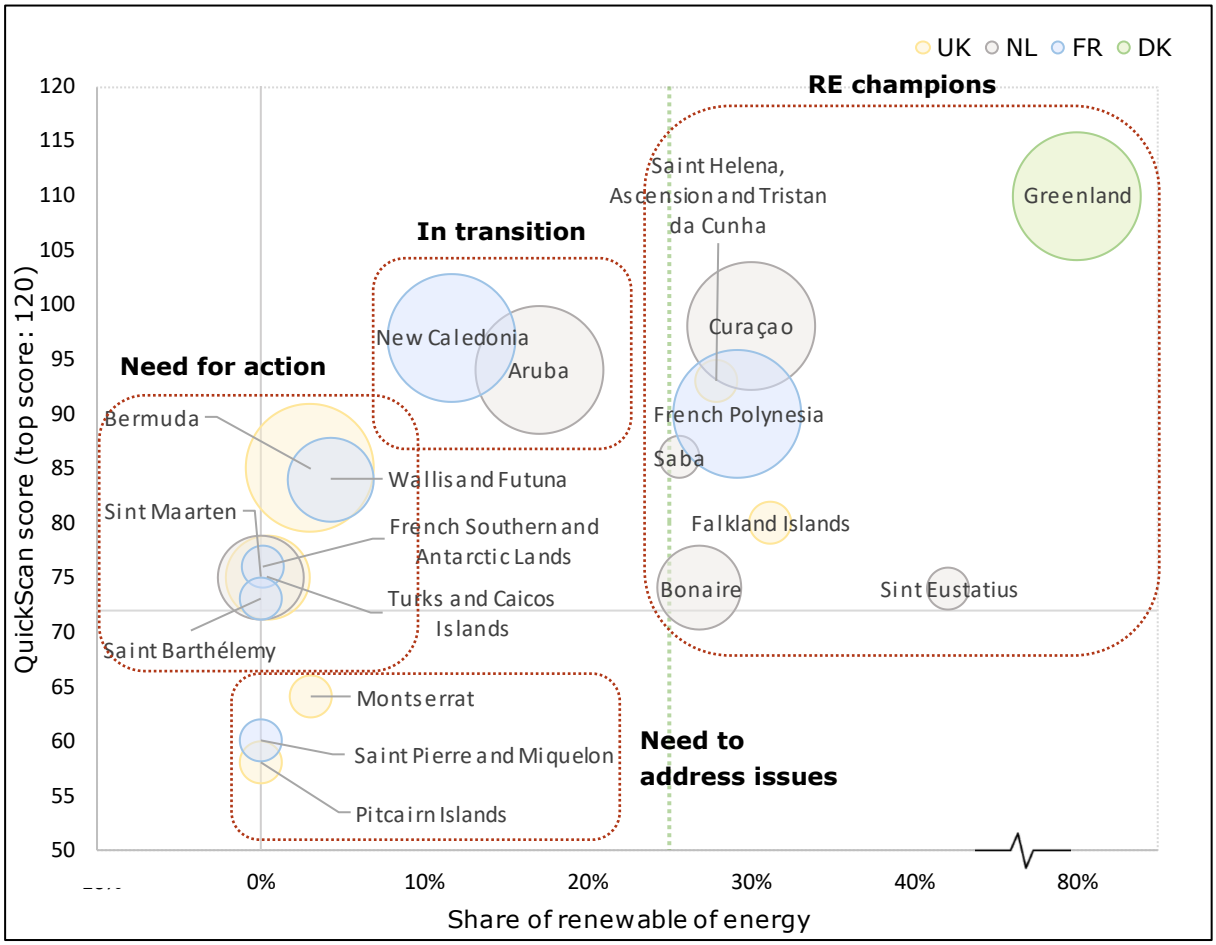
The results are clustered in four groups (following the clusters identified in the 2016 report):

- **RE champions**. These OCTs have a share of RE of more than 25% and with a QS scoring over 60% of the maximum overall score;
- **In transition**. These OCTs have a medium share of RE (10-20%) and have a QS scoring defined as 'very good', generally higher than the OCTs in the group of RE champions (more than 60% of the maximum overall score);
- **Need for action**. These OCTs have a low to inexistent share of RE (below 5%) but have a QS scoring defined as ' very good' (more than 60% of the maximum overall score); and
- **Need to address issues**. These OCTs have a low to inexistent share of RE (below 5%) and have a QS scoring that is below the remaining OCTs (less than 60% of the maximum overall score).

The following presents the global QS results for all OCTs. The OCTs are divided into the four identified clusters. It shall be noted that during the clustering of the OCTs, the size of each OCT is not taken into account. In general, larger OCTs have more potential and financial means to develop RE but are also slower in their transition. Regardless, it does give an overview of the current state of play. This is visually shown in figure 4.1. In order to see the progress, figure 4.2 presents the results from the 2016 report, adjusted to not include scores for element 7.

[9] The 7th element, regional and international co-operation, is excluded from the global QS results as a scoring this element is not meaningful.

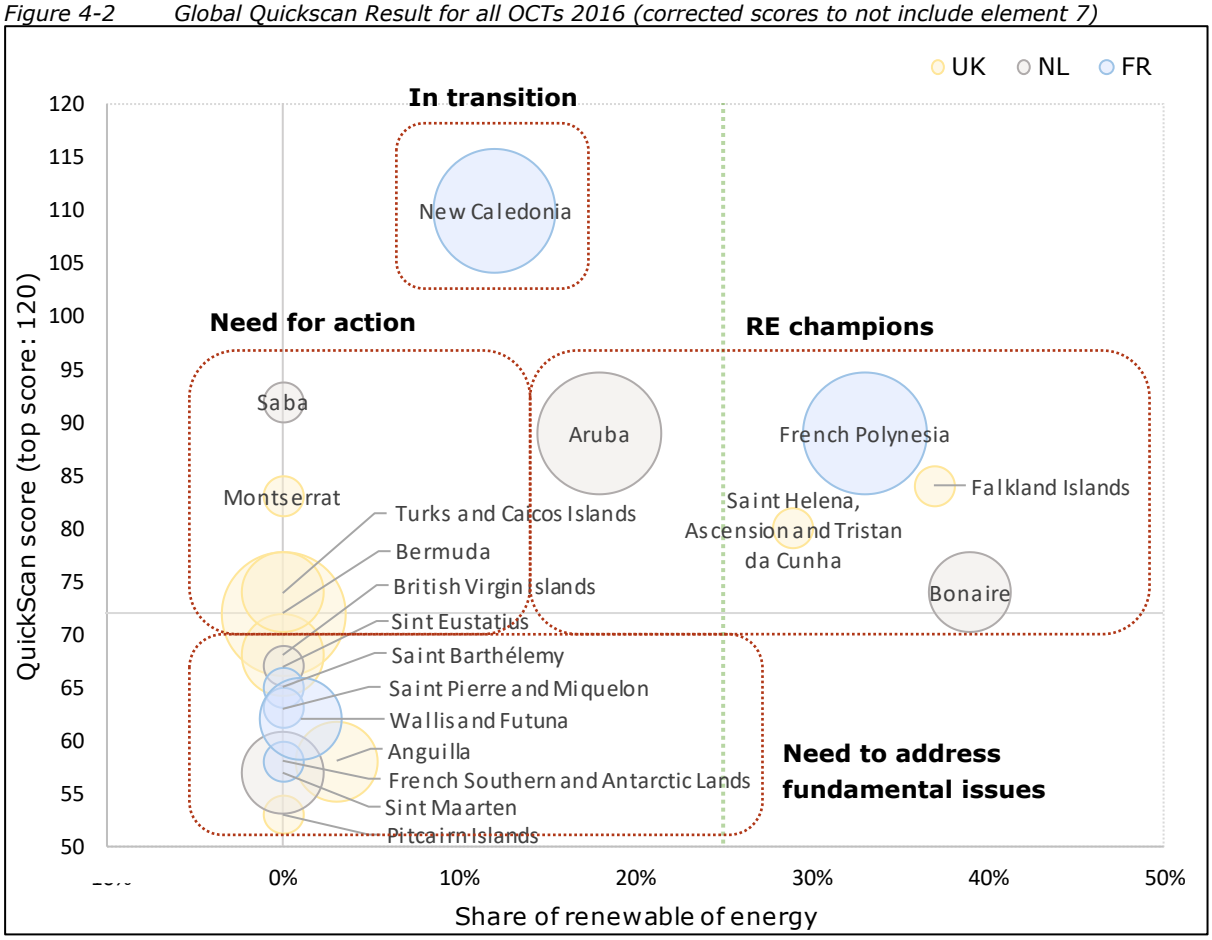
Figure 4-1 Global Quickscan Result for all OCTs 2020[10]



Source: COWI with questionnaires as input

[10] Note that there is a break in the x-axis between 40 and 80%. This is to make the graph more readable. Greenland therefore seems to be closer to the other OCTs than it actually is in terms of RE share. This is applied in all graphs where Greenland is included.

Figure 4-2 Global Quickscan Result for all OCTs 2016 (corrected scores to not include element 7)



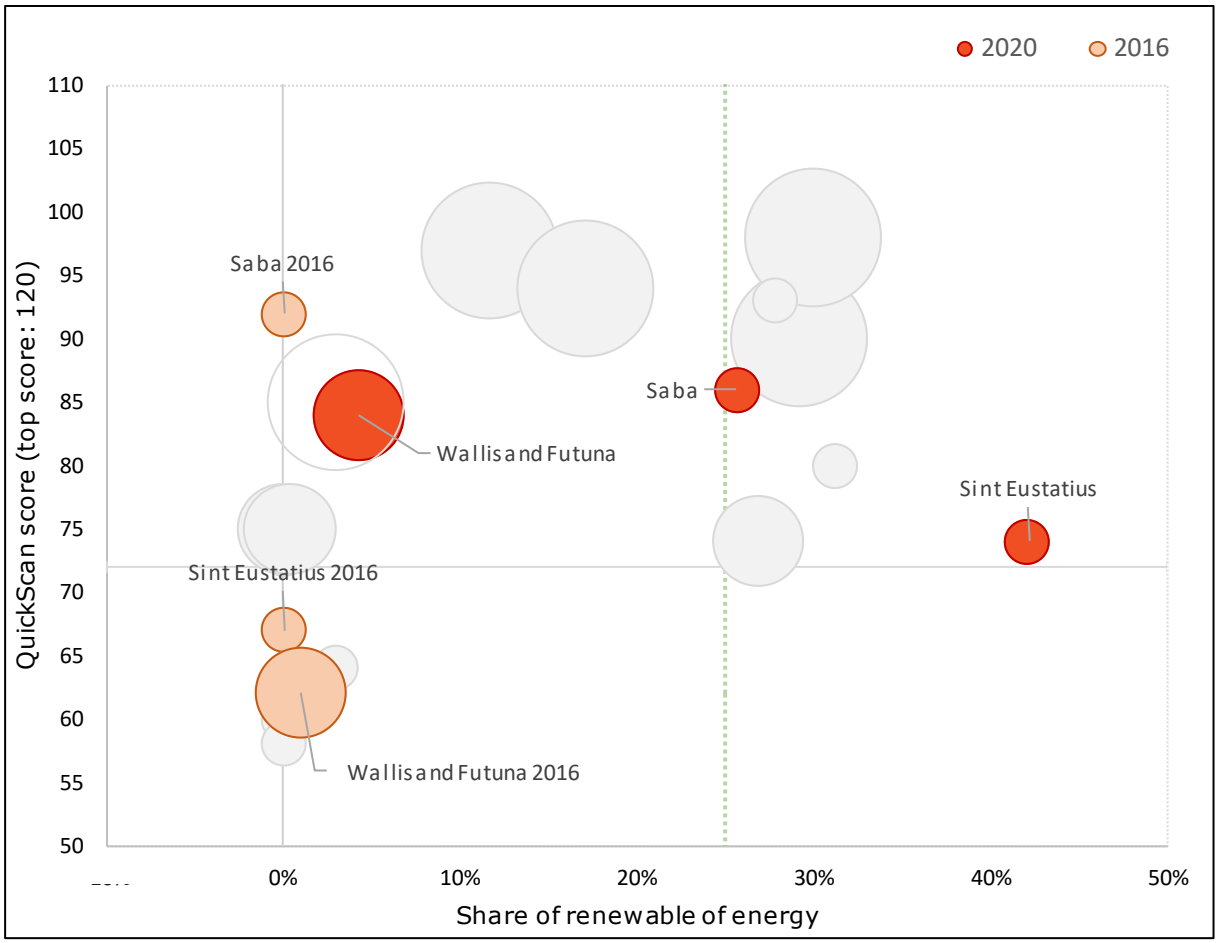
Source: COWI with the results from the QS 2016 as input

Comparison of 2016 – 2020

Generally, the results show that from 2016 to 2020, there is an overall improvement in QS score and RE share. The average RE share is almost doubled (from 9% to 17.7%) and there is an increase of 11% on the average QS score (from 74 to 81), which indicate that collectively, the OCTs are underway in their RE transition.

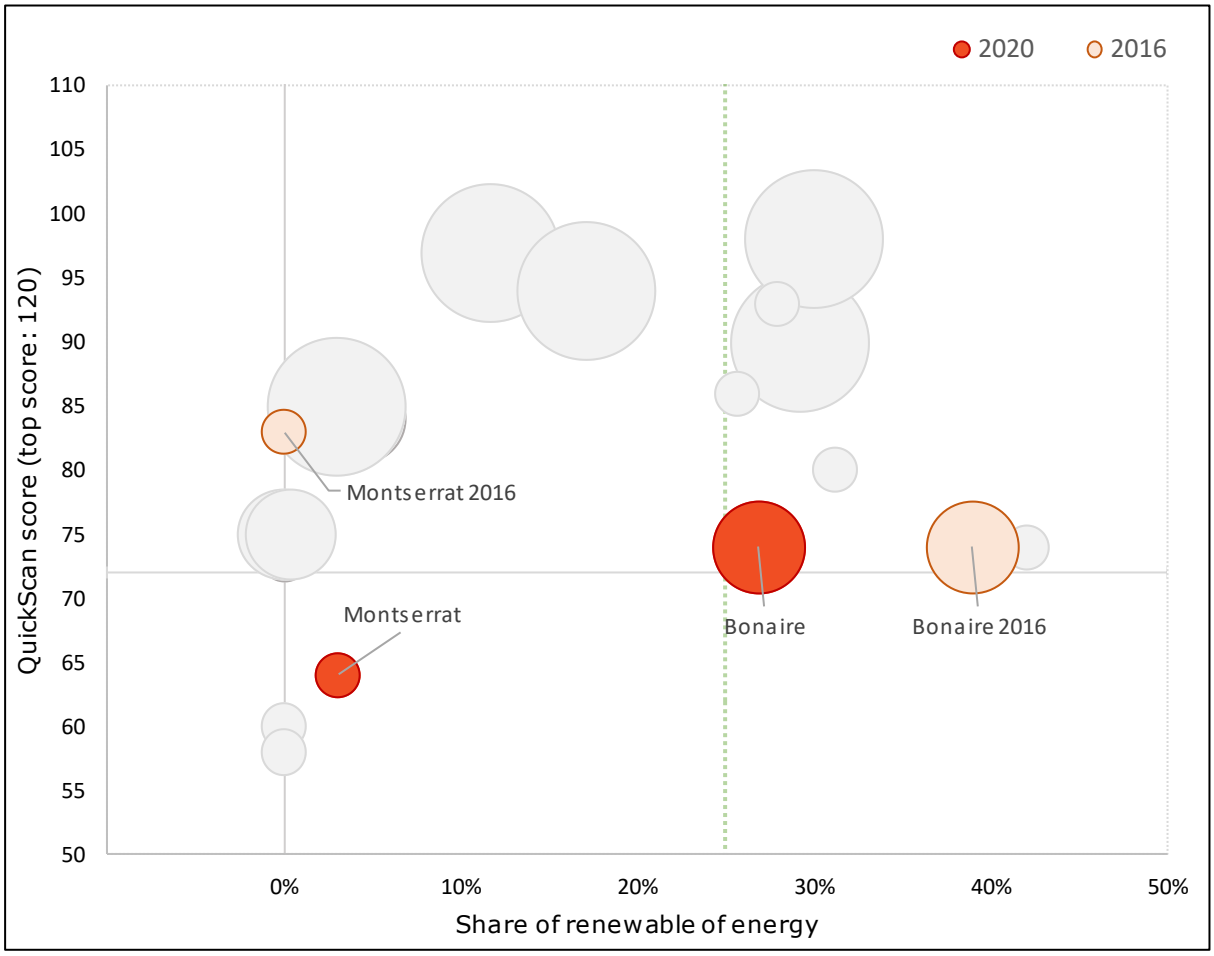
The following two figures highlights the OCTs with most notable improvement in either QS score, or RE share (figure 4.3), and the OCTs that had biggest regression in either QS score, or RE share (figure 4.4).

Figure 4-3 Comparison Quickscan results 2016 – 2020: biggest improvement



Source: COWI with questionnaires as input

Figure 4-4 Comparison Quickscan results 2016 – 2020: OCTs that had biggest regression



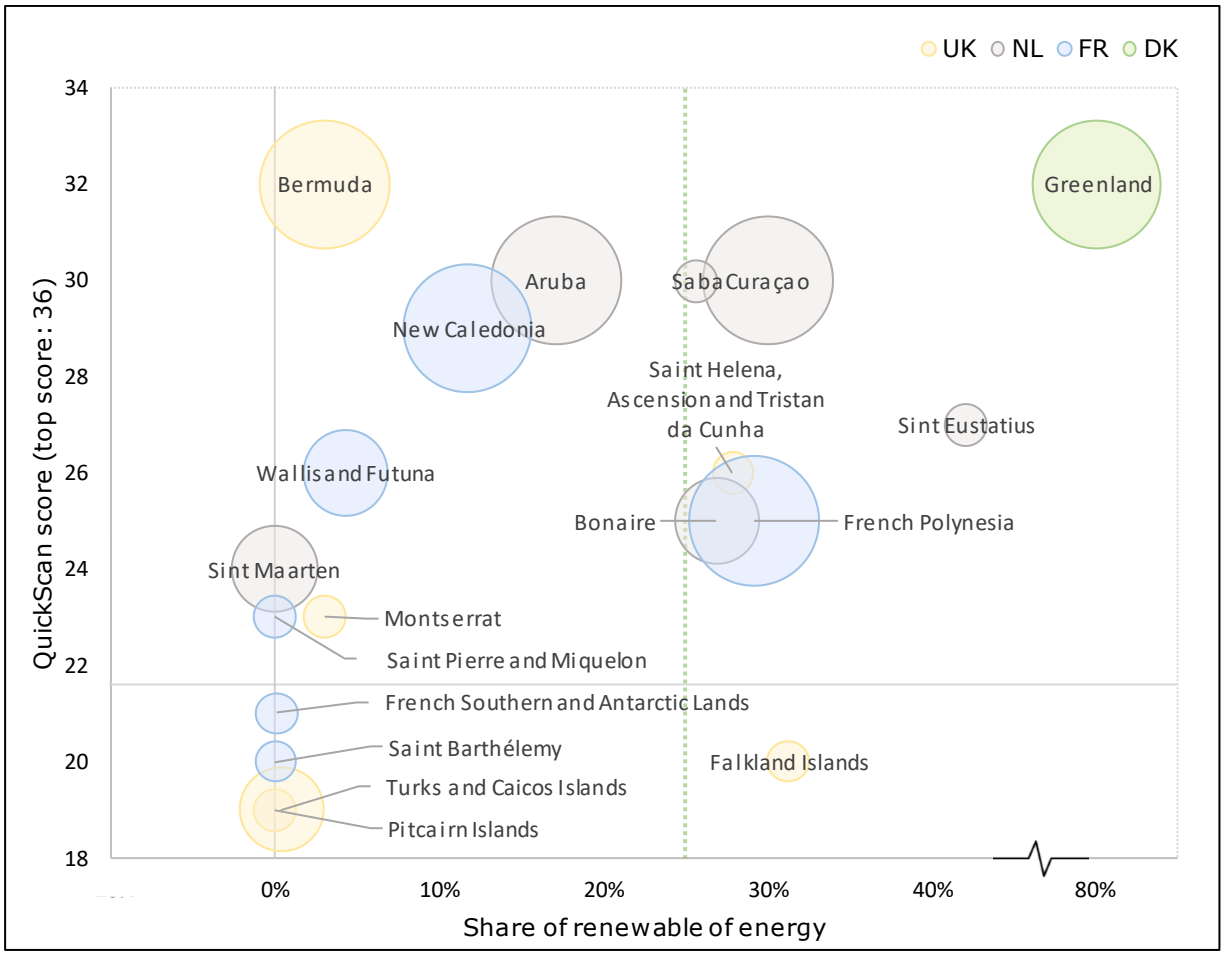
Source: COWI with questionnaires as input

Montserrat had a significantly lower QS score, but they did have an increase in RE share. The low QS score can be seen as an indication that the framework can be further improved. Bonaire did go backwards in their RE share, which can be partly explained by not expanding RE capabilities in parallel with the rising energy demand.

4.2 INSTITUTIONAL FRAMEWORK

The results of the analysis of the OCTs' institutional framework are presented in the figure below. The results indicate a connection between a well-developed institutional framework and a higher integration of RE in the energy mix, as OCTs in the top third of the QS score are more likely to show some extent of RE share. However, it is not a fully clear connection, as some countries with a fairly developed institutional framework, still have a low RE share (i.e. Bermuda, Wallis and Futuna, Montserrat and Sint Maarten). Reversely, the Falkland Islands have a high share of RE, but an underdeveloped institutional framework. The following examples highlights how various OCTs have dealt with this element.

Figure 4-5 Quickscan scores for institutional framework 2020



Source: COWI with questionnaires as input

- **Aruba:** Aruba has a well-developed institutional framework for RE development, but it can be strengthened further. Currently, a national energy policy is being developed. This aligns with the new cabinet, which has a more realistic plan on RE development with an objective set to reach a 50% RE-share by 2030, instead of 100% by 2020. Central to this plan are affordability and emission reduction. In order to fully realize its potential, the island must yet enshrine the framework into legislation, but for now the island's energy provider, relies on the *Aruba Renewable Energy Strategy* (ARES). ARES has shown how a government supported framework, which combines RE development projects, economic incentives for the residential and commercial sector, and international expertise in project development, can be a driving force for RE development.

- **Falkland Islands:** Having installed 6 wind turbines from 2007-2010, the Falkland Islands achieved a 40% RE share a decade ago. While there is a political framework in place to generally advance RE, the

framework lacks concrete targets, broad economic support and a detailed plan and roadmap that specifies concrete next steps. This can perhaps explain, why the RE share has not grown since the islands achieved a 40% RE share in 2010. Falkland Islands are in a risk of not further increasing their RE share since there is no effort in strengthening the institutional framework.

- **Greenland:** Greenland has a well-developed institutional framework for RE-development. In 2017 the Government of Greenland adopted an ambitious Sector Plan for Energy and Water Supply. The core objectives of the Sector Plan for Energy and Water Supply are: 1) Lower prices of electricity and water, 2) Green energy wherever possible, and 3) Modernisation of the energy system.

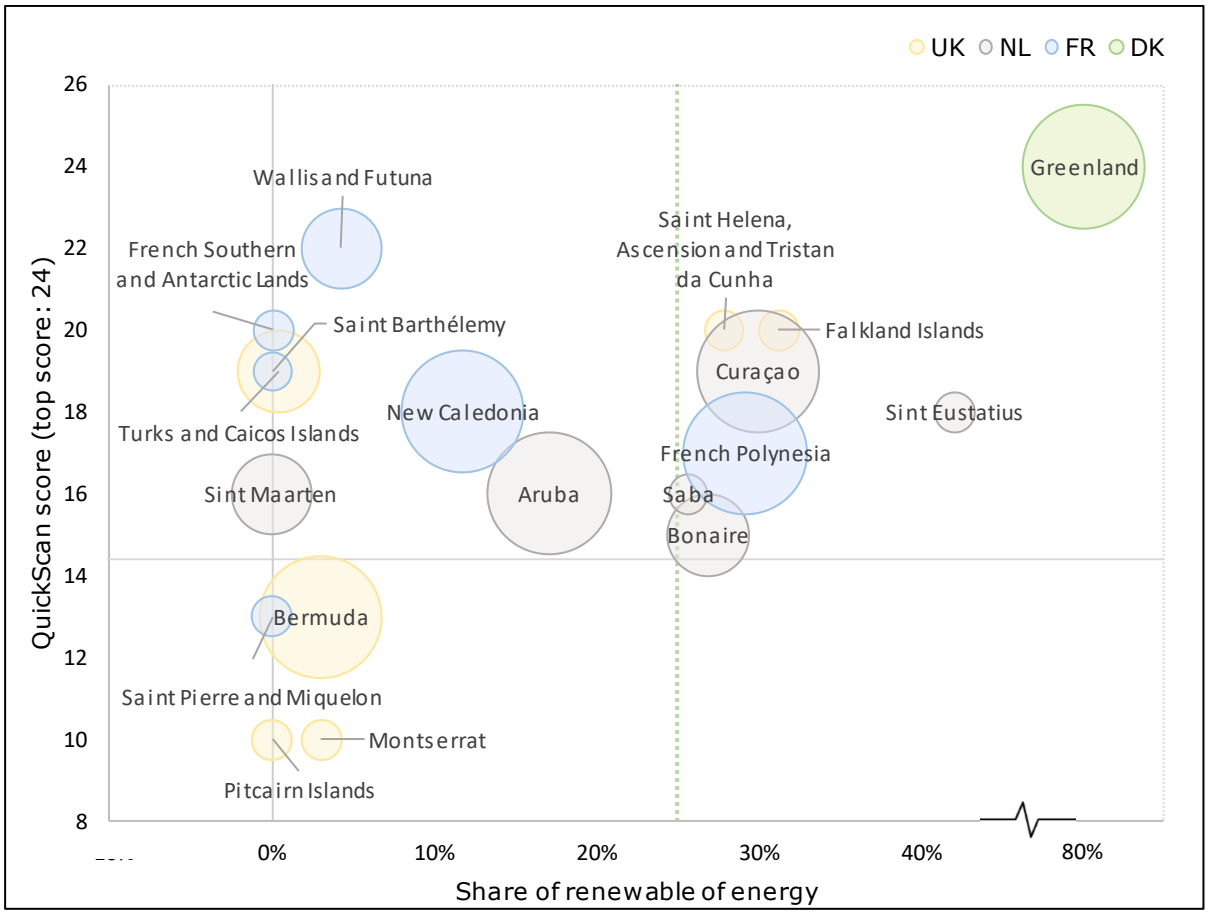
- **Sint Eustatius:** The development of the institutional framework is shaped by a close relation with the Netherlands, who also set some regulations in the Electricity and Water law for the Caribbean Netherlands of Bonaire, Sint Eustatius and Saba. There are no financial incentives like exclusion of import duties, however, local government allotted property in long lease to house the solar park.

