IRENA
International Renewable Energy Agency

SIDS Lighthouses Quickscan

Interim Report

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About IRENA

The International Renewable Energy Agency (IRENA) is an intergovernmental organisation that supports countries in their transition to a sustainable energy future, and serves as the principal platform for international co-operation, a centre of excellence, and a repository of policy, technology, resource and financial knowledge on renewable energy. IRENA promotes the widespread adoption and sustainable use of all forms of renewable energy, including bioenergy, geothermal, hydropower, ocean, solar and wind energy in the pursuit of sustainable development, energy access, energy security and low-carbon economic growth and prosperity. **www.irena.org**

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ABBREVIATIONS

AIMS	Atlantic, Indian Ocean, Mediterranean and South China Sea
BVI	British Virgin Islands
EU	European Union
IRENA	International Renewable Energy Agency
kWh	kilowatt-hour
LCOE	levelised cost of electricity
LED	light-emitting diode
MW	megawatt
MWh	megawatt-hour
OCTA	Association of the Overseas Countries and Territories of the European Union
OCTs	overseas countries and territories
OECD	Organisation for Economic Co-operation and Development
PV	photovoltaics
RE	renewable energy
RRA	Renewables Readiness Assessment
SIDS	small island developing states
TAAF	French Southern and Antarctic Lands
UN	United Nations
US	United States
USD	United States dollar

EXECUTIVE SUMMARY

Quickscan is a tool developed by the International Renewable Energy Agency (IRENA) to assess the supporting conditions for renewable energy deployment on islands, to monitor deployment progress and to identify areas where targeted assistance can accelerate the transition to renewables. Twenty-eight small island developing states (SIDS)[1] and 10 additional island countries or territories have completed Quickscans, providing a wealth of information and insights on how SIDS and other islands can scale up their transition to renewables. This interim report details the case for islands to transition to energy systems based on renewables and explains the methodology and findings of Quickscans completed to date.

Quickscan is a key component of the SIDS Lighthouses initiative, which was launched on 23 September 2014 at the New York Climate Summit by IRENA in co-operation with SIDS and development partners to address the barriers to renewable energy deployment on islands and to help SIDS achieve a sustainable transition to renewable energy.

In support of the Lighthouses initiative goals, Quickscan provides a rapid, country-owned, qualitative assessment of the enabling conditions for renewable energy deployment on islands. The basis of Quickscan is a questionnaire completed by a local energy sector expert appointed by the government. Completed questionnaires are analysed by IRENA or other Lighthouses partners to determine key barriers and opportunities for renewables deployment and to support communication of these needs. Quickscan questionnaire responses are graded as ready, in progress or not ready to provide an overview of progress towards reliance on renewables. Annex 1 of this report contains the Quickscan questionnaire.

In 2015 and 2016 IRENA and the Association of the Overseas Countries and Territories of the European Union (OCTA), a Lighthouses partner, assisted the following 28 SIDS partners of the Lighthouses initiative in completing Quickscans:

Anguilla, Antigua and Barbuda, Aruba*, Bahamas, Bermuda*, British Virgin Islands*, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia*, Kiribati, Maldives, Marshall Islands, Mauritius, Montserrat*, Nauru, New Caledonia*, Niue, Palau, Samoa, Seychelles, Sint Maarten*, Solomon Islands, Tonga, Trinidad and Tobago, Turks and Caicos*, Tuvalu and Vanuatu.*

With assistance from OCTA, the following 10 non-SIDS islands, which all have the status of OCTs completed Quickscans in 2016:

Bonaire, Falkland Islands, French Southern and Antarctic territories (TAAF), Pitcairn Islands, Saba, Saint Barthélemy, Saint Helena, Saint-Pierre-et-Miquelon, Sint Eustatius and Wallis et Futuna.

Figures 1 and 2 provide the grading of Quickscan questionnaire response by SIDS/OCT. It should be noted that these gradings reflect the status of each SIDS/OCT at the time the Quickscan was completed. As such they establish a baseline for measuring current and future progress towards reliance on renewable energy, which could be accomplished through the completion of an updated Quickscan.

1 The United Nations (UN) recognises 38 UN Member States as SIDS belonging to the Alliance of Small Island States (AOSIS), an ad hoc negotiating body established by SIDS at the United Nations. AOSIS also includes 20 island entities that are non-UN Member States or are not self-governing or non-independent territories that are members of UN regional commissions (UN-OHRLLS, 2017). Profiles for each of the SIDS can be found at: unohrlls.org/about-sids/country-profiles/.

* Overseas Countries and Territories of the European Union

Figure 1. Quickscan results for the 20 SIDS assisted by IRENA

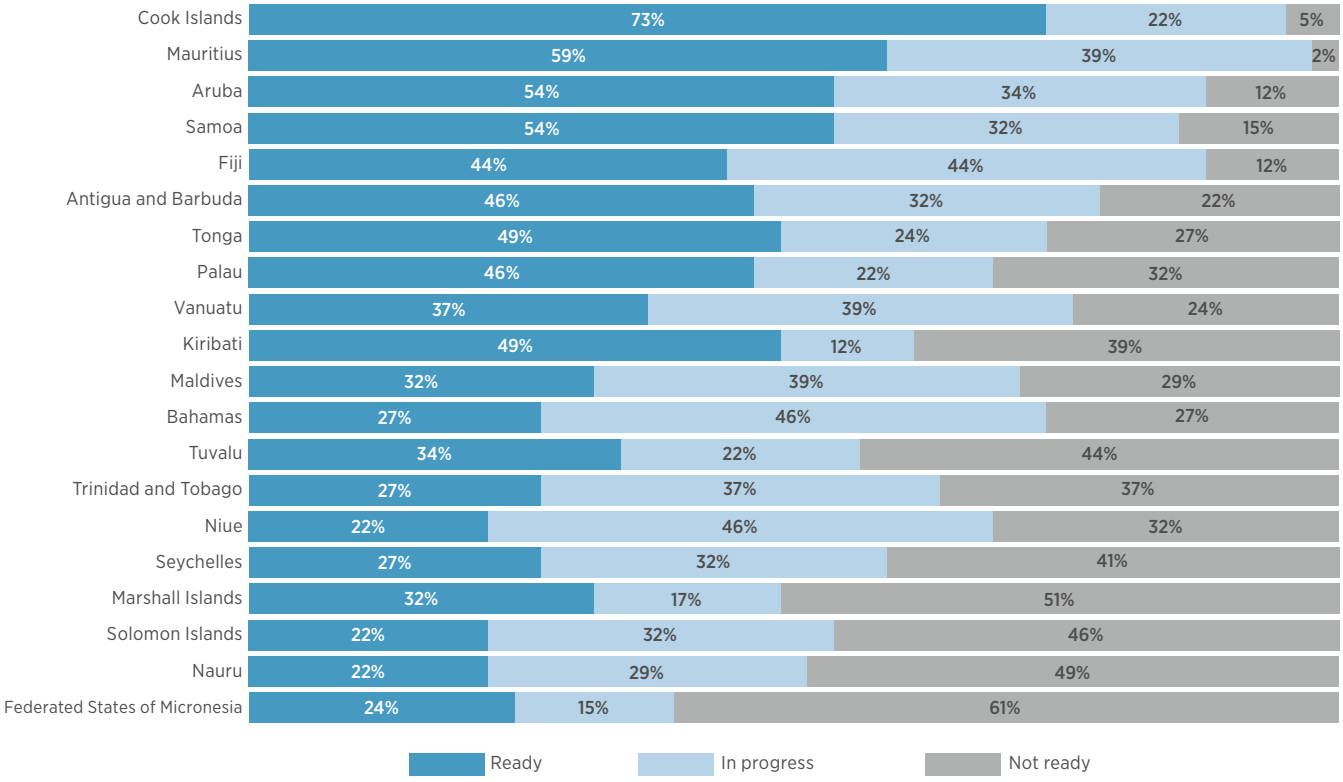
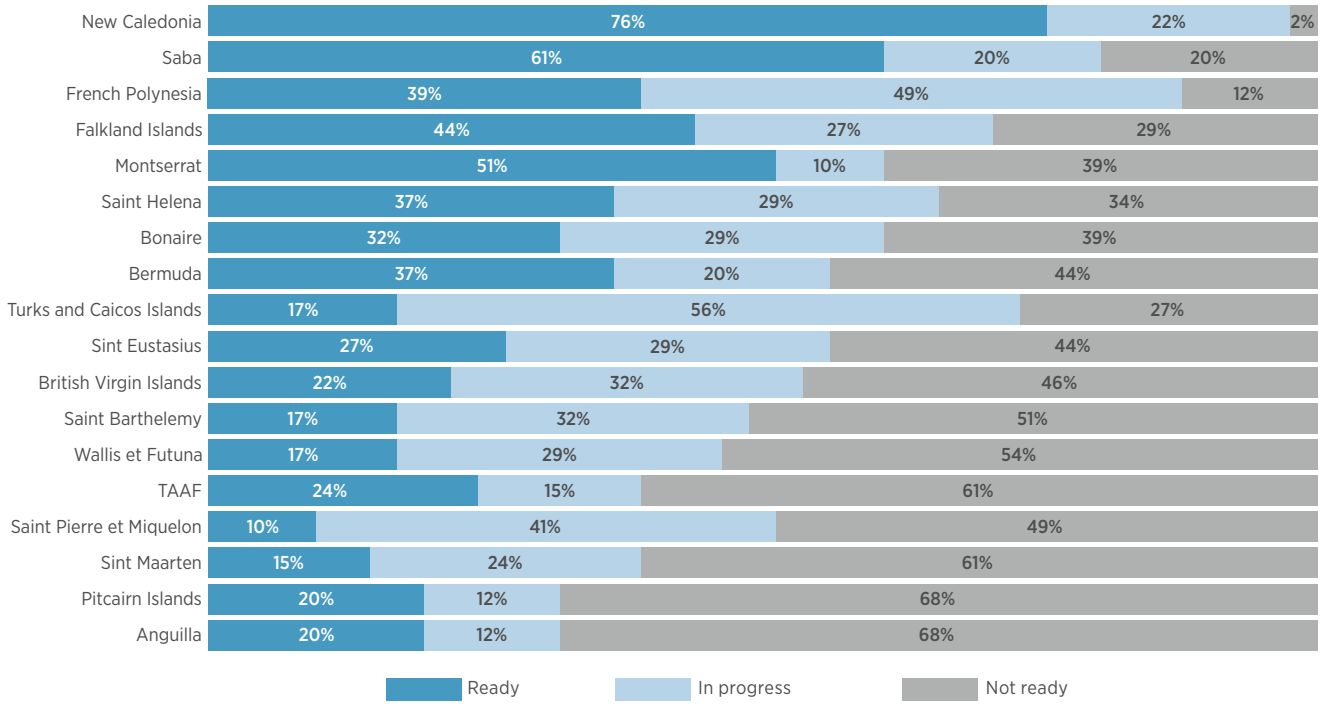


Figure 2. Quickscan results for the 18 OCTs assisted by OCTA



When designing Quickscan, IRENA utilised its extensive experience in supporting renewable energy deployment on islands, which shows that a sustainable transition to reliance on renewable energy requires a comprehensive process that covers planning, financing, deploying and operating an electricity system with high shares of renewable generation. Quickscan focus on seven key elements of a successful transition to renewables: 1) institutional framework, 2) knowledge base, 3) transition planning, 4) project financing, 5) project deployment, 6) capacity building and 7) regional and international co-operation.

Figure 3. Quickscan results by element for the 20 SIDS assisted by IRENA

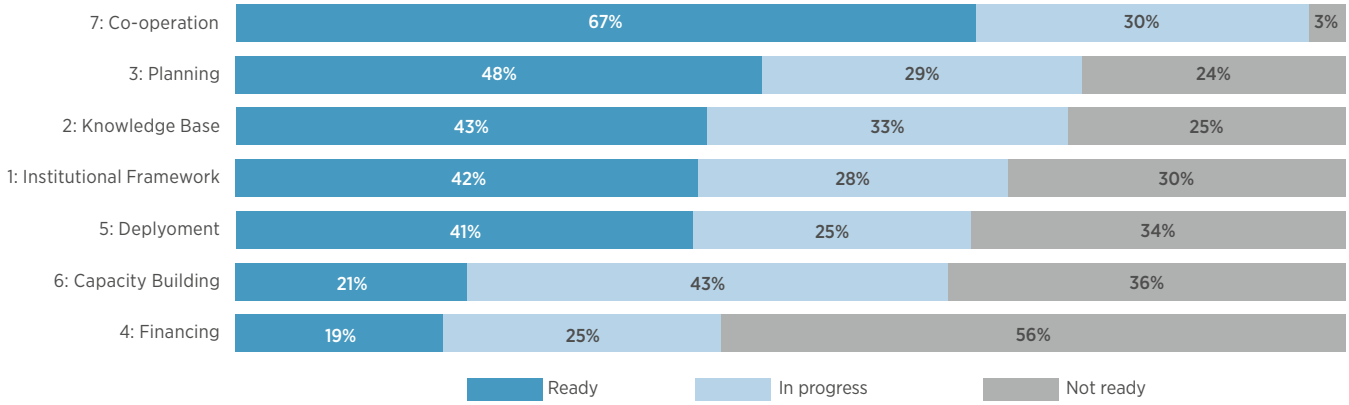


Figure 4. Quickscan results by element for the 18 OCTs assisted by OCTA

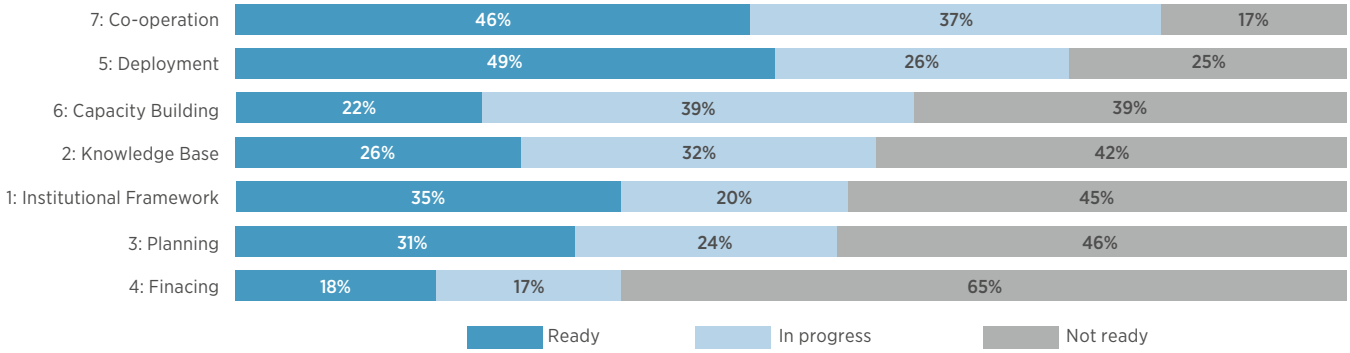


Figure 3 provides a ranking of readiness among the seven elements for the 20 SIDS that IRENA assisted with Quickscans. Figure 4 provides the same information for the 18 OCTs that OCTA assisted with Quickscans.

This report details the results of Quickscan analyses completed to date and shows that Quickscan is a valuable tool for country self-assessments and for rapid collection of data and documentation to identify barriers and opportunities for the deployment of renewables. Quickscans covering numerous SIDS are helpful in identifying common barriers that can serve to focus development partner assistance in areas where there is a broad need for support such as finance and capacity building. The completion of Quickscans for 20 SIDS by IRENA in only five months demonstrates that the methodology can be applied quickly to numerous SIDS.

