SIDS LIGHTHOUSES

Co-ordinated by:
IRENA
International Renewable Energy Agency

SIDS Lighthouses Initiative

Progress and way forward

January 2020

The SIDS Lighthouses Initiative supports regional and national-level action to advance the energy transition in SIDS

Photographs are from the IRENA image archive unless otherwise indicated.

INTRODUCTION

For small island developing states (SIDS), energy challenges constrain sustainable economic development. Most SIDS, which are already among the most vulnerable to climate change, heavily depend on imported fossil fuels. Owing to their small market size and geographic isolation, their energy costs are high and are particularly susceptible to the impacts of oil price and supply volatility.

However, renewable energy technologies, combined with energy efficiency, can achieve transformational socio-economic impacts for SIDS. Renewable sources including solar, wind, geothermal, ocean energy, hydropower and biomass can ensure energy security and create local employment. Renewable energy development is also key to small islands' climate resilience and mitigation measures and forms a vital component in their Nationally Determined Contributions (NDCs) under the 2015 Paris Agreement.

The SIDS Lighthouses Initiative (LHI), launched at the United Nations Climate Summit in 2014, aims to support SIDS in their energy transformation. As a framework for action, it addresses all elements of the energy transition, from policy and market frameworks to technology options and capacity building. The Initiative facilitates co-ordinated support for SIDS, primarily through partnerships with public, private, intergovernmental and non-governmental stakeholder organisations.

This brief provides an overview of the progress achieved in the first five years of the Initiative and highlights key developments since the start of the second phase in 2018.

SIDS IRENA LIGHTHOUSES

SMALL ISLAND DEVELOPING STATES AND OTHER PARTNERS IN THE LIGHTHOUSES INITIATIVE

The Initiative brings together 36 SIDS from the Caribbean, the Pacific, and the Atlantic, Indian Ocean and South China Sea (AIS) regions, as well as 24 other partners including regional and international organisations, development partners, private companies, research institutes and non-profit organisations. Two new partners joined the initiative in 2019: Denmark and Caribbean Electric Utility Services Corporation (CARILEC).

The International Renewable Energy Agency (IRENA), as the Initiative's co-ordinator, acts to facilitate and enhance dialogue at all levels, including through cooperation with other SIDS-related initiatives.

Figure 1 **SIDS and other LHI partners**

Other partners

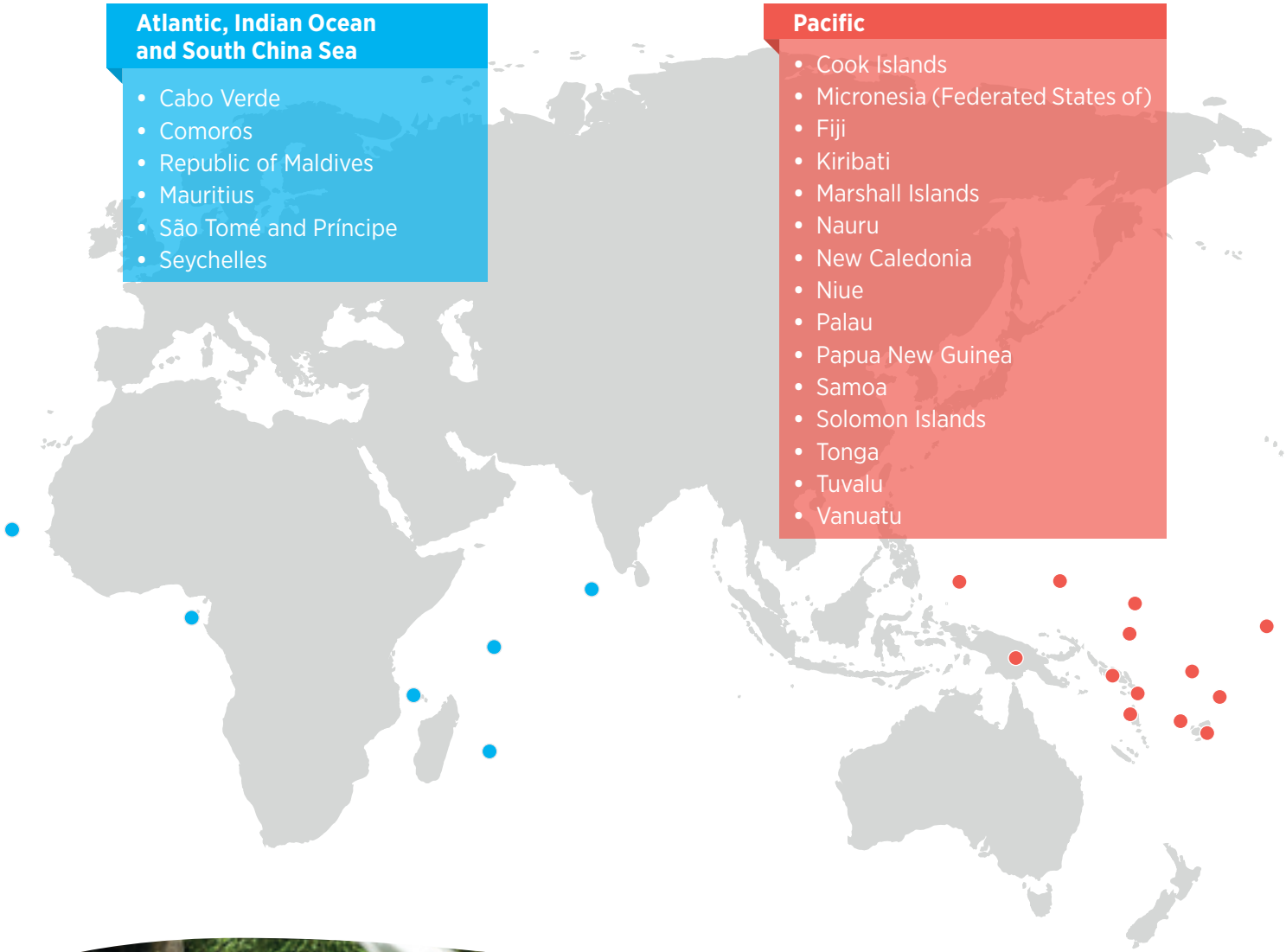
Denmark, France, Japan, Germany, Italy, New Zealand, Norway, United Arab Emirates, United States of America, Association of the Overseas Countries and Territories of the European Union, Clean Energy Solutions Center, Caribbean Electric Utility Services Corporation, Clinton Climate Initiative, ENEL, European Union, Indian Ocean Commission, International Renewable Energy Agency, Organisation of Eastern Caribbean States, Pacific Islands Development Forum, Rocky Mountain Institute - Carbon War Room, Solar Head of State, Sustainable Energy for All, United Nations Development Programme, World Bank.