- **Sint Maarten:** Their institutional framework is characterised by politically supported RE plans and established rules and processes, regarding the development of RE project. GEBE (government-owned) is the only company that currently provides electricity to the island. There are no plans to change the electrical concessions that will permit any other company to provide such a service. There is a risk that the framework lacks economic support, as there is no grid access for the private sector or international power producers, no RE tariff structures to entice customers, and no incentives dedicated to facilitating RE development. The lack of economic support can possibly explain why, despite a partly well-developed framework, Sint Maarten is not growing their share of RE.

4.3 KNOWLEDGE BASE

The results of the analysis of the OCTs' knowledge base are presented in the figure below. The results indicate that a well-developed knowledge base is not a guarantee for RE development, as can be seen in the cases of Wallis and Futuna, French Southern and Antarctic Lands, Turks and Caicos Islands and Sint Maarten. The following examples highlights how various OCTs have dealt with this element.

Figure 4-6 Quickscan scores for Knowledge base 2020



Source: COWI with questionnaires as input

- **Greenland:** Greenland has a sound and expansive knowledge base, which cover areas such as data availability, relevant RE assessments and on-island expertise on RE projects and the technical aspects of RE. There have been several assessments of hydropower potentials in Greenland, and this data is available. The public utility company Nukissiorfiit is further collecting data on wind and solar potentials all over Greenland. An annual report on Greenland's energy statistics is published by the Ministry of Industry, Energy, Research and Labour. Considering the cold climate and the severe consequences of energy fallouts, the public utility company Nukissiorfiit's energy supply is very reliable.

- **Montserrat:** It is a question why Montserrat has such a low score on the knowledge base. Even though it is a small island in terms of population, it still does not explain why it has the lowest score, even though there is some RE development. It is unclear if they are developing a knowledge base, or if the island is completely dependent on outside knowledge. This might pose a risk for future development.

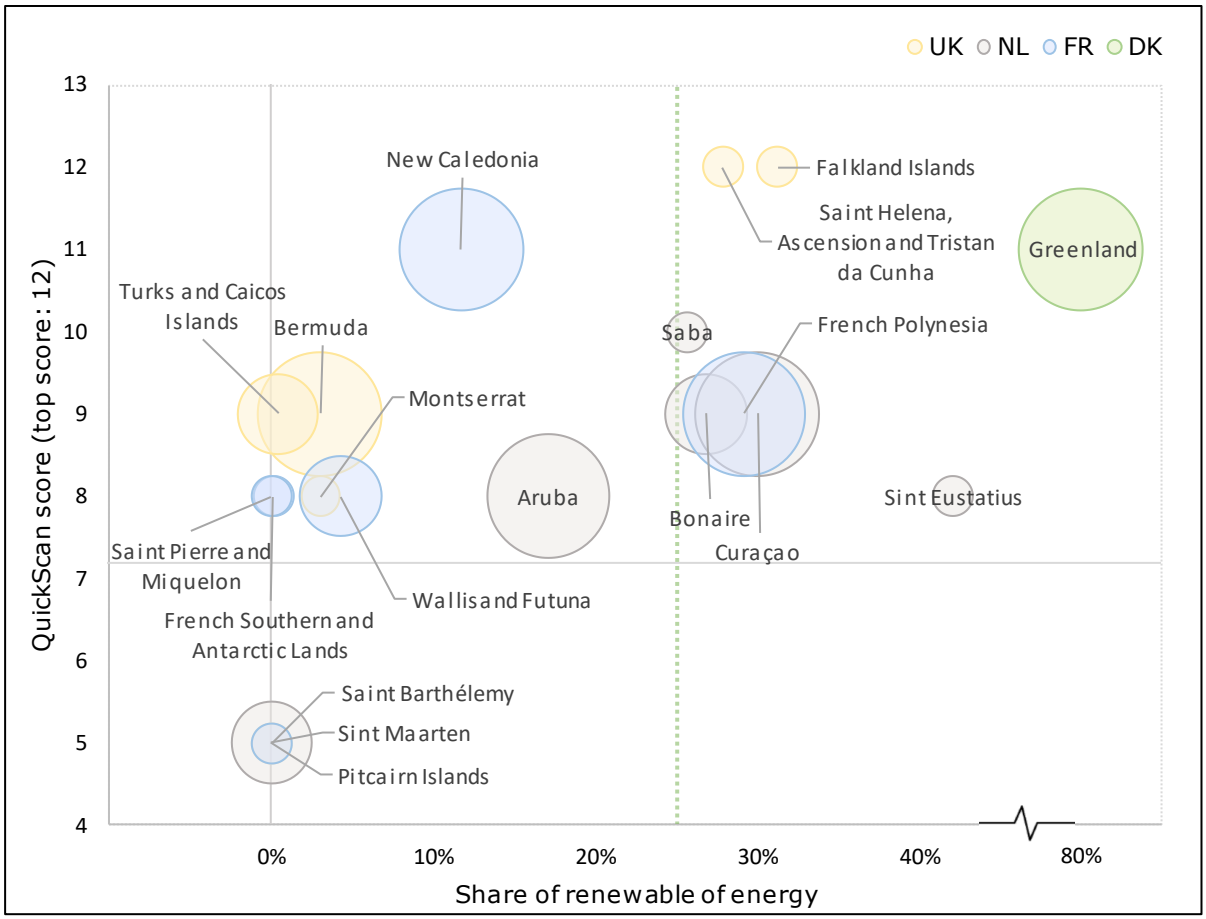
- **Saint Barthélemy:** Since 2000, the desalination plant operates for 50% of its production through the steam produced by a household waste incineration plant. Today, steam accounts for approx. 25% - 35% of the total energy production. Moreover, an energy recovery system has been established on the island that generates energy from desalinated water from the reserve osmosis units (RO units). The system allows to save between 60 KW and 75 KW out of the total installed power of 780 KW. This results in a 10% energy recovery. A study is also underway to extend this technology to the new incineration garbage plant as well.

- **Wallis and Futuna:** Wallis and Futuna shows a highly developed knowlegde base. In part, it seems to be tied with the development of a new energy program (in French: programmation pluriannuelle de l'energie), which has included RE assessments and data gathering and sharing. The knowledge base is also strengthened by the island's attempt to examine RE outside electricity production, where an assessment has been carried out on RE in transport and the new energy program has outlined the development of a project site for electrical vehicles.

4.4 TRANSITION PLANNING

The results of the analysis of the OCTs' transition planning are presented in the figure below. The results indicate that well-developed transition planning is a prerequisite for RE development, although it is not a guarantee. The provided answers underscores that the utility companies play a crucial role in the development of RE as the planning of future development is often anchored in the OCTs' respective utility companies. For example, in Saint Helena, Ascension and Tristan da Cunha, utility provider Connect ltd. is responsible for the implementation aspects of RE development, while the government is responsible for political oversight. Furthermore, several OCTs face challenges in the spatial planning, due to factors such as unsuited topography, limited available space and protected areas, for example, in Saint Barthélemy it is prohibited to clear land for the purposes of installing solar photovoltaics. The following examples highlights how various OCTs have dealt with this element.

Figure 4-7 Quickscan scores for Transitional Planning 2020



Source: COWI with questionnaires as input

- **Aruba:** Like many other OCTs, Aruba faces the challenge of planning on an island with limited space availability and protected areas, and in the case of Aruba, a dense population too. One solution for the establishment of a large solar park was found in spotting a synergy between different government planning objectives, which led to the placement of the solar park, within the grounds of the refinery – an area the government sought to repurpose.

- **Greenland:** The public utility company Nukissiorfiit is continuously working on implementing more RE in the power sector. There have been studies of connecting energy grids along the west coast of Greenland which could potentially increase the renewable energy share in the public energy supply significantly. However, such a project is not at this time financially feasible. There are several smaller

studies being made for the local grids to increase the share of renewable energy including hybrid power plants using wind, solar and diesel as a backup. There are also tests of wind power. Greenland's primary renewable energy technology is hydro.

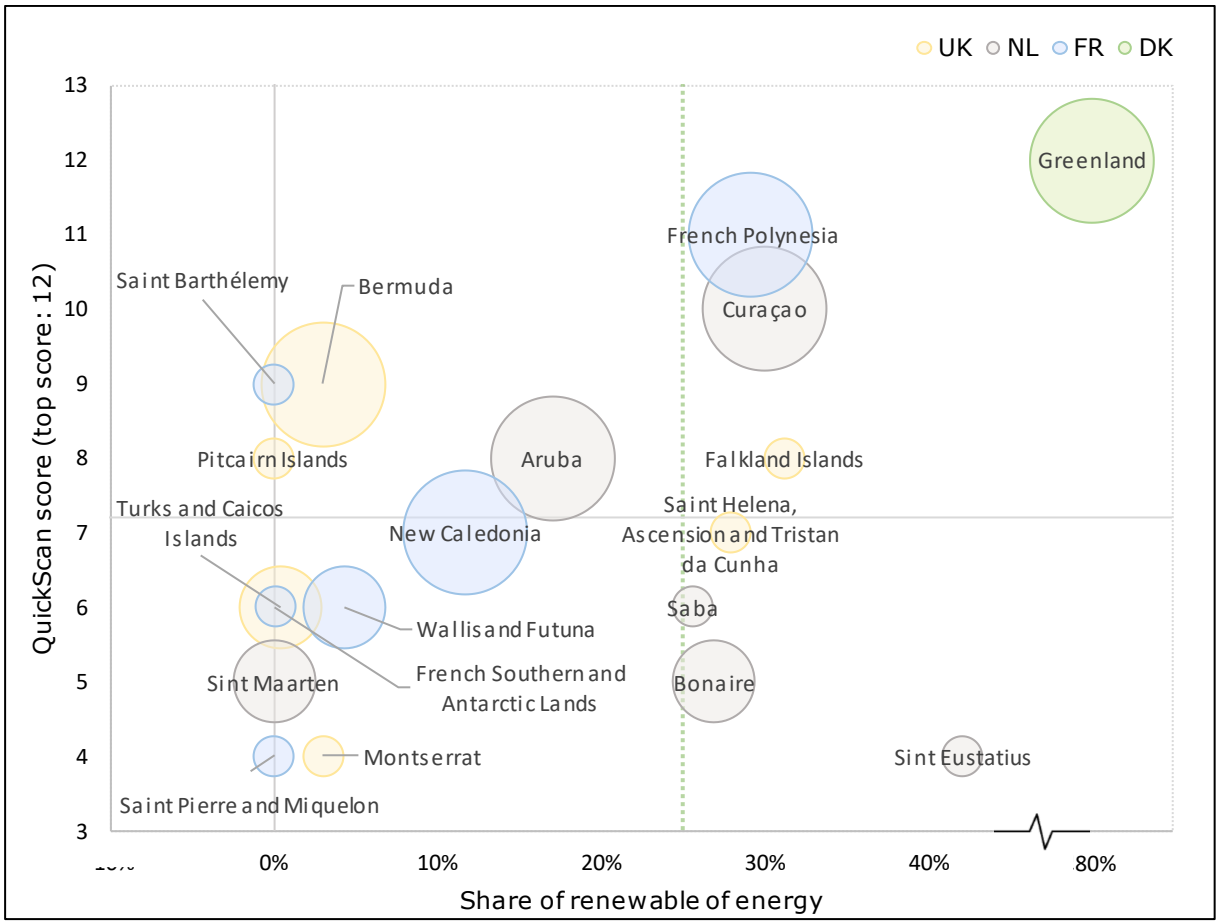
- **Saint Pierre and Miquelon:** This element is the most developed of the elements on the island. Planning capacities are in place. The feasibility of at least two projects in the field of wind energy exploitation is assessed. There are no land use restrictions that hinders existing and future development. In their new urban planning strategy (2020) they have identified areas for RE deployment.

- **Sint Maarten:** In its global score, Sint Maarten scores well, however its RE share remains at 0%. In the institutional framework section, it was argued that one reason for Sint Maarten's lacking RE score, was a lack of economic support. Examining the element of transition planning, a factoring explanation for the lack of RE development, may be found in Sint Maarten's challenge to find suitable land for development, currently requiring the island to think creatively, as they for example are considering floating solar panels on their salt ponds. An energy committee was established in 2014, although it has since been dispended, leaving in its place, a lack of central planning focused on RE development.

4.5 PROJECT FINANCING

The results of the analysis of the OCTs' project financing are presented in the figure below. It is the element with least number of OCTs over the 60% threshold line, a line which indicates the level of readiness for RE progress, meaning that many OCTs are insufficiently ready to develop RE from a financial standpoint. The following examples highlights how various OCTs have dealt with this element.

Figure 4-8 Quickscan scores for Project Financing 2020



Source: COWI with questionnaires as input

- **Curaçao:** Seems to have a well-developed framework for financing, which is needed in order for investors to come to the island and invest in RE development. Currently, all RE projects are financed by the private sector. Clear rules and processes to promote domestic and foreign investment in RE seem to be one of the key factors that contributed to this.

- **French Polynesia:** Has a well-developed economic framework to secure project financing. The success appears to rest on a diversified approach, mixing public and private funding from different resources and the ability to attract funding from EU and France. French Polynesia has experienced targeted tax exemption mechanisms to be a valuable for attracting investment. For example, through tax exemptions for RE during renovation or construction of hotels and residences or by providing zero-ratings for the import of RE equipment.

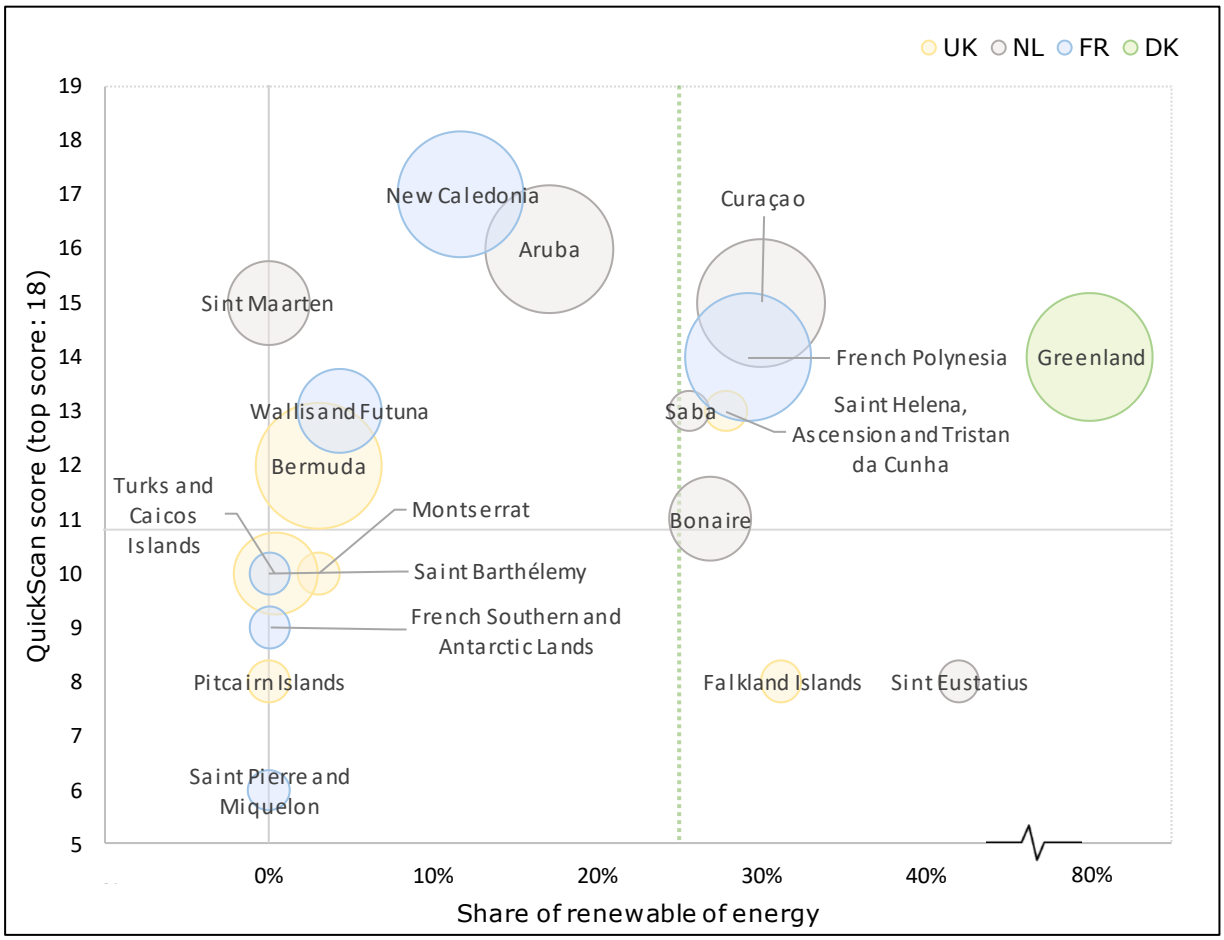
- **Montserrat:** Despite political plans and a wish to develop RE, Montserrat is lacking basic financial resources. They are not making use of financial incentives to spur development and need to establish clear processes on how to attract financing. The island needs international assistance to build capacity to establish foundations for attracting grant funding and concessionary loans.

- **Saba:** Has a relatively small population of approximately 1,900 inhabitants. Due to the limited scale of project on the islands, financing can be lacklustre from domestic sources. Saba appears to have instigated a successful transition by drawing project financing from creating a standardised tender procedure and formulating clear criteria for RE project development within the tender process, thereby compensating for an overall lack of available financial resources. The tender and 2.3MW solar park + storage project was realized through a collaborative effort, that brought together Saba's utility company, two international organizations with respectively technical and legal expertise, funding from two international organisations and companies with experience from similar projects in the region.

4.6 PROJECT DEPLOYMENT

The results of the analysis of the OCTs' deployment frameworks are presented in the figure below. In general, it can be seen that rising demand (for example due to growing population, or extreme weather events / hurricanes) has a downward effect on RE-penetration. It could be a more common issue for OCTs to see an increased energy demand is outpacing RE development. This is something for policy makers to think about in light of project deployment. Similar to the previous study, the results indicate that establishing a framework for project deployment is too a large extent, a prerequisite for facilitating RE development (Falkland Islands and Sint Eustatius both achieved a high RE share despite under-developed conditions for project deployment). The following examples highlights how various OCTs have dealt with this element.

Figure 4-9 Quickscan scores for Project Deployment 2020



Source: COWI with questionnaires as input

- **Bonaire:** The supply chain and infrastructure in Bonaire could be further developed, as large equipment cannot be handled on the island. The size of wind turbines is therefore, for example, more determined by the logistical limitation than by the optimal size and class based on the wind resource. They do however have adequate quantity and capacity of project developers for the development of the necessary RE projects to achieve the policy targets. The generation company is equipped with the capacity to execute projects to meet the target, which is set to 70% RE penetration.

- **Falkland Islands:** All power is supplied by the government. They have a windfarm in place that supplies up to 40% of the energy and have energy grants available for rural communities. The majority of Falkland Islands population reside in the capital Stanley. This is the location of the only grid on the archipelago. The supply of electricity is solely run through government and also financed out of government budgets. At present, there are no further RE plans in place for Stanley. Limited financing for individual outlying houses exists outside of Stanley. The financing for these gives access to grants for the purchase of new RE equipment. This is not administered through government but through an at-arms-length organisation. Grants are generally small and rarely exceed a couple of thousands of pounds. As such, their financing and deployment is extremely limited and certainly not on the scale alluded to in the energy roadmap.

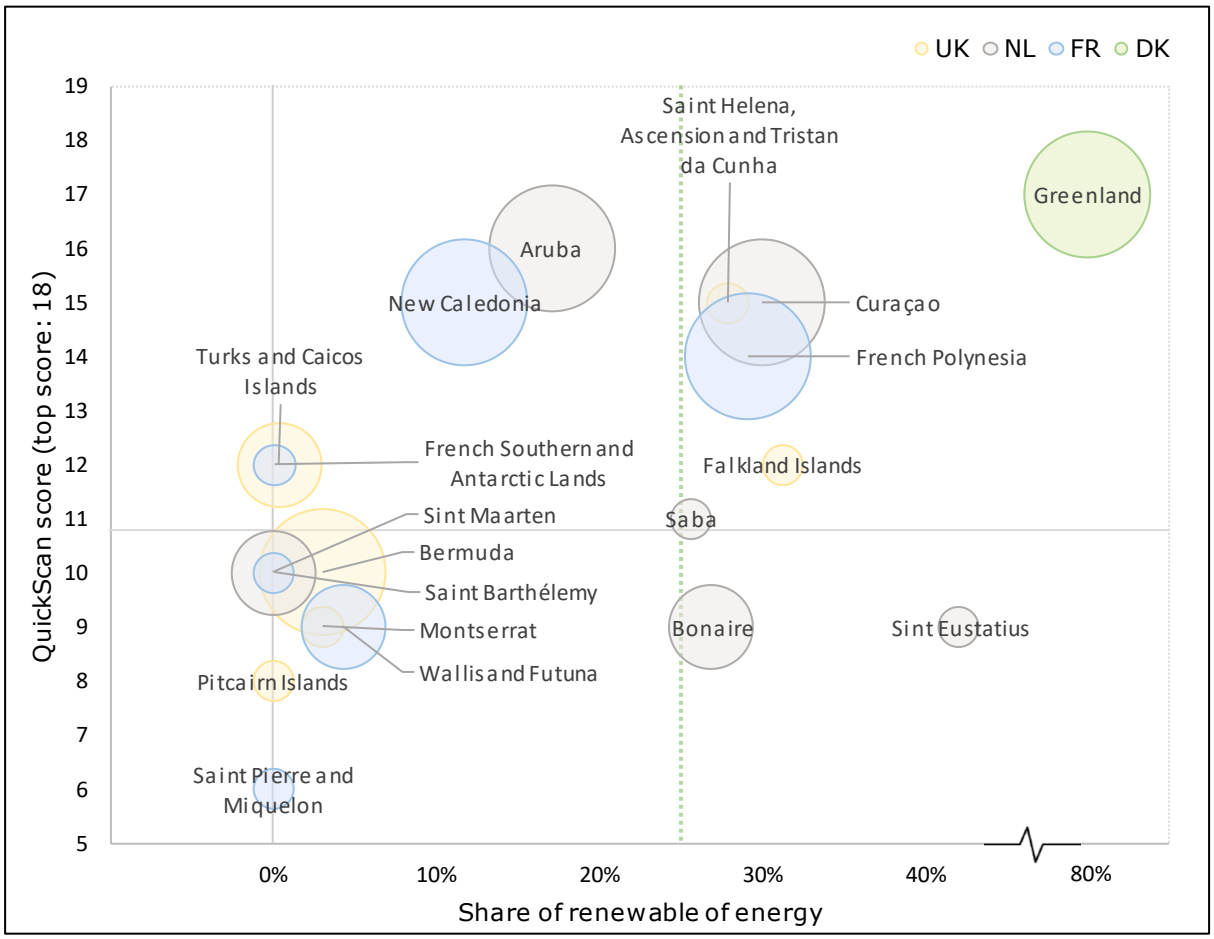
- **New Caledonia:** Multiple project deployment activities have been performed and are ongoing. There are clear procedures and objective criteria for project developers and technology providers for public projects. For example, RE projects submitted as part of a call for tenders are classified according to an objective rating system that was adopted by the government. This rating grid includes pricing criteria and criteria linked to the economic added value of the project, for the area / territory where the project will be established as well as criteria regarding the level of innovation of the project. Generally, there seems to be a high willingness from the government of New Caledonia to promote the development and structuring of real economic sectors around RE. In this sense, the government strives to support the deployment of local operators and investors as much as possible. An Energy Transition Scheme for New Caledonia is in place since 2016 and sets clear development objectives for each energy sector. Also, in 2019 the first photovoltaic (PV) farms with battery storage were set up on the island Lifou. These are intended to be fully operational over two years (covering the whole cycle from production, storage to network management). Nevertheless, there are some financial limitations as New Caledonia is mainly depending on private investments. Moreover, the potential for non-electric RE is not assessed, only one RE service company is active but with a very limited capacity (company in debt situation).

- **Turks and Caicos Islands:** Generally, the capacity is underdeveloped and needs to be strengthened, although there are two local solar installation and maintenance companies who are capable and dependable. The utility company has well established procedures and standards being followed in installing and commissioning of utility-owned RE projects. These established procedures and standards are being applied to the utility’s RE vendors or contractors.

4.7 CAPACITY BUILDING

The results of the analysis of the OCTs' capacity building are presented in the figure below. The results indicate that particularly well-developed capacity building efforts increases the likelihood of a RE share above 10%. While the trend is also partly noticeable in the other elements, it is particularly indicated here, that the size of populations plays a role in the OCTs readiness. Here, the five OCTs with a population over 50.000 are all ranked in the top-6 on the QS score (with a notable exception in Saint Helena, Ascension and Tristan da Cunha). It appears that the increased capacity on the islands with a >50.000 population is due to: 1) more well-developed utility companies with on-island skills and competencies, and 2) a greater presence of RE companies outside the utility companies. The following examples highlights how various OCTs have dealt with this element.

Figure 4-10 Quickscan scores for Capacity Building 2020



Source: COWI with questionnaires as input

- **Bermuda:** Even though there are no RE educational programs or trainings available, there is capable capacity building on the island. There are domestic installers (and the local utility company) for installation, operation and maintenance of RE equipment, they have experienced grid operators, and a dedicated regulator.

- **French Southern and Antarctic Lands:** Has strong technical capabilities among the rotating staff, despite the lack of dedicated local training and educational programs possibilities. French Southern and Antarctic Lands has capacities to set up support where needed.