Quickscan supports the forward-looking objectives of the SIDS Lighthouses initiative by serving as an excellent tool for initial engagement with SIDS, informing SIDS of the initiative's goals and of its support of SIDS. The process of gathering data via Quickscan helps to establish a clear baseline for measuring progress on the initiative's goals. By supporting a self-assessment of local capacity and priority areas for action, Quickscans can empower SIDS governments to push for reforms and to clearly communicate their needs. By making the most pressing needs and opportunities for impactful assistance more transparent, Quickscans can create momentum to mobilise funding and co-ordinated action among SIDS and development partners.

Quickscan also serves as an excellent method for identifying which additional tools and studies are valuable in assisting SIDS in their energy transition and in helping to avoid duplication of efforts. For example, Quickscans were effective in identifying the need for national energy roadmaps in several SIDS while also showing that on many islands, development partner funding could be more effectively directed towards capacity building for planning and operation of systems with high shares of renewables.

The ability to quickly implement Quickscans and to analyse and visualise the results also offers SIDS governments, policy makers and other stakeholders a simple tool that can be used on a regular basis to determine if policy and regulatory measures have been effective in accelerating renewable energy deployment. Key findings from the 20 IRENA-assisted Quickscans are summarised here:

- Political leadership for a transition to renewable energy is present in almost all SIDS. This is demonstrated by the wide adoption of renewable energy targets and by the active participation by high-level government officials in local, regional and international activities focused on renewables.

- Implementation-oriented roadmaps covering deployment of renewable energy have been developed by most SIDS in the Pacific but are still needed for some SIDS in the Caribbean and Atlantic, Indian Ocean, Mediterranean and South China Sea (AIMS) regions.

- 15 of the 20 SIDS have a dedicated office with responsibility for a comprehensive energy planning process that incorporates renewable energy. This is a key element to support the transition to renewables. However, Quickscans show that these offices often lack capacity to plan for the integration of variable renewables such as solar photovoltaics (PV) and wind generation, presenting a key opportunity for targeted capacity building.

- 10 of the 20 SIDS have a list of completed, ongoing, planned and potential projects and an understanding of how much each project will contribute to meeting their renewables targets. These data are essential for understanding progress in transitioning to renewable energy and for identifying what capacity and type of additional projects are needed. SIDS should make sure that this project-level information is available to all energy sector stakeholders and development partners to facilitate co-ordination and to reduce duplication of efforts.

- Access to finance is a major issue in SIDS. Local equity and government funding are insufficient to achieve the renewable energy deployment envisioned, and often the framework to attract foreign investments into renewables is not in place, or is not effective in attracting the necessary foreign direct investment.

- The long-term operation and maintenance of renewable energy projects is a concern in many of the SIDS covered by Quickscans. Only five of them have adequate plans and budgets in place to successfully operate and maintain public and donor-funded renewable energy systems.

- Quickscan analysis found that capacities to plan and operate power grids with a high share of variable renewable energy is a critical need.

- Quickscans indicate that a broad variety of development partners are active in all 20 SIDS and that SIDS believe that co-operation with development partners is a critical tool for removing barriers to renewable energy deployment.

The 18 Quickscans completed with assistance from OCTA identify barriers and opportunities similar to those listed above, with a noted need for capacity building and access to renewable energy project financing. In addition, the OCTA Quickscans highlight challenges to renewables coming from scarcity of land for project deployment and from the lack of co-ordination among key energy sector stakeholders, with co-operation between governments and utilities being especially critical. The results of the OCTA Quickscan analysis are discussed in the main body of this report, while Annex 2 offers additional findings and recommendations from the OCTA Quickscans to accelerate renewables deployment on islands.

IRENA is working to extend Quickscan coverage to all SIDS that are partners of the Lighthouses initiative. In the long term IRENA aims to regularly update Quickscans to track the transition of SIDS to renewables, to measure progress on current Lighthouses initiative goals and to assist in setting future goals for the initiative.

ISLAND ENERGY TRANSITIONS AND THE ROLE OF QUICKSCANS

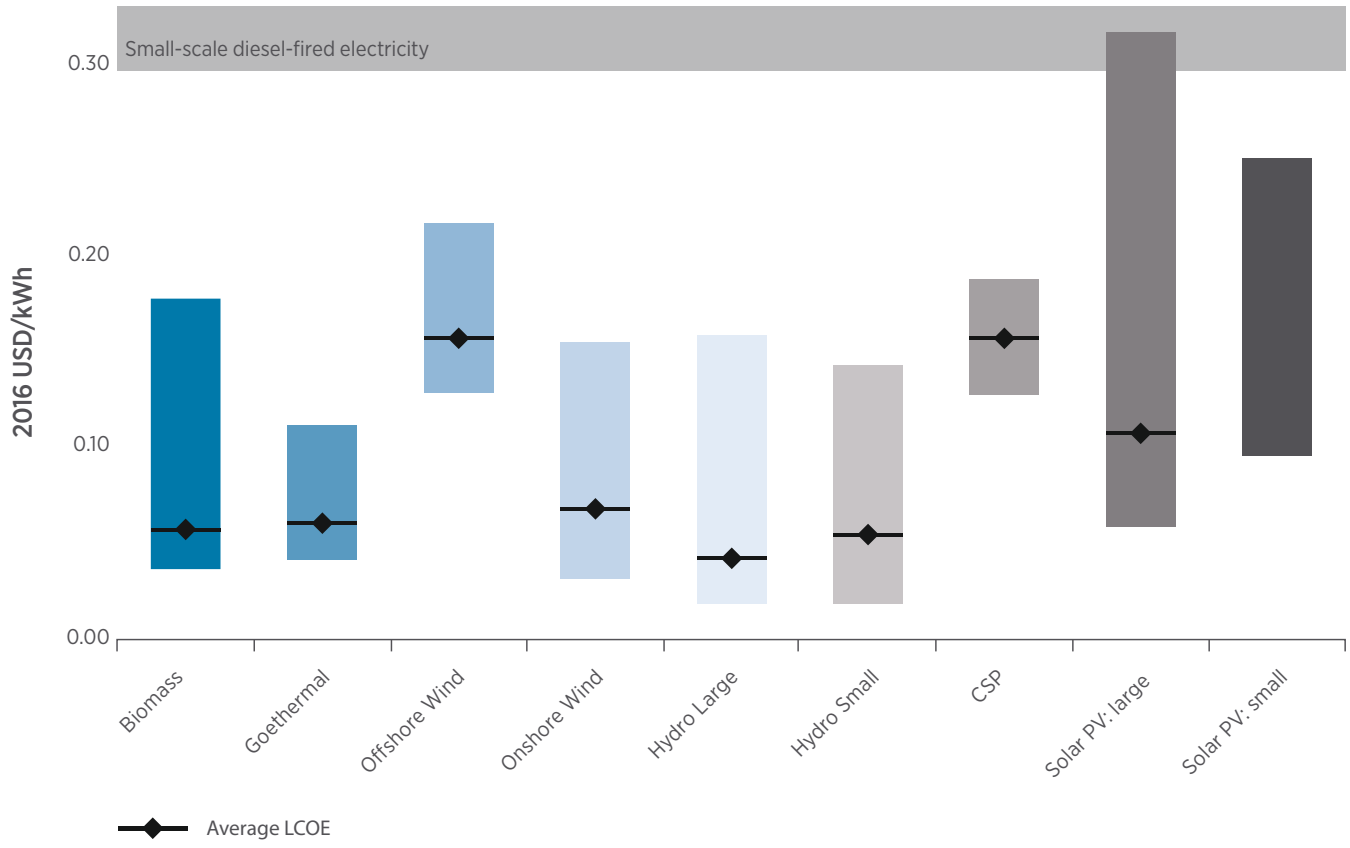
There is a strong case for small island developing states (SIDS) and other islands to transition from a reliance on fossil fuels to economies based on renewable energy (IRENA, 2013). Opportunities exist for SIDS and other islands to deploy renewables in all sectors of their economies (IRENA, 2014); however, electricity generation presents a unique opening for a rapid transition towards renewable energy. Renewable electricity generation is a low-cost option on many islands around the world, and numerous islands have demonstrated long-term sustainable generation of electricity based on renewable energy (IRENA, 2016a).

This report presents the case for energy transition on islands and details the methodology and findings of Quickscan, a tool developed by the International Renewable Energy Agency (IRENA) to assess enabling conditions for renewables deployment, to monitor progress and to identify areas where targeted assistance can accelerate SIDS in their transition to renewables. Quickscan provides a rapid, country-owned, qualitative assessment of the enabling conditions for renewable energy deployment on islands.

Considering the economic case for a transition to renewable energy, it can be noted that electricity in most SIDS is generated using expensive imported refined petroleum products. This dependence, combined with long supply chains and limited purchasing power, means that SIDS have some of the highest electricity costs in the world, ranging from USD 0.30 per kilowatt-hour (kWh) to over USD 1.00 per kWh.

Electricity generated using renewable energy is often the lowest-cost option, offering island governments, businesses and citizens a path to low-cost electricity and sustainable development. Figure 5 shows that the levelised cost of electricity (LCOE) from renewables in non-OECD countries is significantly less expensive as compared to diesel generation, a common source of electricity on many islands.

Figure 5. LCOE ranges and averages for renewables and diesel-based generation



The cost of renewable generation in SIDS and on other islands can be higher than the non-OECD costs shown in Figure 5 due to factors such as the remoteness and small size of island power systems. However, IRENA's extensive experience working with governments of SIDS and other islands demonstrates that when renewable generation is properly planned, deployed and operated, it is consistently among the cheapest options for electricity (IRENA, 2016a).

When examining the options for renewable energy generation, it is best to focus on local renewable resources and on low-cost, commercially available technologies. Hydropower, biomass and geothermal can offer low-cost alternatives to fossil fuel generation that can be integrated easily into existing power systems. However, these resources are limited or unavailable on many islands. Wind generation and especially solar photovoltaics (PV) have special relevance, as the resources supporting these technologies are broadly available on many islands.

Islands have some of the best ocean energy resources; however, ocean energy technologies are still in early stages of development compared to other renewable energy options. Islands may consider collaborating with development partners on ocean energy demonstration projects, but additional technology development and cost reductions will be needed before these technologies can supply significant shares of generation.

Sustainable operation of electricity systems with high shares of renewables has been demonstrated on numerous islands across the world using a variety of renewable energy and enabling technologies. Some key examples include:

- Since 2014, Kodiak Island in the US state of Alaska has used hydro and wind power combined with battery and flywheel electricity storage to meet over 99% of its annual electricity demand with renewable generation (Kodiak Electric Association, 2017).

- The power system of King Island in Tasmania, Australia is designed to meet 65% of annual electricity demand using solar PV and wind generation coupled with energy storage. A biodiesel blending system allows for even higher shares of renewables generation (Hydro Tasmania, 2017).

- São Miguel Island in the Azores has used geothermal and hydro to achieve an annual renewable energy share of around 50% for over a decade (Electricidade dos Açores, 2017).

- Numerous small islands around the globe use solar PV and battery storage to support high shares of renewable electricity; for example, the island of Ta'u in the small island developing state of American Samoa deployed a hybrid power system using 1.4 megawatts (MW) of PV and 6 megawatt-hours (MWh) of battery storage to achieve around 100% reliance on renewable energy (National Geographic, 2017).

- SIDS have demonstrated successful deployment and operation of electricity systems with high shares of renewable energy using a variety of technologies. The island of Upolu in Samoa has deployed 14 MW of solar PV and expanded hydropower capacity to greatly increase generation from renewables, and the Cook Islands are on track to have PV plus battery systems operational on all islands (IRENA, 2016b).

Recognising that a transition to renewable energy is an achievable goal offering broad benefits, many SIDS have established targets aiming for high shares of renewable electricity generation (IRENA, 2016b). Progress is being made towards these goals, with notable renewables deployment taking place in almost all SIDS.

However, a sustainable transition to reliance on renewables in SIDS has been slowed by numerous technical, policy, regulatory and economic barriers. One fundamental challenge is moving from fossil fuel-based power systems, where costs are driven by fuel consumption, to systems dominated by solar PV and wind, where costs are driven by significant upfront capital investment. There also often is a lack of local capacity to plan, operate and maintain electricity systems with high shares of variable renewables like PV and wind.

The SIDS Lighthouses initiative was launched on 23 September 2014 at the New York Climate Summit by IRENA in co-operation with SIDS and development partners to address the barriers to large-scale renewable energy deployment and to help SIDS achieve sustainable transitions to renewable energy. Details on the goals and current partners of the Lighthouses initiative are provided in the following section.

A key component of the Lighthouses initiative is Quickscan, a tool that allows SIDS and development partners to identify key barriers and opportunities to renewables deployment. Quickscan is focused on deployment of renewables in the electricity sector but also serves to inform SIDS of renewable energy options in other sectors.

When designing Quickscan, IRENA utilised its extensive experience in supporting renewable energy deployment on islands, which shows that a sustainable transition to reliance on renewable energy requires a comprehensive process that covers planning, financing, deploying and operating an electricity system with high shares of renewable generation. Quickscan examines key steps across this entire process to identify critical barriers and opportunities for targeted assistance. Quickscan also identifies areas of success that can be used to guide other islands.

Quickscan is based on a questionnaire consisting of 41 questions[2] and serves numerous goals:

- A local expert selected by the government completes the Quickscan questionnaire with assistance from IRENA or other Lighthouses partners as needed. This allows for the collection of a significant amount of valuable information and data in a short amount of time and without the need for expensive site visits.

- Completing the questionnaire builds local awareness of the comprehensive process and of the key steps needed for a transition from a fossil fuel-based system to reliance on renewables.

- The completed questionnaire provides answers that reveal the progress on key steps in transitioning to renewables, along with the documents and data needed to evaluate these answers. Combined, this information is used to develop a scoresheet that provides a qualitative overview of a small island developing state's readiness for and progress towards a power system reliant on renewables.

- The answers, data, documents and scoresheet resulting from a completed Quickscan support a wide variety of analysis, from high-level qualitative insights, to easily communicated visualisation, to detailed quantitative research. Quickscan results support renewables transitions in SIDS in the following ways:

- **Identifying impactful projects/areas of support.** For example, a Quickscan could show that a small island developing state has an adequate pipeline of renewable energy projects to meet its goals but lacks the local capacity to properly operate these projects, showing that local capacity building for the utility should be prioritised over additional renewable energy projects.

- **Helping SIDS to identify and communicate their needs.** Palau's Quickscan identified as a key barrier the lack of a comprehensive national plan for the energy sector. In response Palau reached out to IRENA and is now co-operating to develop a renewable energy roadmap to provide national-level guidance.

- **Helping development partners focus and co-ordinate limited resources.** The detailed information provided by Quickscans allows development partners to understand which barriers are most critical and where opportunities for impactful projects exist. Quickscan results also can help to identify areas of potential co-operation among development partners and to reduce duplication of effort.

2 A blank Quickscan questionnaire is provided in Annex 1 of this report.

Completion of multiple Quickscans allows for the identification of regional trends or common barriers across numerous SIDS that can help development partners set priorities and can allow SIDS to share lessons learned. In addition, Quickscan has been designed so that it can be repeated for each small island developing state numerous times to provide a metric for tracking progress towards reliance on renewable energy.