Disclaimer: Boundaries and names shown on this map do not imply any official endorsement or acceptance by IRENA.

Joining the Initiative

The SIDS Lighthouses Initiative is an inclusive and neutral multi-stakeholder platform that brings together public, private, intergovernmental and non-governmental actors. Participating SIDS and other partners share a common vision to accelerate the deployment of renewable energy on islands.

For more information see: **www.irena.org/islands**; or contact: **islands@irena.org**.



SIDS Lighthouses Initiative: Evolution since 2014

Since the launch of the Initiative in 2014, the renewable energy uptake in SIDS has been impressive. The bold vision of SIDS leaders, together with technology evolution, cost reductions and the support of a wide range of partners, have made renewables an affordable and reliable energy option for small islands.

According to IRENA data, the total installed capacity of renewables in the LHI's 36 SIDS partners accounted for about 2.95 gigawatts (GW) by the end of 2018, of which 660 megawatts (MW) were installed since 2014. Those new installations included more than 400 MW of solar photovoltaics (PV) and 100 MW of wind (see Figures 2, 3 and 4). This means the initial LHI targets for capacity installation by 2020 have been exceeded ahead of schedule.

Another key LHI objective is to ensure that participating SIDS develop renewable energy roadmaps. In general, SIDS have been proactive in developing policies and action plans to adopt renewables. Almost all SIDS partners in the LHI have included renewable energy as an important component in their national energy policy frameworks and strategies.

Figure 2 **Total renewable energy installed capacity in SIDS partners**

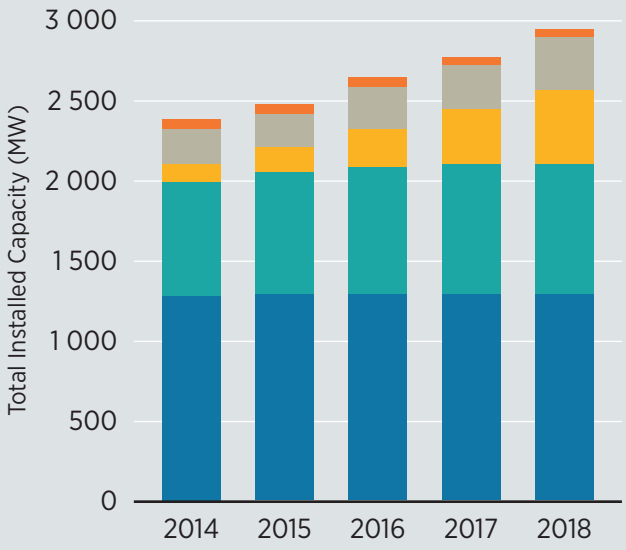
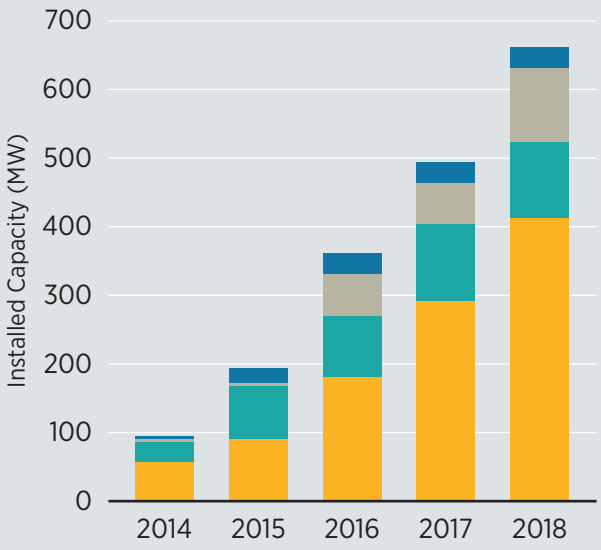