- **Saint Helena, Ascension and Tristan da Cunha:** From the answers provided, it appears that the islands score high on capacity building, based on similar reasons to those that place the OCTs with a large population high on the QS score; a well-developed utility company with on-island skills and competencies. Connect Ltd is the name of the utility company. The staff received initial training in the implemented RE systems by the manufacturers of the equipment, with further training included as a part of a new power purchase agreement (PPA). Connect Ltd has also partaken in the development of Saint Helena Government's tender proposal for private financing, which is close to concluding contractual terms. Other OCT's with smaller utility companies can from this example see, that it is possible to build capacity within the utility companies, while still relying specialist knowledge from abroad, when needed.

- **Pitcairn Islands:** Even though there is currently no RE on the island, the Government of Pitcairn Islands is seeking expressions of interest in an International Tender regarding the introduction of RE to the island to replace the current diesel generated fossil fuel system with the introduction of a solar power system. Part of the tender is also to provide training to members of the local community.

5 PROGRESS ON SUSTAINABLE ENERGY ROADMAP

In June 2015, at the first Summit of OCTs Energy Ministers in Brussels, the OCTs adopted a Sustainable Energy Roadmap which identified priority areas, strategies and actions to be implemented for their countries in their sustainable energy transitions. The following section includes an analysis on progress made, according to the following priority areas:

- Specific networking and collaboration;
- Energy efficiency;
- Buildings and transports;
- Business; and
- Legal.

5.1 SPECIFIC NETWORKING AND COLLABORATION

In general, this priority area seems to be well on track. Many OCTs have a collaboration of some sorts related to financial aspects, technical aspects, or in the field of academic research. Some OCTs are well ahead of others and might be an example for other OCTs on how to approach this. The following examples highlights how various OCTs have dealt with this, followed by an overview which OCTs are not on track (yet), and which OCTs did not respond on this in the questionnaire.

Examples

- **Aruba**: The main actors in the energy sector on the island of Aruba have developed strong links and partnerships at all levels. For instance, for the purpose of developing studies on the energy mix and grid integration, the utility on the island has either hired external consultants or worked with US National Renewable Energy Laboratory (NREL). At academic level, the University of Aruba together with Belgian KU Leuven have jointly set up Sustainable Island Solutions through Science, Technology, Engineering and Mathematics (SISSTEM) with funding from the European Development Fund (EDF). Aruba became a member of the Global Island Partnership and is in close contact with the United Nations Development Programme (UNDP) for strengthening its ambitions to incorporate Sustainable Development Goals (SDGs) in its policy planning. Regarding its collaborations with international financial institutions, Aruba has worked with the International Monetary Fund (IMF) in 2019 in order to update the reform of the island's energy policy.

- **Bermuda:** There are mainly collaboration activities with other countries/members of OOCUR (Organisation of Caribbean Utility Regulators), including setting up a mutual support agreement.

- **French Polynesia:** Various collaboration activities were put in place since 2015. In particular, French Polynesia entered in 2015 into a five-years agreement with the ADEME (the French Environment & Energy Management Agency). A renewal of this agreement is currently in progress. Moreover, a partnership agreement was signed with New Caledonia at the end of 2019, which partly focuses on knowledge-sharing, exchange and feedback from the energy sectors. At the academic level, collaboration exist with the University of French Polynesia, where two PHDs are co-funded by the island, tackling issues such as natural ventilation and the impact on eco-construction, and the management of electric micro grids. At the financial level, French Polynesia collaborates with the French Development Agency (AFD), through green funds, allowing to finance loans at an interest rate of 0%, for projects that aim to mitigate and reduce the impact of climate change.

- **French Southern and Antarctic Lands**: The TAAF and the ADEME (French Environment and Energy Management Agency) launched a partnership for the co-financing and installation of the first PV power plant on the Tromelin island.

- **Greenland**: Nukissiorfiit have participated in the Arctic Remote Energy Networks Academy (ARENA)[11] project with knowledge sharing and mutual education as primary targets. Other participants in the ARENA project counted minor energy companies in Alaska, Arctic Canada and Iceland. Nukissiorfiit is currently planning participation in a new ARENA project. Nukissiorfiit and the Technical University of Denmark collaborated regarding land development in a test site for 2 25kW wind turbines.

- **Montserrat**: The island has forged collaboration ties with the Rocky Mountain Institute (RMI) during the first phase of a Renewable Energy Sources (RES) project that involved mounting solar panels on the rooftops of buildings in the capital. RMI acted as the independent energy advisor that was involved also in the preliminary design and project preparation and management. RMI also assisted the Government of Montserrat with the development of LED street lighting specifications, as well as conducting solar glint and glare studies. Regarding collaborations with financial institutions, Montserrat worked closely with the Caribbean Development Bank (CDB) with a view to financing its Integrated Resource Plan (IRP) that would help the island plan how to produce electricity at the least cost 20 years ahead.

- **New Caledonia:** International cooperation is in place with the CDP (formerly Carbon Disclosure Project), an international non-profit organization which enables cities and regions to measure, control and communicate on their environmental impacts. The CDP collects environmental data from regions and states via a platform, which currently covers the largest collection of self-declared environmental data in the world. New Caledonia is hence contributing to CDP by completing the questionnaire published on the platform. The data collected by the CDP is then compiled and can help regional governments to identify the risks associated with climate change allowing to prioritize the most important actions. They further collaborate with metropolitan research institutes through the CNRT on a project relating to carbonation. In specific, it concerns the development of a reactor that can collect CO_2 emitted by thermal plants (fuel oil, coal, soon gas) through the carbonation of slag from metallurgical plants[12]. The Agency for Energy in New Caledonia (ACE) provides financial support to this project and participates in the Steering Committee (Comité de pilotage, referred to as COPIL).

- **Pitcairn Islands**: Pitcairn is working with the EU and SPC in the introduction of Solar Renewable Energy. This will be a government project.

- **Saba**: The utility company on the island has been engaging with technology companies in order to ensure the training of its staff and also the proper monitoring of the hybrid system. For the purpose of financing solar panels, new diesel power plants and tariff subsidization, the representatives of the island have been engaging with the Dutch Ministry of Economic Affairs and Climate Policy.

- **Saint Helena, Ascension and Tristan da Cunha:** With a view to deploying more RE on the island, the utility provider of Saint Helena is working closely with a preferred bidder for concluding a renewable energy PPA.

[11] Nukissiorfiit has been the representative of Greenland and participated in the Arctic Remote Energy Networks Academy. Nukissiorfiit is also participating in ARENA II.

[12] Centre National de Recherche Technologique, https://cnrt.nc/carboscories-2/

- **Sint Maarten:** In the context of the French Saint Martin applying for funding from the INTERREG Caribbean[13], Sint Maarten, the Dutch part of the island, committed itself to participate in the project by means of in-kind support (i.e. electrical and digital interconnection). The funding would go into conducting a pre-feasibility study for an interconnected grid - the so-called Leeward Islands Interconnection Network and geothermal development on the islands of Saba, Sint Eustatius and St. Kitts.

- **Wallis and Futuna:** A strategic partnership with ADEME has been set up. Wallis and Futuna will also collaborate in the near future with New Caledonia and possibly with French Polynesia. As part of a special agreement with New Caledonia, Wallis and Futuna will request the island's assistance towards implementing their multi-year energy programme. Some collaborations are ongoing with international organisation such as with the Pacific Community (SPC) and the ACP countries, within the framework of the Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE)[14]; and with financial institutions through an agreement with the Deposits and Consignments Fund.

OCTs not on track

- **Curaçao**: The islands have begun a collaboration with the Clinton Foundation, but the precise nature of the outcomes is not defined at the moment.

- **Saint Barthélemy:** Indicated they have not put any collaboration activities in place since 2015.

- **Saint Pierre and Miquelon:** Indicated they are not on track. A partnership program from 2009, to replace inefficient boilers in order to increase EE in households is still in place, but they have not established any new collaborations.

No answer provided

- **Bonaire**
- **Falkland Islands**
- **Sint Eustatius**
- **Turks and Caicos Islands**

5.2 ENERGY EFFICIENCY

Most OCTs are showing significant efforts in developing EE, either through technical solutions, or in implementing regulation and setting up standards. The level of maturity for EE technologies is very well developed, which gives ample room for improvement for the majority of the OCTs. The following examples highlights how various OCTs have dealt with this, followed by an overview which OCTs are not on track (yet), and which OCTs did not respond on this in the questionnaire.

Examples

- **Aruba**: It is expected that the upcoming energy policy will mention the objectives and actions to be taken in order to promote EE for both households and businesses. Since 2015 the generator on the island has implemented flywheel and battery storage systems thus managing to address the need for short term storage, deal with variable wind and solar generation and ensure grid stability whilst allowing more RES into the network. As a result of adding new distributed energy solar technologies

[13] Further information can be obtained on https://interreg.eu/programme/interreg-caribbean/

[14] Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE), https://www.pcreee.org/content/objectives-and-mandate

and the adoption of EE measures, there has been a decline in the average monthly consumption in the case of large commercial clients.

- **Bermuda:** The focus is mainly on reducing energy use in households via EE initiatives.

- **French Polynesia:** Multiple actions were implemented in the field of eco-construction; a methodological guide was drafted for project owners and training activities were organised for architects. Over 65 energy audits have been carried out for companies that are supported under the ADEME / Country partnership agreement. About 15 energy audits for municipalities were also funded (45 municipalities in French Polynesia). Efforts are also noted regarding the development of affordable energy storage. Seven PV-Diesel hybrid power plants have been installed in small towns in the Tuamotu Archipelago. These hybrid power plants have a Lithium-Ion battery storage system. Moreover, 14.4% of the electricity consumption of Tahiti, the largest island of the Windward group of the Society Islands in French Polynesia, was audited. The energy saving potential was estimated at 3.4%.

- **French Southern and Antarctic Lands:** French Southern and Antarctic Lands adopted a policy regarding the reduction of energy consumption. It includes recommendations regarding the purchase of specific materials, that should be followed by the population on the island. For example: Washing machines and tumble dryers should be energy efficient, allowing for a lower energy consumption, outdoor lights need to include energy efficient lightbulbs and should work by detection of motion or via a clock system, double glazing should be installed, lightening in factories should be turned off in the evening (if not required), new generation electric radiators should be installed (e.g. these allow to turn off the radiator when a window is opened).

- **Greenland**: The Sector Plan for Energy and Water Supply published in 2017 by the Government of Greenland outlines the main priorities for Greenland's energy policies towards 2030. The main objectives are: 1) Lower prices of electricity and water, 2) Green energy wherever possible, and 3) Modernisation of the energy system. As part of the Sector Plan for Energy and Water Supply published in 2017 the Government of Greenland is actively trying to facilitate electrification of the transport sector. Furthermore, hydropower and new energy technologies will be included in the heat supply system in all parts of Greenland as the use of these technologies becomes technically, operationally and socio-economically available in Greenland. Waste is being considered a resource and residual heating from waste incineration plants will be utilised for district heating purposes. There are regular initiatives to optimise the operation of installations with a view to enhancing the utilisation of residual heating. From 2018, individual heat meters were installed in all publicly owned rental properties technically prepared for such installations – which equals to about 3,000 apartments. In 2017 the Government of Greenland significantly reduced the prices on electricity and water resulting in large savings for people all over Greenland. Energy storage with batteries is being tested as part of a hybrid plant in Igaliku. The public utility company Nukissiorfiit is actively testing RE solutions in Greenland and is a participant in international forums of knowledge sharing.

- **New Caledonia:** The Caledonian Energy Agency (ACE) has been created in 2017, which is a public administrative establishment whose purpose is to coordinate the implementation of an energy transition scheme for New Caledonia (STENC). It contributes to the development of electrical systems, promotes the rational use of energy and the development of renewable energies, in order to achieve the objectives set out in the energy transition scheme (roadmap of 2019). In December 2018, the Congress of New Caledonia voted in favour of an EE law for appliances and equipment. The law covers three important parts, being, 1) the overall obligation to only import electrical household appliances that meet the energy efficiency standard and the obligation to assign an energy label on these appliances as from 1st of March 2019; 2) an import ban regarding equipment that contains substances

(cold) that deplete the ozone layer as from 1st of March 2019; 3) an import ban regarding incandescent or halogen bulbs since 1st of January 2020. Since 1st of May 2019, there is also an obligation to indicate energy information on all advertising messages that are directly or indirectly linked to energy since May 1, 2019 (e.g. messages disseminated by product display, electronic media, press messages, television publicity, radio broadcasting services, cinema, advertising correspondence and on printed advertising material distributed to the public and to professionals).Lastly, the solar thermal sector has been restructured.

- **Pitcairn Islands:** There is an agreement with the EWU to fund the cost of introduction of solar power to Pitcairn under EDF 11 Regional. Work is progressing on this and a tender document for a design, build, install and train scenario is about to distributed.

- **Saba:** 2.3 MWh of energy storage have recently been added onto a PV farm which it is assumed it will save about one million litres of diesel per annum. As per the estimations of the local utility, in diesel-off mode the storage system will help save approximately 300 litres of fuel per hour.[15]

- **Sint Eustatius**: Not a lot of development, but a workshop has been held on how to reduce energy use in the hospitality sector.

- **Sint Maarten:** In 2019, along most public roads and in some private development, street lighting was changed to PV-LED or solar power on the island of Sint Maarten.

- **Turks and Caicos Islands:** The utility implemented in 2015 the so-called Energy Audit Program whereby households are assisted in identifying ways for improving energy efficiency in their houses.

OCTs not on track

- **Curaçao:** No EE measures have been taken, but it is indicated that some measures are pending., although these are not described.

- **Montserrat:** Although the island has taken measures to facilitate energy reduction of end-use sectors, these have not been expanded upon. In regard to the deployment of energy storage, Montserrat is expecting 1.1 MWh of battery storage to be installed in 2020.

- **Saint Barthélemy:** At the end of 2019, the island established a Committee (see deliberation 2019-1231-CE[16]) as an initiative to facilitate the reduction in energy use of end-use sectors. No reliable and affordable energy storage has been developed nor promoted.

- **Saint Helena, Ascension and Tristan da Cunha:** As part of its work to deploy more RE on the island, the use of storage technology would be included in the upcoming PPA, which is expected to be concluded with the utility provider of Saint Helena.

[15] photon.info (2019), SMA commissioned 2.3 MWh PV storage system at the island of Saba, https://www.photon.info/en/news/sma-commissioned-23-mwh-pv-storage-system-island-saba

[16] Délibérations du Conseil Exécutif 2019, la Collectivité de Saint-Barthélemy, http://www.comstbarth.fr/pageLibre0001aa93.aspx

- **Wallis and Futuna:** Energy pre-diagnostics were carried out in the energy-intensive companies and administrative buildings located on the island. No energy storage systems have been developed nor promoted since 2015.

- **Saint Pierre and Miquelon:** Indicated that they have not instigated any new EE initiatives.

No answer provided

- **Bonaire**
- **Falkland Islands**

5.3 BUILDINGS AND TRANSPORTS

Actions in this priority area are diverse and there is still room for improvements. Most of the actions that are being implemented can be divided into tax measures, technological solutions, and policy development. The following examples highlights how various OCTs have dealt with this, followed by an overview which OCTs are not on track (yet), and which OCTs did not respond on this in the questionnaire.

Examples

- **Curaçao:** Measures for promoting renovation and adaptation of building stock is pending, but for transport, a new initiative was implemented that resulted in import taxes being lowered to 0% for electric vehicles.

- **Bermuda:** has a focus on sustainable transport development through the elimination of related customs duties.

- **French Polynesia:** A public transport master plan was finalized in 2017. A new delegation of the public transport service was signed in January 2019 and will run until 2033. In the fleet of 240 buses, there will be in total 80 electric buses. Two municipalities have launched their public transport master plan for the development of bicycle paths. An eco-mobility charter has been drafted and many stakeholders have signed it in order to encourage car-sharing. Since 2013, targeted trainings in relation to the environmental quality for buildings has been organised for projects owners and architects. Construction methodological guides were drafted that take into account the environmental quality of buildings. Funding through the ADEME-Country Agreement for Project Management Assistant in QEB was also supported. In the first half of 2020, the first bioclimatic school should also be built in French Polynesia.

- **Greenland**: As part of the Sector Plan for Energy and Water Supply published in 2017 the Government of Greenland is actively trying to facilitate electrification of the transport sector. They consider it vital to closely monitor technological developments. RE solutions in the Arctic are developing fast and Greenland's goal is to be among the frontrunners.

- **Montserrat:** The introduction of tax incentives for the purpose of reducing the costs of importing electric vehicles on the island serves is an example of measures aimed at facilitating sustainable transport development.

- **New Caledonia:** Since 2019, the lanes supporting the Tanéo bus lines were put in place. Further in 2019, the application "Kedia" was created, which refers to the first mobility center in New Caledonia. It offers a free and easy-to-use digital tool that allows travellers (both Caledonians or tourists), to prepare their journeys in a few clicks. A premium was provided for the purchase of electrically assisted bicycles in 2018/2019. Eco-driving training was set up in 2018. A number of private and public travel

plans (companies, communities, administrations) were deployed since 2016. It results in the implementation of a mobility plan. Priority is given to all transport solutions which limit the use of the private car. In 2016, the carpooling platform was also renovated. In 2015, the eco-mobility charter was created, offering a tool for all organizations (municipalities, inter-municipal authorities, companies, public or private establishments, etc.) which makes it possible to implement eco-mobility actions as part of a more global commitment to sustainable development. Further to that, in 2019, New Caledonia also started to draft a standard for the energy performance of buildings, which should be applicable in the course of 2020. It also created the Energy Info Point (PIE) in 2015, that functions as a key player for individuals with energy questions, especially on renovation of houses or construction projects.

- **Pitcairn Islands**: Pitcairn is a small island with a government diesel power system. There are neither issues with compensation of current electricity providers, nor transport issues.

- **Saint Helena, Ascension and Tristan da Cunha**: Customs duties in Saint Helena are conducive towards higher levels of imports of low emissions vehicles.

- **Sint Eustatius:** Building code has been upgraded.

- **Sint Maarten:** Government buildings in Sint Maarten have switched to LED lighting and efforts have also been put into making air conditioning more efficient. There have been some minor changes in the private sector and schools to integrate solar power use.

- **Wallis and Futuna:** In the framework of developing sustainable transport, a feasibility study was carried out to assess different options. Discussions are also ongoing to set up a project to develop and implement electric cars on the island. One measure was taken to encourage the renovation or adaptation of buildings. In specific, the PPE includes specific measures for improving the energy performance of buildings.

OCTs not on track

- **Aruba:** Since 2015 no new measures have been taken to facilitate sustainable transport development. However, an import tax incentive for electric vehicles is in effect as of 2012. Also, the new national energy policy will define the objectives and actions both for reducing transport emissions and promoting sustainable building practices, such as Government construction projects.

- **Saba:** It was reported that no sustainable measures had been taken in either the buildings or transport sectors since 2015.

- **Saint Barthélemy:** Since 2015 no new measures have been taken to facilitate sustainable transport development.

- **Saint Pierre and Miquelon:** Indicated that they are not on track.

- **Turks and Caicos Islands:** Since 2015 no new measures have been taken to facilitate sustainable transport development.

No answer provided

- **Bonaire**
- **Falkland Islands**
- **French Southern and Antarctic Lands**

5.4 BUSINESSES

In general, the OCTs in the private sector are quite active and progress can be seen in investments, tax incentives / tariffs and in creating awareness. This is however not always due to an active policy from the public authority. The following examples highlights how various OCTs have dealt with this, followed by an overview which OCTs are not on track (yet), and which OCTs did not respond on this in the questionnaire.

Examples

- **Aruba:** The policy framework for distributed generation (DG) on the island, which was adopted in 2012, has been the catalyst for the installation of approximately 5 MW of renewable energy (i.e. roughly 50% residential and 50% commercial installations). As a result of the recent drop in PV investment costs, requests for DG have been increasing. Regarding the initiatives for raising awareness in the field of RE, a recently conducted study revealed a strong increase in public awareness for sustainability, environmental and more broadly EE issues amongst the population on the island of Aruba.

- **Bermuda:** For businesses, Bermuda has some economic incentives to promote RE in place through rebates and 0% customs duties, and the introduction of a feed-in-tariff. Few initiatives taken to green the building sector

- **Curaçao:** Business models have been altered to better facilitate RE (no details were provided on these business model changes) and there are activities and initiatives in place to raise awareness about RE and to promote RE. To facilitate investment and policies, an energy regulator has been put in place, and they are working on establishing an energy office and a new energy regulation.

- **French Polynesia:** Companies benefit from a total tax refund when important equipment that is used for the production of RE. Also, under certain conditions, companies might be eligible to receive local and metropolitan tax exemptions. Business model changes occurred. The PV farm projects presented by the project leaders now also include a share of storage. EIA (Espace-Info Energie) aims to raise awareness and encourage actions and good practices, by offering individuals, communities, schools and small businesses, advice and concrete solutions with as objective to better control the energy consumption and make more usage of RE.

- **Greenland**: The Government of Greenland is actively working towards promoting RE-solutions in including potentials as a hub for energy intensive industry supplied by hydropower. Greenland's huge hydropower potential can be exploited commercially in connection with supplying energy to large industrial enterprises based on RE. For still larger, more worldwide and trendsetting businesses, supply based on renewable energy is an absolute requirement, not least as a way of branding the business. Large and easily exploitable potentials are found between the towns of Nuuk and Sisimiut. Alcoa has analysed two of the largest hydropower potentials for the purpose of erecting an aluminium smelter in Greenland. The estimates done by Greenland Development show a capacity of at least 650 MW. The hydropower resources can be utilized at a very competitive cost per kWh. The Government of Greenland has put together a marketing package with relevant hydrological data, legislation and benchmarks on taxes, energy prices and more. With the implementation of the Sector Plan in 2017 Greenland's public utility company Nukissiorfiit is increasingly working to transition to renewable energy in Greenland wherever possible. The Government of Greenland is marketing Greenland's RE-potentials internationally. In January 2020 a delegation from the Ministry of Industry, Energy, Research and Labour visited Copenhagen, Frankfurt, Berlin and Paris where the delegation promoted RE-potentials.

- **New Caledonia:** Specific buying tariffs were implemented, with or without self-consumption. No significant changes occurred, since 2015, in amending the business models to facilitate RE. In 2019, ACE collaborated with another New Caledonian public establishment, and initiated a network of Shared Energy Advisors (CEP) who acts at the level of municipalities and in particular at the level of administrations and professionals. At the same time, an Energy Info Point was set up to inform and educate individuals.

- **Pitcairn Islands:** The introduction of solar power to Pitcairn under EDF 11 Regional is progressing and is currently described in a tender document for a design, build, install and train scenario. This will positively affect the businesses located on the island and might open some future opportunities in terms of employment.

- **Saint Helena, Ascension and Tristan da Cunha:** On the one hand, the Government of Saint Helena has taken measures to reduce import duties in order to facilitate investment in RE, while on the other hand businesses have invested in RE to reduce their energy costs. In addition, whenever an application for development permit is being submitted to the public authorities, public hearings are held and the advantages of investing in renewable energy are being explained to stakeholders.

- **Saba:** Since 2015, measures have been taken to facilitate investment in solar panels with a capacity of 2 MW.

- **Sint Eustatius:** Even though there is currently no RE development, there is a tender in place through EDF to invest in the development of a solar park.

- **Sint Maarten:** Despite the lack of Government-led actions to promote renewable energy in Sint Maarten, the private sector has led the way in solar investment.

- **Turks and Caicos Islands:** Measures have been taken by the utility company in promoting RE. They have implemented programs that promote RE infusion and provide incentives to customers.

- **Wallis and Futuna:** Some information sessions on RE were held on the island, with an objective to further facilitate the investment in RE. Further to that, public information meetings were held in partnership with ADEME and the CCI-NC (Chamber of Commerce).

OCTs not on track

- **Montserrat:** There are some there any activities /initiatives for raising awareness and promotional activities in the field of RE, but these are not defined.

- **Saint Barthélemy:** Limited measures were taken since 2015 to facilitate investment in RE. No changes were performed in business models to facilitate RE. A small number of initiatives are however foreseen to raise awareness regarding RE. For example, a detailed multi-year study will be undertaken during 2020 aiming at determining the economic model or models of energy transition in the region. The model for energy transition that the island wishes to promote is based on private investments that should allow to generate incomes for the stakeholders / investors on the territory.

- **Saint Pierre and Miquelon:** Indicated that they are not on track.

No answer provided

- **Bonaire**

- **Falkland Islands**
- **French Southern and Antarctic Lands**

5.5 LEGAL

The progress on the legal aspect is very limited. There are a few OCTs who have set up a legal framework or introduced a multi-annual energy programme, but this priority area is by far the least developed. The following examples highlights how various OCTs have dealt with this, followed by an overview which OCTs are not on track (yet), and which OCTs did not respond on this in the questionnaire.

Examples

- **Aruba:** Upon publication of the upcoming energy policy of Aruba, the institutional and regulatory framework is also expected to undergo changes. In the meantime, as of January 1st, 2020 a reduction in electricity tariffs is in effect for households, NGOs and businesses alike.

- **Bermuda:** Bermuda has introduced a feed-in-tariff.

- **Greenland**: Has a regulatory framework regulating the supply of energy to towns and settlements. In 2018 Greenland adopted a new hydropower act, a framework for the commercial use of hydropower. Following the political agreement regarding the Financial Act of 2020 the corporate tax will be further reduced from 30% to 25% as of 2020, further increasing the competitiveness of energy intensive industry in Greenland.

- **New Caledonia:** In June 2016, an Energy Transition Scheme of New Caledonia (STENC) was adopted by the congress (deliberation n ° 135 of June 23, 2016). It reflects the ambition of the public authorities in matters related to RE transition.

- **Pitcairn Islands**: Pitcairn's current energy provider is its government. There are currently no legal or compensation issues.

- **Wallis and Futuna:** A new multi-annual energy programme has been adopted in March 2017 to further deploy RE.

OCTs not on track

- **Curaçao:** No new regulatory frameworks have been put in place, but it was indicated that these are in progress.

- **French Polynesia:** The Polynesian Energy Code is currently being drafted. Title III of the Energy Code concerns the production of electricity including renewable energy.

- **French Southern and Antarctic Lands**: No new regulatory framework has been put in place for the deployment of RE

- **Montserrat:** There are no new regulatory frameworks for the deployment of RE.

- **Saba:** Although reference is made to Electricity and Drinking Water Act as being applicable on the island of Saba as of July 2016, no further details have been provided as to how the deployment of RE is supported through this piece of legislation.

- **Saint Helena, Ascension and Tristan da Cunha:** The Government of Saint Helena has not yet put in place any regulatory frameworks for RE deployment.