This report is intended to increase understanding of the Quickscan methodology and of the types of outreach and analysis that Quickscans can support to assist SIDS in their transitions to renewables. To date the following 28 SIDS have completed Quickscans:

Anguilla, Antigua and Barbuda, Aruba*, Bahamas, Bermuda*, British Virgin Islands*, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia*, Kiribati, Maldives, Marshall Islands, Mauritius, Montserrat*, Nauru, New Caledonia*, Niue, Palau, Samoa, Seychelles, Sint Maarten*, Solomon Islands, Tonga, Trinidad and Tobago, Turks and Caicos Islands*, Tuvalu and Vanuatu.*

In addition, the following ten non-SIDS islands, which all have the status of Overseas Countries and Territories of the European Union have completed Quickscans:

Bonaire, Falkland Islands, French Southern and Antarctic Lands (TAAF), Pitcairn Islands, Saba, Saint Barthélemy, Saint Helena, Saint Pierre et Miquelon, Sint Eustatius and Wallis et Futuna.

This report presents findings from analysis of completed Quickscans and examines opportunities for further leveraging Quickscans to support renewable energy deployment in SIDS and on other islands.

* Overseas Countries and Territories of the European Union

THE SIDS LIGHTHOUSES INITIATIVE

The SIDS Lighthouses initiative is a partnership between SIDS, IRENA and other partners focused on co-operation to address the challenges that SIDS face in transitioning to reliance on renewable energy. The Lighthouses initiative aims to mobilise funding and political will to accelerate renewable energy deployment in island settings around the world. Within the initial five-year time frame (through 2020), the Lighthouses initiative will focus on the power sector with the aim of achieving the following goals:

- Mobilise USD 500 million
- Deploy 100 MW of new solar PV power
- Deploy 20 MW of new wind power
- Deploy significant quantities of small hydropower, geothermal power and some ocean energy projects
- Ensure that all participating SIDS have renewable energy roadmaps in place.

The Lighthouses initiative currently has 36 SIDS partners:

Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, British Virgin Islands*, Cabo Verde, Comoros, Cook Islands, Cuba, Dominican Republic, Federated States of Micronesia, Fiji, Grenada, Guyana, Kiribati, Maldives, Marshall Islands, Mauritius, Montserrat*, Nauru, New Caledonia*, Niue, Palau, Papua New Guinea, St. Lucia, St. Vincent and the Grenadines, Samoa, São Tomé and Príncipe, Seychelles, Solomon Islands, Tonga, Trinidad and Tobago, Turks and Caicos Islands*, Tuvalu and Vanuatu.*

There are 19 additional partners of the Lighthouses initiative:

European Union, France, Germany, Italy, Japan, New Zealand, Norway, United Arab Emirates, United States of America, Indian Ocean Commission, IRENA, Association of the Overseas Countries and Territories of the European Union, United Nations Development Programme, World Bank, Enel, Clean Energy Solutions Center, Clinton Climate Initiative, Rocky Mountain Institute – Carbon War Room and Sustainable Energy for All (SEforALL).

The Lighthouses initiative offers a framework for SIDS to move away from piece-meal deployment to a structured, holistic, sustainable approach to renewables that accounts for medium- and long-term needs. The initiative considers all elements of a transition to renewables, from policy and market frameworks; through technology options, project development and financing; to capacity building to ensure sustainability. By accelerating the deployment of renewable energy on islands, the Lighthouses initiative helps SIDS provide lessons in addressing climate change issues for the rest of the world. IRENA's role in the Lighthouses initiative is to serve as a hub supporting and facilitating interactions between SIDS and other partners and to assess if the initiative is on track to deliver on its goals.

Quickscan is a key element of the SIDS Lighthouses initiative, serving as an initial country engagement to rapidly assess barriers and opportunities for renewables deployment. It can help to mobilise funding and project deployment by identifying key barriers that need to be overcome and high-impact funding opportunities for renewable energy projects and other areas of support. The Quickscan questionnaire includes specific questions on the installed capacity of renewable energy generation and the presence of national energy planning roadmaps. As such, the initial Quickscans can establish a baseline for the Lighthouses goals, while future Quickscans allow for measuring progress on achieving these goals.

* Overseas Countries and Territories of the European Union

Quickscans also determine the need for and scope of additional assistance from IRENA or other Lighthouses partners. Quickscans show which of IRENA's tools can assist SIDS with the transition to renewable energy. The IRENA tools of importance to islands in planning and implementing a sustainable transition to renewables are detailed below:

Renewables Readiness Assessment (RRA)

- Co-operative exercise with a country to establish the current baseline and to yield a list of actions for advancing renewables deployment
- Comprehensive review of renewable energy development to improve understanding of the national energy sector
- Identification and analysis of key issues associated with the deployment of renewables
- Presents the opportunities for scaling up renewable energy development
- Discusses the specific issues to be addressed, and prepares specific policy recommendations
- Produces a portfolio of actionable initiatives to be developed
- Qualitative in nature

Energy roadmaps for islands

- Country-driven process; focus varies depending on a country's needs
- Yields a forward-looking, model-based energy sector plan providing transition pathways to meet government goals for the energy sector
- Quantitative, techno-economic analysis; different quantitative tools are used depending on the sector focus, data availability and government targets
- Can cover only the electricity sector, or a country's entire energy sector
- Can cover the whole country (national roadmap), or specific islands
- Provides specific recommendations to policy makers for implementation

Grid studies

- Quantitative, technical, model-based analysis of current grid infrastructure to determine its ability to integrate variable renewables and to identify investments to support additional renewables integration
- Assessment of reliability and security of the system with planned penetration levels of variable renewable energy through statistical analysis and electricity grid modelling and simulation
- Identification of technical solutions to maintain reliable grid operation
- Facilitate co-ordination between long-term, policy-driven renewable energy targets and their actual deployment in the grid
- Development of grid codes for specific use on islands
- Provision of technical assistance and online access to modelling software to support grid studies by local experts

Project Navigator

- Online member-based platform accessible at: irena.org/navigator
- Increase the bankability of projects
- Enhance the quality of project proposals
- Reduce costs and mitigating risks through proper planning and efficient use of funds
- Facilitate effective implementation
- Provide qualitative and quantitative, technical and financial analysis of projects
- Provide a pipeline of viable projects to support achievement of national renewable energy goals and targets

Quality control, standards and certification

- Support is provided through a variety of IRENA publications, guides and workshops
- Facilitate assistance in developing quality infrastructure for renewable energy technologies, e.g., certification, standardisation and testing
- In-depth analysis of quality infrastructure for solar PV, solar water heaters and small-scale wind generation
- Studies in quality assurance of technologies in countries with extreme weather conditions: hurricanes, high humidity, high ultraviolet radiation, etc.Support of grid codes conception, identifying technical requirements depending on country context
- Country engagement through workshops, capacity building and exchange of best practices

Sustainable Energy Marketplace

- Online platform accessible at: irena.org/marketplace
- Vehicle to channel projects to right financiers
- Identifies projects and supports development towards investment maturity
- Provides transaction advisory service
- Spans 85 funds, facilities and programmes offering funding for renewable energy projects in Africa, Latin America and the Caribbean

The above tools support different stages of the energy transition on islands, from an assessment of barriers for the accelerated deployment of renewables (RRA), to the techno-economic planning of the least-cost future energy system (roadmaps). Once such a plan is in place, the technical feasibility is assessed in terms of impact on operations and need for grid integration measures through a grid study. The additional renewable generation capacity identified in a roadmap can be developed into a discrete set of projects using the Project Navigator. These projects can be made accessible to potential investors through the Sustainable Energy Marketplace.

By identifying the key barriers and impactful opportunities for renewable energy deployment Quickscan helps to identify which IRENA tools can provide targeted assistance; for example, the Quickscan questionnaire asks about the presence of national-level roadmaps/planning documents and whether grid studies have been conducted to determine the impact of planned renewables deployment. The broader goals, methodology, progress and impact of Quickscan is detailed in the following sections.

QUICKSCAN GOALS AND METHODOLOGY

In support of the Lighthouses initiative, IRENA developed Quickscan as a tool to assist SIDS and other islands in their transition away from fossil fuels towards energy systems based on renewable energy. Quickscan is a government-led exercise supported by analysis from IRENA or other Lighthouses partners with the following goals:

- Use a targeted questionnaire, completed by a local expert, to establish readiness for large-scale renewables deployment and progress towards reliance on renewable energy
- Gather documents and data to establish the status of the energy sector and validate the questionnaire answers
- Produce a scoresheet that allows for visualisation and quantification of questionnaire results
- Identify critical barriers to renewable energy deployment
- Identify high-impact opportunities to accelerate the transition to renewables
- Increase government understanding of the comprehensive process necessary to drive a transition to reliance on renewable energy
- Facilitate engagement with and raise awareness among key stakeholders regarding the potential and benefits of renewables.

To achieve these goals Quickscan uses a methodology based on IRENA's extensive experience supporting renewable energy deployment on islands. This work includes co-operation with SIDS and other islands on national energy roadmaps, grid studies and other areas of engagement covering the technical, policy, regulatory and economic challenges to renewables.

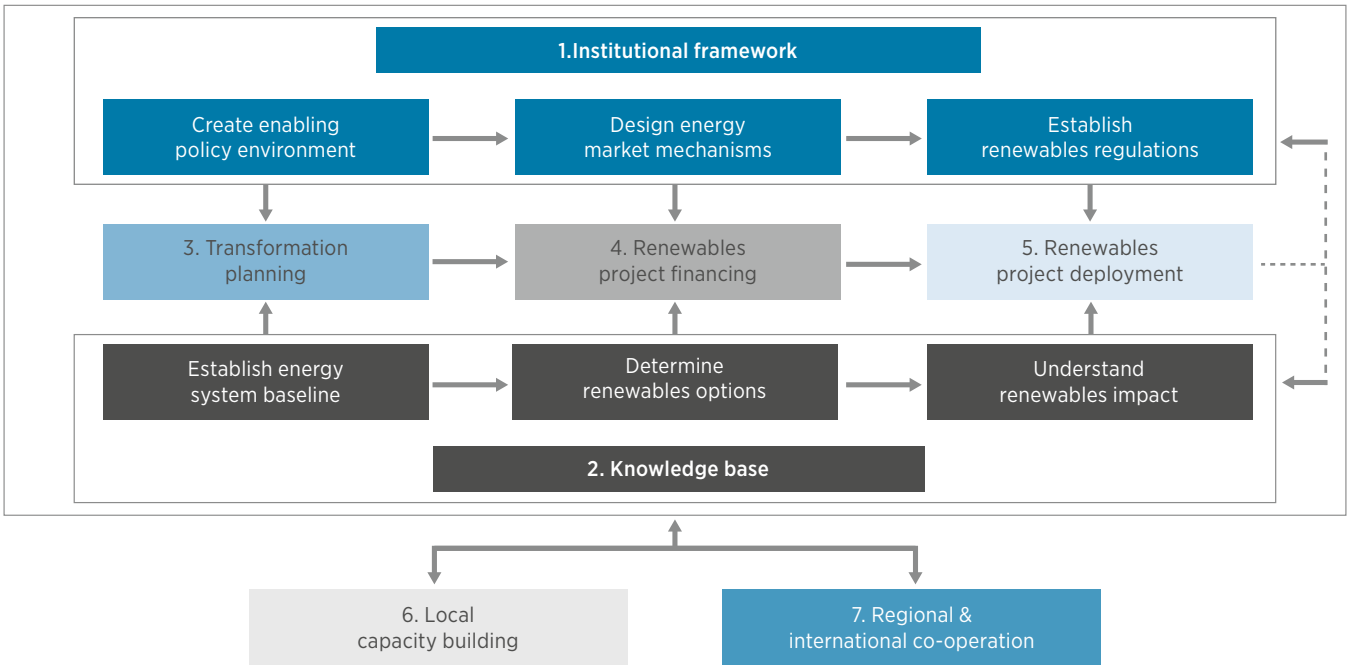
IRENA's co-operative work with SIDS and other islands shows that a sustainable transition from fossil fuels to renewable energy requires a comprehensive and iterative process. Quickscan has been designed to determine the status of a small island developing state on key steps in this process that reveal overall progress and identify barriers and opportunities.

The core of the process supporting a transformation to reliance on renewable energy relies on local understanding of the benefits and challenges associated with renewable energy, combined with strong capacity among energy sector institutions and stakeholders. Local knowledge and capacity determine the success of the planning, financing and deployment of renewable energy projects that make up the steps on a path towards reliance on renewables.

Figure 6 show how the iterative process of transforming the energy system can be broken down into seven key elements. Institutional framework (Element 1) reflects a stable and transparent policy and regulatory environment needed to effect changes to the energy system. Knowledge base (Element 2) indicates the understanding of the impacts of renewable energy technologies on the overall energy system.

Institutional framework and knowledge base serve as the foundation for energy transformation and support the sequential steps of incorporating renewables into energy system planning (Element 3), financing the envisioned projects (Element 4) and successfully deploying these projects (Element 5). The entire transformation process can be assisted by targeted capacity building (Element 6) and by regional and international co-operation (Element 7).

Figure 6. Comprehensive renewable energy transformation process



As shown by the dashed lines in Figure 6, each completed project serves as a learning experience enhancing local understanding and providing valuable feedback to improve the execution of future projects. This process also recognises that as the energy system integrates higher share of renewables, new challenges emerge that require adjustments to policies as well as additional local knowledge and capacity.

IRENA developed the Quickscan questionnaire to reflect the seven key elements of the process detailed in Figure 6. The questionnaire consists of 41 targeted questions and includes requests for supporting data and documents to validate the responses to each question. The full questionnaire is provided in Annex 1 of this report. The following list summarises the importance of each element to a sustainable transition to renewable energy in SIDS and notes how the questionnaire is used to determine a small island developing state's level of readiness in each element.

1 **Institutional framework:** The framework created by local policy, regulation, market structure and interactions among key stakeholders directly impacts the effective and sustainable deployment of renewable energy. For this element, targeted questions provide an overview of the existing framework governing the energy sector, focusing on areas that impact renewable energy deployment.

2 **Knowledge base:** Extensive institutional and technical knowledge are critical to enable a successful transition to renewables. For this element, the questionnaire seeks to establish the level of understanding among energy sector stakeholders in areas relevant to renewable energy and to determine the availability and quality of data necessary to implement a transition to renewables.

3 **Renewable energy transition planning:** Due to a traditional focus on fossil fuel-based power systems, there often is limited knowledge in SIDS of the different planning procedures required for large-scale renewable energy projects. For this element, the questionnaire seeks to determine the robustness of local energy planning institutions, organisations and processes with respect to renewables.

4 **Renewable energy project financing:** Fossil fuel power system costs are driven primarily by fuel and operational costs. The cost of renewable energy base generation is driven by upfront capital cost. As such, the availability, accessibility and affordability of financial resources is critical to implement a renewable energy transition. To address this concern, the questionnaire assesses the accessibility and adequacy of available foreign and domestic funding options from public and private sources to support renewable energy deployment.

5 **Renewable energy project deployment:** The successful deployment, operation and maintenance of renewable energy projects requires specific processes, procedures and infrastructure that may be lacking in some SIDS. Questions for this element focus on the key steps required to take renewable energy projects from design to sustainable operation in an island context.

6 **Capacity building:** A successful transition to renewable energy depends on strong local capacity across the entire process described above. Questions for this element identify high-impact opportunities for boosting local capacity with regard to renewables.

7 **Co-operation:** International and regional co-operation supporting financial, technical, policy and regulatory knowledge transfer can support renewable energy deployment in SIDS. This element of the questionnaire examines: the state of co-operation between a small island developing state and international and regional partners, how such co-operation can support the transition to renewable energy and which areas would benefit from increased co-operation or better co-ordination.