Figure 3 **New cumulative renewable energy installations since 2014**



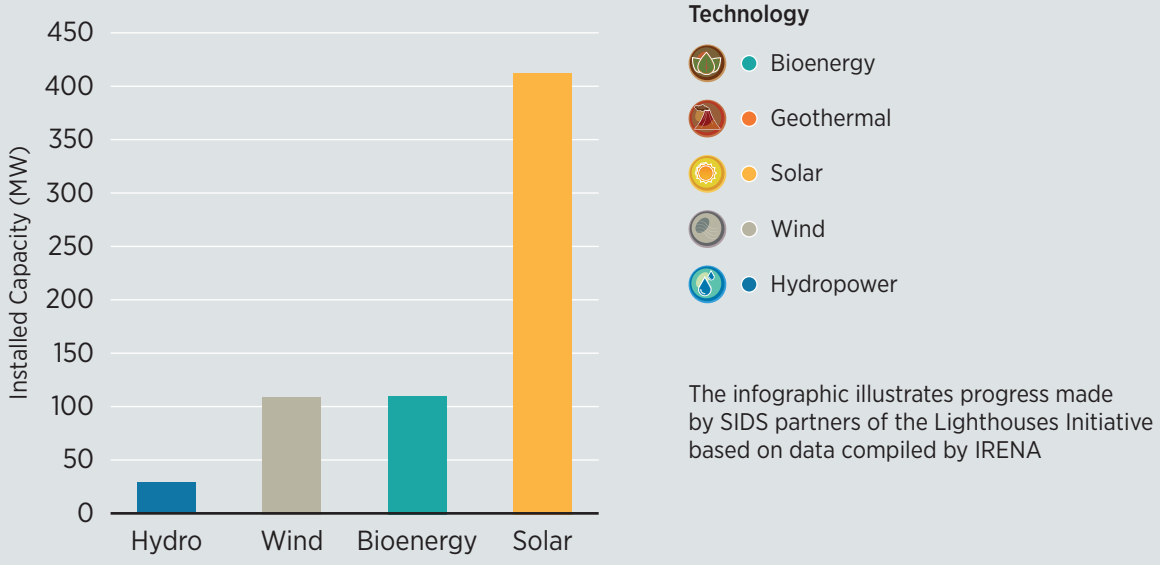
Source: IRENA statistics

In particular, 23 of the SIDS in the LHI have developed specific renewable energy roadmaps or action plans to achieve sustainable energy goals.

In recent years, SIDS partnering in the Initiative have gained access to:

- **Policy, regulatory and technical advisory services** for renewable energy roadmaps, assessments and grid stability analyses, as well as project planning, identification, structuring and execution.
- **Capacity building** for local policy makers, utilities, private sector, financing institutions and other relevant actors.
- **Funding for early-stage transactions and project finance**, aiming to attract private investments in renewable energy projects.
- A platform to share **information, knowledge, lessons learned and good practices**.

Figure 4 **New renewable energy installations by technology (2014 - 2018)**



The infographic illustrates progress made by SIDS partners of the Lighthouses Initiative based on data compiled by IRENA