- **Sint Eustatius**: Expansion of the solar park has been taken place through the EDF 11 programme, no mention of legal aspects being set up.

- **Sint Maarten:** In Sint Maarten, no studies have been executed as yet. A feasibility study will have to be carried out, this will also shed more light on the feed-in-tariff study.

- **Saint Barthélemy:** No new regulatory framework has been taken since 2015 for the deployment of RE projects. However, in 2020, the island will launch a study to identify appropriate legal and regulatory frameworks and drivers. These should ensure that a solid legal environment can be established that can boost investments in energy efficiency and RE. The study will also focus on determining the economic models of energy transition in the region.

- **Saint Pierre and Miquelon:** Indicated that they are not on track, however, a new multi-annual energy program is expected to guide future development of RE transition.

- **Turks and Caicos Islands:** Despite the utility making progress in developing RE, the missing link in furthering higher uptakes of RE generation is an enabling legal framework which would also support the attainment of targets set in the Resilient National Energy Strategy (RNETS).

No answer provided

- **Bonaire**
- **Falkland Islands**
- **Sint Eustatius**

6 BEST PRACTICES AND LESSONS LEARNT

This chapter presents best practices from the OCTs and highlights relevant lessons learnt. This information was directly collected from the local energy experts, who shared best practices and lessons learnt in their sustainable energy transitions and applicable projects that were set up towards that end, on their island. For each best practice, a visual aid is added, which showcases which of the seven elements the provided example applies to.

Table 6-1 below, outlines general barriers for RE development. Not all barriers apply to all OCTs, but most OCTs face several of the challenges as the barriers pertains especially to RE transition on islands. The barriers are listed here as a reminder of the unique nature of the challenges that OCTs face in their RE transition, but also, it serves as a tool of reflection, as this chapter highlights several initiatives that OCTs have taken which shows how the barriers for RE development can be overcome. For example, Sint Eustatius was recently fully dependent on diesel power generators, but they have with a new PV power plant gained a high RE share. The PV project saw the inclusion of battery inverters, a storage technology that helps ensure a reliable energy supply, and furthermore, they optimized the angle of solar panels to enable installation of additional PVs on the same limited area, which also increased the PVs endurance towards extreme weather events.

Table 6-1 General barriers for RE development in OCTs

Barriers for RE development
› OCTs are isolated and not connected to mainland grids
› OCTs experience seasonal spikes in energy consumption (mostly due to tourism)
› RE provides an intermittent supply of energy (no possibility to sell surplus energy or to buy energy from external sources in instances of insufficient local supply)
› There is a lack of institutional framework and legislation to attract private investors
› There is a gap between RE targets and implementation efforts
› Utility monopoly (low chance for market development in private companies)
› OCTs lack knowledge on the market potential of RE
› OCTs lack technical expertise
› There is often limited space for RE development
› RE projects require a high initial investment
› Due to the population sizes of the OCTs, there are low economies of scale
› High cost of delivering equipment and limited availability of relevant infrastructure to facilitate RE development
› Harsh environments for hardware (humidity, erosion, natural weather extremes)

Sources: Questionnaires, PowerPoint slides from the Energy Workshop, and (Blechinger et al, 2015)

6.1 RENEWABLE ENERGY STRATEGY, ARUBA

Project outline

The San Nicolas Solar Park is Aruba's second solar park and with its 6MW capacity it takes a place among the largest solar parks in the Caribbean region. It follows the construction of the 3,5MW Airport Solar Park commissioned in 2015 - both projects growing out of the ARES. Apart from contributing to energy mix diversification, the San Nicolas Solar Park has proved to be a success on other fronts as well.

Typically, in the Caribbean region, projects of this scope are realized through an independent power producer (IPP), meaning profits are partly allocated to international power producers abroad[17]. However, the local utility company WEB Aruba is the sole owner of the San Nicolas Solar Park. The project started with preparation of technical specifications and procurement documents. The Rocky Mountain Institute led the global proposal dissemination process which attracted interest from a total of 64 companies. TNO simulated and objectively compared the most promising PV solutions offered and thus assisting in the selection of the most cost-effective alternative. This ultimately led to the choice of partnering with Spanish ISOTRON. Altogether these processes resulted in securing a highly attractive cost-price for the project. [18]

Through the low cost-price and ARES's focus on distributed generation, the Solar Park benefits further solar dissemination in Aruba, as complimentary buy back rates and fixed grid usage fees for grid-tied solar systems has led to an uptake of residential and commercial solar systems.

With a dense population and large nature reservations, Aruba faces a challenge in the spatial planning of RE expansion and large projects. For the San Nicolas Solar Park, the solution was to make use of the area belonging to Aruba's refinery. Accordingly, the park now occupies roughly 90.000 square meters (about 13 football fields) within this area, in line with the governments agenda of repurposing the refinery premises.

The success of San Nicolas Solar Park has been the culmination of several processes and initiatives, as can be seen in the Lessons Learnt.

Lessons learnt

- The success has been contingent on the collaboration between several actors, each contributing to the realization of the project, among others; WEB Aruba (owner), ISOTRON (developer), Rocky Mountain Institute (global dissemination network), TNO (expertise in performance simulations), Government of Aruba (supporting policies and economic incentives), Aruba's refinery (site location) and many others;

[17] New Energy Events (2017), WEB Aruba N.V.'s 'Sunrise Solar Park' gets a 'green light' for initiation, http://newenergyevents.com/web-aruba-n-v-s-sunrise-solar-park-gets-a-green-light-for-initiation

[18] https://rmi.org/press-release/press-release-web-aruba-sunrise-solar-park-project-ground-breaking-monumental-for-caribbean-clean-energy-transition/

- Ambitious RE strategies (ARES) can with support from the government and attractive economic incentives (buy back rates + fixed grid usage fees for solar systems) spark residential and commercial development;
- Synergies between several/independent goals can reduce obstructions (repurposing refinery premises and site for RE projects solves issue of limits in the spatial planning); and
- Local companies can be independent project owners, with the assistance of expertise from international organizations/NGOs.

6.2 ENERGY VISION 2030, BONAIRE

Project outline

Bonaire's energy vision on renewables aims at cutting fuel costs by increasing the share of RE, using the saved money for community investments. Moreover, the strategy makes full use of individuals, since the regulator gives the opportunity to clients to deliver energy back to the grid with decentral generation. From its current share of 33%, Bonaire has set itself a target to increase up to 60% of its share of electricity production from renewables by 2022. Against this background, the Independent Power Producer (IPP) of Bonaire managed the addition of a 6 MW battery-based energy storage system (BESS) to the power grid on the island. The new system provides spinning reserves and frequency stabilization, thereby avoiding wind generation curtailment and leading to the increase in its uptake from 15-20% to 30% after the commissioning of BESS. The project has also been an award winner of the **Best Microgrid Project** at the 2019 Caribbean Renewable Energy Forum (CREF).

Lessons learnt

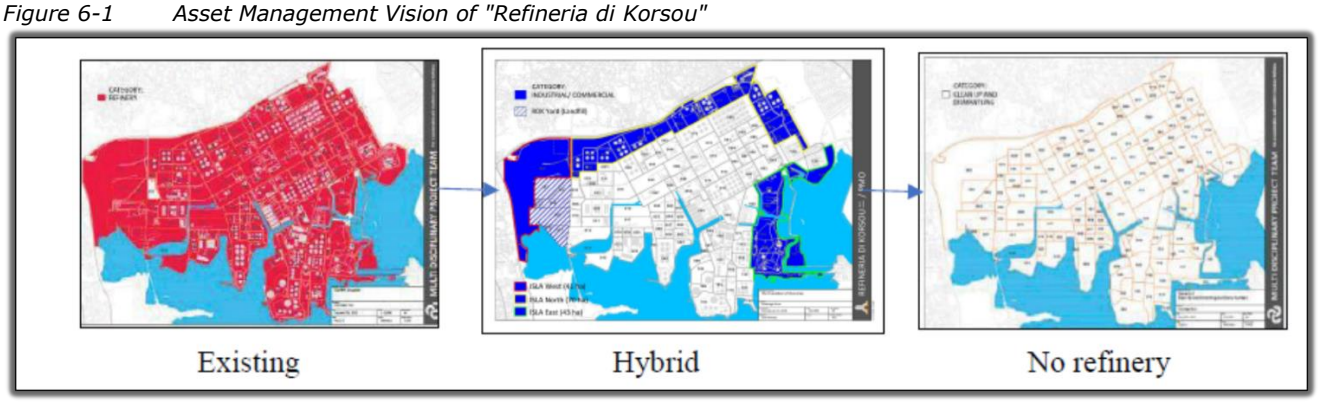
- Focus on the energy chain: production and distribution of energy; and
- Continue monitoring new developments and innovations in the field of renewable energy, such as hydrogen and algae parks.

6.3 ENERGY TRANSITION IN THE REFINERY SECTOR, CURAÇAO

Project outline

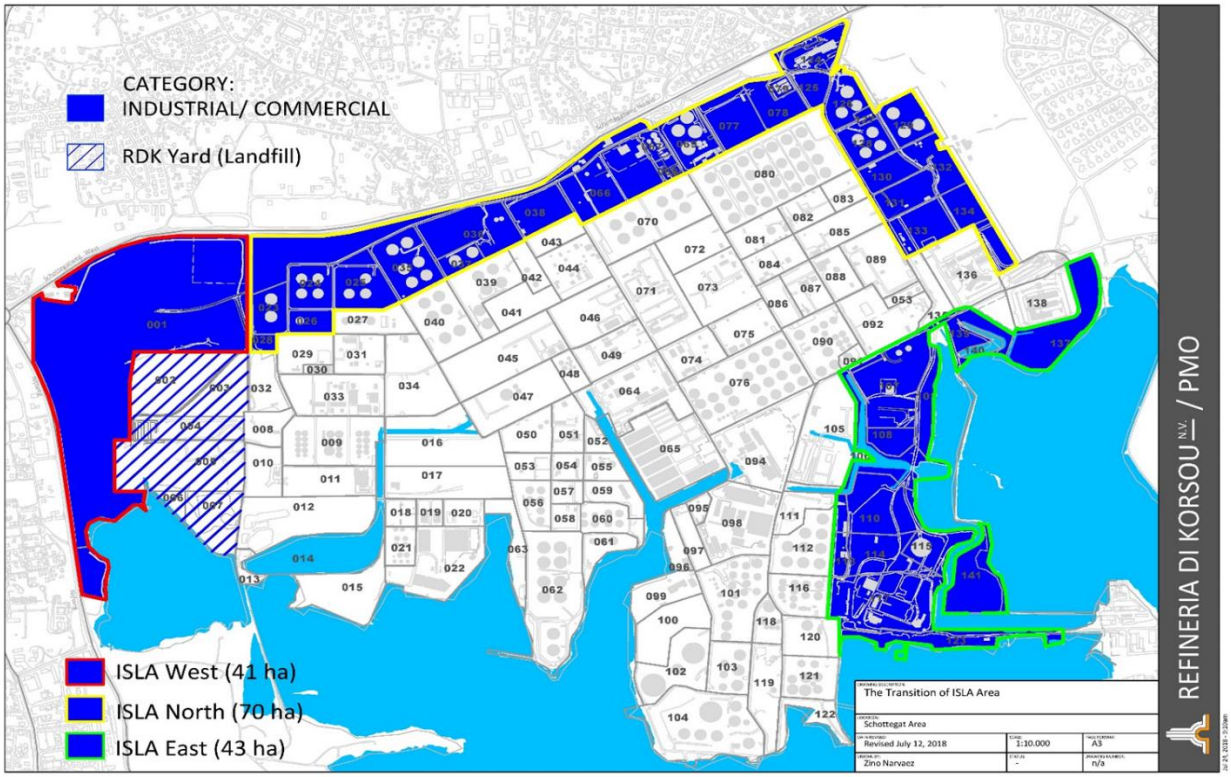
A new asset management vision has been developed in recent years by the "Refineria di Korsou" (RdK) which owns an oil refinery, a transhipment terminal and a utility production facility. Currently, there are ambitious plans to re-develop the areas of the refinery along sustainable energy and eco-industrial development terms. The plan is to initiate developments of substantial surface areas of adjacent lots with sustainable energy sources and corresponding research. The initial phase, with the refinery still operative, is called the hybrid stage. It is expected that the refinery's physical footprint will reduce in the future, allowing expansion of sustainable energy transition to include the entire island's energy demand. This is currently being studied in cooperation with TNO (Dutch research institute).

Figure 6-1 Asset Management Vision of "Refineria di Korsou"



Source: OCTA Sustainable energy workshop - Curaçao presentation

Figure 6-2 Asset Management Vision of RdK for the Hybrid version (Plan A)



Source: OCTA Sustainable energy workshop - Curaçao presentation

Figure 6-3 Possible sustainable developments within the Hybrid version (Plan A)

ISLA West	ISLA North	Schottegat Marina (Isla East)

› 85 Ha land
› Brownfield Development
› Eco-Industrial development
› Sustainable Energy
  › Solar Park
  › H2 industry
› Recycling
  › Plastic recycling companies
  › Steel scrap yards
› Soil Remediation
  › Composting
  › Bio soil Remediation
	› 70 Ha
	› Smart City
	› Creating a Business District on the North Side of the Area
	› Eco-Industrial Park
	› Start-ups, Incubators & Accelerators
	› Research Facilities
	› Testing Labs / Living Labs
		› Redevelopment of separated lots.
		› New governance structure
		› New Curaçao Fuel Terminal
		› Full scale introduction of **sustainable development**
		› Sustainable energy
		› Introduction of remediation and recovery

Source: COWI based on Curaçao presentation

Lessons learnt

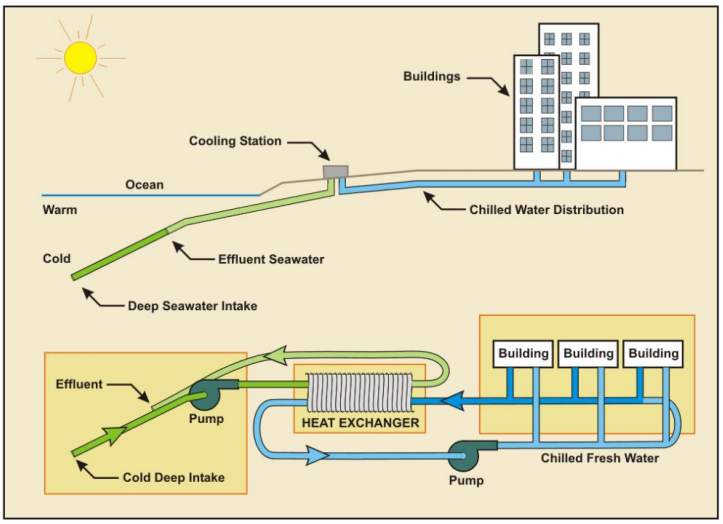
- Re-development of urban areas in sustainable and renewable terms contributes to the green transition; and
- A smart city is also considered to be developed, with a business district, an eco-industrial park, start-ups, incubators and accelerators, research facilities and testing labs. This could increase the economic growth.

6.4 SEA WATER AIR CONDITIONING (SWAC), FRENCH POLYNESIA

Project outline

As temperatures rise across the globe, the need for cooling grows. Air conditioners, together with many other cooling technologies, are essential to the health and well-being of populations for most OCTs, but they present a challenge from an emissions perspective. Most cooling technologies rely on refrigerants, which release hydrofluorocarbons (HFCs) – greenhouse gasses which can be 10,000 times more potent than CO_2.[19] in 2018, the European Union ratified the United Nation's Kigali Amendment, put in place to phase out HFC gasses.[20] Alternative cooling technologies already exists, and are being developed, one of which is the Sea Water Air Conditioning technology, pioneered, among others, by a project in French Polynesia. The concept of Sea Water Air Conditioning (SWAC) technology is to use deep cold seawater for the purpose of cooling buildings, as opposed to using other energy intensive systems (See).

Figure 6-4 Sea Water Air Conditioning principles



Source: Makai (2004)

[19] United Nations Environment Programme (2019), "Cool Coalition" comes together to save lives, energy and trillions for the global economy, https://www.unenvironment.org/news-and-stories/press-release/cool-coalition-comes-together-save-lives-energy-and-trillions-global

[20] European Commission (2018), EU ratifies Kigali Amendment to the Montreal Protocol, https://ec.europa.eu/clima/news/eu-ratifies-kigali-amendment-montreal-protocol_en

In tropical areas, for instance, where generation of electricity is mainly fossil-fuel based, the use of air conditioning makes up to 50% of the annual electricity bill leading to high energy costs per KWh (>30 FCP/kWh).[21] Thus, the use of SWAC technology can lead to up to 90% savings on the air conditioning bill, as well as in the reduction of fossil fuel dependence and of CO^2 emissions. French Polynesia is also the place where the first private SWAC was pioneered, as the project involved the construction of a 2 000-metre-long pipeline at 900-metre depth.

Conventional air conditioning (AC) consists of a 'chiller unit' regulating the temperature of a closed loop of cold water within a building. As the 'chiller unit' requires substantial energy and emits HFCs, the technology is not ideal from either an economic or environmental perspective. in short, the SWAC technology replaces the 'chiller unit' with a heat exchanger. The heat exchanger connects the closed loop of chilled water within a building, to cold water from the sea. Consequently, the cooling of water no longer relies on refrigerants emitting HFCs, and the energy demand from pumping the water from the sea and facilitating the heat exchanger, is substantially lower, than that of conventional AC cooling.[22]

Figure 6-5 Benefits and challenges to the application of SWAC system in OCTs

Benefits of SWAC	Challenges to SWAC
› Ideal for tropical, coastal areas (most OCTs) › Reliable, stable and renewable source of cooling › Reduces greenhouse gas emissions from cooling processes › Technology is mature › Reduces cooling system's electricity consumption of around 80-90% › Reduces fuel and water consumption in cooling systems › Cooling costs become independent of volatile energy and electricity prices › Reduces heat island phenomenon caused by conventional AC systems › Reduces the need of refrigerant gases (HFCs) › Potential secondary applications from seawater (aquaculture, desalination, agricultural use)	› The seawater outlet should be handled with care to minimize impact on coastal wildlife. › District cooling and buildings retrofit can demand high capital costs › Cavitation and pipe collapse resulting from water suction with the pump › Technology not yet primed for residential use (small scale) › Because each SWAC must be tailored to the specific site, the relevant parties must possess: 1) Detailed knowledge required for project design, such as seawater temperature depth profiles; 2) Detailed knowledge on SWAC cooling demand requirements (including daily and seasonal loading) and prediction of future cooling demand growth; 3) Skills to optimally design elements such as pipe diameter, length, seawater pump excavation, and thermal energy storage.

Source: Technical potential and cost estimates for seawater air conditioning[23]

Lessons learnt

› The SWAC technology plays a role in reducing the costs of energy up to 45% of the overall energy bill, reduces dependence on fossil fuels and reduces CO_2 emissions.

[21] CFP franc is pegged against the Euro as 1 CFP = 0.838 Euros

[22] Makai (2004), Seawater Air Conditioning: A Basic Understanding, http://www.makai.com/brochures/Seawater Air Conditioning by Makai.pdf

[23] Hunt, JD., Byers, E. & Sanchez, AS. (2019): "Technical potential and cost estimates for seawater air conditioning" in *Energy* vol. 166 p. 979-988.

6.5 STRATEGIC RE DEVELOPMENT AND EXPANSION OF HYDROPOWER, GREENLAND

Project Outline

In 2019 the Parliament of Greenland voted in favour of a decision of principle regarding the construction of two new hydropower plants. In the autumn of 2020, the Government of Greenland will put forth a formal proposal regarding construction, operation and financing of the coming hydropower plants. These plants will join the existing 5 hydropower plants already present on Greenland and will help push the RE share of the public energy supply. The coming hydropower plants will push the RE share in Greenland's electricity generation from 83,5% to 87,6%.

Greenland regards the two hydropower plants as one project, which is necessary from a financial perspective, as financial modelling indicate that one of the plants, on its own, would not be a viable economic investment. However, sharing resources between the two projects is what enables the construction of both hydropower plants, and is necessary, for Greenland to meet its RE targets.

Figure 6-6 Financial overview of two new hydropower plants combined as one project

Renewable energy project	Share of renewable energy in the areas Total energy consumption	Reduced usage of fossil fuels (million litres / 22 years ***)	CO_2 reduction (1000 tons / over 22 years **)	Total investment (million DKK / million €)	Net present value * (million DKK / million €)
Nuuk, expansion of hydropower	Ca. 99%	326	830	1 675/224	465/62
Qasigiannguit and Aasiaat, hydropower	Ca. 95%	219	568	1 345/180	-217/-29
Total project		545	1 398	3 020/404	284/33

Source: Greenland in presentation with QS questionnaire

* The net present value is calculated from a discount rate on 4% based on the Government of Greenland's guidelines in the preparation of socioeconomic impact assessments.

** The fuel savings are from a variety of fossil fuels.

*** The socioeconomic evaluation period is 22 years incl. the construction period of both hydropower plants.

The expansion of hydropower is closely connected to other strategic objectives in Greenland. Notably, Greenland is working towards attracting energy intensive industries to settle in Greenland, as the presence of industries can boost infrastructure development and diversify the private sector industries, which is a priority for Greenland. In turn, Greenland can provide cheap and reliable hydropower to energy intensive industries, for example data centres and metallurgy companies.

Lessons learnt

- Linking two or more initiatives/projects by sharing resources and pooling finances can help boost the economic viability of project who otherwise would be disregarded from an economic standpoint. This can be an approach suited to realize ambitious RE targets
- Regarding the abundant RE potentials as a resource, can expand the frame of RE development from being focused on providing RE to using RE to attract new industries and companies and spur other desired developments

6.6 ENERGY TRANSITION PLAN (STENC 2016 - 2030), NEW CALEDONIA

Project outline

The New Caledonia Energy Transition Plan 2016 - 2030 (STENC) was adopted in 2016, setting out three objectives:

- Reduction in the final energy consumption by an average of 25% by 2030 (except for mining and metallurgy activities);
- Development of RE sources in order to have autonomy in the public energy distribution by 2030; and
- Reduction in greenhouse gas emissions (transports, metallurgy and residential) by an average of 20% by 2030.

In 2017, the Government also agreed on the multi-year program for electricity generation investments. The island has clear energy autonomy targets on public distribution: to achieve a target of 84% of its overall energy autonomy by 2021 and 100% by 2023. Even though this is not including the mining and metallurgy activities, it is a good step in the right direction.

Figure 6-7 Multi-year programming of electricity generation investments, New Caledonia

Mode of renewable energy production	Authorized power 31/12/2015	Authorized supplementary power 01/01/2016			
		2020	2025	2030	Total
Hydroelectricity with restraint (dams)	68 MW	0 MW	44 MW	44 MW	112 MW
Run-of-the-river hydroelectricity (ROR)	9,4 MW	12 MW	18 MW	30 MW	39,4 MW
Wind	54 MW	0 MW	5 MW	15 MW	69 MW
Photovoltaics	22 MWc	37 MWc	37 MWc	37 MWc	59 MWc
Photovoltaics with storage	0 MWc	25 MWc	45 MWc	63 MWc	63 MWc
Biomass	0,3 MW	2 MW	3 MW	4 MW	4,3 MW
Total	153,7 MW	+ 76 MW	+ 76 MW	+ 41 MW	346,7 MW

Source: Clean Energy for EU Islands Secretariat (2019)[24]

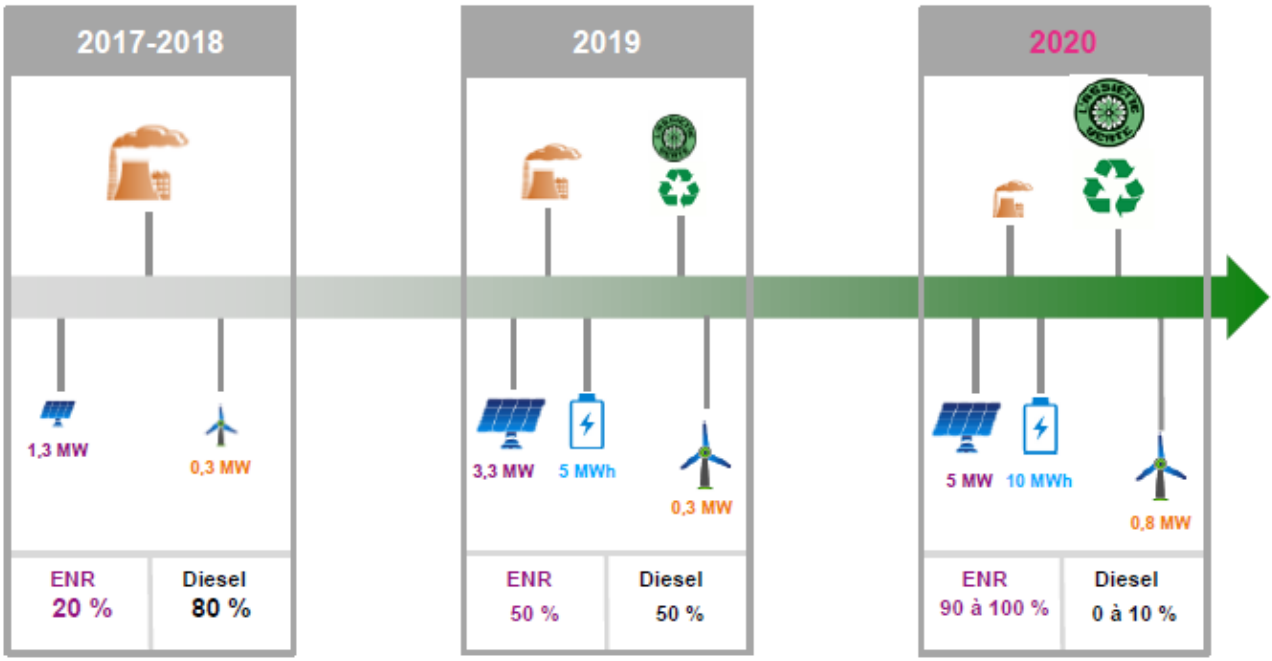
Since 2016, the Government decided to give a push to PV investment by setting out targets for the development of solar self-consumption, small urban PV production units, large PV farms and the development of energy autonomy on small and non-connected islands (i.e. on Lifou, Mare, Ouvea, Isle of Pines). As a result, 19 new large PV units and 1.970 small PV and self-consumption units have been authorised for a total of 103 MW and 19 MW, respectively. Therefore, the 2020 target for photovoltaic sector has been reached ahead of schedule, i.e. 2018 and energy autonomy target on public distribution is expected to be at 84% by 2021 (in view of the 100% by 2030 target).