Using questions covering these seven elements, the Quickscan questionnaire allows SIDS governments, with the support of IRENA or other Lighthouses partners as needed, to perform a self-assessment that serves as a knowledge-building exercise while also providing the detailed information needed to support an analysis of the key barriers and opportunities related to renewable energy deployment.

The questionnaire is designed to be completed independently by a government focal point with a high level of knowledge of the local energy sector and established contacts with key stakeholders. As needed IRENA or other Lighthouses partners can assist the government focal point in completion of the questionnaire and in collection of the supporting data and documents. The Quickscan questionnaire also can serve as a tool to facilitate initial engagement with a small island developing state regarding renewables or to support a country visit or scoping mission.

The Quickscan questionnaire can be completed in a few days. Analysis of Quickscan results can take a week or longer depending on the complexity of the energy sector in the small island developing state and on the level of data and documentation provided. Once completed, the answers to each Quickscan questionnaire are reviewed by IRENA or the supporting Lighthouses partners and are validated using the documents and data provided. If the questionnaire responses or supporting documents lack the required level of detail or if there are conflicts between responses and supporting documents or data, then IRENA or the supporting Lighthouses partner works with the government focal point to clarify or elaborate the answers so that they can be evaluated accurately.

As part of the analysis the validated answers are graded as ready (blue), in progress (light blue) or not ready/unanswered (gray) to create a scoresheet giving a visual overview of the questionnaire responses that allows for grading of the results to a single question, element, entire Quickscan or multiple Quickscans. Figure 7 provides a sample section of a scoresheet showing the grading of answers to the questions of Element 3 (Planning) from three completed Quickscans.

Figure 7. Sample of Quickscan scoreshee

Quickscan questions for Element 3: planning	Antigua and Barbuda	Aruba	Bahamas
Is there a dedicated office with responsibility for a comprehensive energy planning process that incorporates renewable energy?			
Is there a list of projects (completed, ongoing, palnned and potential), and an understanding of how much they contribute to meeting the renewable energy targets?			
Are there any land use restrictions that could limit renewable energy deployment?			
Have grid integration studies been done to allow more variable renewable energy in the power sector?			

Legend: Grading of responses to Quickscan question	Ready	In progress	Not ready

The detailed information resulting from a completed Quickscan – scoresheet, questionnaire answers, data and documents – are returned to SIDS governments and can be used to communicate their needs and to support additional detailed analysis. As such, completed Quickscans give SIDS, IRENA and other Lighthouses partners insights on progress towards reliance on renewable energy, on which areas will have the highest impact in accelerating renewables deployment and on how SIDS governments and development partners can co-operate to target these areas.

The completion of multiple Quickscans allows analysis to be expanded to identify common barriers or opportunities that exist regionally or among SIDS with shared characteristics. Progress in completing Quickscans and key findings determined from the additional analysis completed to date are highlighted in the following sections.

The following sections of this report detail the progress on completing Quickscans and give an overview of the additional analyses of Quickscan results that have been completed by IRENA and Lighthouses partners.

QUICKSCANS PROGRESS

From May to December of 2015, IRENA assisted the following 20 SIDS in completing a Quickscan:

Antigua and Barbuda, Aruba, Bahamas, Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Maldives, Marshall Islands, Mauritius, Nauru, Niue, Palau, Samoa, Seychelles, Solomon Islands, Tonga, Trinidad and Tobago, Tuvalu and Vanuatu.

In a demonstration of the application of the IRENA-developed Quickscan by partners of the SIDS, the Association of the Overseas Countries and Territories of the European Union (OCTA) assisted the 18 overseas countries and territories (OCTs) in completing Quickscans. OCTA's analysis of Quickscan results also included Aruba, an OCT and SIDS that IRENA assisted in completing a Quickscan.

Of the 18 OCTs that OCTA assisted with Quickscans, the following 8 are also SIDS:

Anguilla, Bermuda, British Virgin Islands, French Polynesia, Montserrat, New Caledonia, Sint Maarten and Turks and Caicos Islands.

Of the 18 OCTs that OCTA assisted in completing Quickscans, the following 10 are not SIDS:

Bonaire, Falkland Islands, French Southern and Antarctic Lands (TAAF), Pitcairn Islands, Saba, Saint Barthélemy, Saint Helena, Saint Pierre et Miquelon, Sint Eustatius and Wallis et Futuna.

OCTs association with the European Union and the role of OCTA

There are 25 OCTs currently listed in annex II of the Treaty on the Functioning of the European Union (TFEU). Their associated territories status was created under the Treaty of Rome in 1957, and is defined as the territories which have special relations with Denmark, France, the Netherlands and the United Kingdom. The purpose of the OCT's Association with the EU is to "promote the economic and social development of the OCTs and to establish close economic relations between them and the Community as a whole". (OCTA, 2017a)

In November 2000, the governments of the OCTs decided to establish the Association of Overseas Countries and Territories of the European Union (OCTA) to serve as a platform through which the OCTs realize their common goals by working collectively through cooperation, policy dialogue, promotion of common positions and partnerships for the sustainable development of OCTs. All the twenty-one permanently inhabited OCTs are currently members of OCTA as well as the French Southern Antarctic Lands (TAAF). (2017b)

The objectives stated in Article 199 of the TFEU and priorities for cooperation are further defined in the 2013 Overseas Association Decision (OAD) of the Council of the European Union. In the context of the 2013 OAD, sustainable energy has been identified as a specific area of cooperation between OCTs and the EU. (OCTA, 2017a)

As part of its 2015-2020 Strategic Plan, OCTA has identified sustainable energy as one of its key areas of cooperation to foster Sustainable Development in the OCTs. On 17 June 2015, the 22 members of OCTA approved the Sustainable Energy Roadmap for OCTs, aimed towards significant increase of renewable energy and energy efficiency deployment on their territories. Following this, OCTA joined the SIDS Lighthouse initiative in September 2015 and offered assistance to the OCTs in completing Quickscans.

All 22 OCTA members are islands that face the energy sector challenges common to SIDS and other islands. The following 11 OCTs are also SIDS: Anguilla, Aruba, Bermuda, British Virgin Islands, Cayman Islands, Curaçao, French Polynesia, Montserrat, New Caledonia, Sint Maarten and Turks and Caicos Islands.

The link below provides an interactive Quickscan scoresheet with gradings and summaries of each Quickscan questionnaire response from the 20 IRENA-assisted Quickscans:

islands.irena.org/Quickscans.aspx

The findings and actions resulting from analysis of the 20 IRENA-assisted and 18 OCTA-assisted Quickscans are detailed in the following section of this report.

QUICKSCAN FINDINGS

Each completed Quickscan results in detailed answers covering the seven elements of a transition to renewable energy; documents and data validating and elaborating on these answers; and a scoresheet grading each answer. To date Quickscans have been completed for 28 SIDS and ten additional islands with OCT status. This represents a wealth of information that can support a variety of analyses to assist SIDS and other islands in scaling up their transition to renewables. This section provides findings of Quickscan analyses completed by IRENA and OCTA.

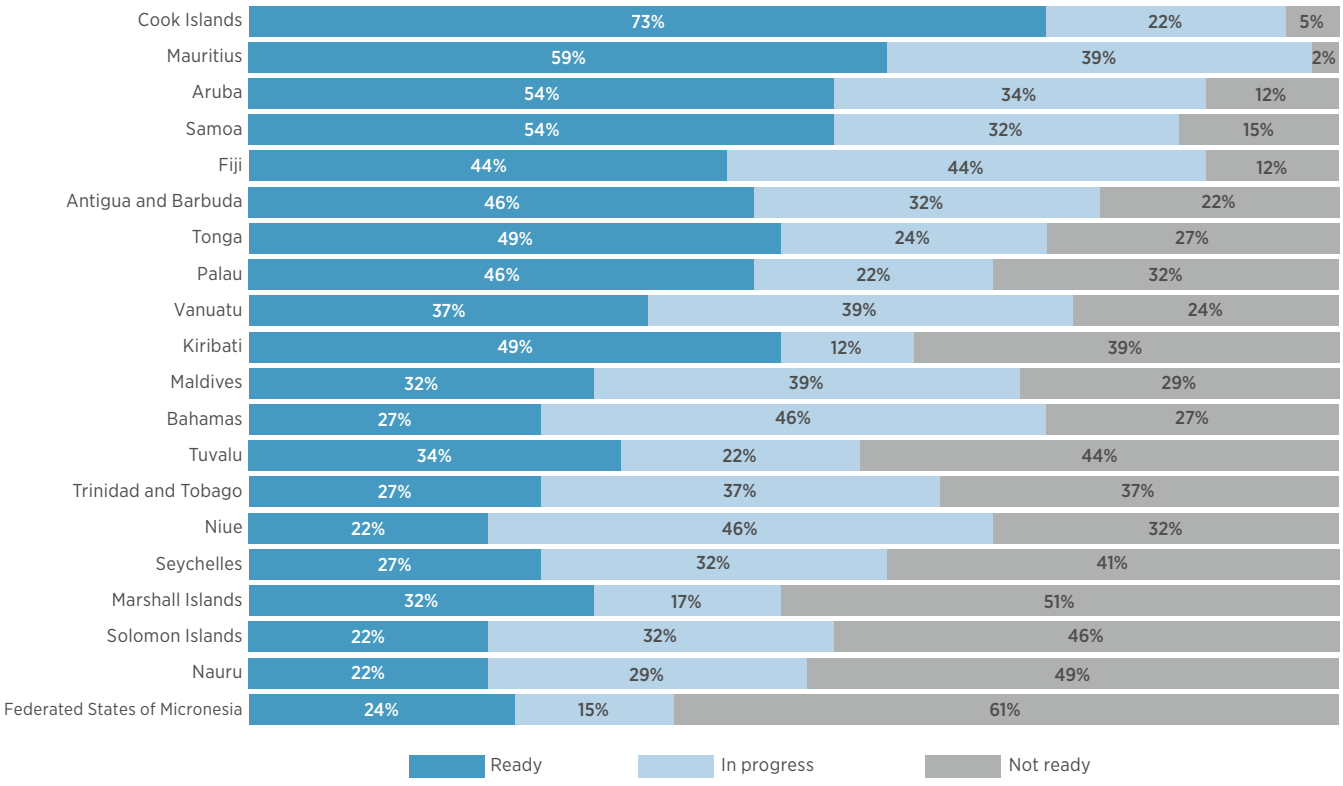
IRENA Quickscan analysis

IRENA assisted 20 SIDS with the completion of Quickscans in 2015 and conducted analysis of the collected answers, documents and data to determine progress towards reliance on renewables and to identify specific barriers or opportunities for renewables. The 20 Quickscans also establish a baseline that can be used to measure progress towards reliance on renewable energy in each of these SIDS.

As an initial step in this analysis Quickscan scoresheets for the 20 SIDS were examined to provide a high-level snapshot of the readiness for renewables in each small island developing state and across the seven Quickscan elements. The scoresheet grades each Quickscan questionnaire response as ready, in progress or not ready for each small island developing state. The questionnaire is designed such that a scoresheet with 100% ready responses indicates complete readiness to plan, finance, deploy and operate the large-scale renewable energy projects needed for a reliance on renewable energy. In progress scores indicate that a small island developing state is active but could use assistance. A high percentage of not ready scores indicates that the small island developing state has need for a more detailed look at the underlying barriers to renewables.

Figure 8 shows the percentage of questionnaire response scores graded as ready, in progress or not ready for each of the SIDS that IRENA assited with Quickscans.

Figure 8. Quickscan results for the 20 SIDS assisted by IRENA

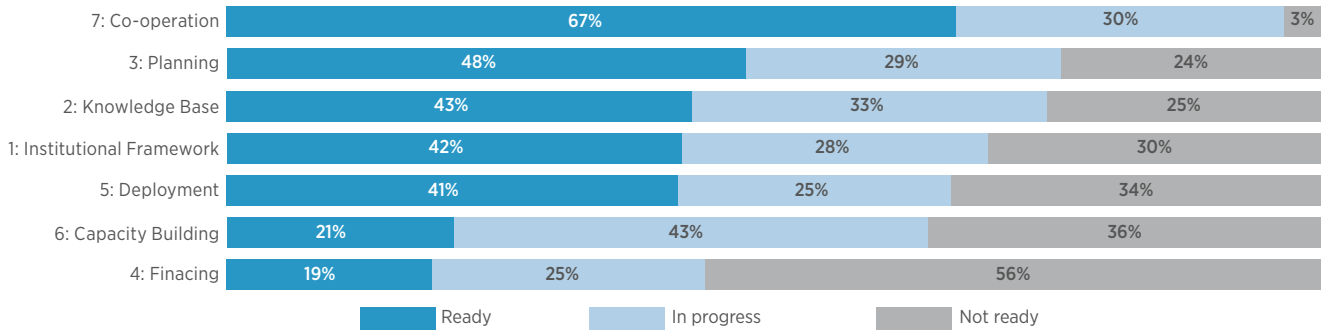


As can be seen in Figure 8, there are notable differences across the 20 SIDS is terms of their readiness for renewable energy, with percentages of not ready questionnaire scores ranging from 5% to 61%. IRENA's analysis did not show a direct relation between a high percentage of not ready scores and gross domestic product (GDP) per capita or population/size of the power system. There are SIDS with low GDP per capita that have made significant progress in deploying renewables, as well as SIDS with high GDP per capita that show only limited deployment of renewables and have significant remaining barriers.

Despite these differences among SIDS, Quickscans help to provide insights on common challenges.

Figure 9 provides the breakdown of ready, in progress or not ready scores for the Quickscan questionnaire response in each of the seven elements.

Figure 9. Quickscan results by element for the 20 SIDS assisted by IRENA



As can be seen in Figure 9, there are some elements, such as co-operation, where most SIDS show notable progress. Other elements, particularly financing, represent challenges that are still present across most SIDS. A deeper analysis of Quickscan findings for each element and regionally is presented below.

1. Institutional framework

- Political leadership for a transition to renewable energy is present in almost all SIDS. This is demonstrated by the wide adoption of renewable energy targets and by active participation by high-level government officials in local, regional and international activities focused on renewables.

- Implementation-oriented roadmaps covering deployment of renewable energy have been developed by most Pacific SIDS but are needed for some SIDS in the Caribbean and AIMS regions.

  - These roadmaps focus primarily on electricity generation and should be expanded to cover the full energy sector.

  - In some cases, the roadmaps lack the needed level of detail to support a sustainable deployment of renewables that can achieve national renewable energy targets and will likely need to be replaced with a comprehensive document.

- There are notable issues impeding renewables deployment in most SIDS relating to how electricity sales are regulated.

  - Current tariff structures in most SIDS are designed for diesel generation, are linked to fuel consumption and do not capture costs and benefits of deploying renewables.

  - Very few SIDS have open electricity markets, and none of the 20 SIDS covered by the analysis have hourly pricing or links between marginal generation cost and electricity price, which creates difficulties in appreciating the value of renewable generation at different times of the day and year and at different levels of deployment (e.g., which fossil fuel generator(s) renewables are displacing).

  - Tariff studies and capacity building in market design and regulation are needed to ensure that renewables can compete on a level playing field

- Subsidies for fossil fuel-based electricity are in place for half of the SIDS covered in the analysis, affecting renewable energy competitiveness.

2. Knowledge base:

- Assessments of local renewable energy resources have been completed or are in progress in all SIDS. However, in many cases the completed resource assessments offer only a general assessment of the types and quality of renewables available but lack the detailed information required to support project siting, development and investment. This is an issue for wind power and geothermal, both of which require time-consuming studies to confirm a viable resource; in the case of geothermal, resource assessment also can require significant investment to drill test wells.