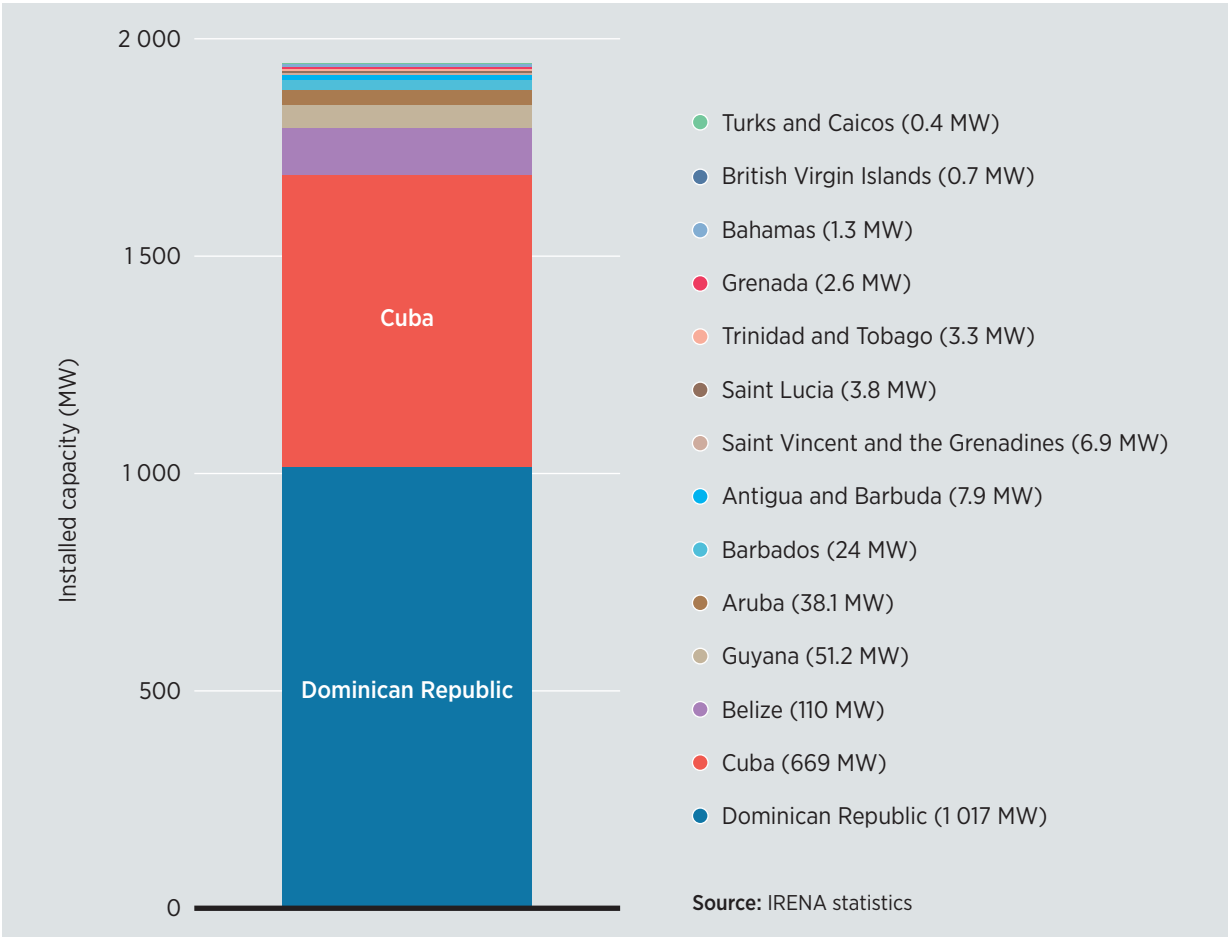
Source: IRENA statistics

REGIONAL DEVELOPMENT IN THE CARIBBEAN

The Caribbean region is home to islands that are among the most severely affected by natural disasters and climate change. Several of the 15 Caribbean island partners in the LHI rely heavily on fossil fuels for their energy needs, making them vulnerable to external factors such as oil-price fluctuations. Caribbean SIDS have identified energy-system resilience and renewable energy deployment as key goals in their energy transition. In this context, the Member States of the Caribbean Community (CARICOM) have set a regional target of 47% renewable energy contribution to total electricity generation by 2027.

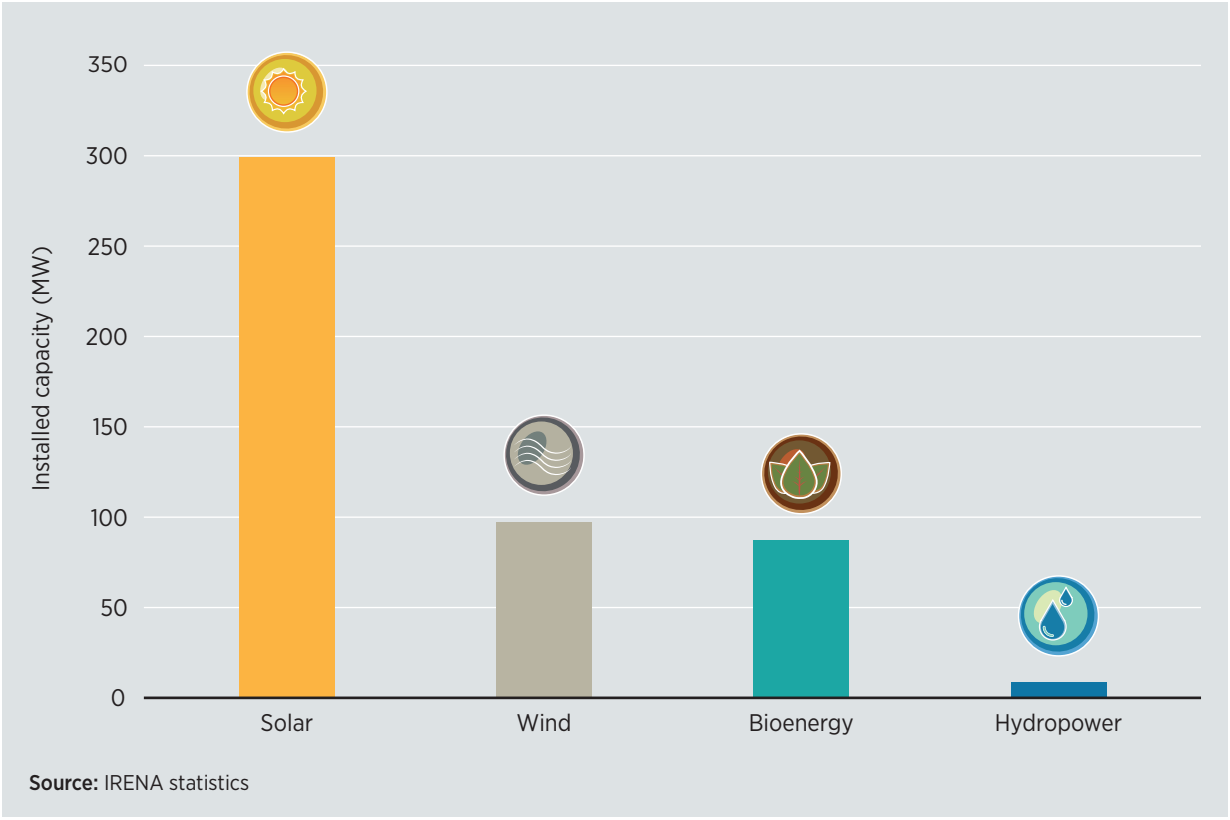
In the 2014-2018 period, solar PV has grown significantly among the SIDS LHI partners in the region, with 300 MW of new capacity installed, mostly in the Dominican Republic, Cuba and Barbados. In the same period, growth was observed in installed biopower capacity, particularly in the Dominican Republic (36 MW) and Belize (24 MW). Wind power has also experienced growth, with new capacity installed in the Dominican Republic during the period. So far no geothermal or ocean energy projects are operational in the LHI partners in the region. However, drilling for a geothermal project began in Saint Vincent and the Grenadines in May 2019, and exploration is on-going in other eastern Caribbean SIDS partners (see Figures 5, 6 and 7).