Focus in Lifou Island

In 2018, RES covered 25% of the overall annual generation of electricity; however, in order to increase the share of renewables, the installation of storage became compulsory in order to store the excess of solar energy produced during the day time and release it in the evening when demand rises. Before the implementation of the storage system on the Island of Lifou as in Figure 6-8, there was a historic diesel plan with a mix of renewable energy made of solar and wind farms.

[24] Clean Energy for EU Islands Secretariat (2019), New Caledonia (France), https://www.euislands.eu/island/new-caledonia

Figure 6-8 Depiction of all 3 phases of the storage system installation project



Source: OCTA Sustainable energy workshop - Lifou Island presentation

Phase 2 of the project involved adding 2 MW of solar energy as well as the installation of 5 MW of storage facilities, whereas phase 3 involved the doubling of storage capacity and the addition of 2MW of solar and 2 new wind turbines. The EMS implemented alongside the installation of storage enables diesel generators on the island to be switched off when demand is fully covered by renewables without any risk to the stability of the network (also called grid-forming).

Lessons learnt

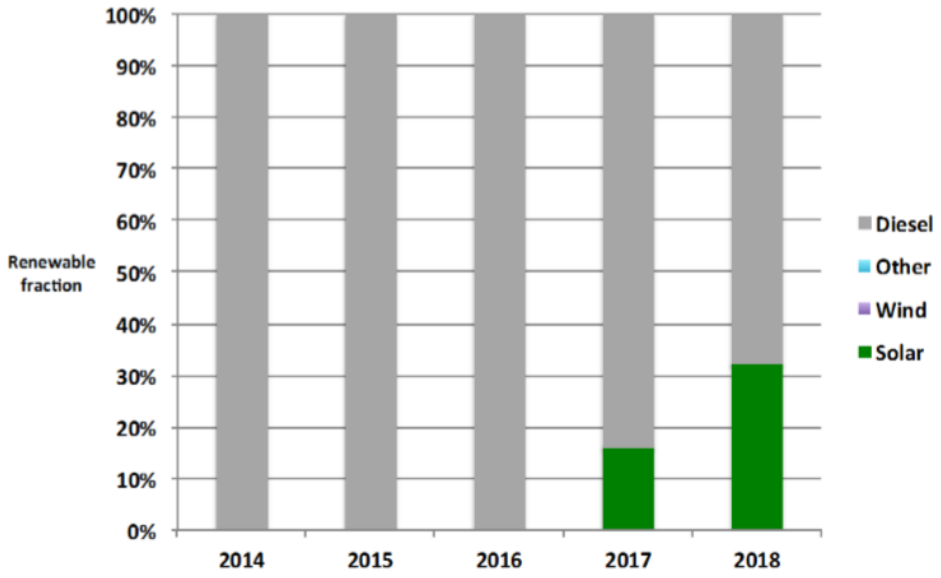
- The island of Lifou represents an example on how islands can implement projects to become 100% energy autonomous Lessons; and
- Favour local companies that have been involved in construction and operation activities, it promotes local partnerships with the local tribes and is an asset for the ecotourism of the island.

6.7 ENERGY POLICY 2020-2025, SABA

Project outline

The long-term vision of Saba is to rely solely on RE and, in this respect, they have taken several steps. Most significant has been the modernization and relocation of their diesel power plant, which resulted in a 15% reduction of fuel consumption, and the installation of 2 MW solar power. In addition, a new energy management system (EMS) has been installed and has been linked with fiber optic cables between the solar parks at the airport and the power plant / battery storage at the harbor. These actions have led to a 40% increase in the amount of RE production, exceeding initial projections as per Figure 6-9 below. With the battery storage system in place, the utility can now switch off all diesel generators for up to ten hours on sunny days and supply electricity from solar energy to the island's population.

Figure 6-9 Planned increase of renewables in Saba



Source: https://zoek.officielebekendmakingen.nl/blg-776649.pdf

The takeaways from implementing an energy strategy on a small island, such as Saba, could be summarized as follows: Acknowledge the limited appetite for change and take one step at a time; use only mature technologies as well as a reliable / independent supervising company for installing the new technologies; and last but not least, conduct on-going training of staff, i.e. before, during and after installing new technologies.

Lessons learnt

- Adopt "baby steps", i.e. an incremental, smart approach;
- Use mature technologies on smaller islands;
- Use reliable / independent supervising company for installing new technologies; and
- Train existing energy company staff before, during and after installing new technologies.

6.8 PHOTOVOLTAICS ON RECYCLING CENTER ROOFTOP, SAINT BARTHÉLEMY

Project outline

Saint Barthélemy faces a difficult challenge in their RE transition, as the islands is small – only around 25 km^2, there are protected areas, and generally, the topography is unsuited for energy development projects. Consequently, it is prohibited to clear land and trees to construct solar photovoltaics and windmills. To overcome these barriers, a study was carried out, examining the feasibility of installing solar photovoltaics on the rooftop of Saint Barthélemy's recycling center. Following the completion of the study, the project moved into the development phase and the construction of these photovoltaics is now soon to begin. It is estimated that they will have an energy capacity of 500 kW and they will contribute to diversifying the island's energy mix.

The initiative to install 3,500 m^2 of photovoltaic panels on the site's roof contributes to the island's energy transition, as its magnitude will results in a positive impact on the supply of RE to the island's habitants. It is noteworthy that the project is feasible due to the construction of a recycling center, constructed a few years ago. Among other things, the facility recycles all the island's waste - industrial and household - and thus gives them a second life in a logic of circular economy. Utilizing the rooftop of the recycling center as a site for RE thus shows, that two recurring island challenges (waste management and energy production), has been addressed through linking two different sustainable development objectives.[25]

The takeaways from this project are twofold. Firstly, the process of using studies as knowledge generators from which RE and EE projects has proven useful and shows potential as a general approach to get RE projects of the ground. Another study is now underway, examining heat recovery technology whether it is feasible in the new incineration plant. Secondly, the project showcases how traditional planning must think alternatively, in order to overcome barriers common for smaller islands such as limited space and unsuited topography. Therefore, there is need to think alternatively in the spatial planning of RE projects.

Lessons learnt

- Use studies as means to build knowledge and use knowledge to create concrete projects
- Alternative planning to circumvent spatial planning challenges
- Utilize local expertise (in this case local expertise within solar photovoltaics)

[25] Dalkia, Economie circulaire : Saint-Barthélemy et Dalkia Wastenergy inaugurent le nouveau Site de propreté https://www.dalkia.fr/fr/espace-presse/communique-de-presse/economie-circulaire-saint-barthelemy-et-dalkia-wastenergy

6.9 SOLAR ENERGY INTEGRATION, ST. EUSTATIUS, STUCO

Project outline

Up until March 2016, the power supply on the island had been fully based on diesel gensets. However, since the introduction of PV power and battery storage technology, St. Eustatius Electric Utility (STUCO) – the local utility company – reduced its fossil fuel consumption by 30%. The addition of battery inverters with grid-forming characteristics also allowed diesel generators to be switched off automatically without putting at risk the stability of the frequency in the grid. As a result, at the 2017 Caribbean Renewable Energy Forum (CREF), STUCO was the award winner of the **Best Storage Project** for its PV-Hybrid and Energy Storage system Phase 1&2 project.

Additionally, they have lowered the solar panel angle from 15 degrees to 5 degrees with minimal loss of solar energy, however by so doing we have been able to install subsequent rows of panels closer to each other, whereby the efficiency of the property was significantly increased and as such we can install more panels on the same piece of property as originally planned, and most importantly we have been able to raise the hurricane withstand capacity of the solar park from a category 4 to a minimal category 5, as reassessed by the supplier of the solar park

Lessons learnt

- Take efforts in integrating solar energy in the energy system;
- Out of the box thinking may lead to higher efficiency;
- The projects undertaken show the feasibility of solar energy technologies and can serve to encourage other OCTs to exploit this type of energy source;
- Financing remains a difficulty, financial support from EU and member states is still needed; and
- OCTs need to adopt ambitious energy policies.

6.10 EDF CARIBBEAN PROGRAMME ON SUSTAINABLE ENERGY, SINT MAARTEN

Project outline

In 2018, the Government of Sint Maarten signed a letter of commitment for the purpose of conducting pre-feasibility studies in the context of the Leeward Islands Geothermal and Digital Interconnection Hub initiative. Depending on the outcome of the studies, more formal commitments on the part of Sint Maarten Government may take place. The envisioned project would be split into two. The first part refers to an energy part involving the use of geothermal resources for the purpose of electricity generation and transmission through an interconnector that would link all Leeward Islands.

The second part would involve the digital interconnection of the islands through optical fiber installed alongside the electricity one.

The private sector has also become involved in supporting the energy transition on the island. The island has undertaken upgrades to improve the resiliency of its grid system and evaluates the potential of RE. For instance, since 2015, one beach resort started using solar installations that eventually allowed it to cover its demand for up to eight hours during peak times. In the future, micro grids for schools and government buildings could be installed. A system of floating solar panels in the Great Salt Pond is also being considered. There are also plans to reduce the carbon footprint of the harbour by connecting cruise ships to a high voltage grid. The high-tension cables have already been installed.

Lessons learnt

- Given that the island of St. Maarten is in the tropical hurricane belt, it is necessary that infrastructure is resilient and resistant to this type of extreme weather events in order to avoid loss of power installations;
- Insurance coverage is also mandatory. Implementation costs remain high, given that land is expensive; and
- Always think ahead in terms of future possibilities.

6.11 INSTALLATION PHOTOVOLTAIC SYSTEM, TROMELIN ISLAND, FRENCH SOUTHERN AND ANTARCTIC LANDS

Project outline

In November 2017, the first PV power plant was inaugurated on the Tromelin island, part of the French Southern and Antarctic Lands. The power plant consists of 24 photovoltaic panels and provides energy storage through robust batteries (BAE Secura solar batteries). The PV system was launched in partnership with the ADEME, who further co-financed the project, as a clear initiative towards RE. The power plant also replaces the fossil fuel generators that were previously used to supply electricity for the whole island. Previous initiatives towards RE development were conducted but appeared not to be successful (e.g. the installation of wind turbines).

After stock-taking of different areas in TAAF, the government decided to start the deployment of RE on the Tromelin island, considering it has various advantages:

- Low energy consumption (6 KW);
- Technical capacity thanks to the permanent presence of three staff;
- Group of generators that reached the end of their useful life;
- Relatively easily accessible; and
- A generally lower technical and financial risk, that can be supported with the island's capacities.

The TAAF also collaborated with different stakeholders to transport the technicians and the relevant materials for the PV system installations on the island. It mobilised exceptional logistical resources such as the Marion-Dufresne vessel, a research and supply vessel providing logistics support to the islands, conducted a partnership with the Air Forces from the South Ocean area Indian and benefited from the use of a military aircraft, the Casa CN235.

Lessons learnt

- Conduct a feasibility and risk assessment to reduce challenges that were noted in e.g. the installation of the PV system and its maintenance, due to the remoteness and extreme weather conditions; and
- The projects undertaken show the feasibility of solar energy technologies and can serve to encourage other OCTs to exploit this type of energy source.

7 CONCLUSIONS AND RECOMMENDATIONS

The purpose of this chapter is to synthesise the results of the study, by providing clear-cut conclusions and recommendations for the progress of the OCTs in their transition towards sustainable energy. The conclusions and recommendations of this chapter are based on the findings from the questionnaires, supported by additional analysis of the provided extra information by the OCTs, complemented by desk research where needed. The first Chapter 7.1 provides an overview of the key findings and recommendations, presented per OCT clusters (Section 7.1.1), the seven elements as presented in the OCTs questionnaire (See Table 2-1) (Section 7.1.2), and the Sustainable Energy Roadmap (7.1.3). Conclusions are presented in Chapter 7.2.

7.1 FINDINGS AND RECOMMENDATIONS

7.1.1 OCT CLUSTERS

As presented in Chapter 4.1, the study distinguishes different types of OCTs and has divided these into the four clusters (i.e. OCTs identified as RE champions; OCTs in transition; OCTs with a need for action; and, OCTs with a need to address fundamental issues). The clustering follows a similar methodology as was performed in the QS from 2016 and hence, allows for data comparability. For each cluster, different findings were noted, and recommendations apply.

Cluster 1: RE champions

These OCTs have a share of RE of more than 25% and with a QS scoring result over 2/3 of the maximum overall score. There are in total **8 RE champions** for the current study (compared to five as reported in the 2016 study).

Recommendations:

- Whereas the RE champions currently have a RE share of more than 25%, it is recommended to continue their development, by reaching for a higher target of RE. This will also allow the RE champions not to lose this positioning and will set higher standards for the other OCTs, by showing a good example and best practice. Moreover, this will enable OCT to better align with global emission reduction targets in light of the global Climate Change debate;
- RE champions should also further assess their current measures towards RE transition and develop more advanced measures. This can be done through exchanges with other RE champions in discussions on bottlenecks, best practices, potential collaborations, etc.;
- RE champions should integrate RE development into other government and development objectives, for example regarding RE as a resource that can attract new industries, create local employment, be used in promotion of tourism; and
- The importance of continued development should not be underestimated. On the one hand, it is key to establish a permanent mentoring system or partner programme in order to benefit from experience and know-how from RE champions or In Transition OCTs that have similar conditions. On the other hand, achieving the position of an 'RE champion' should not be considered as the final stage in the path towards a sustainable RE transition. To illustrate: the Falklands are identified as RE champions thanks to their previous efforts and have defined an RE target of 31%. Nevertheless, taking into account that the RE targets across OCTs will gradually increase, the Falkland's 31% target will eventually become a low standard, and if no substantial efforts are undertaken, it may be that the position of a RE champion will no longer be applicable.

Cluster 2: OCTs in transition

These OCTs have a medium share of RE (10-20%) and have a QS scoring result defined as 'very good', (more than 2/3 of the maximum overall score). There are in total **2 OCTs in transition** for the current study (compared to 1 as reported in the 2016 study).

Recommendations:

- The OCTs in transition should benefit from the knowledge and expertise of the RE champions. These OCTs were previously in a similar situation and were able to define measures to better integrate RE. By leveraging this knowledge, OCTs in transition will be able to understand their challenges, gaps, and could further receive support (e.g. financial, human resources, etc.) from the RE champions to overcome this; and
- OCTs in transition are typically engaged in collaboration with international organisations who contribute with expertise on concrete projects. The OCTs should use this as a chance to retain relevant knowledge, so it does not leave with the experts. For example, several OCTs have had great success with receiving technical and legal help in developing tenders. This process could be used to create familiarity with such a process and is an opportune time to establish processes for further tenders.

Cluster 3: OCTs with a need for action

These OCTs have a low to inexistent share of RE (below 5%) but have a QS scoring result defined as 'good to very good' (more than 2/3 of the maximum overall score). There are in total **6 OCTs with need for action** for the current study (compared to six as reported in the 2016 study).

Recommendations:

- Similar recommendations can be provided as highlighted above. The OCTs with a need for action should benefit from the experiences of other OCTs that used to be in a similar position. By following successful examples, through exchanges and potential partnerships, it will allow them to implement measures and increase their share of RE;
- OCTs with a need for action should also define long-term strategies. First, the focus should be on establishing an institutional framework and basic policy instruments. Once these are developed, they should focus on actions and implementing these instruments and targets; and
- The importance of continued development should not be underestimated. It is key to establish a permanent monitoring system or partner programme in order to benefit from experience and know-how from RE champions or In Transition OCTs that have similar conditions.

Cluster 4: OCTs with a need to address issues

These OCTs have a low to inexistent share of RE (below 1%) and have a QS scoring overall results that is below the remaining OCTs (less than 2/3 of the maximum overall score). There are in total **3 OCTs with need to address fundamental issues** for the current study (compared to seven as reported in the 2016 study).

Recommendations:

- It is key to develop and appropriately implement a strong institutional framework. Once a strong framework is developed, it will allow for opportunities to invest in RE, which may ultimately result in an increase of the RE share within the OCT; and
- It is further important to identify bottlenecks and understand what is preventing RE development;

7.1.2 SEVEN ELEMENTS

Chapter 4 (Results) and its sub-sections (Sections 4.2 – 4.7) presented the six elements part of the questionnaire (institutional framework, knowledge base, transition planning, project financing, project deployment, and capacity building).

The current section provides an overview of the key findings and recommendations, as presented for each of the seven elements.

Element 1: Institutional Framework

For some OCTs, the progress towards RE development has mainly been hindered by **a lack of an underlying institutional framework.** Moreover, the (potential) impacts of natural disasters have also limited the progress towards a sustainable energy transition (e.g. hurricane Irma). For some OCTs, this resulted into a halt of their RE development and in a drop in RE share for others.

Some OCTs however showed examples of how to deal with such issues. Sint Maarten, for example, is an appropriate illustration of how to try and overcome this, considering that the island has been actively looking for financial means and sources of funding for RE and sustainable energy projects and technical assistance (e.g. for development of policy and legislative frameworks and energy efficiency schemes).

Recommendations:

- Develop an appropriate institutional framework towards RE development, including the set-up of a detailed energy transition plan with specific targets, an RE transition roadmap, and strategic objectives. While doing this, the OCTs should move to binding targets at the earliest stage as possible;
- Benefit from previous and new partnerships and exchanges with other OCTs. In that perspective, OCTs may seek external support from RE champions or other OCTs that were successful in setting up strong frameworks. Such support will allow to adopt a targeted framework, be efficient in the process, while keeping track of resources; and
- Adjust the institutional framework to be more pragmatic, with a clear view on how to implement the measures.

Element 2: Knowledge base

Where some OCTs have a very strong knowledge base, it was noted that some others are lagging behind. This is for example due to the small number of inhabitants of OCTs, or their isolated position. Having limitations with establishing a sufficient knowledge base has been acknowledged by all OCTs. In general, the findings of the questionnaires and stakeholder consultation activities showed that there is a high motivation for corporation between OCTs, and at the international level, in order to strengthen their knowledge base. The stakeholder consultation with Greenland showed that this OCT strongly benefits from a strong connection with Danish universities. They reported a strong willingness to contribute to knowledge sharing with other OCTs in relation to their experiences with green energy transitions. New Caledonia, on the other hand, suggested that the OCT partnerships (intra-partnerships, such as the INTEGRE project) should be further developed. For example, in the Pacific zone, enhanced cooperation should be improved, not only between French-speaking OCTs, but also with other territories. New Caledonia has shown already its commitment and strong action in favour of the deployment of RE since 2017 and will make itself available to OCTA to play a leadership role in the Pacific zone if necessary.

Recommendations:

- Develop a reliable knowledge base for RE deployment. As part of this knowledge base, it is important to establish energy data collection capacities, to develop appropriate energy efficiency plans and to ensure availability and transparency of all data relevant for the energy systems; and

- Progressively facilitate different forms of investments. For each funding effort, a sound assessment of the potential for RE should be conducted through dedicated studies. Also, identify which funding programs the OCT can be eligible for, in order to perform such in-depth studies.

Element 3: Transition Planning

The stakeholder consultations showed that the utility companies play a crucial role in the development of RE as the planning of future development is often anchored in the OCTs' respective utility companies. For example, in Saint Helena, Ascension and Tristan de Cunha, utility provider Connect ltd. is responsible for the implementation aspects of RE development, while the government is only responsible for political oversight.

Furthermore, other challenges related to spatial planning for the transition planning were noted. Several OCTs indicated that they face challenges in the due to factors such as unsuited topography, limited available space and protected areas. For example, in Saint Barthélemy, it is prohibited to clear land for the purposes of installing solar photovoltaics.

Recommendations:

- Maintain an updated available list of all ongoing RE projects;
- Collaborate more closely with utility companies to further deploy RE to drive the planning. In doing that, it is recommended to have a clear responsible entity in place that can drive the planning process with the utility companies; and
- Assess where feasible the current restrictions, such as having limited available space and land restrictions, and how this impacts the transition towards RE. Clear solutions should be defined to reduce the impact of these restrictions.

Element 4: Project Financing

Lack of financing and/or difficulties in accessing international funding programs or granting public funding for private sector are a significant barrier for many OCTs. For example, Montserrat is faced with challenges associated with access to finance for RES and EE projects, as well as has gaps in the capacity and institutional framework. For Sint Eustatius, financing is and remains the most critical challenge/hurdle in realizing its RE targets/objectives.

In addition, OCT's that are already on track expressed the need for more cooperation. Despite taking significant steps towards generating electricity from RE, Aruba reckoned that there is potential in several territories pooling resources in order to seek access to climate finance funds. New Caledonia showed high hopes that OCTA could strengthen its action with the OCTs by facilitating the access to European funding, via aid as well as through cooperation with the European Investment Bank. This is essential and will allow to contribute to the accelerated deployment of RE, especially in fields such as the production of RE (electro-mobility, network management, etc.). It would also be interesting for OCTA to be able to support territories in setting up international co-financing mechanisms through the use of possible green funds with which the EU is today associated.

Recommendations:

- Progressively facilitate different forms of investments and in specific, open the market for private investments that may resolve issues with limited access to funding programs;
- Leverage on international support programmes for creating markets and attract investors. There is a general high need for collaborations between partners with expertise in the field of RE and for OCTs to have a facilitated access to European funding and a dedicated cooperation with other EU and international organisations;
- Ensure access to expertise to translate the energy policy into an action document;
- The training of political decision-makers should also be envisaged. There is also a need for to be informed about calls for projects, to have a better view on potential sources for EU funding, and to receive further assistance for the submission of such projects; and
- Provide capacity building for project financing and share and learn from success stories.

Element 5: Project Deployment

Similarly to the 2016 report, the results indicate that establishing a framework for project deployment is a prerequisite for facilitating RE development and that defining practical framework conditions for RE deployment are essential for a successful implementation of RE policies.

Recommendations:

- Identify clear roles and responsibilities for the development and deployment of RE projects. It is recommended to define this for each kind of process such as regulatory processes ranging from authorisations, administrative processes, but also for the actual implementation processes of the projects.

Element 6: Capacity Building

The results indicate that particularly well-developed capacity building efforts increase the likelihood of a RE share above 10%. While the trend is also partly noticeable in the other elements, it is especially indicated here, that the size of populations plays a role in the OCTs' readiness. Here, the five OCTs (see chapter 4.7) with a population over 50.000 are all ranked in the top-6 on the QS score (with a notable exception in Saint Helena, Ascension and Tristan da Cunha). It appears that the increased capacity on the islands with a population over 50.000 is due to:

- More well-developed utility companies with on-island skills and competencies; and
- A greater presence of RE companies outside the utility companies.

Recommendations:

- Ensure to customise capacity building initiatives according to the characteristics of each OCT. As noted, this may be different for OCTs with a larger size of population as compared to others. Capacity building should be appropriately defined in the policy framework, project deployment and project management processes, technical processes, etc.; and
- OCTs with a larger size of population should further attract utility companies and programme funding to further establish RE projects. They can provide support to the other OCTs in their process towards RE transition.

Element 7: regional and international co-operation

This element was not discussed earlier in this report, but looking at the received information, climate finance is a related area where OCT-collaboration can be of value. Whereas affordable finance is a catalyst for the clean energy transition, it is not easy for remote OCTs to clearly oversee all available funding options, their criteria and their application procedures. OCTA could facilitate in this area (e.g. through a climate finance workshop for OCT's). Moreover, adhering to the 1.5°C Global Warming target would place OCTs in a more favourable position to jointly seek access to climate finance funds and to remove administrative barriers.

Recommendations:

- OCTA to further verify how regional and international cooperation could be facilitated across the OCTs. They could amongst others organise capacity building visits between partner islands to identify accessible resources and how they could collaborate together; and
- Identify relevant cooperation programs and networks forums to share experiences, success stories, obstacles and pitfalls.

7.1.3 SUSTAINABLE ENERGY ROADMAP

In Chapter 5, we have presented the progress of OCTs with regards to the five priority areas that are part of the Sustainable Energy Roadmap. This roadmap was adopted at the first Summit of OCTs Energy Ministers in Brussels and aims at facilitating the path towards lowering fossil fuel dependency and towards increasing energy efficiencies in OCTs.

The current Section elaborates further on the progress of OCTs on this Sustainable Energy Roadmap and presents key findings and recommendations categorised for each of the five priority areas.

Priority area 1: Specific networking and collaboration

Chapter 5.1 presented the key findings of this first priority area. Of those OCTs that provided input in relation to their specific networking and collaboration, it was noted that **12 out of 22 OCTs are on track**, **whereas only 3 out of 22 OCTs are indicated not to be on track**. The latter mainly referred to limitations in collaboration activities or the fact that no dedicated monitoring of collaboration activities was performed, which makes it difficult to assess its success. Our general recommendation for this priority area is therefore to continue and to further elaborate on specific networking and collaboration is for the OCTs, and in particular, to focus on the identification of relevant cooperation programmes, initiatives, opportunities and network forums, where they can share examples, experiences, lessons learnt, challenges and other obstacles. Most importantly, it can be the platform to learn from one another and to see where collaborations can be set up.

In recent years the inter-linkage between RE and climate change has become increasingly stronger. For example, Aruba very much welcomes collaboration initiatives such as the joint OCTA Sustainable Energy Roadmap. A more targeted recommendation is therefore to **better / more strongly incorporate the notion of climate change and the UN 1.5°C Global Warming Goal**[26] in the upcoming update of the OCTA Sustainable Energy Roadmap. It was noted that Greenland is quite far ahead in their transition to RE as compared to most other OCTs. One reason for this is the Government of Greenland's ambitious Sector Plan for Energy and Water Supply from 2017. The Government of Greenland actively promotes the energy transition and the public utility company Nukissiorfiit has been collecting data on renewable energy potentials in Greenland for several years.

[26] United Nations (UN) Intergovernmental Panel on Climate Change (IPCC) (2018), Global Warming of 1.5°C, https://www.ipcc.ch/sr15/

Nukissiorfiit has a collaboration with the Technical University of Denmark regarding land development in a test site for two 25kW wind turbines. They also participated in ARENA with knowledge sharing and mutual education as primary targets. Other participants were minor energy companies in Alaska, Arctic Canada and Iceland. Greenland is currently planning to participate in ARENA II. This might also be relevant for other OCTs.