- Lack of energy data remains a major barrier to the energy transition of SIDS. Numerous SIDS do not have regularly updated national energy balances, and key energy sector data often are not recorded or are recorded in formats that are less reliable and are difficult to share, such as hand-written data logs.

- 50% of Quickscans indicated that even if data are recorded, they are not easily accessible and are not shared among key stakeholders.

- The potential for renewables in non-electricity sectors and in applications such as cooling, heating, cooking, manufacturing, desalination and transport has not been examined in over half of the 20 SIDS covered by this Quickscan analysis.

3. Planning:

- 15 of the 20 SIDS have a dedicated office with responsibility for a comprehensive energy planning process that incorporates renewable energy.

- 10 of the 20 SIDS have a list of completed, ongoing, planned and potential projects and an understanding of how much each project will contribute to meeting their renewables targets. Nine more are in the process of developing such lists.

- With the support of IRENA and other development partners, 11 SIDS have developed grid studies to assess the impact of, and to identify solutions for, the integration of large shares of solar and wind. However, for island systems moving rapidly towards reliance on renewable energy (especially solar PV and wind) grid studies need to be undertaken on a regular basis as more renewable projects are deployed. This represents a significant area of need among SIDS, and IRENA is working actively to develop a grid study guide to help SIDS understand when and how to implement these studies.

- Land restrictions were noted as a significant barrier to renewables deployment in 11 of the 20 SIDS. Assistance should be provided to SIDS in the areas of land policy and regulation to ensure that renewables deployment can proceed without negative impacts on other land uses or protections.

4. Financing:

- Access to finance is a major issue in SIDS. Local equity and government funding are insufficient to achieve the renewable energy deployment envisioned, and often the framework to attract foreign investments into renewables is not in place, or is not effective in attracting the necessary foreign direct investment.

- Only 1 of the 20 SIDS indicated that sufficient public and private financing exists to achieve their renewable energy targets.

- Only 3 of the 20 SIDS indicated that building owners have access to sufficient financing to support renewable energy projects.

- 8 of the 20 SIDS stated that there are clear rules and processes in place to promote domestic and foreign investment in renewables. Assisting other SIDS in developing and maintaining transparent and reliable investment regulations is an area of support that development partners should consider.

5. Deployment:

- 10 of the 20 SIDS noted that infrastructure limits – such as port facilities, roads to project sites or access to specialty equipment such as cranes for wind turbine deployment – are either preventing renewable energy projects or increasing their price.

- For public projects, there is a general need for transparent criteria, standards and processes for selecting the equipment and the supplier, as well as for successfully conducting tenders in line with international standards.

- The long-term operation and maintenance of renewable projects is a concern in many of the SIDS covered by Quickscans. Only five of them have adequate plans and budgets in place to successfully operate and maintain public and donor-funded renewable energy systems. This reflects the need for SIDS and donors to include long-term operation and maintenance plans and budgets in the project planning and deployment process.

6. Capacity building:

- Quickscan analysis found that capacities to plan and operate power grids with a high share of variable renewable energy is a critical need. Only 1 of the 20 SIDS stated that these capacities are currently in place. Variable renewable energy sources such as solar PV and wind play a central role in achieving a high share of renewable generation in all the SIDS reviewed in this analysis. As such, capacity building in this area represents a clear high-impact opportunity for development partners.

- Quickscans also revealed a need for capacity building covering renewable energy target setting and developing the clear policies to achieve these targets. The Quickscan scoresheet found that 2 of the 20 SIDS score as ready in relation to renewable energy target setting and supporting policies.

- A lack of local companies providing the services needed for significant renewable energy deployment was noted in 12 of the 20 Quickscans.

- Development of capacities for the installation, operation and maintenance of renewable energy projects represents another area where SIDS need assistance. Only five SIDS stated that these capacities are now in place.

- Lack of capacity to develop bankable project proposals for funding and local private sector expertise to implement renewable energy projects are a major barrier as well, with only five SIDS noting that these capabilities are at a ready level.

7. Co-operation:

- Quickscans indicate that a broad variety of development partners are active in all 20 SIDS and that SIDS believe that co-operation with development partners is a critical tool for removing barriers to renewable energy deployment.

- However, the multitude of development partners and projects in each small island developing state puts pressure on governments to set up a co-ordinating unit inside the government structure to be able to provide the needed co-ordination role and to ensure that limited resources are used effectively. Sixteen SIDS indicated that they are in the process of setting up an office of donor co-ordination or have some existing capacity in this area.

In addition to the key findings by element detailed above, the analysis of the 20 Quickscans completed by IRENA determined the following key findings by region.

Caribbean region results:

Need for regulatory capacity that can:

- Correctly value electricity generated at different times from different sources
- Support cost-reflective tariff setting

Pacific region results:

- In several SIDS, regulators are not in place or do not have the capacity to perform their functions
- Need for regulatory capacity that can correctly value electricity generated at different times from different sources
- Need for regulatory capacity that can support cost-reflective tariff setting
- Need to establish a reliable market environment for investors
- Generalised need for capacity building in multiple areas in many SIDS
- Data issues are particularly evident in some of the smaller SIDS

AIMS region results:

- Need for regulatory capacity that can correctly value electricity generated at different times from different sources
- Need to reflect the changing generation mix and cost structure in the tariff
- Need for additional efforts to create a level playing field for investors in renewables
- Need for additional capacity-building efforts on planning and grid operations with variable renewables.

OCTA Quickscan analysis

OCTA followed the same process as IRENA when assisting the 18 OCTs in completing Quickscan questionnaires: working with in-country experts appointed by the relevant governing body to answer the questions and to collect supporting documents and data. OCTA undertook an independent analysis of Quickscan results for the 18 OCTs along with Quickscan results for Aruba, an OCT and SIDS that IRENA assisted in completing a Quickscan. The full results of the OCTA Quickscan analysis are include in Annex 2 of this report.

This section of the report summarises the results of the 18 OCT Quickscans and compares them with results from the 20 SIDS Quickscans detailed in the previous section of this report. Figure 10 shows the percentage of OCTA Quickscan questionnaire responses graded as ready, in progress or not ready for each OCT.

Quickscan results in Figure 10 show that, overall, the OCTs are less prepared to transition their energy systems to renewable energy in comparison to the 20 SIDS analysed by IRENA (Figure 8). Comparing these figures shows that nine SIDS had ready questionnaire responses of 40% or more, while only four OCTs indicated a similar level of readiness. Only 6 SIDS had not ready scores of over 40%, while 10 OCTs had not ready questionnaire responses of 40% or more.

Figure 10. Quickscan results for the 18 OCTs assisted by OCTA

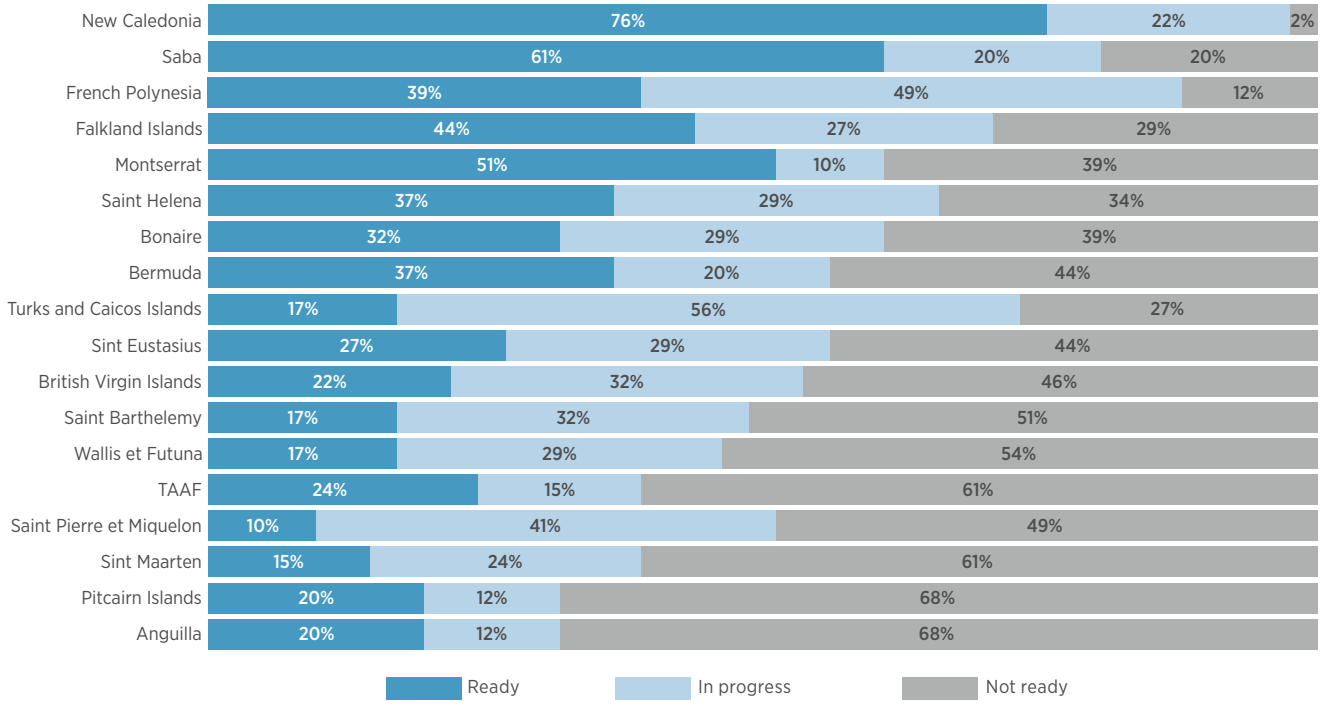
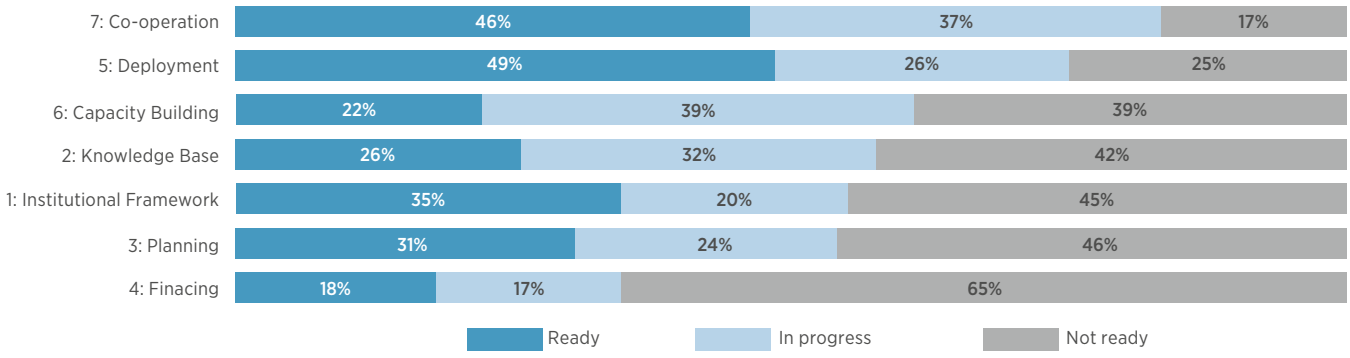


Figure 11 details the ranking of Quickscan element scores in the OCTA questionnaires and shows some similarities and differences when compared with the 20 SIDS Quickscan results given by element in Figure 9.

A comparison of the OCT and SIDS results by element shows that for both groups financing is the element where the most assistance is needed, while co-operation is the element that is most developed. The OCTs show a higher level of readiness for renewable energy project deployment, with questionnaire responses showing 49% ready and 26% in progress versus 41% ready and 25% in progress in SIDS. However, for all other elements the questionnaire responses show a lower level of readiness in OCTs versus SIDS and a different ordering of the elements.

Figure 11. Quickscan results by element for the 18 OCTs assisted by OCTA



These differences can be very helpful to development partners when determining what types of support could be most impactful. It also should be noted that the OCT Quickscan had a much higher percentage of unanswered questions compared to the SIDS Quickscan, which could reflect the need for a higher level of support from Lighthouses partners if an update of the OCT Quickscans is completed.

Quickscan use

Completed Quickscans can be used by SIDS to identify and communicate their needs. For example, Palau's Quickscan identified that the country was lacking a comprehensive energy roadmap and that this presented a significant barrier to renewable energy deployment. This finding led the government of Palau to co-operate with IRENA on the development of a national renewable energy roadmap. Palau's Quickscan also provided a strong starting point for the roadmap analysis as it established an interaction between IRENA and key local stakeholders and provided critical documents and data that helped to quickly determine the areas where the roadmap analysis should focus. Needs identified in Quickscans also can be addressed with the other IRENA tools described in the SIDS Lighthouses section of this report, or by development partners that have an expertise in the barriers and/or opportunities identified by Quickscans.

CONCLUSIONS

To date Quickscans have been completed for 28 SIDS and ten additional islands with Overseas Countries and Territories (OCT) status. In co-operation with SIDS governments, IRENA and OCTA have analysed Quickscans to provide insights on:

- Progress of SIDS in transitioning to renewable energy
- Areas that have the highest impact in accelerating renewables deployment
- How SIDS governments and development partners can co-operate to target these areas.

The work completed to date shows that Quickscan is a valuable tool to support country self-assessments and to rapidly collect answers to key questions and supporting data and documentation for identification of key barriers and opportunities related to the deployment of renewables. This work also shows that Quickscan analyses covering numerous SIDS are helpful in identifying common barriers that can serve to focus the attention of development partners in areas where there is a broad need for support such as finance and capacity building.

The completion of Quickscan data collection and analysis for 20 SIDS by IRENA in only five months demonstrates that the methodology can be applied quickly to numerous SIDS. The completion of 18 Quickscans by the Overseas Countries and Territories Association (OCTA) shows that the methodology can be implemented by other Lighthouses partners. This should encourage other development partners to utilise Quickscans.

Quickscan supports the forward-looking objectives of the SIDS Lighthouses initiative by serving as an excellent tool for initial engagement with SIDS, informing SIDS of the initiative's goals and of its support of SIDS. The process of gathering data via Quickscan helps to establish a clear baseline for measuring progress on the initiative's goals. By supporting a self-assessment of local capacity and priority areas for action, Quickscans can empower SIDS governments to push for reforms and to clearly communicate their needs. By making the most pressing needs and opportunities for impactful assistance more transparent, Quickscans can create momentum to mobilise funding and co-ordinated action among SIDS and development partners.

Quickscan also serves as an excellent method for identifying which additional tools and studies are valuable in assisting SIDS in their energy transition and in helping to avoid duplication of efforts. For example, Quickscans were effective in identifying the need for national energy roadmaps in several SIDS while also showing that on many islands, funding from development partners could be directed more effectively towards capacity building for planning and operation of systems with a high share of renewables.

The ability to quickly implement Quickscans and to analyse and visualise the results also offers SIDS governments, policy makers and other stakeholders a simple tool that can be used on a regular basis to determine if policy and regulatory measures have been effective in accelerating renewable energy deployment.

The key findings from the 20 IRENA-assisted Quickscans are summarised below:

- Political leadership for a transition to renewable energy is present in almost all SIDS. This is demonstrated by the wide adoption of renewable energy targets and by active participation by high-level government officials in local, regional and international activities focused on renewables.

- Implementation-oriented roadmaps covering deployment of renewable energy have been developed by most SIDS in the Pacific but are still needed for some SIDS in the Caribbean and AIMS regions.