Figure 5 **Total renewable energy installed capacity in the Caribbean partners of the LHI, 2018**



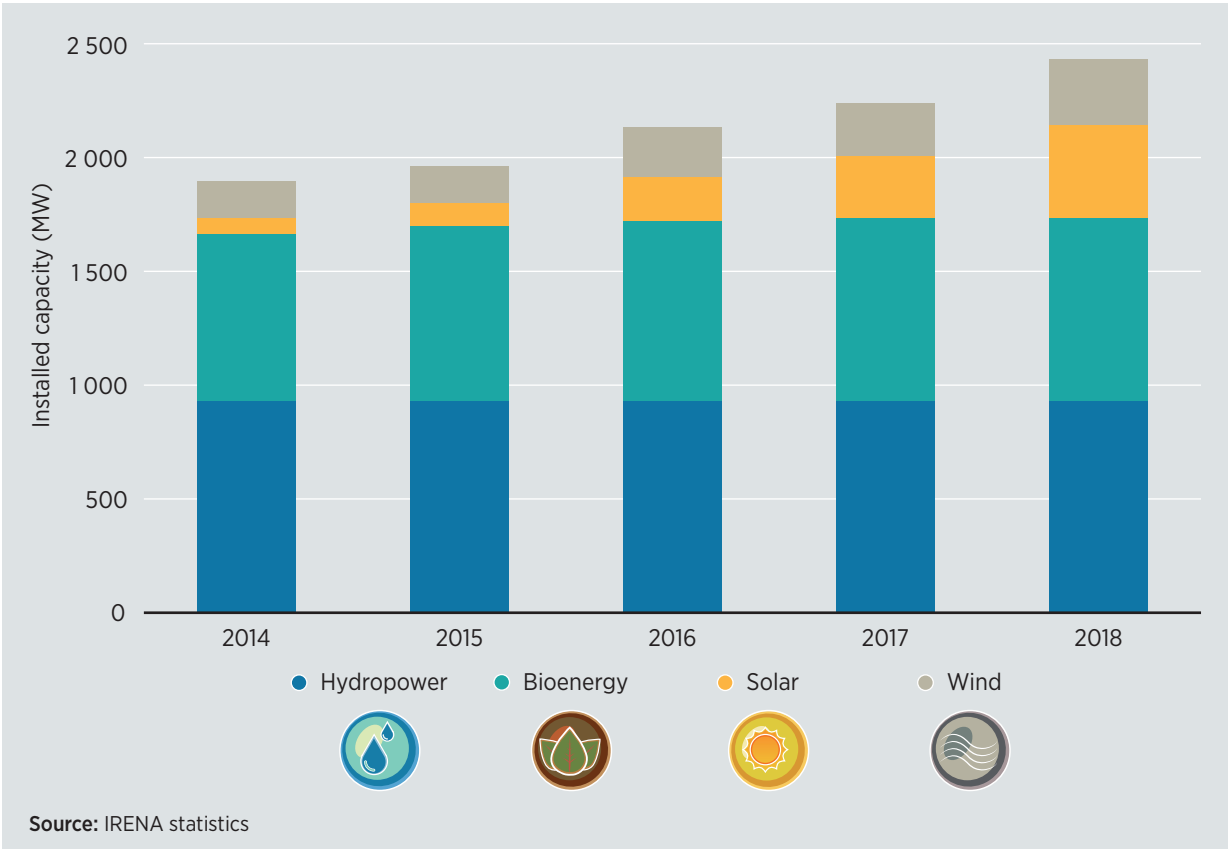
1 Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, British Virgin Islands, Cuba, Dominican Republic, Grenada, Guyana, Montserrat, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago, and Turks and Caicos.