Priority area 2: Energy efficiency

Chapter 5.2 showed that **11 out of 22 OCTs are on track**, **and that 6 out of 22 OCTs are not on track towards sustainable energy efficiency**. Most OCTs demonstrated to have put already some actions in place towards the development of energy efficiency. This was either done through technical solutions, or via the implementation of regulation and the set-up of standards. Some OCTs reported that measures towards energy efficiency are foreseen, or that measures were adopted, but these were not expanded enough, which limits their level of achievement towards appropriate energy efficiencies.

The level of maturity of the OCTs towards energy efficiencies is quite widespread, which gives room for improvement for the majority of the OCTs. In specific, actions should be undertaken by the OCTs to further define measures at the regional level to support energy efficiency (covering the industry, buildings, services, products, etc.). An appropriate policy framework should therefore be adopted towards that end. Further to that, a monitoring system should be defined that regularly assesses the share of RE and the impact on energy efficiency of the implemented measures.

Priority area 3: Buildings and transports

Chapter 5.3 showed that **11 out of 22 OCTs are on track in relation to this third priority area**, **and that 5 out of 22 OCTs are not on track**. Actions in this priority area are diverse and included mainly initiatives to facilitate the electrification of the transport sector. Reported initiatives were amongst others to lower import taxes on electric vehicles, specific transportation plans to allow electric buses and bicycle paths on the islands, the establishment of an eco-mobility chapter, etc. In general, most of the actions that are being implemented can be divided into tax measures, technological solutions, and policy development. Nevertheless, there is still room for improvement as a few islands have not yet adopted any of such measures since 2015.

To facilitate initiatives towards an increased sustainability in buildings and the transport sector, it is recommended to include such objectives in a dedicated institutional framework. A deep-dive analysis should be performed by the relevant OCTs to understand what measures can be adopted (i.e. what is feasible with the current financial and human resources and support). Also, international cooperation and institutional capacity building can support this priority.

Priority area 4: Business

The findings of the fourth priority area are described in Chapter 5.4. It was noted that **13 out of 22 OCTs are on track in relation to this third priority area**, **and that 3 out of 22 OCTs are not on track**. In the private sector, the OCTs generally showed to be quite active. Progress was noted in relation to the number of investments, the received tax incentives / tariffs and in the number of initiatives to create general awareness to business and the population. Also, several OCTs reported to have conducted studies to raise awareness on sustainability, energy efficiency and other key areas relevant for this study. These initiatives were however not always due to an active policy from the public authority.

Therefore, it is recommended for the OCTs to integrate such initiatives in more active policies led by their respective authority (i.e. institutional framework). To raise further awareness, studies could be further conducted, and as described for the first priority area, OCTs should continue to elaborate on specific networking and collaborations, which may allow businesses to further flourish on their islands. To keep businesses active and increase further investments, it is recommended for the OCTs to provide, where feasible, incentives such as tax incentives for equipment, or local tax exemptions to businesses that adopt measures towards energy efficiency and RE.

Priority area 5: Legal

The findings of the last priority area are highlighted in Chapter 5.5. It was noted that **6 out of 22 OCTs are on track**, **and that 11 out of 22 OCTs are not on track**. The progress on the legal aspect is as such quite scarce. There are a few OCTs who have set up a legal framework or introduced a multi-annual energy programme, however, this priority area is by far the least developed.

Considering the legal framework were reported not to be well-established yet across the OCTs, it is strongly recommended to take measures towards the establishment of an enabling legal and regulatory framework that could support higher uptakes of RE generation. This can be done as part of the institutional framework, but, is also an important factor to be considered while actively seeking accessible international cooperation to support such policy development and institutional capacity building.

7.2 CONCLUSIONS

This Final Report on the 'Progress of OCTs on their transition to sustainable energy' aimed at presenting the results from the stakeholder consultations conducted with 22 OCTs over the course of 2019 – 2020. In particular, data has been collected from a dedicated QuickScan questionnaire and supplemented by additional exchanges with the local energy experts via separate communications (i.e. e-mail, phone exchanges).

The Report presented **findings in relation to the status of OCTs transition towards RE**, focusing mainly on the relevant policy frameworks and efforts in the fields of knowledge base, transition planning, project financing, project development and capacity building. On the basis of the findings, recommendations were produced with a view to further facilitating the implementation of the Sustainable Energy Roadmap and measuring the OCTs progress.

The overall study results demonstrated that:

- An institutional framework is useful for RE deployment and in particular requires the OCTs to set-up an energy transition plan with specific targets, a RE transition roadmap, and strategic objectives with binding targets. It was noted however that the institutional framework can only be truly successful when it not only focuses on the policies, but focuses on pragmatic ways to implement the defined measures;

- A reliable knowledge base is an important pre-requisite for the transition towards RE. Hence, the benefits of such knowledge base can only be fully exploited when there are sufficient data collection and analysis capacities, while ensuring availability and transparency of the data. In most cases, OCTs are already conducting relevant studies in the field of RE and EE towards that end;

- Local utility firms play a key role in transition planning. Coordination mechanisms should be set up between the government and the local utility firms;

- Some OCTs reported to have difficulties in relation to financing international programs, or obtaining public funding for the private sectors, which limits the further development of RE projects. OCTs should therefore progressively facilitate different forms of investments and favour private investments as a way to increase their shares of RE. In most cases, where OCTs were granted private investments, a higher share of RE was noted. The positive impacts from involving utility in RE projects, through for example PPPs, could therefore be further looked into;

- OCTs also visibly benefit from previous and new partnerships and exchanges with other OCTs. Targeted capacity building seemed to play a key role in the successful transition towards RE and was noted to have a positive impact on knowledge-creation and the long-term sustainability of the RE projects. Moreover, most OCTs stressed the importance of capacity building and expressed the need for support in this area from OCTA (on both policy and technical matters);

- OCTs further stressed the need to have appropriate conditions to deploy RE projects, and that these are essential for its success (e.g. may avoid project delays, and may help to remove administrative burdens);

- A positive correlation was found between the population size of the OCT and the level of development of the element, being, the larger the population of the OCT, the more developed the elements were. For example, the highest shares for RE were noted in for example in Greenland, Curaçao, French Polynesia, and Aruba. All islands with a larger population size. This is potentially due to the fact that these islands can benefit from economies of scale, may attract more investments and have wider capacities in terms of their knowledge base and general technical local capacities.

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APPENDIX A: QUESTIONNAIRE TEMPLATE

Section 1: Key electricity system data

1	**Peak demand (MW):** If there are multiple islands or isolated generation systems please list the peak demand for each system.
2	**Electricity generation cost (EUR/kWh):** If there are multiple islands or isolated generation systems please list the generation cost for each system
3	**Total installed electrical generation capacity (MW**): Please include a breakdown that lists the capacity for all technologies in use, e.g. diesel generators, steam turbines (please specify fuel used), gas turbines (please specify fuel used), solar PV, wind, biomass (please specify feedstock and technology), geothermal, hydro, ocean, etc.
4	**Annual generation (MWh/year):** Please include a breakdown that lists the annual generation of all technologies listed in the previous question on total installed capacity.

Section 2: Detailed questions on the 7 elements

Since the aim of this section is to perform an analysis of the progress made since the last Lighthouse Quickscan analysis of 2016, please provide answers to the questions with measures taken as of 2016.

Element 1 – Institutional Framework

1.1	Is there government leadership and political support for a Renewable Energy (RE) transition?
1.2	Is there a recent national energy policy the clearly promotes RE?
1.3	Are there official RE targets defined in legislation? For which sectors (total energy, electricity generation, transportation, etc.)

1.4	Is there an official energy roadmap or detailed plan for RE deployment including clear definition of roles and responsibilities?
1.5	Have quality standards for RE technologies been officially adopted?
1.6	Is there an independent energy regulator to oversee the electricity sector?
1.7	Is there grid access and attractive rates of return allowing for IPPs and residential or commercial customers to invest in RE?
1.8	Does the electricity price (not the retail tariff) take into account the variation in generation costs from different generation technologies at different times of the day and year?
1.9	Does the current tariff structure allow for savings in generation cost from RE to be passed on to customers, and how? Was there a dedicated tariff study to assess this?
1.10	Are there incentives (financial or not) dedicated to facilitate RE investment?
1.11	Are there subsidies in place for fossil fuels (incl. for electricity from fossil fuels)?
1.12	Are there clearly defined procedures to develop RE projects? If yes, what is the average time and cost for permitting?

Element 2 – Knowledge Base

2.1	Are renewable resource assessments available (hydro, geothermal, wind, solar, biomass, ocean)?
2.2	Are energy balances available and updated at least yearly?

2.3	Are regularly updated data available on the reliability and performance of current generation and grid assets incl. distributed, off-grid and RE generation?
2.4	Is a forecast of demand growth available and updated at least yearly (national, per island, per sector, etc.)?
2.5	Is relevant data easily accessible and shared between key agencies and RE stakeholders?
2.6	Is there in-country experience with design, installation, procurement or use of RE technologies? Which technologies, who has the experience?
2.7	Has the potential for energy efficiency improvement been assessed for both supply and demand-side (e.g. through benchmarking)?
2.8	Has the potential for non-electric RE been assessed (e.g. for cooling, heating, cooking, manufacturing, desalination, transportation, etc.)?

Element 3 – Planning

3.1	Is there a dedicated office with responsibility for a comprehensive energy planning process that incorporates RE?
3.2	Is there a list of RE projects (completed, ongoing, planned and potential), and an understanding of how much they contribute to meeting official RE targets?
3.3	Are there any land use restrictions that could limit RE deployment?
3.4	Have grid integration studies been done to allow more variable RE in the power sector?

Element 4 – Financing

4.1	Is the available volume of public and private financing for RE projects sufficient to achieve official RE targets?
4.2	Do building owners (hotels, households, etc.) have access to sufficient financing to support investment in RE?
4.3	Are there RE service companies active in the country which are able to finance RE projects and sell the electricity as a service?
4.4	Are clear rules and processes in place to promote domestic and foreign investment in RE?

Element 5 – Deployment

5.1	Are there clear, objective selection criteria for project developers and technology providers for public projects?
5.2	Are the necessary supply chain and infrastructure (incl. ports and roads) in place to implement RE projects?
5.3	Is there an established procedure for inspection and grid-connection of RE projects that is efficiently and effectively implemented?
5.4	Are adequate plans and budget in place to successfully operate and maintain public and donor-funded RE systems?
5.5	Is the quantity and capacity of project developers active in the country adequate for the development of the necessary RE projects to achieve the policy targets?
5.6	Is there a formally established process to initiate and develop renewable energy projects? If yes, please provide references and describe the process.

Element 6 – Capacity Building

6.1	Are there any RE educational programs or trainings available?
6.2	What are the capacities for installation, operation and maintenance of RE equipment?
6.3	What are the capacities to plan and operate power grids with a high share of variable RE?
6.4	What is the capacity of policy makers to develop ambitious and achievable RE plans?
6.5	Is there a sufficient number of qualified RE companies to provide the necessary services for RE deployment?
6.6	What is the capacity to develop viable project proposals for grant, loan and private financing?

Element 7 – Cooperation

7.1	Can international cooperation help in addressing some of the barriers identified above, and how?
7.2	Which international or regional organizations are actively supporting deployment of RE in your country?
7.3	Is there a specific government office responsible for donor coordination? Do they have specific RE expertise?

Section 3: References and data request

To provide supporting documentation for a more in-depth assessment of the answers provided above, COWI is asking for electronic copy of documents that can further qualify the need for support and the level of readiness for the transition to a RE-based power system. Please give a web link to any documents provided (if available online) or file name (if attached with Quick Scan). Please also provide references to the relevant sections of these documents for each related question.

Element 1 – Institutional Framework

Reference	Available	Document
Please provide copy of policies and public statements in support of RE		
Please provide a copy of the latest energy policy and any energy roadmap, master plan or action plan that includes RE, pointing at sections of legislation where responsibilities for RE deployment are assigned		
Please provide copy of any relevant regulation for RE (e.g. utility concession, IPP framework, distributed RE framework)		
Please provide copy of the law that established the regulator, and links to its website or latest structure		
Please provide copy of the administrative requirements for RE systems deployment		
Please provide a copy of any regulation that provides incentives for RE or any subsidies for the energy sector		
Please quote the relevant standards that are required for RE systems to be connected to the grid, imported, supplied to the public sector, etc.		
Please provide the relevant legislation that establishes the current RE targets		
Please provide any regulations defining tariff setting and market design, and any tariff impact assessment related to RE		

Element 2 – Knowledge Base

Reference	Available	Document
Please provide any RE technology assessment that has been conducted		
Please provide any EE assessment and audits that have been conducted		
Please provide any renewable resource assessments available (hydro, geothermal, wind, solar, biomass, ocean)		
Please provide copy of the latest energy balances: national and for each island		
Please provide copy of the latest Detailed specifications for power generation and grid assets		

Please provide copy of the latest Energy demand forecast (national, per island, per end use…)		
Please provide any assessment of the potential for RE in end-use sectors (e.g. cooling, heating, buildings, industry, desalination, transportation…)		

Element 3 – Planning

Reference	Available	Document
Please point at any legislation that establishes a formal energy planning process		
Please provide any assessment of the social impacts of RE		
Please provide any environmental impact assessment undertaken for RE projects		
Please provide any applicable procedure for RE projects to gain access to land		
Please provide the latest RE projects pipeline		
Please provide any grid study developed (e.g. load flow and dynamic stability studies)		

Element 4 – Financing

Reference	Available	Document
Please provide copy of any applicable rules to promote domestic and foreign investment in RE		
Please provide copy of any regulation that establishes specific financing facilities for RE		

Element 5 – Deployment

Reference	Available	Document
Please provide copy of any regulations for inspection and grid-connection of RE projects		

Element 6 – Capacity Building

Reference	Available	Document

Please provide a list of recent or ongoing trainings and institutionalized courses on RE, and number of people trained so far, from each sector (e.g. government, private sector, etc.)		
Please provide a list of certified RE designers, installers and inspectors		

Element 7 – Cooperation

Reference	Available	Document
Please provide a list of development partners active in the country, and key ongoing projects		

Section 4: Good examples

Please provide any examples you might have on best practices regarding the green energy transition in your island. This can for example be a collaboration, a breakthrough in a project or development, a turn-around, or maybe a lesson learnt that would be helpful to others.

Section 5: Progress on the implementation of the OCTs' Sustainable Energy Roadmap

In June 2015, at the first Summit of OCTs Energy Ministers in Brussels, the OCTs have adopted a Sustainable Energy Roadmap which identified priority areas, strategies and actions that could be implemented for their clean energy transitions. An analysis of progress made by the OCTs in the implementation of this Roadmap will be performed with the results of the following questions. The Roadmap is circulated together with this questionnaire.

Specific Networking and collaboration

1	Since 2015, have you put any collaboration activities in place? a) On technical partnerships? b) On collaboration with OCTs? With other countries? With ACP or Outermost Regions?

	c) On collaboration with research institutes, academia, etc.? d) On collaboration with international organisations? e) On collaboration with financial institutions?
2	Please detail the collaborations as well as the outcomes.

Energy efficiency

3	Since 2015, have measures been taken to facilitate the reduction in the energy use of end-use sectors (industry, transport, households, services, etc)?
4	Since 2015, has reliable and affordable energy storage been developed or promoted?
5	What is the rate of growth (or annual deployment figures) in energy efficiency?

Buildings and Transports

6	Since 2015, have measures been taken to facilitate sustainable transport development (eco-mobility)?
7	Since 2015, have measures been taken to promote the renovation and adaptation of building stock?

Businesses

8	Since 2015, have measures been taken to facilitate investment in renewable energies?
9	Since 2015, have there been any changes in business models to facilitate renewable energies?
10	Are there any activities /initiatives available for raising awareness and promotional activities in the field of RE?

Legal

11	Since 2015, have new regulatory frameworks been taken for the deployment of renewable energy project? (e.g. support schemes such as feed in tariffs, green certificates, tax benefits, etc)

Final thoughts / remarks (optional)

12	Please provide any final thoughts or remarks your OCT has. This could for example be some suggestions you might have on possible improvements from the support as attained from OCTA, or needs your OCT has on increasing the RE share.

APPENDIX B: SYNTHESIS PER OCT

ANGUILLA

Not provided

ARUBA

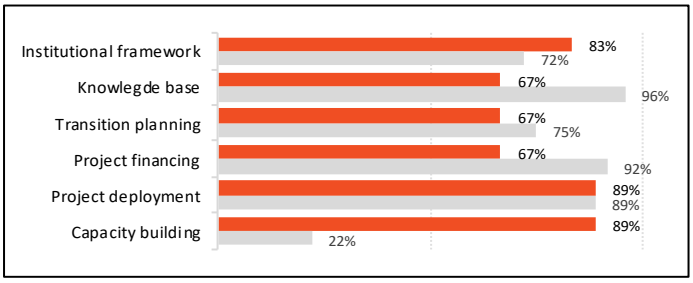
Summary of elements

Element	Summary
1	The institutional framework has to be strengthened. For example, a national energy policy is yet to be formalised and legislation needs to be modernized. However, this process is underway. The overall RE goals are now achieved via the local energy producer, who has detailed technical plans and strategies, which are currently driving the development of RE, backed by a well-developed economical support framework.
2	The relevant RE knowledge is present in Aruba, although currently it is kept private, primarily within the local utility company, which hinders knowledge sharing and free access to relevant data.
3	The planning of RE development takes place within the utility companies, who has also carried out studies on RE integration into the electricity grid. Planning is challenged by limited land availability.
4	There are enough finance resources to meet the RE targets, but there is a need to establish clear rules to attract investment, and to create incentives for local building owners to pursue RE.
5	The conditions for project deployment are well-developed through established processes and criteria, as well as the presence of local project developers.
6	Certification and training in RE are available and there is are active local companies to advance RE development. A designated government office on energy would strengthen capacity.
7	Aruba has valuable experience with leveraging international cooperating to strengthen their institutional framework and financing mechanisms. Currently the utility companies are engaged in several international collaborations, such as the Global Island Partnership (GLISPA).

General information

European country:	The Netherlands
Population:	105,845
Installed capacity:	290.0 MW
Electricity generation:	957.9 GWh / year
RE Technologies:	163.8 GWh / year
RE Share:	17.1%
Total QS score	94/120 (2016: 89/120)

QS Scoresheet: *2020* *2016*



Progress on Roadmap

- The main actors in the energy sector on the island of Aruba have developed strong links and partnerships at all levels
- Since 2015, no new measures have been taken to facilitate sustainable transport development. However, an import tax incentive for electric vehicles is in effect as of 2012.
- The new national energy policy will further align Aruba and address overlooked RE issues

Recommendations

- Formalise current and upcoming energy policies and enhance legislation to further strengthen the framework for RE transition
- Ensure that relevant data is gathered and made available for sharing among relevant stakeholders and the region
- Continue the positive development brought on by the renewable strategy, by updating and expanding on current successful strategies in place

BERMUDA

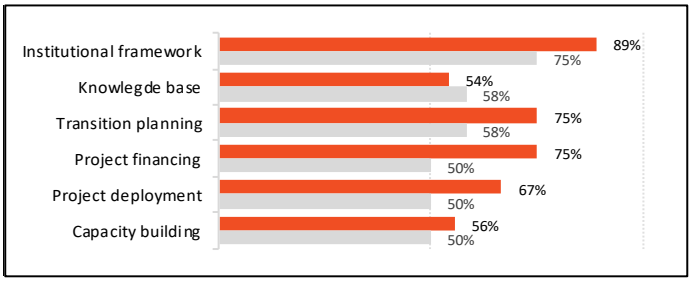
Summary of elements

Element	Summary
1	Bermuda has a well-developed institutional framework where political will and RE targets are supported by clear plans to facilitate transition and a sound economic framework. The institutional framework could be further strengthened as retail fuel is excessively taxed.
2	The knowledge base is under-developed. There is some on-island experience with solar design, installation and procurement, but there is a need to assess RE potential and make data available.
3	There is limited land available for RE development, but a strength in the transition planning is the presence of a dedicated office (Regulatory Authority) to ensure RE integration.
4	The financial resources in place are sufficient to meet the RE target, but there is a need to develop clear rules and processes to promote foreign investment in RE solutions.
5	There is a need to establish formal procedures for RE project development – it is expected that this will be introduced in the near future, as it is currently under development.
6	There is some local capacity present, but Bermuda relies on international expertise. There are no local training opportunities. From a political perspective, there is a dedicated regulator capable of setting realistic RE targets and developing supportive policies to realise the targets.
7	Currently, no international organisations are active in Bermuda. It is believed that international organisations can be particularly helpful with wind-study donations and funding.

General information

European country:	The United Kingdom
Population:	63,968
Installed capacity:	174.3 MW
Electricity generation:	628.7 GWh / year
RE Technologies:	18.9 GWh / year
RE Share:	3.0%
Total QS score	85/120 (2016: 72/120)

QS Scoresheet: *2020* *2016*



Progress on Roadmap

- Generally, on track on the Roadmap, but need to expand networking and collaboration. Currently partaking in the OOCUR collaboration
- EE initiatives have been introduced to households and storage options are being integrated into the utility company.
- Economic incentives to promote RE in place
- Few initiatives taken to green the building sector

Recommendations

- There is a need to strengthen the knowledge base, by carrying out RE assessments, as well as collecting and sharing relevant data among relevant stakeholders
- Establish formal rules and procedures for both investment processes (e.g. tenders) and for RE project development, to attract interest from foreign developers
- Engage in collaborations with international organisations

BONAIRE

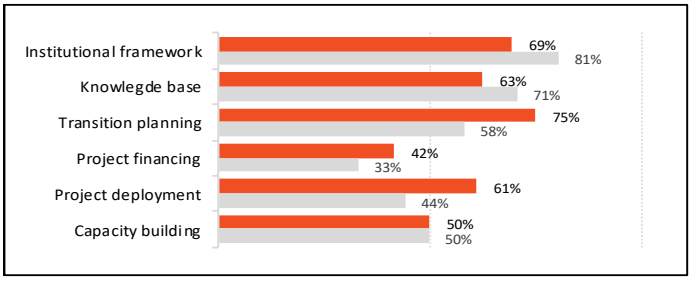
Summary of elements

Element	Summary
1	There is political support for RE, but no RE targets are set and the transition plans are lacking. Despite unclear plans, Bonaire has a strong economic framework in place, supporting RE development, through tariffs and grid access. An independent energy regulator is present.
2	There is on-island experience with wind, and data is collected. There is a need to make the data accessible and share it among stakeholders, as well as carry out assessment of RE potentials.
3	The utility company plans the concrete implementation and development of RE. From a government perspective, overall plans are in place, to increase the RE share to 60%-70%.
4	The financial framework is underdeveloped, as there is a lack of domestic companies to invest in RE, as well as a lack of clear rules to attract international investment.
5	Challenged by too large equipment, which cannot be handled on-island, leading to logistical matters impacting the scope of RE solutions. There is a need to develop clear processes for project development, but the local utility company are expected to be able to reach 60%-70% RE share.
6	The local utility company handles installation, operation and maintenance of RE systems, but overall, there is a lack of expertise, where the island relies on external aide from e.g. consultants.
7	There is no office coordinating international funding or collaboration within the field of RE. At present, there are no international organisations present. it is not certain, whether international organisations can help address some of the issues faced by Bonaire in their RE transition.

General information

European country:	The Netherlands
Population:	19,549
Installed capacity:	18.4 MW
Electricity generation:	120.6 GWh / year
RE Technologies:	32.4 GWh / year
RE Share:	26.9%
Total QS score	74/120 (2016: 74/120)

QS Scoresheet: *2020* *2016*



Progress on Roadmap

- No answer

Recommendations

- Develop clear rules and processes to engage in collaboration with international organisations, both public, NGOs and private organisations
- Set an official RE target and develop clear plans with concise steps and allocated responsibility to help attain the RE target
- Carry out RE potential assessment and share this, and existing data among relevant domestic stakeholders

BRITISH VIRGIN ISLANDS

Not provided

CAYMAN ISLANDS

Not provided

CURAÇAO

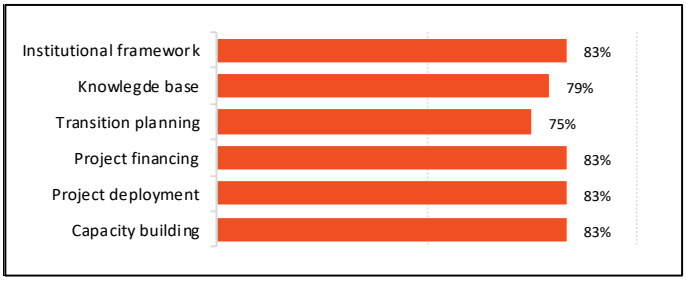
Summary of elements

Element	Summary
1	Curaçao displays a well-developed institutional framework with clear RE targets in legislation. Further strengthening the framework will require incentives dedicated to RE development and the establishment of the independent energy regulator, which is currently underway.
2	Relevant knowledge is present, but there is a general need to make it public, also to ensure that stakeholders have access to data and that they can share relevant information.
3	A dedicated office for energy planning is currently in the process of being established, which will strengthen the transition planning. A current zoning plan limits the space for RE development.
4	Nearly all RE project are financed by the private sector and there are clear processes in place, to attract both domestic and foreign investment.
5	Deployment processes are in place. Work is underway to fine-tune and clarify the selection criteria for public projects, but there is also a need to establish clear processes for initiating RE projects.
6	Local capacity is present, but there is a need to expand opportunities for training in RE and to strengthen government policies and the capacity to develop viable project proposals.
7	Curaçao is engaged in international collaborations and is currently in the process of establishing a designated government office responsible for donor coordination.