- 15 of the 20 SIDS have a dedicated office with responsibility for a comprehensive energy planning process that incorporates renewable energy. This is a key element to support the transition to renewables. However, Quickscans show that these offices often lack capacity to plan for the integration of variable renewables such as solar PV and wind generation, presenting a key opportunity for targeted capacity building.

- 10 of the 20 SIDS have a list of completed, ongoing, planned and potential projects and an understanding of how much each project will contribute to meeting their renewables targets. These data are essential for understanding progress in transitioning to renewable energy and for identifying what capacity and type of additional projects are needed. SIDS should make sure that this project-level information is available to all energy sector stakeholders and development partners to facilitate co-ordination and to reduce duplication of efforts.

- Access to finance is a major issue in SIDS. Local equity and government funding are insufficient to achieve the renewable energy deployment envisioned, and often the framework to attract foreign investments into renewables is not in place, or is not effective in attracting the necessary foreign direct investment.

- The long-term operation and maintenance of renewable projects is a concern in many of the SIDS covered by Quickscans. Only five of them have adequate plans and budgets in place to successfully operate and maintain public and donor-funded renewable energy systems.

- Quickscan analysis found that capacities to plan and operate power grids with a high share of variable renewable energy is a critical need.

- Quickscans indicate that a broad variety of development partners are active in all 20 SIDS and that SIDS believe that co-operation with development partners is a critical tool for removing barriers to renewable energy deployment.

The 18 Quickscans completed with assistance from OCTA identify barriers and opportunities similar to those listed above with a noted need for capacity building and access to renewable energy project financing. In addition, the OCTA Quickscans highlight challenges to renewables coming from scarcity of land for project deployment and the lack of co-ordination among key energy sector stakeholders, with co-operation between governments and utilities being especially critical. The results of the OCTA Quickscan analysis are detailed in Annex 2 of this report and offer additional findings and recommendations to accelerate renewables deployment on islands.

Moving forward, IRENA is aiming to extend the coverage of Quickscan to all SIDS that are partners of the Lighthouses initiative and to conduct another update round of Quickscans that can be used to measure the progress of SIDS in transitioning to renewables and to serve as a metric for the 2020 goals of the Lighthouses initiative.

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ANNEX 1: QUICKSCAN QUESTIONNAIRE

This annex provides a version of the Quickscan questionnaire with a condensed formatting to give insights on the questions and data requested as part of Quickscan. The questionnaire normally is provided as a Word document that is formatted to provide the government-appointed expert with sufficient space to fill in detailed answers. SIDS wishing to complete a Quickscan should contact IRENA at: info@irena.org.

SIDS Lighthouses Quickscan questionnaire

The Small Island Developing State (SIDS) Lighthouses Quickscan aims to assess the readiness of SIDS to deploy renewables and transition the electricity sector from fossil fuels to renewable energy. Based on its extensive experience supporting the deployment of renewable energy on islands IRENA has developed the Quickscan questionnaire, which focuses on seven key elements of a successful and accelerated transition to reliance on renewable energy.

This questionnaire serves as the first step in completing a Quickscan and should be completed by a local energy sector expert with the assistance of IRENA or other Lighthouses partners as needed. The goal of this questionnaire is to collect answers, data and documents that can be analysed to determine the barriers to a renewable energy transition and to assist development partners in identifying high-impact areas where they can focus their support. It also serves to increase local awareness of the process and of the key steps required to transition to reliance on renewables.

Please begin by filling in the top-level information on this page and then follow the instructions in each section of the questionnaire. For any questions or clarifications please contact the IRENA staff person or Lighthouses partner assisting with Quickscan, or email IRENA at: info@irena.org.

Name of SIDS/island:
Personnel responsible for completing questionnaire (name, position, email, phone number):
Local focal points (names, positions, emails, phone numbers):
Quickscan questionnaire completion date:

Key electricity system data

Please provide the following data on the electricity system; these data are critical to determine the status of the power system and serve as a baseline to determine the options for transitioning towards reliance on renewable energy.

Peak demand (MW): If there are multiple islands or isolated generation systems please list the peak demand for each system.

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.

Total installed electrical generation capacity (MW): Please include a breakdown/table that lists the capacity for all technologies in use or planned for deployment. For example: diesel generators, steam turbines (please specify fuel used), gas turbines (please specify fuel used), solar PV, wind, hydropower, biomass (please specify feedstock and technology), geothermal, ocean energy, etc.

Electricity generation cost (USD/kWh): If there are multiple islands or isolated generation systems please list the generation cost for each system.

Quickscan elements

Please provide concise answers to the following questions. Try to avoid yes/no answers and give details that will allow an easy understanding by someone who may not be familiar with the local context. If there are any documents supporting your answers to the questions in this section, please clearly indicate the document name and the relevant sections of the document. Note that documents and/or data supporting your answers can be attached/referenced in the Supporting documents and data section at the end of this document.

Element 1: Institutional Framework

1.1 Is there government leadership and political support for a renewable energy transition?

1.2 Is there a recent national energy policy that clearly promotes renewable energy?

1.3 Are there official renewable energy targets defined in legislation? For which sectors (total energy, electricity generation, transport, etc.)?

1.4 Is there an official energy roadmap or detailed plan for renewable energy deployment including clear definition of roles and responsibilities?

1.5 Have quality standards for renewable energy 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 independent power producers (IPPs) and residential or commercial customers to invest in renewable energy?

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 renewable energy 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 renewable energy investment?

1.11 Are there subsidies in place for fossil fuels (including for electricity from fossil fuels)?

1.12 Are there clearly defined procedures to develop renewable energy 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 (including distributed, off-grid and renewable energy generation)?

2.4 Is a forecast of demand growth available and updated at least yearly (national, per island, per sector, etc.)?

2.5 Are relevant data easily accessible and shared among key agencies and renewable energy stakeholders?

2.6 Is there in-country experience with design, installation, procurement or use of renewable energy technologies? Which technologies, and who has the experience?

2.7 Has the potential for energy efficiency improvement been assessed for both the supply and demand sides (e.g., through benchmarking)?

2.8 Has the potential for non-electric renewable energy been assessed (e.g., for cooling, heating, cooking, manufacturing, desalination, transport, etc.)?

Element 3: Planning

3.1 Is there a dedicated office with responsibility for a comprehensive energy planning process that incorporates renewable energy?

3.2 Is there a list of renewable energy projects (completed, ongoing, planned and potential), and an understanding of how much they contribute to meeting official renewable energy targets?

3.3 Are there any land use restrictions that could limit renewable energy deployment?

3.4 Have grid integration studies been done to allow more variable renewable energy in the power sector?

Element 4: Financing

4.1 Is the available volume of public and private financing for renewable energy projects sufficient to achieve official renewable energy targets?

4.2 Do building owners (hotels, households, etc.) have access to sufficient financing to support investment in renewable energy?

4.3 Are there renewable energy service companies active in the country which are able to finance renewable energy projects and sell the electricity as a service?

4.4 Are clear rules and processes in place to promote domestic and foreign investment in renewable energy?

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 (including ports and roads) in place to implement renewable energy projects?

5.3 Is there an established procedure for inspection and grid-connection of renewable energy projects that is efficiently and effectively implemented?

5.4 Are adequate plans and budgets in place to successfully operate and maintain public and donor-funded renewable energy systems?

Element 6: Capacity Building

6.1 Are any renewable energy educational programmes or trainings available?

6.2 What are the capacities for installation, operation and maintenance of renewable energy equipment?

6.3 What are the capacities to plan and operate power grids with a high share of variable renewable energy?

6.4 What is the capacity of policy makers to develop ambitious and achievable renewable energy plans?

6.5 Is there a sufficient number of qualified renewable energy companies to provide the necessary services for renewable energy deployment?

6.6 What is the capacity to develop viable project proposals for grant, loan and private financing?

Element 7: Co-operation

7.1 Can international co-operation help in addressing some of the barriers identified above, and how?

7.2 Which international or regional organisations are actively supporting deployment of renewable energy in your country?

7.3 Is there a specific government office responsible for donor co-ordination? Do they have specific renewable energy expertise?

Supporting documents and data

This section of Quickscan identifies documents and data that can support an in-depth assessment of the answers provided in the previous section and further qualify the need for support and the level of readiness for the transition towards renewables. For each requested document or data set please give the document name and note the relevant sections. Please attach the requested documents directly to this file, provide a web link for each document or attach the document to the email with the completed Quickscan questionnaire.

Element 1: Institutional Framework

- Please provide any policies and official public statements in support of renewable energy.
- Please provide the latest energy policy and any energy roadmap, master plan or action plan that includes renewable energy, pointing at sections of legislation where responsibilities for renewable energy deployment are assigned.
- Please provide any relevant regulations for renewable energy (e.g., utility concession, IPP framework, distributed renewable energy framework).
- Please provide the law establishing the regulator, and links to its website or latest structure.
- Please provide administrative requirements for renewable energy systems deployment.
- Please provide any regulation that provides incentives for renewable energy or any subsidies for the energy sector.
- Please quote the relevant standards that are required for renewable energy systems to be connected to the grid, imported, supplied to the public sector, etc.
- Please provide the relevant legislation that establishes the current renewable energy targets.
- Please provide any regulations defining tariff setting and market design, and any tariff impact assessment related to renewable energy.
- **Element 2: Knowledge Base**
- Please provide any renewable energy technology assessment that has been conducted.
- Please provide any energy efficiency assessment and audits that have been conducted.
- Please provide any renewable resource assessments available (hydro, geothermal, wind, solar, biomass, ocean).
- Please provide the latest version of the following:
  - Energy balances: national and for each island
  - Detailed specifications for power generation and grid assets
  - Energy demand forecast (national, per island, per end use, etc.).
- Please provide any assessment of the potential for renewable energy in end-use sectors (e.g., cooling, heating, buildings, industry, desalination, transport, etc.).

Element 3: Planning

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

Element 4: Financing

- Please provide any applicable rules to promote domestic and foreign investment into renewable energy.
- Please provide any regulation that establishes specific financing facilities for renewable energy.

Element 5: Deployment

- Please provide any regulations for inspection and grid-connection of renewable energy projects.

Element 6: Capacity Building

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

Element 7: Co-operation

- Please provide a list of development partners active in the country, and key ongoing projects.

ANNEX 2:
OCTA QUICKSCAN ANALYSIS

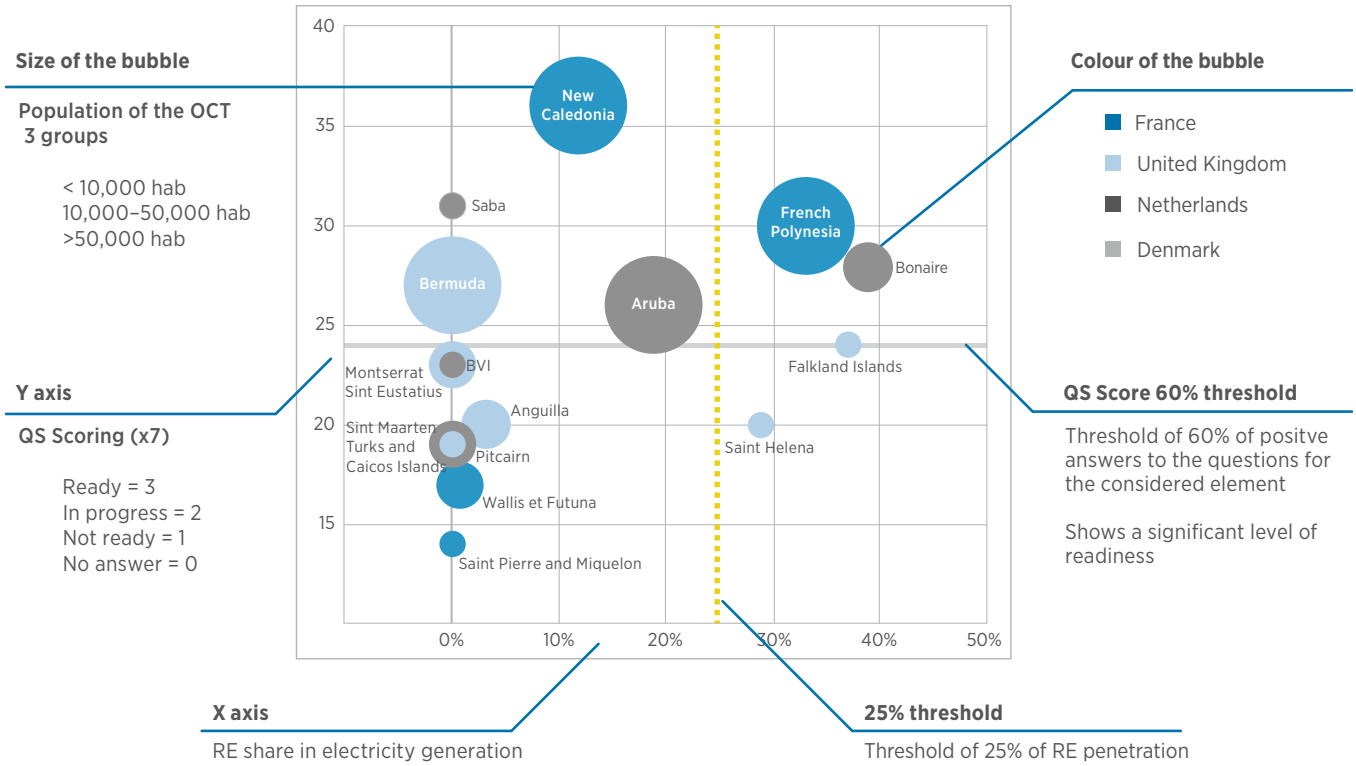
This section contains the results of Quickscan analysis for the 18 OCTs that OCTA assisted with Quickscans. The analysis also includes Aruba, an OCT and small island developing state that IRENA assisted in completing a Quickscan.

OCTA analysis visualisation tool

Figure 12 provides an overview of the visualisation tool that OCTA developed to display the results of Quickscan analysis of the 19 OCTs. The horizontal axis provides the renewable energy share achieved by each OCT in electricity generation as an indicator of the current success in renewables deployment. The vertical axis provides the scoring of Quickscan responses, with ready answers valued at three, in progress answers at two, not ready answers at one and no answer given a score of zero. This score serves as an indicator of readiness for a transition to reliance on renewables.

A bubble representing each OCT is placed on a chart based on the renewable share and the Quickscan score, with the bubble size based on population and the colour based on each OCT's EU country affiliation. The tool makes it possible to visualise the results for a single question, element or an entire Quickscan.

Figure 12. OCTA Quickscan results visualisation template



Overall Quickscan analysis results

With the OCTA scoring method, the maximum score for the 41 questions in the Quickscan questionnaire is 123. Based on the overall Quickscan score and the renewable energy share, OCTA analysis identified four clusters of OCTs, shown in Figure 13, with the following characteristics.