Figure 6 **New renewable energy installed capacity by technology in the Caribbean partners of the LHI (2014-2018)**



Source: IRENA statistics

Figure 7 **Total renewable energy installed capacity in the Caribbean partners of the LHI**

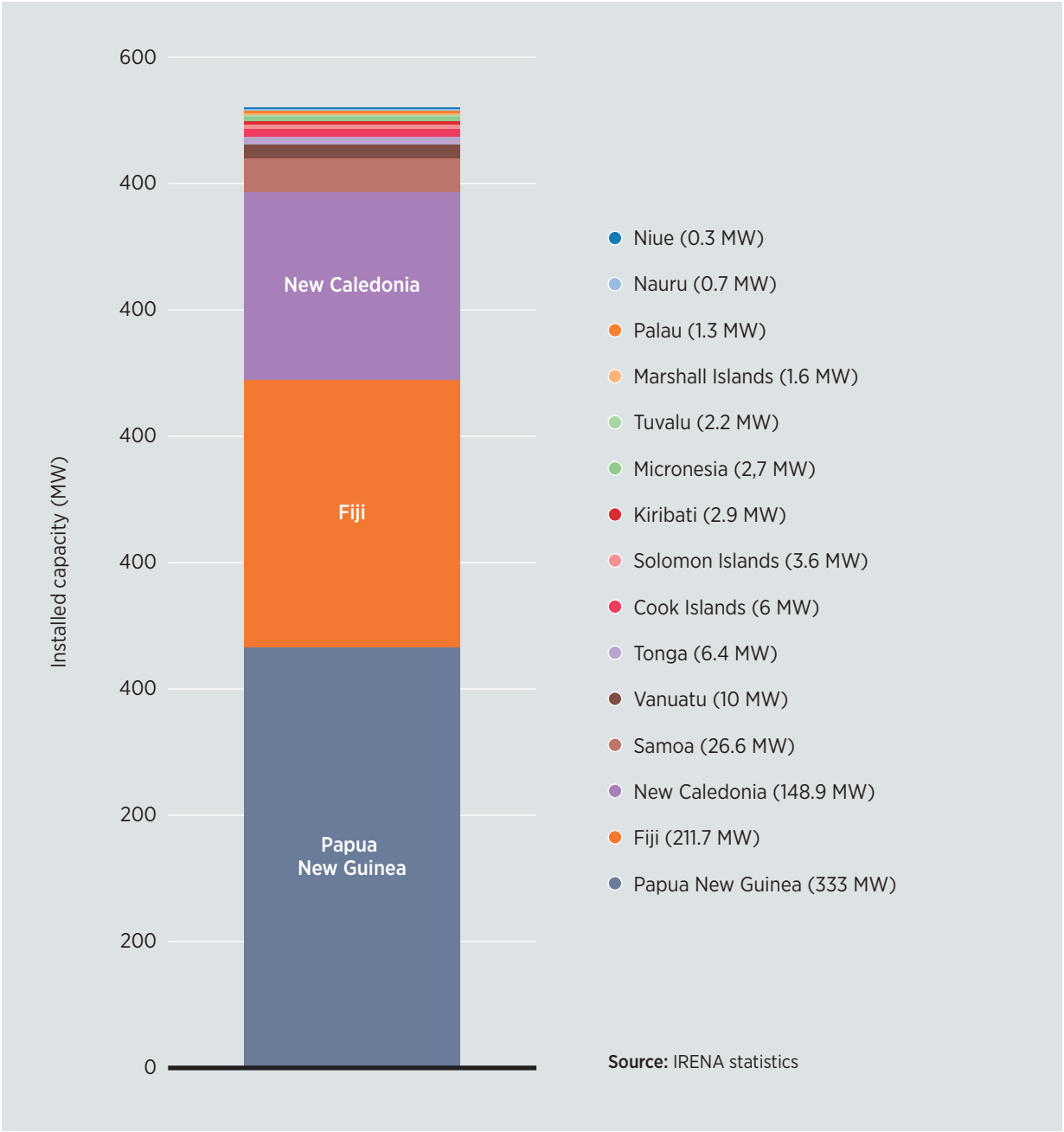


Source: IRENA statistics

REGIONAL DEVELOPMENT IN THE PACIFIC

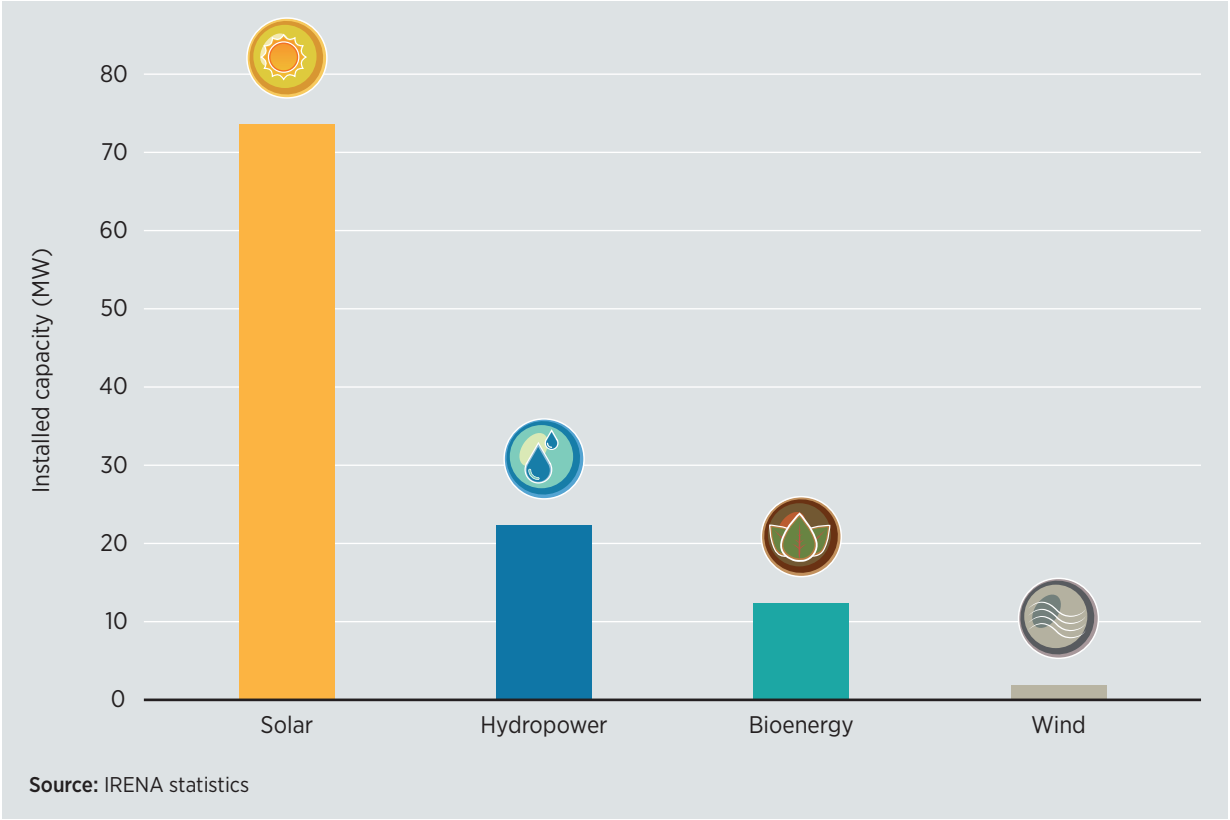
The Pacific island countries and territories – where energy security and access to sustainable and affordable energy are top priorities – have some of the most ambitious renewable electricity targets in the world today. At present, the main renewable source used in the power sector of the 15 SIDS partners of LHI in the