General information

European country:	The Netherlands
Population:	159,849
Installed capacity:	256.5 MW
Electricity generation:	654.4 GWh / year
RE Technologies:	196.3 GWh / year
RE Share:	30.0%
Total QS score	98/120

QS Scoresheet: *2020* *2016*



(No data available for 2016)

Progress on Roadmap

- Generally, Curaçao indicates that the upcoming plans will address the desired actions highlighted in the Roadmap
- Some current initiatives align with the Roadmap, such as an introduced 0% tax on imported electrical vehicles and the establishment of an energy regulator
- Activities and initiatives are in place to promote and advance RE

Recommendations

- Engage in collaborations and knowledge sharing with other OCTs in the Caribbean region to further strengthen regional RE transition
- Finalise the establishment of a dedicated office for the planning of RE, as well as establish a dedicated donor coordination office with RE knowledge to attract further investment
- Increase data availability, transparency, and access to data to further benefit from knowledge sharing among stakeholders

FALKLAND ISLANDS

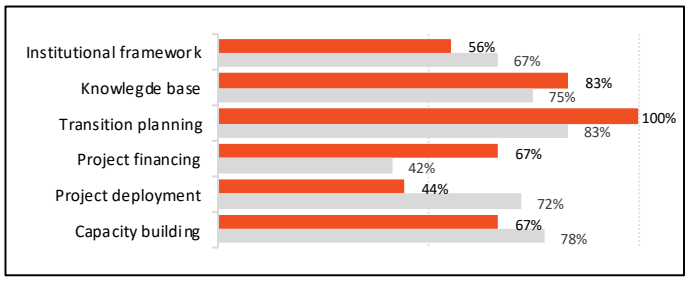
Summary of elements

Element	Summary
1	Political plans and RE strategies are present, along with grants for RE in both towns and rural areas. However, there is still a need to further specify and elaborate on the RE plans and strategies, as well to establish a supportive financial framework.
2	Generally, there is a strong knowledge base in terms of studies, data and experience with RE.
3	Generally, planning of RE is well established and does not face major challenges as there is available land for development, and a dedicated office ensures RE integration.
4	While both public and private financing is available to meet the RE targets, there is a lack of clarity regarding the processes to attract foreign and domestic investment.
5	Through a RE grant scheme for landowners and individuals, a formally established framework is in place to initiate the development of RE projects. However, the procedures for initiating RE projects at the project developer level are not clearly defined.
6	Policy makers promoting RE and training opportunities are present, but there are still opportunities to build capacity in private RE companies and regarding the relevant skills to create viable proposals to attract financing.
7	It is unclear how international cooperation can assist in the RE transition and currently no international organizations are present on the Falkland Islands.

General information

European country:	The United Kingdom
Population:	3,234
Installed capacity:	8.6 MW
Electricity generation:	17.6 GWh / year
RE Technologies:	5.5 GWh / year
RE Share:	31.2%
Total QS score	80/120 (2016: 84/120)

QS Scoresheet: 2020 2016



Progress on Roadmap

- At present there are no RE plans in place to further increase the share of RE, although current grant schemes for small RE initiatives for outlying houses are still in place
- Among the OCTs with a small population, Falkland Islands show that it is still possible to obtain a high share of RE

Recommendations

- Specify current plans by developing concise steps to ensure development of the well-functioning RE system
- Develop the capacity to attract investments by establishing clear processes for project development and creating viable proposals
- Engage in partnerships with international organisations, and draw on their expert knowledge to, for example, asses RE sources alternative to wind, or to build a clear framework for attracting projects developers

FRENCH POLYNESIA

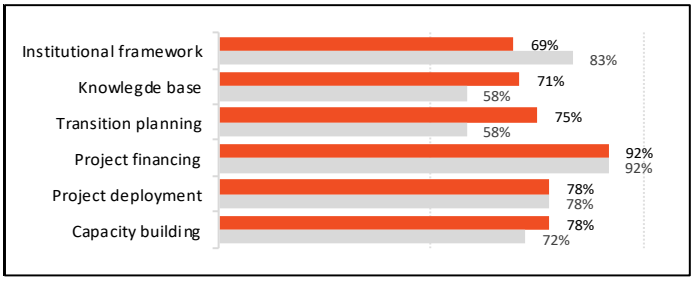
Summary of elements

Element	Summary
1	An Energy Transition- and Energy Climate plan are in place, and will be complemented by an Energy Roadmap for deployment in 2020. There is no independent energy regulator, no incentives provided for RE, but there is a strong push towards RE. Fossil fuels are still subsidised.
2	Coordinated government initiatives have led to evaluations and studies on wind, hydraulics, energy potential of the sea and potential for exploiting biomass. Data on RE lacks regular updates. There is an overall need for expertise in the fields of mobility and eco-construction.
3	Planning capacities on RE integration are in place via the publication of studies. E.g. RE grid integration studies are ongoing. Land restrictions still limit the development of solar farms.
4	Volume of private/public financing for RE appears to be sufficient. There is a lot of donor funding originating from the French State or from the EU. Investment incentive mechanisms are in place.
5	Adequate deployment initiatives implemented, and formal processes to initiative and develop RE projects is expected. Equipment maintenance is generally not sufficiently due to scope of projects.
6	Capacity building activities exist in French Polynesia – it is widely accepted, relies on expertise, is diverse and further growing. Multiple companies are specialised in RE development. However, there are insufficient human resources to develop viable project proposals.
7	There is a limited cooperation at the international level towards RE. Regionally, active collaboration with a regional institution. There is no central government office in charge of donor coordination.

General information

European country:	France
Population:	277,679
Installed capacity:	372.3 MW
Electricity generation:	689.0 GWh / year
RE Technologies:	201.0 GWh / year
RE Share:	29.2%
Total QS score	90/120 (2016: 89/120)

QS Scoresheet: 2020 2016



Progress on Roadmap

- Generally, very good process of the Roadmap's establishment
- Strong networks and collaboration, for example through agreements with ADEME, AFD, and the local university
- Efforts taken to address RE by developing practice guidelines, energy audits and more
- A transport plan (2017) introduced 80 electric busses. Municipalities take local actions
- Tax incentives are widely applied to boost RE

Recommendations

- Improve the involvement of the French State and/or the EU to reduce purchase prices for RE
- Further promote international and regional cooperation to reduce barriers, support deployment of RE
- Diversify incentives to facilitate RE investments, besides the widely accepted tax and customs exemptions
- Reduce restrictions on land use that hinder RE development and in particular the development of solar farms

FRENCH SOUTHERN AND ANTARCTIC LANDS (TAAF)

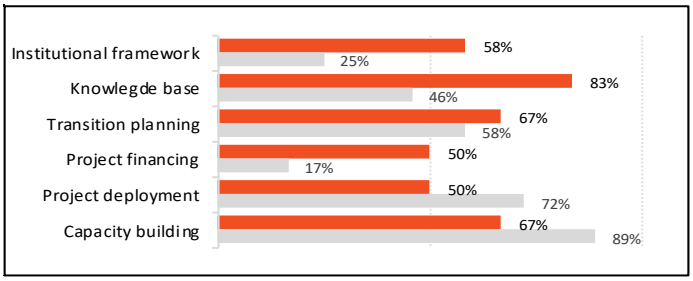
Summary of elements

Element	Summary
1	Efforts are made to put a dedicated RE policy structure in place. RE leadership was initiated in 2017 with the inauguration of a photovoltaic power plant on the island of Tromelin. No provisions in French legislation are applicable to TAAF. TAAF are not mentioned in the French Energy Code.
2	Past and future projects allow/will allow to gather data regarding the demand growth at the island level. Apart from the photovoltaic plant in Tromelin, no other RE technologies are in place, as the island has no industrial capacities. Energy efficiencies occurred and were monitored.
3	Energy Service, under the supervision of the ministry, is responsible for energy planning and RE. Land use restrictions exist. Limited planning efforts and no studies.
4	No private and public financial support for RE projects available (not known at TAAF level). Absence of an investment market and well-defined processes to promote domestic and foreign RE investments, limits investment possibilities for RE (not applicable at TAAF level).
5	Limited deployment capacities for RE. Lack of established processes and procedures to initiate and developed RE projects.
6	Strong technical capabilities among the rotating staff, despite the lack of dedicated local training and educational programs possibilities. TAAF has capacities to set up support where needed.
7	Need to better integrate TAAF in government policies in favour of RE. Cooperation with mainland France.

General information

European country:	France
Population:	150
Installed capacity:	3.2 MW
Electricity generation:	3.6 GWh / year
RE Technologies:	0.0 GWh / year
RE Share:	0.1%
Total QS score	76/120 (2016: 58/120)

QS Scoresheet: 2020 2016



Progress on Roadmap

- Few answers provided. Answers indicate that French Southern and Antarctic Lands are not on track in relation to the Roadmap. However, in collaboration with ADEME, strides towards adopting RE technologies has been taken, notably the establishment of a photovoltaic plant on Tromelin Island

Recommendations

- Promote further exchange of knowledge through regional and national collaborations
- Identify opportunities for international and national cooperation to invest further in RE
- Better integrate TAAF in government policies/legislation in favour of RE (where feasible)

GREENLAND

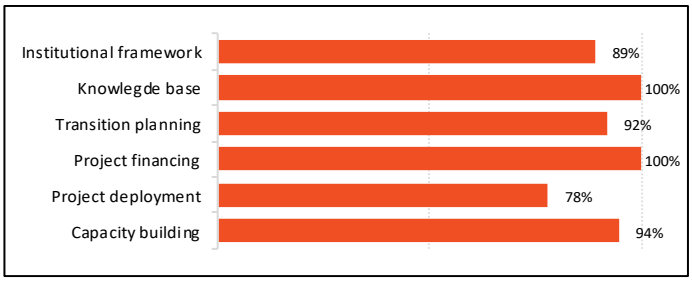
Summary of elements

Element	Summary
1	Greenland shows a strong institutional framework based on official and clearly defined goals and concise steps for how to achieve them, supported by economic incentives. Establishing an independent energy regulator would further strengthen the institutional framework.
2	Greenland has a sound and expansive knowledge base, which covers areas such as data availability, relevant RE assessments and on-island expertise on RE projects and the technical aspects of RE.
3	A designated office for planning of RE development, ensures that RE is integrated into the overall development. Due to a UNESCO world heritage site classification, some areas have specific requirements for RE development and some areas lack adequate infrastructure for development.
4	The financial resources for Greenland to meet its RE targets are in place, drawing from a mix of public and private financial resources.
5	Measures for project deployment are well in place, but depending on the location, and due to its size and topography, it can be necessary to ensure sufficient infrastructure prior to implementing RE development (for example southern Greenland).
6	Greenland has full capacity to ensure the continued development of RE. Fine-tuning the capacity would require an expanded focus on providing training opportunities for jobs in the RE sector.
7	Greenland is well-experienced in hydropower, but for wind and solar in the artic regions, Greenland also draws on experience from international organisations. The Public Utility Company Nukissiorfiit is collecting data on wind and solar potentials all over Greenland. They are engaged in several knowledge sharing platforms, such as the Nordic Council of Ministers and the Artic Council.

General information

European country:	Denmark
Population:	56,025
Installed capacity:	135.1 MW
Electricity generation:	501.0 GWh / year
RE Technologies:	419.0 GWh / year
RE Share:	83.5%
Total QS score	110/120

QS Scoresheet:



(No data available for 2016)

Progress on Roadmap

- Collaborations are excellent
- Big focus on the public energy (70% RE), could improve in the private sector
- Greenland is actively facilitating electrification of the transport sector. Wants to be amongst frontrunners
- Best scoring in all elements.

Recommendations

- Further diversify the RE mix by integrating wind, solar and biomass to a greater extent, notably in cities and small settlements which are not suited for hydropower
- Engage in knowledge sharing with other OCTs, who can benefit from Greenland's experiences and expertise, and Greenland in turn, can benefit from OCTs experience on wind and solar for outlying settlements

MONTSERRAT

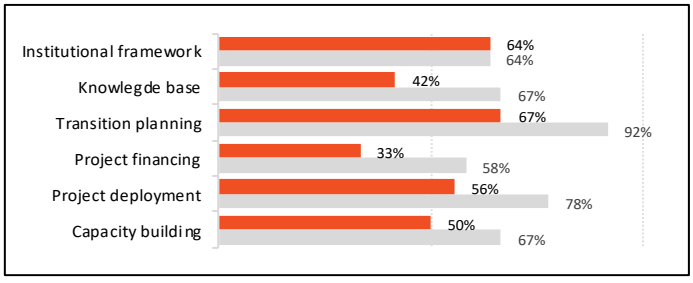
Summary of elements

Element	Summary
1	Action plans and roadmaps are in place but following a need to re-envision a previous goal of 100% RE, there are no specific RE targets set. Furthermore, the institutional framework is not geared towards spurring RE development and there is a lack of economic incentives.
2	Generally, there is an underdeveloped knowledge base, however, RE assessment for geothermal and wind are available.
3	There is a designated office dedicated to incorporating RE into the energy mix, understanding of how current and ongoing projects contribute to achieving the RE targets. However, spatial planning is a challenge as 2/3 of the islands is a restricted zone due to a 1995 volcanic eruption.
4	Generally, there are insufficient public and private financing resources available and there is a lack of clear rules and processes on attracting finances. Under current state, the targets will not be met.
5	Infrastructure to facilitate RE development is in place, but there is an absence of a framework to ensure project deployment through lack of guidelines and project selection criteria etc.
6	Capacity exists locally but it is underdeveloped and will require further capacity building and financial support to grow and allowing to facilitate the RE transition.
7	There is a local office to coordinate and attract donor support, however the office is not specialized in RE development. Several international organisations are present, and it is assumed that the international organisations can play a role in developing RE on Montserrat.

General information

European country:	The United Kingdom
Population:	4,993
Installed capacity:	7.2 MW
Electricity generation:	14.5 GWh / year
RE Technologies:	0.4 GWh / year
RE Share:	3.0%
Total QS score	64/120 (2016: 83/120)

QS Scoresheet: *2020* *2016*



Progress on Roadmap

- Some actions taken, but still a need to improve
- Strides towards network and collaboration has been fruitful, notably a collaboration with RMI. Room to further strengthen networking
- No major steps towards EE, although a storage projects will see the light of day in 2020
- Steps taken to 'green' the transport sector, by imposing tax reductions on electric cars

Recommendations

- Re-align the framework for RE development and based on achievable targets, formulate concise steps and an allocation of responsibilities
- Integrate economic incentives to support the uptake of RE technology
- Establish clear rules and processes for RE development to attract foreign investment and developers

NEW CALEDONIA

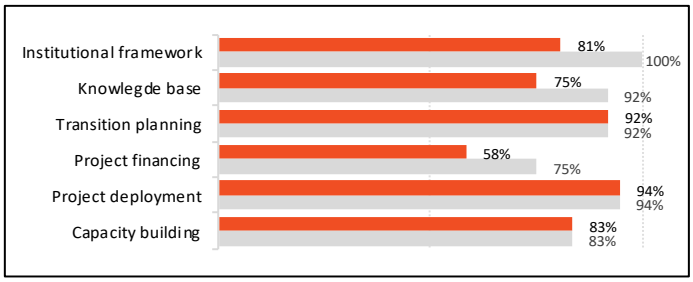
Summary of elements

Element	Summary
1	Institutional framework is in place, with strong commitment of public authorities towards RE transition. 2030 target is 100% RE in public electricity consumption. Regular tender procedures for photovoltaics (> 1 per year). Procedures are framed by government decrees.
2	Studies in the field of RE are performed or are planned. Actions are in place to fill the knowledge base gaps. Operating data of the electrical system exists and is available upon request.
3	RE projects are known and monitored. No land use restrictions limit the RE deployment. Grid integration studies are carried out by the network operator to strengthen the network.
4	Government aims to examine alternative funding sources, in the deployment of pilot projects. Tax incentives are in place to increase RE investments. Limited local financial resource from companies.
5	RE projects submitted as part of a call for tenders are classified according to an objective rating system adopted by the government. Mainly private donor funded RE systems.
6	High level of capacity, due to the presence competent RE companies (6 in total capable of building solar farms; around 20 can carry out small roof installations). Consular chambers are offering education programs and training on RE. Sufficient local capacity to begin complex projects.
7	International cooperation is considered as essential for the RE deployment of RE covering 2021-2030. Government established a long-standing partnership with ADEME.

General information

European country:	France
Population:	284,060
Installed capacity:	1,046.6 MW
Electricity generation:	3,485.9 GWh / year
RE Technologies:	407.9 GWh / year
RE Share:	11.7%
Total QS score	97/120 (2016: 110/120)

QS Scoresheet: *2020* *2016*



Progress on Roadmap

- Generally strong progression on Roadmap
- Networks are strong, for example the collaboration with CSP, CNRT, ACE and the local knowledge sharing platform SYNERGIE
- Introduced a law to promote/advance EE
- A greening of the transport/building sector is underway with eco-mobility and drafts of energy performance standards for buildings
- No significant changes in relation to business

Recommendations

- Continue to define and implement plans to adapt transport and distribution network to maximize RE integration and to structure areas of RE application such as eco-mobility
- Promote further incentives to facilitate RE investments
- Promote knowledge exchange and data sharing between key agencies and RE stakeholders
- Implement more regular updates of demand growth forecast (yearly recommended)

PITCAIRN ISLANDS

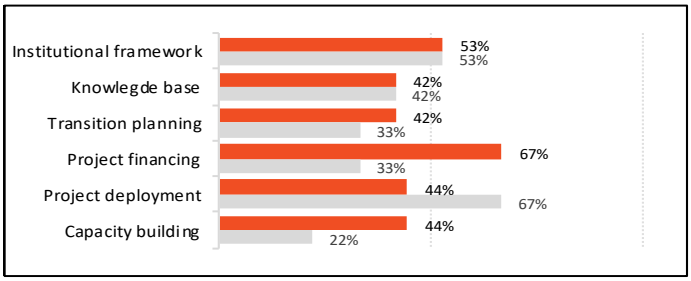
Summary of elements

Element	Summary
1	The institutional framework is under-developed. There is government support for RE transition, but there are no RE targets, no plans dealing with how to achieve transition and generally no economic support to facilitate development. It is intended to replace approx. 90% of current fossil fuel usage Solar Panels linked to the current grid.
2	There is not a strong knowledge base. But both solar and wind-power options have been under investigation since 2006. Several reports have been produced.
3	There is no central planning of, or ongoing RE projects under implementation. There is feasibility study from 2017 on the implementation of RE on the island. This might create some opportunities.
4	There are financial resources to achieve RE (funding from EU).
5	Infrastructure allows for RE development, but there is no established deployment framework.
6	There is currently no local capacity to further RE development, but it is in the planning to build this up through a tender on installing solar energy, and providing training for the local experts.
7	Pitcairn Islands are currently in collaboration with EU on a project, wherein a tender has been developed, which is now awaiting proposals. The tender details a RE project (solar), addressing the under-developed state of the elements above. Once implemented, solar energy is expected to contribute substantially to Pitcairn Islands RE share.

General information

European country:	The United Kingdom
Population:	55
Installed capacity:	0.5 MW
Electricity generation:	- GWh / year
RE Technologies:	0.0 GWh / year
RE Share:	0.0%
Total QS score	58/120 (2016: 53/120)

QS Scoresheet: *2020* *2016*



Progress on Roadmap

- Generally, not on track to meet the Roadmap's objectives. A collaboration with EU and SPC is the exception, and the project which will result in the establishment of photovoltaic technology, is expected to contribute substantially to Pitcairn Islands' RE share

Recommendations

- Retain knowledge from current collaboration with EU and SPC and use the project as a catalyst to build local capacity and knowledge.
- Set RE targets and create concise plans for how the target should be realised

SABA

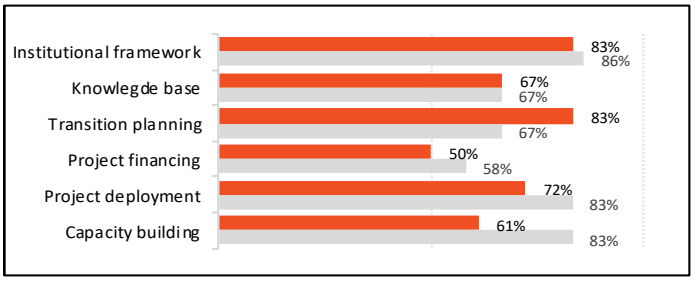
Summary of elements

Element	Summary
1	There is an institutional framework in place to advance RE. While there are economic incentives in place to spur development, the incentives are not sufficiently attractive to facilitate transition.
2	The knowledge base consists of assessment for solar and wind, and the sharing of relevant data. However, knowledge is lacking in the design, installation and procurement of RE technologies.
3	Saba Electric Company is responsible for the planning of RE, but they are challenged by ownership issues and geographical conditions, as 80-90% of Saba's land is too steep for RE development.
4	Despite clear rules and processes in place to promote both domestic and foreign investment in RE, there is a general lack of public and private financing.
5	Conditions for project deployment is in place, e.g. infrastructure, formal processes for initiating projects - although not specifically RE projects, but there is a lack of active project developers.
6	Local policy makers are able to set RE targets and meet them, and there is capacity to operate a power grid with high share of mixed RE. However, there is a lack of training opportunities and a lacking skill set in manpower to install, operate and maintain RE equipment.
7	There is a designated policy advisor in place to attract international funding, although the position lacks RE expertise. International organisations are present on the island, and it is believed that generally international organisations can contribute with expert knowledge and funding.

General information

European country:	The Netherlands
Population:	2,155
Installed capacity:	6.3 MW
Electricity generation:	9.3 GWh / year
RE Technologies:	2.4 GWh / year
RE Share:	25.6%
Total QS score	86/120 (2016: 92/120)

QS Scoresheet: *2020* *2016*



Progress on Roadmap

- Partly on track, but room for improvement within all five areas
- The utility company teamed with companies for staff training and collaborated with the Dutch Ministry of Economic Affairs and Climate Policy
- Big strides toward EE with 2.3MW grid-storage
- Lacking efforts in the transport and building sectors, with no new efforts since 2015

Recommendations

- Build local capacity for minor RE initiatives in order to not only rely on external project developers for large projects
- Establish partnerships with other OCTs in the region and especially the other BES islands, to share knowledge and combine forces to attract project developers and finance
- Develop economic incentives to spur RE development
- Continue drawing on expertise from international NGOs

SAINT BARTHÉLEMY

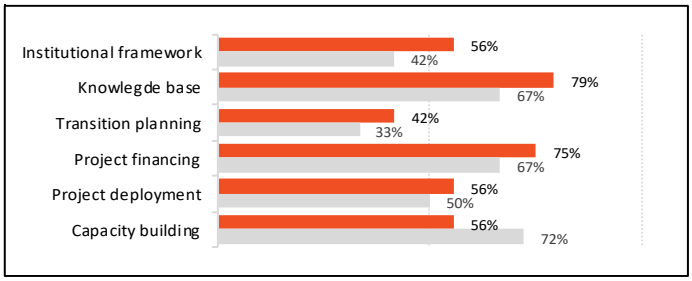
Summary of elements

Element	Summary
1	An Energy Policy/Energy Code will be adopted in the course of 2020, wherein official targets for RE will be included. Financial incentives are managed by CRE. There are subsidises for the installation of photovoltaic panels in private homes. No specific procedures exist to develop RE projects.
2	An Energy Committee was established in 2019 to balance the energy supply and demand through a compensation framework. Local expertise only relates to the installation of photovoltaic panels.
3	No central planning structure to foster RE deployment. One major project is under development to create a photovoltaic power plant. Land availability seems to be a real issue.
4	Sufficient financing to invest in RE in Saint Barthélemy. No RE service companies active on the island, but knowledge-sharing and collaboration with service companies from neighbouring islands.
5	Infrastructure is in place to deploy RE, but only for those projects supported by the small size of the island (decentralised production). Limitation in terms of clear procedures and plans.
6	No RE training and educational programs in place. Capacity and expertise in photovoltaic panels and solar water heaters that can support such small-sized projects. Limited political will to finance RE projects with public funds. Political will seeks rather to encourage private investment.
7	Very limited international cooperation, but cooperation with neighbouring OCTs. A shared project on geothermal energy on another OCT is under consideration. Government does not favour the energy source and wants to firstly finalise renewal of a local thermal power plant to secure supply.

General information

European country:	France
Population:	9,816
Installed capacity:	34.2 MW
Electricity generation:	117.7 GWh / year
RE Technologies:	0.0 GWh / year
RE Share:	0.0%
Total QS score	73/120 (2016: 65/120)

QS Scoresheet: *2020* *2016*



Progress on Roadmap

- Generally, not on track on the Roadmap. The political will is limited, despite capacity and capability to facilitate RE development
- No international collaborations, although potential partnership with neighbouring OCTs
- No actions on EE, facilitating RE business development, or greening the transport or building sectors.

Recommendations

- Leverage further on cooperation between neighbouring OCTs to promote exchange of knowledge
- Provide customised training for RE technicians further than those areas for which there is capacity
- Establish dedicated, formal processes and procedures to initiative and develop RE projects. Political support will be required
- Attract financial incentives to boost RE

SINT EUSTATIUS

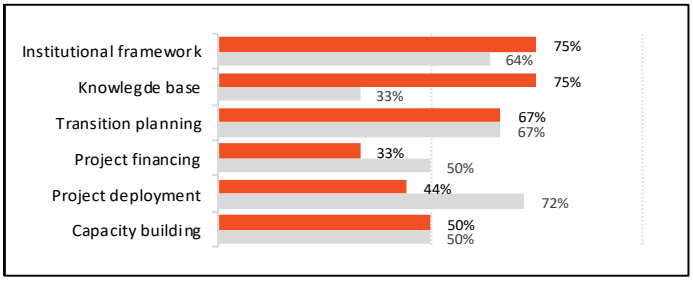
Summary of elements

Element	Summary
1	The institutional framework is in place – clear RE policies and economic support to realise the policies have been developed. There is a need to further formalise the RE plans by integration them into legislation and a detailed plan outlying concise next steps, should be created.
2	There is a sound knowledge base in place, but there is a need to further share knowledge amongst relevant stakeholders and agencies. There is also a need to develop knowledge within design, installation and procurement processes in relation to RE project development.
3	Planning of RE development takes places in collaboration between a government office and the local utility company. Limitations for development are outlined in the Spatial Development Plan.
4	Lack of sufficient financing. Financing remains the most critical challenge in realising Sint Eustatius' RE targets and objectives.
5	There is a lack of deployment framework to attract project developers as there is no formal procedures for developing RE projects, no local capacity and no selection criteria for developers.
6	Outside the utility company, local capacity is not present. Within the utility company, there is capacity to further develop RE.
7	International collaborations are regarded as being an opportunity for learning, training and analysis in relation to RE and currently the EU is present via OCTA. The Office OF Economy Nature and Infrastructure – finance unit coordinates international donor funding.

General information

European country:	The Netherlands
Population:	3,348
Installed capacity:	2.5 MW
Electricity generation:	14.9 GWh / year
RE Technologies:	6.3 GWh / year
RE Share:	42.1%
Total QS score	74/120 (2016: 67/120)

QS Scoresheet: *2020* *2016*



Progress on Roadmap

- Generally, not on track to the Roadmap
- Few initiatives align with the Roadmap, e.g. an EE workshop for the hospitality sector took place, and the building code has been updated.