1. Renewable energy champions

- Annual renewable energy generation share greater than 25%
- Quickscan scoring greater than two-thirds of the maximum score of 123

2. Followers

- Annual renewable energy generation shares of 10% to 20%
- Higher Quickscan scores compared to the renewable energy champions

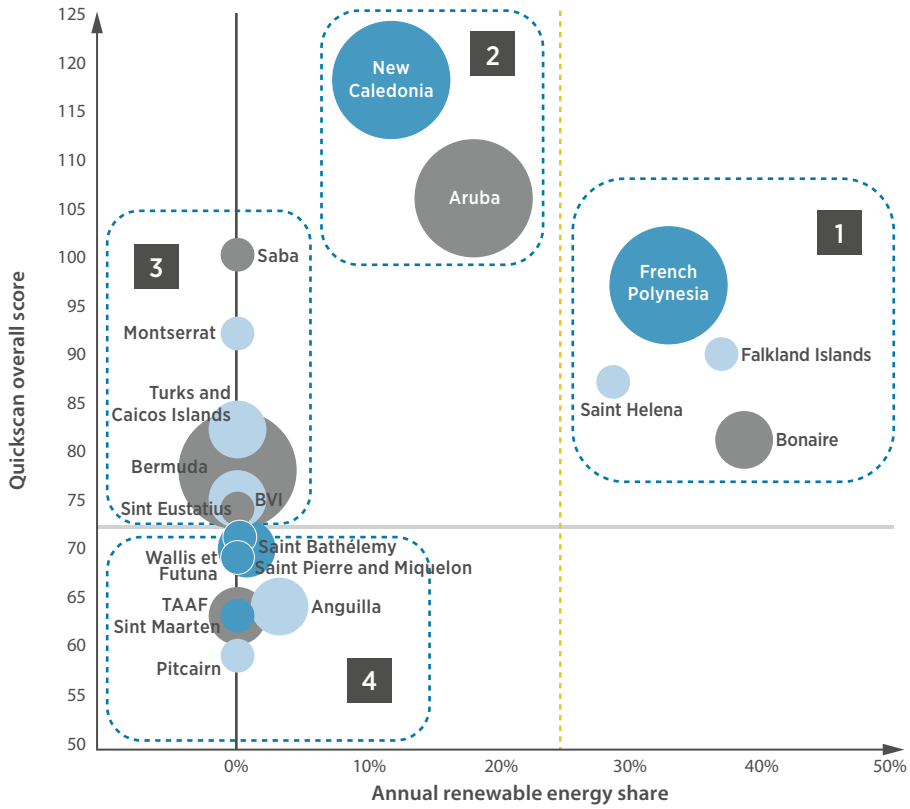
3. Need for action

- Annual renewable energy generation less than 1%
- But with Quickscan scores greater than two-thirds maximum score

4. Need to address fundamental issues

- Annual renewable energy generation less than 1%
- Quickscan score less than two-thirds maximum score

Figure 13. OCTA analysis for full Quickscan results



Quickscan analysis results by element

The OCTA Quickscan analysis was applied separately to six of the Quickscan elements to provide insights to the barriers and opportunities that are distinct within each element. The visualisation tool and summary of key findings for each element are provided below.

Institutional framework

The OCTA Quickscan analysis for Element 1, institutional framework focused on the four OCTs labelled with numbers in Figure 14 and highlighted the following findings:

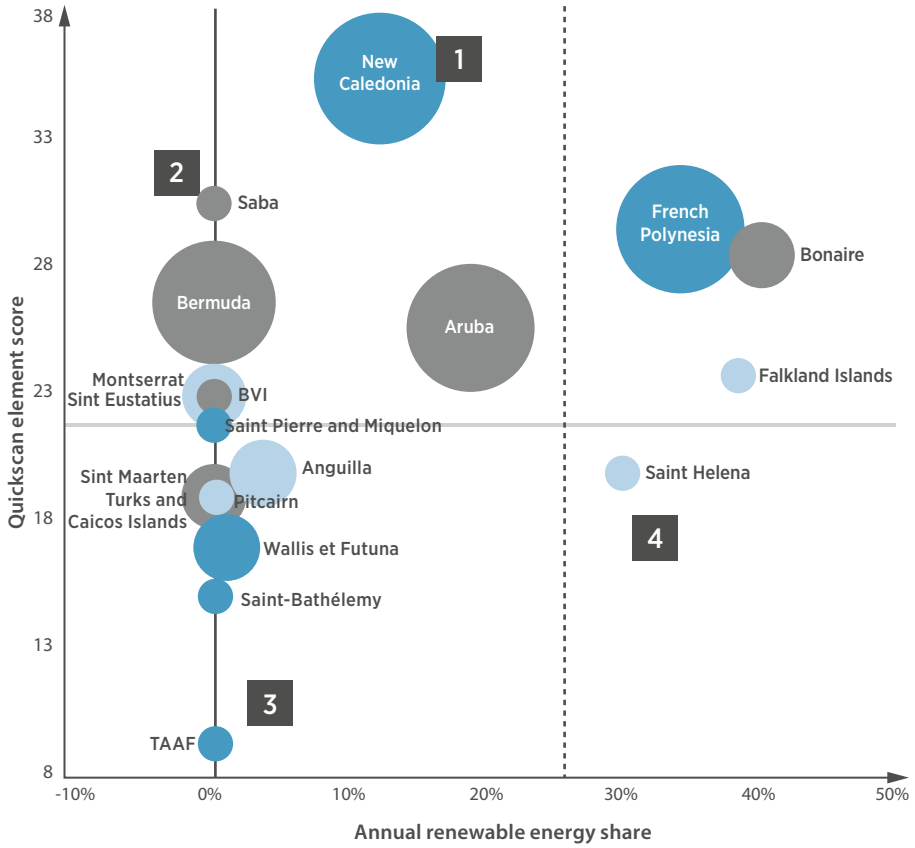
1 **New Caledonia:** A complete and regularly updated institutional framework, allowing for IPPs and the setting of clear and binding renewable energy targets with a long-term vision for 100% electricity generation from renewables. The current renewable energy generation share is 12%.

2 **Saba:** Social development plan (2014) and Energy Strategy (2015) define a long-term vision of 100% renewable energy with an interim goal of 40% in 2020.

3 **TAAF:** No dedicated political structure to promote renewables vision; no permanent inhabitants.

4 **Saint Helena:** Renewables deployment led by government and the single local utility has been successful (renewable share over 25%) despite a weak institutional framework.

Figure 14. OCTA Quickscan analysis for Element 1: Institutional framework



Knowledge base

The OCTA Quickscan analysis highlighted the following findings for Element 2, knowledge base in the four OCTs numbered in Figure 15.

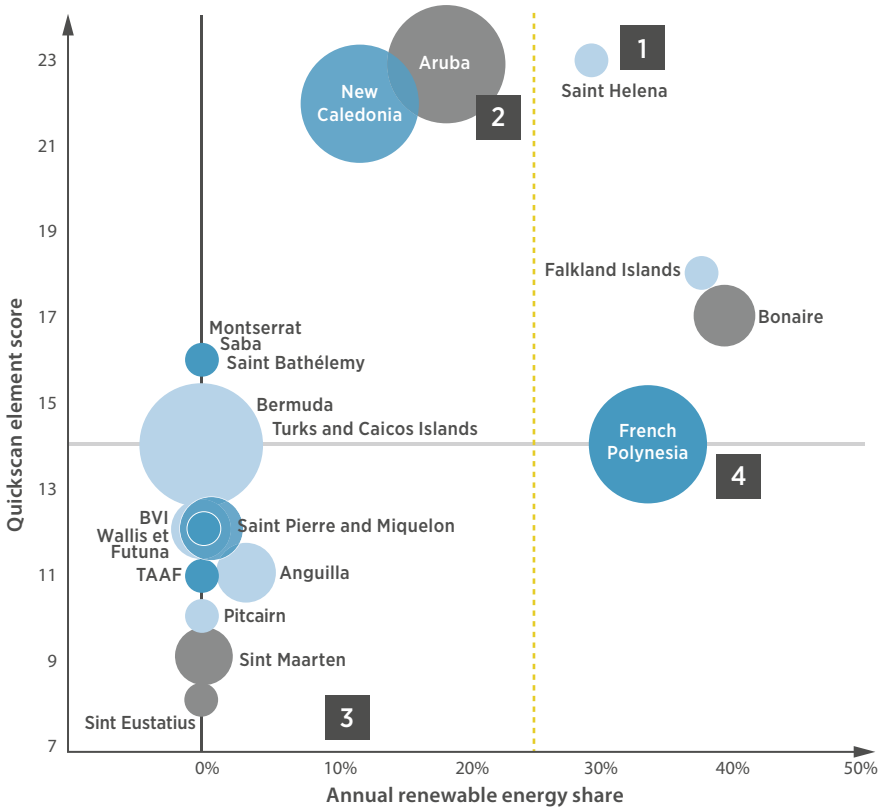
1. **Saint Helena:** Support by the incumbent utility for renewable energy projects is a key factor as it supplied access to critical data and has a solid knowledge of renewable electricity generation, energy efficiency and non-electric renewable energy applications.

2. **Aruba:** Renewable energy resource assessments for wind, solar, biomass and pumped hydro with geothermal assessment are being conducted. Electrical data are available and updated by the utility companies. Energy efficiency, electric vehicle and non-electrical renewable options have been evaluated.

3. **Sint Eustasius:** Lowest Element 2 score. The utility has some renewable energy knowledge and data, but these are not available to other stakeholders. Some wind and solar studies are being developed.

4. **French Polynesia:** Renewable resource data are based only on a few deployed projects, and there is no systematic resource data collection. Electrical sector data are dispersed among many stakeholders and not easily shared. Energy efficiency and non-electrical renewables potential are not being characterised. Despite these barriers, a high share of renewable energy has been achieved

Figure 15. OCTA Quickscan analysis for Element 2: Knowledge base



Transformation planning

The OCTA Quickscan analysis highlighted the following findings for Element 3, transformation planning in the four OCTs numbered in Figure 16.

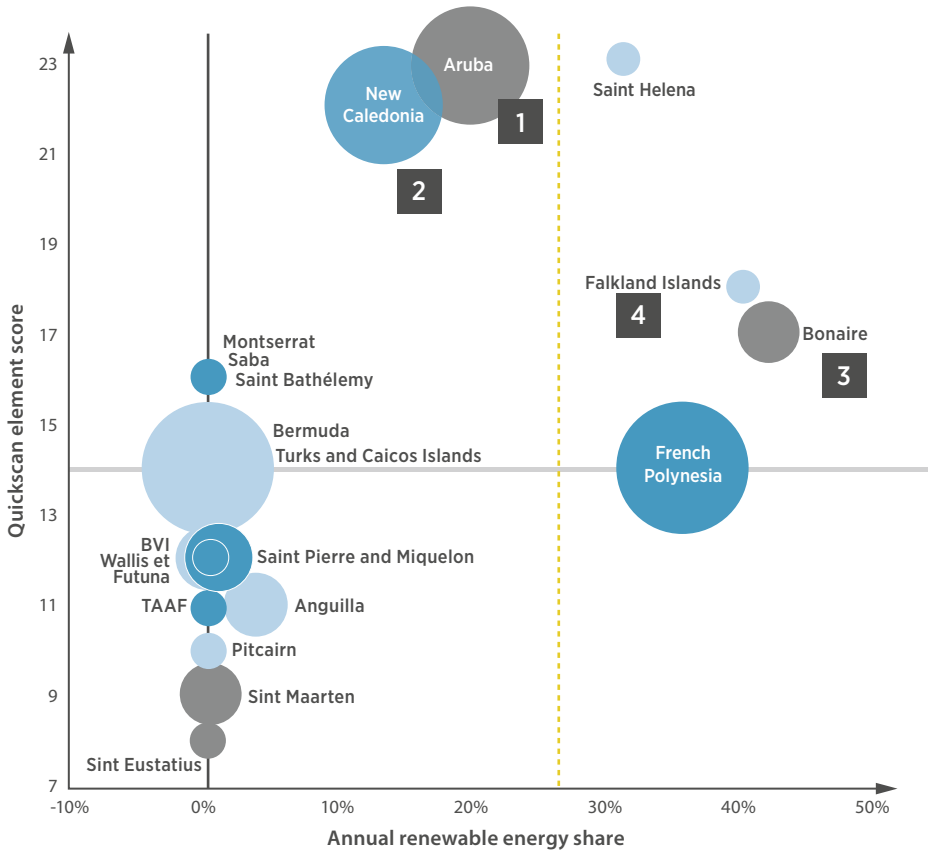
1. **Aruba:** A clear vision of renewable energy projects coming online with an aim to achieve a 50% renewable energy share in electricity generation by 2018. Planning is co-ordinated between government and utilities.

2. **New Caledonia:** A centralised planning office, Direction de l'Industrie, des Mines et de l'Energie de la Nouvelle-Calédonie (DIMENC), co-ordinates with the national regulator, utilities and private developers.

3. **Bonaire:** An average Quickscan score results from the utility, Water- en Energiebedrijf Bonaire (WEB), handling all planning alone. However, this has not prevented achievement of a high share of renewable energy generation.

4. **Falkland Islands:** A list of renewable energy projects is available and a grid integration study is being completed. Implementation of the Energy Strategy 2015 will define dedicated responsibilities for the planning process.

Figure 16. OCTA Quickscan analysis for Element 3: Transformation planning

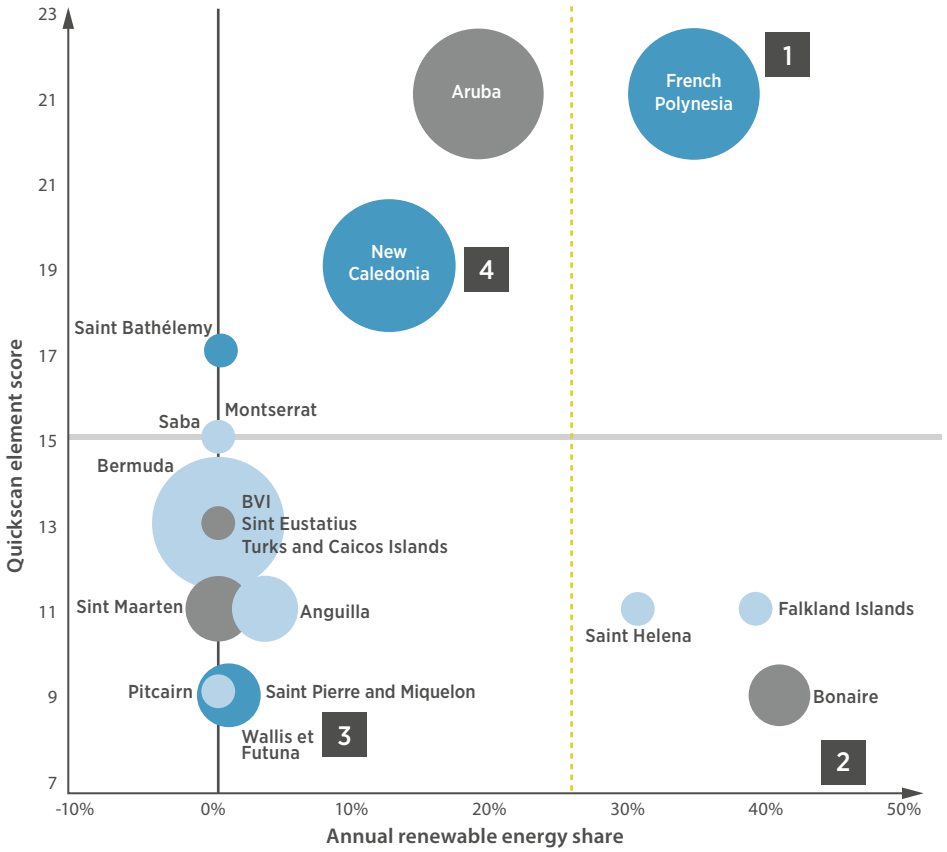


Renewable energy project financing

The OCTA Quickscan analysis highlighted the following findings for Element 4, project financing in the four OCTs numbered in Figure 17.

1. **French Polynesia:** A tax incentive framework is designed to attract foreign investment. Some loans are available to facilities for renewable energy project financing. A distribution market exists in rural areas.
2. **Bonaire:** The lowest financing score, yet the highest renewable energy share, indicates the need for further investigation to determine how projects have been financed.
3. **Wallis and Futuna:** Analysis shows a crucial need for financial support.
4. **New Caledonia:** A tax incentive framework is designed to attract foreign investment, but it is not specific to renewable energy. The distribution market is not open.