Pacific is hydropower, but there has also been significant deployment of bioenergy and solar PV in recent years. In 2014-2018, around 18 MW of hydropower were installed in Papua New Guinea and 3.6 MW in Samoa, some 12 MW of biopower in Fiji and 73 MW of solar PV across the region, with notable growth in Samoa, New Caledonia, Fiji and Tonga (See Figures 8, 9 and 10).

Figure 8 **Total renewable energy installed capacity in the Pacific partners of the LHI, 2018**



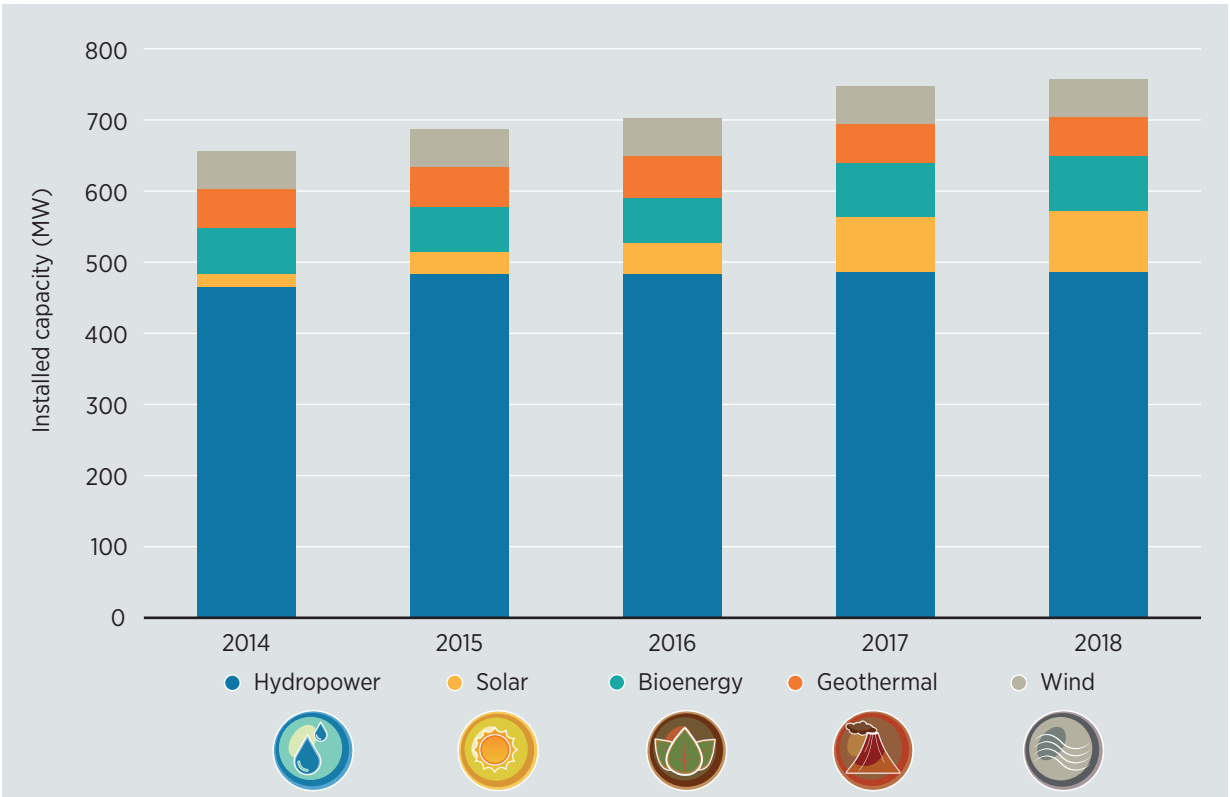
2 Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Nauru, New Caledonia, Niue, Palau, Papua New Guinea, Samoa, Republic of the Marshall Islands, Solomon Islands, Tonga, Tuvalu and Vanuatu.