Recommendations

- Formalise RE plans and create concise steps for further development
- Engage in knowledge sharing domestically and with regional islands undergoing similar RE transitions
- Develop clear processes for project development and a framework for attracting investments from abroad.
- Build capacity outside the local utility company e.g. through training or local business in the RE sector

SAINT HELENA, ASCENSION AND TRISTAN DA CUNHA

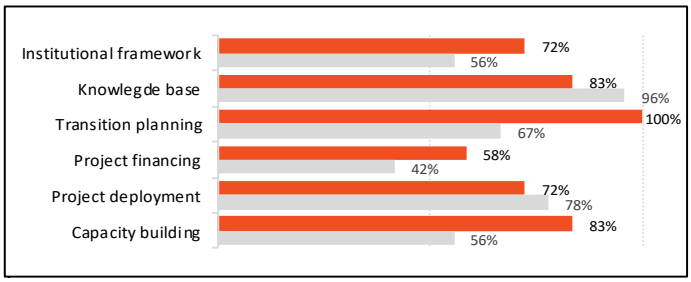
Summary of elements

Element	Summary
1	Plans and strategies for RE development are in place, but they are not incorporated into legislation or binding targets. At present, a new PPA is being developed, which upon implementation is expected to strengthen the framework and economic incentives for RE significantly.
2	There is a well-developed knowledge base, anchored in the government owned utilities provider Connect Saint Helena Ltd, who has procured, installed and maintains their own RE systems.
3	Connect Saint Helena is responsible for planning the RE development and the upcoming PPA will bind Connect to contractual obligations to ensure RE contributions in the energy mix.
4	The islands face a challenge of attracting investment, as the national bank has insufficient lending capacity. Currently the organisation Enterprise Saint Helena works on attracting RE investments.
5	Project deployment framework and infrastructure are in place, but there is a need to further formally clarify the rules and processes surrounding project development.
6	Local capacity is in place, anchored primarily in Connect Saint Helena. Specialists are brought in in cases where expertise knowledge is needed.
7	The Financial Secretary coordinates donor funding and will rely on Connect Saint Helena for RE knowledge. Generally, international cooperating can aide RE development through funding. Previously, the Department for International Development (UK) provided funding.

General information

European country:	The United Kingdom
Population:	6,035
Installed capacity:	9.2 MW
Electricity generation:	11.0 GWh / year
RE Technologies:	3.1 GWh / year
RE Share:	27.9%
Total QS score	93/120 (2016: 80/120)

QS Scoresheet:



Progress on Roadmap

- Generally, some steps taken towards the Roadmap, but there are still gaps which need to be addressed. A new PPA, close to conclusion, is expected to address some of these gaps, for example, by including measures to increase EE
- In the private sector, a stakeholder approach and targeted reduced taxes have facilitated businesses to engage in RE development

Recommendations

- Engage in a close partnership on knowledge sharing and strategy development between the government and the local utility company
- Ensure that an outcome of the PPA will result in capacity building among local utility staff to build on-island expertise and experience with RE development
- Develop clear rules and processes for project development to attract foreign investment as on-island financial resources are limited

SAINT PIERRE AND MIQUELON

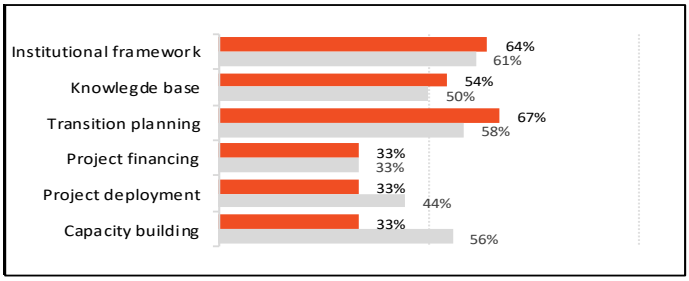
Summary of elements

Element	Summary
1	A Multiannual Energy Program (PPE) is almost in place and will provides provisions on the development of RE or EE. Targeted values remain to be defined. Many initiatives are underway in this area, but at present there is no clear procedures defined for RE project development.
2	General level of knowledge on RE and information-sharing is very limited. The PPE will cover an inventory of all the energy sources including RE. Some studies are ongoing in the areas of wind field and energy measurements and will be published. Other data is published on EDF's website.
3	Planning capacities are in place. The feasibility of at least two projects in the field of wind energy exploitation is assessed. No land use restrictions. The new urban planning strategy (2020) identifies areas for RE deployment.
4	Insufficient data provided.
5	Insufficient data provided.
6	Limited capacities for local RE training and education. An Energy Info Point was created in 2019 to inform the general public and companies about energy renovation and offers energy audits for the residential sector. In the actions of the Strategic Development Plan (2015-2020), companies were trained in energy efficiency and energy renovation, entirely focused on the residential sector.
7	Insufficient data provided.

General information

European country:	France
Population:	5,849
Installed capacity:	26.2 MW
Electricity generation:	55.2 GWh / year
RE Technologies:	0.0 GWh / year
RE Share:	0.0%
Total QS score	60/120 (2016: 63/120)

QS Scoresheet: *2020* *2016*



Progress on Roadmap

- Saint Pierre and Miquelon is not on track in relation to the Energy Roadmap. There is an absence of new initiatives taken since 2015.

Recommendations

- Improve data exchange on RE through dedicated initiatives between key stakeholders at the regional and national level
- Assess technical capacities for RE, potential for RE and train accordingly local operators and decision-makers
- Improve financial support for RE studies, collaborations, and incentives (financial/non-financial)
- Define RE targeted values for integration in the Multiannual Energy Program (PPE)

SINT MAARTEN

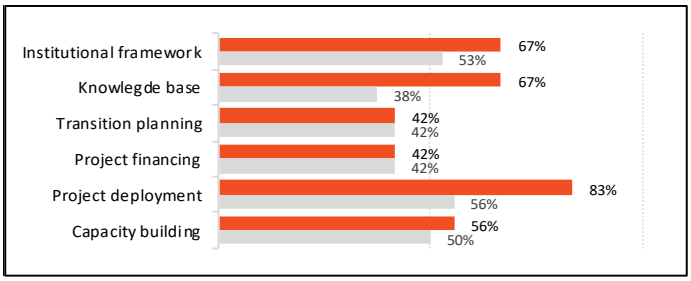
Summary of elements

Element	Summary
1	Overall, a framework is in place to facilitate RE development, and there is a binding agreement to meet defined RE targets. There is still a need to embed economic incentives for RE in the institutional framework. Work is planned to create a detailed implementation plan for RE.
2	A rather basic knowledge base is present. Studies on RE are underway and St. Maarten can draw on knowledge from the BES Islands. Sharing of and access to data and knowledge can be improved.
3	Planning of RE development is hampered by the lack of a dedicated office to oversee development, a lacking overview of past, current and future RE projects and limited land availability.
4	RE projects are already deployed, but at present there is insufficient financing to ensure that the RE targets are met. The National Energy Plan is likely to include methods to promote investment.
5	RE developers are present, but not in the quantity needed to realize the RE targets. Procurement procedures are in place, but there is a need to successfully plan and budget RE projects.
6	Local capacity is available, but a lack of quantity and expertise to develop project proposals and RE project indicates that there is a need to strengthen and expand the current capacity.
7	There are currently no international organizations who are active in Sint Maarten, but there is an interest from several organisations.

General information

European country:	The Netherlands
Population:	41,486
Installed capacity:	57.0 MW
Electricity generation:	274.5 GWh / year
RE Technologies:	0.0 GWh / year
RE Share:	0.0%
Total QS score	75/120 (2016: 57/120)

QS Scoresheet: *2020* *2016*



Progress on Roadmap

- Generally, some actions are taken, but there is a need to expand efforts to be on track for the Roadmap
- International collaboration is currently not being utilized, but regional teamwork with the regional BES Islands is resulting in work on a shared interconnection network
- Businesses has played a role in fostering RE development (solar).

Recommendations

- Increased efforts from the government is needed, if binding RE targets are to be met
- Seek collaborators outside the regional zone
- Develop economic incentives to support the uptake of RE technologies
- Develop a central planning unit to coordinate activities and align efforts within RE development

TURKS AND CAICOS ISLANDS

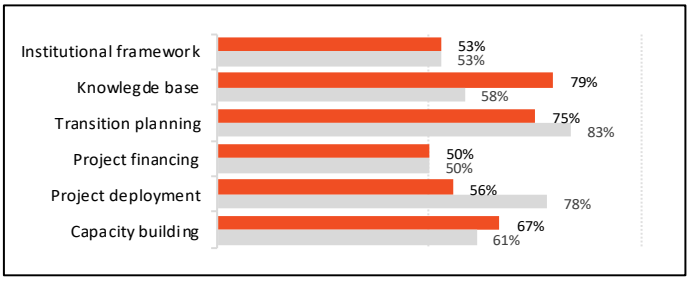
Summary of elements

Element	Summary
1	The institutional framework is under-developed, as there are no policies promoting RE, and there is a limited government support. Currently, a Resilient National Energy Transition Strategy (RNETS) from 2013 serves as a limited framework, but it is not supported by legislation.
2	The knowledge base is fairly developed, and assessments and relevant data are available. There is a need to increase sharing of information and data between stakeholders and to foster development of in-country experience with design, installation and procurement of RE technologies.
3	Currently, the utility company is the nexus of RE planning, as the relevant government department is understaffed and underqualified to create progress in the RE development.
4	The utility company draws on internal financial resources, but financing from other actors is insufficient. There is a need to develop clear processes to attract foreign and domestic investment.
5	Current conditions are unfavourable for project deployment, as there are no detailed plans or criteria for project development, and there is a lack of project developers. The utility company's RE Program does offer established processes for RE project initiation and development.
6	Generally, the capacity is underdeveloped and needs to be strengthened, although there are two local solar installation and maintenance companies who are capable and dependable.
7	Two international organisations are currently present on the Turks and Caiços Islands; the Rocky Mountains Institute and Clinton Climate Imitative. They are working on addressing RE implementation issues.

General information

European country:	The United Kingdom
Population:	37,665
Installed capacity:	91.0 MW
Electricity generation:	251.0 GWh / year
RE Technologies:	1.0 GWh / year
RE Share:	0.4%
Total QS score	75/120 (2016: 74/120)

QS Scoresheet: *2020* *2016*



Progress on Roadmap

- Generally, some actions taken, but greater efforts need to be made, to be on tract
- An enabling legal framework to support realization of the Resilient National Energy Strategy (RNETS) is missing
- An Energy Audit Program, allows households to assess their energy use and improve EE

Recommendations

- Develop an enabling legal framework to support the attainment of targets set in the RNETS
- Develop clear rules and processes for RE development projects in order to attract international financing
- Spur local development through economic incentives for businesses and local knowledge sharing/capacity building

WALLIS AND FUTUNA

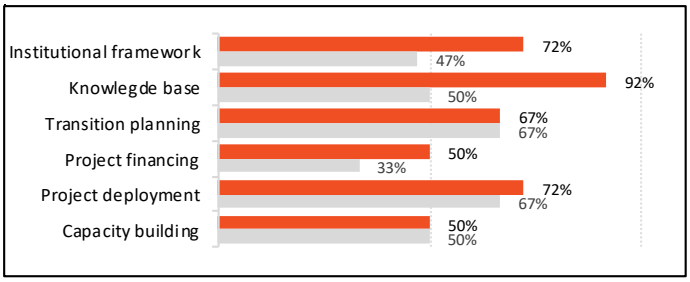
Summary of elements

Element	Summary
1	Limited local government leadership capacities. A multi-year energy programming (PPE) was adopted in March 2017 and includes a roadmap for RE transition. Independent energy regulator present. Fossil fuel is subsidised. No tariff adaptation to RE sources.
2	The knowledge base is well developed. In the PPE framework, RE assessments are available and developed; yearly updates on energy balances are performed. Data is easily shared between key agencies and RE stakeholders. Experience on RE is only found with the local electricity distributor.
3	No central planning structure for energy planning and RE, but strongly needed. Three ER projects are planned. Grid studies are performed. Land restrictions exist and limit RE deployment.
4	Lack of public/private funding and financing mechanisms with clear rules to promote domestic and foreign RE investments. The production of RE is open to everyone, EEWF can finance RE projects, but does not have a monopoly on the production of RE.
5	Infrastructure is in place, but there is a limited capacity to deploy RE. No public and donor funded RE systems exist. Selection criteria do exist for project developers. Formal validation process in place as RE projects are submitted to the Energy Regulatory Commission for validation, taking into account the feedback from the Territorial Assembly and the EEWF in relation to connection to the network.
6	In terms of training, almost no training is available. RE educational programs and training are foreseen in the PPE. Limited capacity of operators. Capacity of policy makers is unknown.
7	Very limited to no international cooperation exists. The governmental structure to handle relations with international organizations and conduct donor coordination is unknown and unclear.

General information

European country:	France
Population:	11,661
Installed capacity:	8.8 MW
Electricity generation:	20.2 GWh / year
RE Technologies:	0.9 GWh / year
RE Share:	4.3%
Total QS score	84/120 (2016: 62/120)

QS Scoresheet: *2020* *2016*



Progress on Roadmap

- Generally, actions are taken on issues addressed in the Roadmap, but there is room for further improvement of these initiatives
- Collaboration with New Caledonia and ADEME to implement a multi-year RE program
- Lack of action or promotion of energy storage
- Talks of greening transport are underway, and some measures for EE in buildings are taken

Recommendations

- Define and implement quality standards for RE technologies
- Build capacity by developing local technical expertise
- Develop clear rules, procedures to develop RE projects
- Set up regional office responsible for RE energy planning
- Promote international and regional cooperation to reduce barriers, support deployment of RE, and attract investments in RE

APPENDIX C: QUIKCSCAN SCORESHEETS

Highest score in questionnaire (3)

Medium score in questionnaire (2)

Lowest score in questionnaire (1)

No answer given in questionnaire (1)

		Greenland	French Polynesia	French Southern and Antarctic Lands	New Caledonia	Saint Barthélemy	Saint Pierre	Wallis and Futuna	Aruba	Bonaire	Curaçao	Saba	Sint Eustatius	Sint Marteen	Bermuda	Falkland Islands	Montserrat	Pitcairn Islands	Saint Helena, Ascension and Tristan de Cunha	Turk and Caicos Islands
Institutional Framework	Is there government leadership and political support for a renewable energy transition?																			
	Is there a recent energy policy the clearly promotes RE?																			
	Are there official RE targets defined in legislation or government mandate? For which sectors (total energy, electricity generation, transportation, etc.)																			
	Is there an official energy roadmap or detailed plan for RE deployment including clear definition of roles and responsibilities?																			
	Have quality standards for RE technologies been officially adopted?																			
	Is there an independent energy regulator to oversee the electricity sector?																			
	Is there grid access and attractive rates of return allowing for IPPs and residential or commercial customers to invest in RE?																			
	Does the electricity price take into account the variation in generation costs from different generation technologies at different times of the day and year?																			
	Does the current tariff structure allow for savings in generation cost from RE to be passed on to customers, and how? Was there a dedicated tariff study to assess this?																			
	Are there incentives (financial or not) dedicated to facilitate RE investment?																			
	Are there subsidies in place for fossil fuels (incl. electricity from fossil fuels)?																			
	Are there clearly defined procedures to develop RE project? If yes, what is the average time and cost for permitting?																			
Knowledge Base	Are renewable resource assessments available (hydro, geothermal, wind, solar, biomass, ocean)?																			
	Are energy balances developed and updated at least yearly?																			
	Are regularly updated data available on the reliability and performance of current generation and grid assets incl. distributed, off-grid and RE generation?																			
	Is a forecast of demand growth available and updated at least yearly (national, per island, per sector, etc.)?																			
	Is relevant data easily accessible and shared between key agencies and RE stakeholders?																			
	Is there in-country experience with design, installation, procurement or use of RE technologies? Which technologies, who has the experience?																			
	Has the potential for energy efficiency improvement being assessed for both supply-side and demand-side (e.g. through benchmarking)?																			
	Has the potential for non-electric RE been assessed (e.g. for cooling, heating, cooking, manufacturing, desalination, transportation…)?																			
Planning	Is there a dedicated office with responsibility for a comprehensive energy planning process that incorporates RE?																			
	Is there a list of projects (completed, ongoing, planned and potential), and an understanding of how much they contibute to meeting the RE targets?																			
	Are there any land use restrictions that could limit RE deployment?																			
	Have grid integration studies been done to allow more variable RE in the power sector?																			
Financing	Is public and private financing for RE projects sufficient to achieve RE target?																			
	Do building owners (hotels, households) have sufficient financing to invest in RE?																			
	Are there RE service companies active in the country which are able to finance RE projects and sell the electricity as a service?																			
	Are clear rules and processes in place to promote domestic and foreign investment in RE?																			
Deployment	Are there clear, objective selection criteria for project developers and technology providers for public projects?																			
	Are the necessary supply chain and infrastructure (incl. ports and roads) in place to deploy RE systems?																			
	Is there an established procedure for inspection and grid-connection of RE projects?																			
	Are adequate plans and budget in place to successfully operate and maintain public and donor-funded RE systems?																			
	Is the quantity and capacity of project developers active in the country adequate for the development of the necessary RE projects to achieve the policy targets?																			
	Is there a formally established process to initiate and develop renewable energy projects? If yes, please provide references and describe the process.																			
Capacity Building	Are there any RE educational programs or training available?																			
	What are the capacities for installation, operation and maintenance of RE equipment?																			
	What are the capacities to plan and operate power grids with a high share of variable RE?																			
	What is the capacity of policy makers to set RE targets, develop policies to meet them?																			
	Is there a sufficient number of competent RE companies providing the necessary services for RE deployment?																			
	What is the capacity to develop viable project proposals for grant, loan and private financing?																			
Co-operation	Can international cooperation help in addressing some of the barriers identified above, and how?																			
	Which international or regional organizations are actively supporting deployment of RE in your country?																			
	Is there a specific government office responsible for donor coordination? Do they have specific RE expertise?																			

APPENDIX D: OCTA - SUSTAINABLE ENERGY ROADMAP

ASSOCIATION OF THE OVERSEAS COUNTRIES AND TERRITORIES OF THE EUROPEAN UNION ("OCTA")

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LGO ASSOCIATIE

OVERSØISKE LANDE OG TERRITORIERS ASSOCIATION

Sustainable Energy Roadmap for OCTs

The Energy Ministers, Council Members and Representatives of the Overseas Countries and Territories of the European Union,

Having met in Brussels, Belgium on the 16th & 17th of June 2015 on the occasion of the Summit of OCT Energy Ministers, in the margins of the EU Sustainable Energy Week;

Following the joint conclusion of the most recent OCT-EU Forum, held in February 2015, where the sustainable use of natural resources has been declared of critical importance to the OCTs, and Sustainable Energy and Climate Change (including disaster risk reduction) have been endorsed as focal sectors for the Thematic Programme of the 11th European Development Fund;

Unlocking OCTs' potential to serve as regional hubs and centres of excellence and reinforcing OCTs' competitive advantages emerging from their association with the EU, as well as international and regional partners;

Capitalizing on the European Commission's support to OCT policies for sustainable development;

Conscious that Overseas Countries and Territories are amongst the most vulnerable to climate change, and the consequences it has on entire ecosystems, our public infrastructures, our food security, resilience, health and welfare, and therefore on our existence;

Recognizing that climate change will amplify existing risks and create new challenges for natural and human systems, and that these risks are unevenly distributed;

Aware of the urgency to promote and facilitate renewable energy and energy efficiency to address the challenges of energy security and climate change mitigation;

Committed to show worldwide leadership towards a reliable and affordable transition of our energy systems to fossil fuel independence;

Acknowledging the opportunities that this transition offers to economic development;

Recognising the key role that isolated energy systems can play in the development of smart grid technologies and innovations to overcome the challenges due to intermittent supply;

Highlighting the added value of cooperating closely with applied research institutions from EU Member States, and other countries, particularly those that have links with OCTs;

Highlighting the need to increase the capacity of governmental and non-governmental institutions and the private sector to plan, develop and manage sustainable energy projects by

commissioning specific studies on sustainable energy technologies in island settings;

Concentrating their efforts on indicating OCT wide priorities for the programming process of the Thematic Programme of the 11th European Development Fund;

Aware that OCTs are located in areas where there is an abundance of natural energy sources such as wind, solar, thermal, hydro and marine; and that OCTs can take advantage of this position by promoting themselves as centres of excellence in the field of sustainable energy;

Conscious that smart, innovative energy solutions can be tested and applied in a confined setting, and that this enabling policy environment will be beneficial to both OCTs and providers of sustainable energy solutions;

Encouraged by the fact that OCTs can utilize their assets by enabling quick and valuable insights to assist with sustainable energy transitions in other remote areas and larger energy systems worldwide.

Have decided to,

Engage in a common sustainable energy strategy to significantly increase the penetration of reliable and affordable renewable energy and greatly increased energy efficiency. Actively use the OCT energy network to take advantage of a wealth of experiences and technology know-how from individual OCTs;

Strengthen local capacity through the development of technical partnerships and other means, to collaborate with other EU, OR, ACP and OCT bodies in the area of research projects and applications, including for innovative sustainable energy technologies;

Facilitate and partner in developing innovative sustainable energy solutions adapted to local conditions, particularly with applied research institutions from EU Member States that have links with OCTs;

Raise awareness to reduce energy consumption by promoting energy efficiency in supply and demand;

Set the following OCT Sustainable Energy Priorities as OCT wide objectives, where applicable:

Technical:

- Increase the deployment of Sustainable Energy projects and programmes

- Reduce energy use & dependency on fossil fuels by improving energy efficiency
- Develop reliable and affordable energy storage using environmentally friendly, mature and new technologies;
- Promote the adoption of technologies to continuously improve grid control and management
- Promote the renovation and adaptation of building stock by retrofitting with renewable energy and energy efficiency applications;
- Create real life testing and demonstration environments for sustainable energy solutions;
- Explore opportunities to develop responsible disposal of sustainable energy equipment

Economic:

- Switching transportation fuel consumption from hydrocarbons to renewable electrical energy
- Promote eco-mobility
- Carry out an analysis of the technical and financial impacts of increased intermittent renewable energy resources on grid stability, where required;
- Assess and develop a suitable business model for electric utilities integrating renewable technologies into the generation mix;
- Promote OCT policy frameworks for investments (OCT-PFI) to improve investment conditions and increase bankable project proposals;
- Engage with the European Union to establish an OCT/EU Energy Declaration

Legal:

- Promote renewable energy and energy efficiency applications for new buildings in the building code;
- Facilitate the development of enabling regulatory frameworks for rapid deployment of sustainable energy projects;

In order to allow the testing of promising and innovative ideas, modalities of organisation /implementation, research or technologies, the identified priorities need to be transformed into concrete plans, where possible in accordance with financing from the 11th European

Development Fund, which include funding for knowledge build up and pilot projects within the OCTs. These pilot projects can be implemented through grant contracts.

- The following timeline is indicative to achieve and evaluate the commonly defined objectives, in accordance with the relevant timelines established in the 11th EDF programming instruction for OCTs.

2016: Sign the programming documentation and Finance Agreement for the Thematic Programme of the 11th European Development Fund

2017: Start implementation, setup institutional framework and knowledge base

2018: Initiation of sustainable energy pilots in the OCTs

2020: Evaluation of transition progress

This Roadmap does not, nor is it intended to, create any binding, legal or financial obligations under domestic or international law, and is subject where applicable to endorsement by individual OCT governments.

REFERENCE

This Roadmap which OCT Representatives listed below approve, shall be referred to as the "Sustainable Energy Roadmap for OCTs".

Signed in Brussels on June 17th 2015

For the Delegation of Anguilla
Hon. Curtis Arville Richardson
Minister of Infrastructure, Communications, Utilities, Housing, Agriculture and Fisheries

For the Delegation of Aruba
Hon. Oslin Benito Sevinger
Minister of Spatial Development, Infrastructure and Integration

ASSOCIATION OF THE OVERSEAS COUNTRIES AND TERRITORIES OF THE EUROPEAN UNION ("OCTA")

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For the Delegation of Bonaire
Mr. Marco Gravenhorst
Policy Advisor

For the Delegation of British Virgin Islands
Hon. Dr. Kedrick Pickering
Deputy Premier and Minister for Natural Resources and Labour

For the Delegation of Cayman Islands
Mr. Robert Prince Lewis
Director & Policy Coordination Unit at Cabinet Office

For the Delegation of Curaçao
Mrs. Ann Philipps
Representative of the Government of Curaçao at the European Union

For the Delegation of Falkland Islands
Hon. Roger Anthony Edwards
Member of the Legislative Assembly

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For the Delegation of French Polynesia
Hon. Nuihau LAUREY
Vice President - Senator of the Government of French Polynesia, Minister of Budget, Finance and Energy

For the Delegation of Greenland
Hon. Mala Høy Kúko
Minister for the Nature, Environment and Justice

For the Delegation of Montserrat
Hon. Paul Lewis
Minister of Communications, Works and Labour with responsibility for energy

For the Delegation of New Caledonia
Mr. Thierry CORNAILLE
Minister, Member of government in charge of energy

For the Delegation of Pitcairn,
Mr. Leslie Jaques
Councilor for International Relations, Government of Pitcairn Islands

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For the Delegation of Saba,
Drs. Menno van der Velde
Territorial Authorizing Officer & Senior Policy Advisor

For the Delegation of Saint Barthlémy,
Mr. Michel Magras
Sénateur de Saint-Barthélemy, Président de la Délégation sénatoriale à l'Outre-mer

For the Delegation of Saint Helena, Ascension, Tristan da Cunha
Mr. Wilson Duncan, Councilor
Chair Environment and Natural Resources

For the Delegation of Saint-Pierre-and-Miquelon
Mr. Bernard Briand
Vice-Président Du Conseil Territorial

For the Delegation of Sint Eustatius,
Mr. Simon Dijkshoorn
Territorial Authorizing Officer

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OVERSØISKE LANDE OG TERRITORIERS ASSOCIATION

For the Delegation of Sint Maarten
Mrs. Josianne Stefanie Artsen
Minister Plenipotentiary

For the Delegation of Turks and Caicos Islands
Hon. Anya Williams
Permanent Secretary

For the Delegation of Wallis et Futuna
Mr. Paino Vanai
Délégué du Territoire à Paris