Figure 17. OCTA Quickscan analysis for Element 4: Project financing



Renewable energy project deployment

The OCTA Quickscan analysis highlighted the following findings for Element 5, project deployment in the four OCTs numbered in Figure 18.

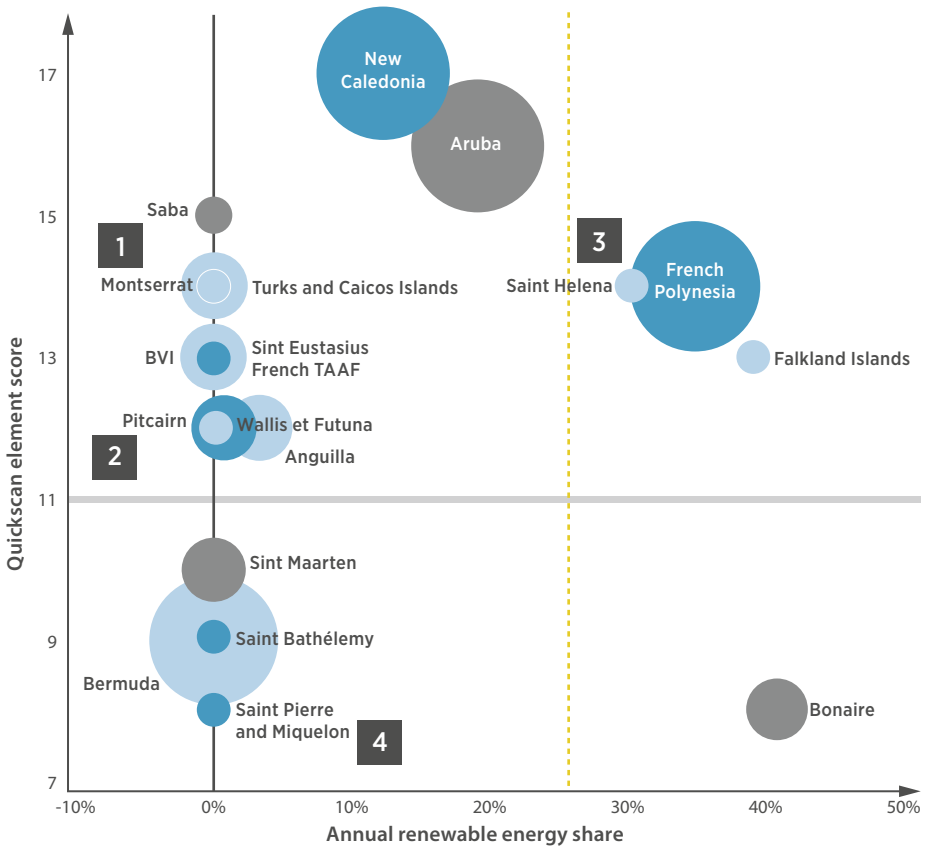
1. **Montserrat:** Deployment of renewable energy projects is under the responsibility of the Government of Montserrat. No independent project development exists at present.

2. **Pitcairn:** No formal process exists for deployment or grid connection of renewables. Procurement policies are in place and a sufficient quantity of project developers exists on the island.

3. **Saint Helena:** Deployment of renewable energy projects is managed by the government-owned utility (Connect) through a competitive procurement process. Overseas experts are consulted as needed.

4. **Saint Pierre et Miquelon:** Infrastructure and local resources are lacking to support deployment of renewable energy.

Figure 18. OCTA Quickscan analysis for Element 5: Project deployment



Capacity building

The OCTA Quickscan analysis highlighted the following findings for Element 6, capacity building in the four OCTs numbered in Figure 19.

5 **TAAF:** Staff on the islands are highly qualified to install, operate and maintain renewable energy equipment; however, no personnel are living on a permanent basis on the islands.

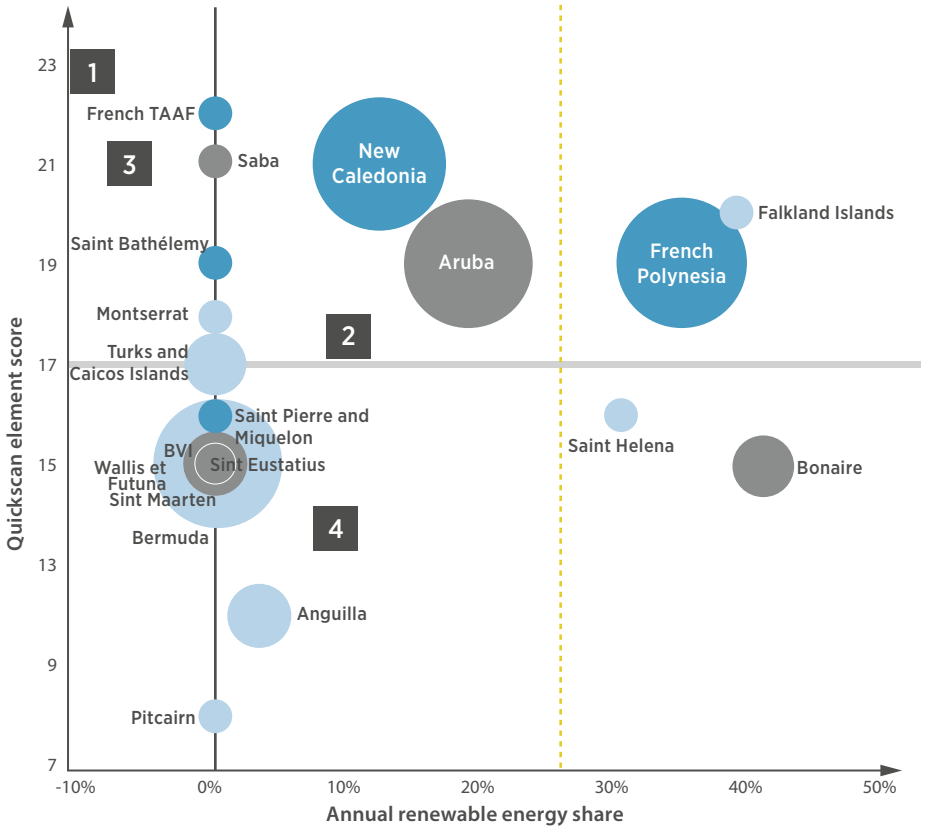
6. **Turks and Caicos Islands:** Policy-making activities are undertaken with support from external consultants, so there is a need for the development of in-house capacity for policy development and implementation as well as project financing.

7. **Saba:** Qualified policy makers and utility technicians exist, but the government lacks renewable project development capabilities.

8. **Bermuda:** There is a need for a clear assessment of the areas where capacity building is necessary.

Note that the OCTA analysis does not include a visualisation tool for Element 7, covering regional and international co-operation.

Figure 19. OCTA Quickscan analysis for Element 6: Capacity building



OCTA Quickscan analysis findings and recommendations

Despite diversities, the following barriers to renewable energy deployment are common to most OCTs:

1) **Lack of stakeholder collaboration:** When renewable energy deployment is controlled by the government or the utility, without enough collaboration, or without involving private sector (limited grid access for IPPs), delays and hurdles in implementation appear (e.g., Anguilla, Sint Maarten). Notable exceptions include: Saint Helena, Falkland Islands. An organised and open market supports renewable deployment (New Caledonia, Aruba)

   Recommended actions: Set up an institutional framework, assigning to the government the task of steering the renewable energy deployment process and ensuring that independent entities can drive the implementation. This guarantees transparency and attracts foreign investments. Also, involve the utility in renewable energy projects, for example through public-private partnerships.

2) **Scarcity of land:** Most OCTs face a significant scarcity of land. There is strong competition for land, and renewable energy deployment is not always the preferred choice.

   Recommended action: When land constraints limit the deployment of certain renewable energy technologies (e.g., ground-mounted solar PV) other options should be investigated (e.g., rooftop PV and wind generation which is compatible with agricultural use). Energy efficiency is critical for land-constrained OCTs as they need to make the most of limit renewables generation. Small islands also can consider piloting new technologies or showcasing new technological solutions, attracting investors and sponsors. Some non-electric renewable energy technology such as roof-mounted solar water heaters can be deployed more easily on land-constrained islands. For example, Saint Helena, Falkland Islands, Aruba, Bonaire, New Caledonia and French Polynesia have developed programmes for energy efficiency and non-electric renewables.

3 **Need for capacity building:** The lack of qualified personnel is a common problem on all OCTs, notably on the more isolated islands. Capacity building is especially needed on policy matters and technical topics: project development, grid connection, and operation and maintenance of the renewable technologies.

   Recommended action: Capacity building can happen only where there is a clear policy framework and implementation roadmap to assess the need for capacity building. When external consultants/ experts are required, training should be included for local staff to ensure that capacity is transferred (see Montserrat and Turks and Caicos Islands).

4) **Limited access to funding programmes:** Many OCTs have difficulty accessing international funding programmes and foreign direct investment and transferring available public funding to private sector partners (building owners, IPPs). Lack of financing and/or a lack of attractive remuneration conditions for developers is a significant barrier to renewable energy projects

   Recommended action: Create an open market for private investment and leverage international support programmes to create market conditions attractive to investors. Identify which funding programmes (national/regional/international) are available to support renewables deployment. Provide capacity building for project financing but add fundraising, e.g., tourist areas could crowdfund renewable energy projects.

The OCTA analysis presents the following key findings and recommendations for the seven Quickscan elements:

Institutional framework: A sophisticated institutional framework is useful but does not guarantee successful renewable energy deployment.

- Open dialogue internally to set up an energy transition plan/roadmap.
- Move to binding renewable energy targets as quickly as possible.
- Involve the incumbent utility in development and implementation of the roadmap.
- Do not focus only on policy, but also on implementation.
- Seek external support to implement the roadmap and speed up the process, e.g., for increased market openness.

Knowledge base: A reliable knowledge base covering the energy sector and renewable energy is a cornerstone prerequisite for renewable energy deployment.

- Ensure availability and transparency of the energy system data.
- Funding efforts should be directed to sound assessments of the potential for renewable energy, including any non-electric renewables and energy efficiency measures.
- Identify which funding programmes are available for performing studies.

Planning: Co-ordination among government, utility, and private developers is key to support successful planning for a transition to renewable energy.

- Establish a single entity with clear responsibility for driving the planning process.
- Maintain an updated and publicly available list of ongoing renewable energy projects.
- Drive the planning: stimulate competition (when applicable) through challenging timelines.

Financing: Favouring private investment usually correlates with high shares of renewable energy deployment and generation.

- Open market for private investment.
- Leverage international support programmes to create market conditions attractive to investors.
- Identify which funding programmes OCTs are eligible for (national/regional/international)
- Provide capacity building for project financing but also fundraising (e.g., tourist areas could crowdfund renewable energy projects).

Deployment: Practical framework conditions for deployment are essential for successful implementation of renewable energy policy.

- Identify clear responsibility for the processes impacting deployment of renewable energy projects, both from the regulatory point of view (authorisations, removing administrative hurdles) and from the point of view of implementation (grid connection, infrastructure, etc.).
- Facilitate the development process with a "one-stop-shop" that makes all required steps transparent and minimises the number of steps required to deploy a project.

Capacity building: Capacity building is a cornerstone of renewable energy deployment, but capacity needs differ among OCTs (policy framework, technical, project management).

- Quickscan results for each OCT help to determine where capacity building efforts should be concentrated.

The OCTA analysis presents the following key findings and recommendations for the four OCT clusters identified in Figure 13.

Recommendations for Champions cluster

- Aim for 100% renewable electricity generation
- Address grid stability with storage to support higher renewable energy share
- Increase market openness for IPPs
- Identify remaining barriers and seek targeted external support as needed
- Learn about best practices on other islands

Recommendations for Followers cluster

- Examine deployment pathways followed by OCTs in the Champions cluster to understand how they have dealt with shared barriers
- Identify remaining barriers and seek targeted external support as needed
- Learn about best practices on other islands

Recommendations for Need for actions cluster

- Go beyond theory.
- If the basic policy instruments are developed, focus on implementationIdentify remaining barriers and seek targeted external support as needed
- Follow successful examples of implementation by OCTs with similar barriers

Recommendations for Address fundamental issues cluster

- Rally and secure true political support for renewable deployment, seeking external support as needed
- Identify barriers to strategic long-term development
- Implement a mentoring system to benefit from experience and know-how from Champions or Followers clusters with similar barriers
- Seek external support to accelerate the transition to renewables

The OCTA analysis presents the following recommendations in relation to additional analysis that is needed to follow up on Quickscan findings:

Promote exchange of knowledge

- Identify relevant co-operation programmes, networks and forums to share experiences, success stories and barriers. For example, engage in dialogue with IRENA, SEforALL, Caribbean Electric Utility Services Corporation (CARILEC), Pacific Power Association (PPA), Pacific Community (SPC), Scaling Up Renewable Energy Programme (SREP), etc.
- Arrange capacity building visits between islands.

Measure progress

- Ensure that an implementation roadmap exists with clear milestones and measurable targets.
- Set up a monitoring system with clear metrics, e.g., Quickscan score sheet, renewable energy share, etc. Implement incentives for successful implementation of the roadmap (OCT renewable energy challenge).

OCTA Quickscan analysis next steps

The OCTA Quickscan analysis makes the following recommendations for next steps to undertake in support of renewables deployment in OCTs:

Perform a deep-dive analysis for each of the OCTs

- Start with OCTs in the Address fundamental issues cluster
- Identify what financial support is available to OCTs
- Develop connections between OCTs with common barriers and those with experience overcoming these barriers
- Define common key performance indicators for the renewables transition, e.g., through Quickscans

Develop dedicated case studies: Based on the Quickscan analysis OCTA recommended that the following case studies be undertaken in the indicated OCTs:

Regulatory framework: New Caledonia, Saba, Bonaire

- These OCTs have the highest Quickscan scores regarding implementation of an enabling institutional framework, but very different situations in terms of renewable generation share: Saba 0% renewables, New Caledonia 12% and Bonaire 39%.

- This case study could help to understand which aspects of the institutional framework are critical for renewables deployment and to identify specific development pathways that can be replicated.

Energy mix: French Polynesia, Montserrat, Aruba

- French Polynesia has deployed the most diverse renewable energy mix of the OCTs: wind generation, solar PV, hydropower and seawater air conditioning (SWAC).
- Montserrat has deployed solar PV and wind generation but has struggled to deploy geothermal. The case study could provide details on the hurdles of implementing geothermal in an island context.
- Aruba has the largest wind power capacity of the OCTs, which was developed through a public-private partnership between the project developer and the utility. As many islands face difficulties between the government will to promote renewables and the utility will to keep business as usual, an examination of this successful co-operation could yield valuable insights for other OCTs.

Energy efficiency and renewables integration: New Caledonia, Saint Helena, Falkland Islands

- New Caledonia is planning on generation-side energy efficiency measures at existing thermal plants, and on the demand side it has an energy policy goal to reduce electricity consumption 25% before 2030.
- Saint Helena has a programme for demand-side energy efficiency; LED street lighting powered with solar PV; and programmes for biomass, biogas, water management (to reduce costs for desalinisation) and energy storage.
- Falkland Islands has energy efficiency programmes for the demand and supply sides and could make an interesting case study for managing grid integration issues, as the islands meet 37% of electricity demand with wind generation.

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International Renewable Energy Agency

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