Figure 9 **New renewable energy installed capacity by technology in the Pacific partners of the LHI (2014-2018)**



Source: IRENA statistics

Figure 10 **Total renewable energy installed capacity in the Pacific partners of the LHI**



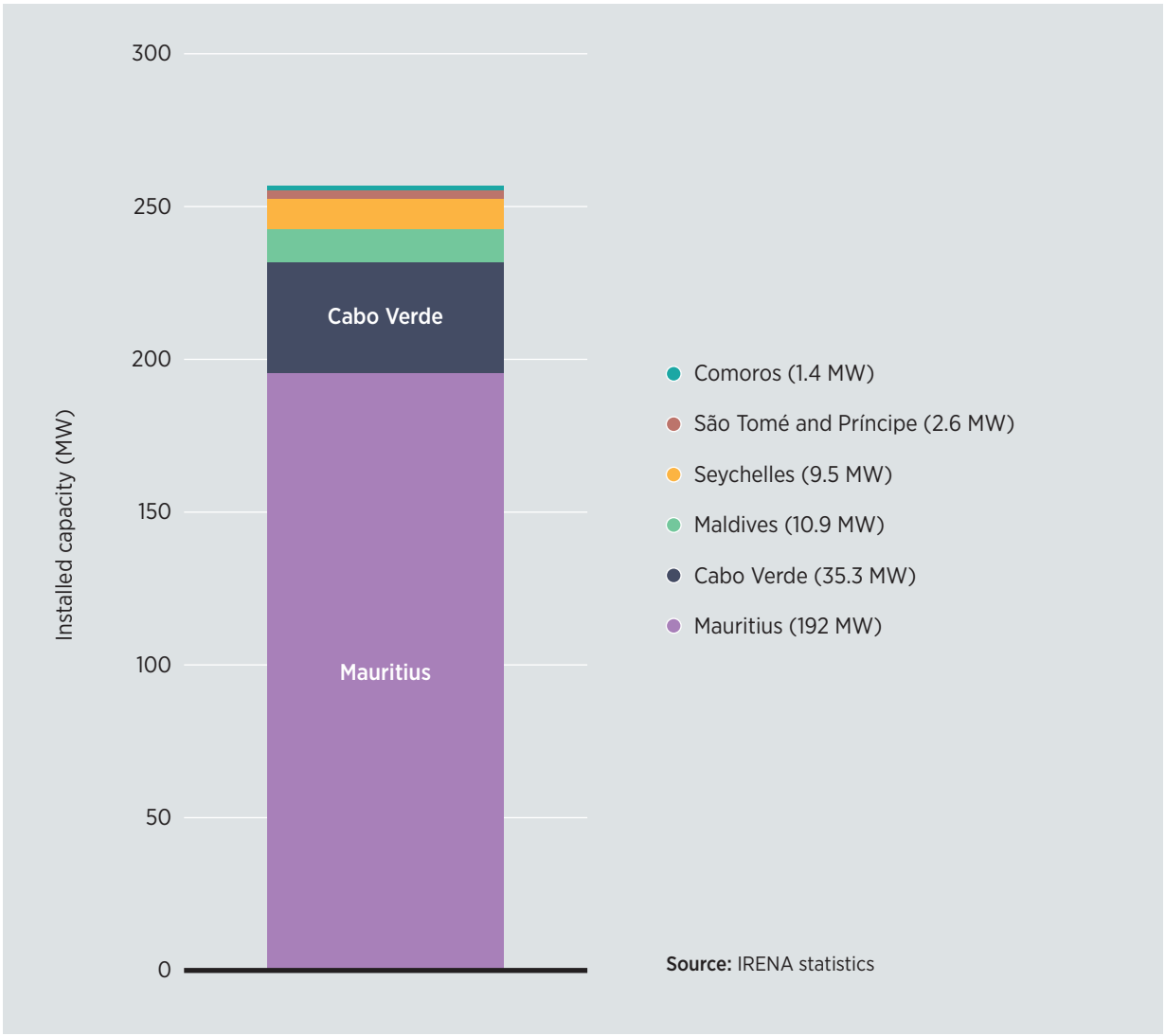
Source: IRENA statistics

REGIONAL DEVELOPMENT IN THE ATLANTIC, INDIAN OCEAN AND SOUTH CHINA SEA (AIS)

Each of the six SIDS LHI partners from the Atlantic Indian Ocean, and South China Sea grouping is unique in terms of geography, energy sector development and resource potential. Nevertheless, the transition to a sustainable energy future is a common priority across these islands. Mauritius, the AIS country with the highest installed renewable energy capacity, accounts for nearly all of the bioenergy and hydropower installed in the combined region, while Cabo Verde has the highest wind energy deployment.

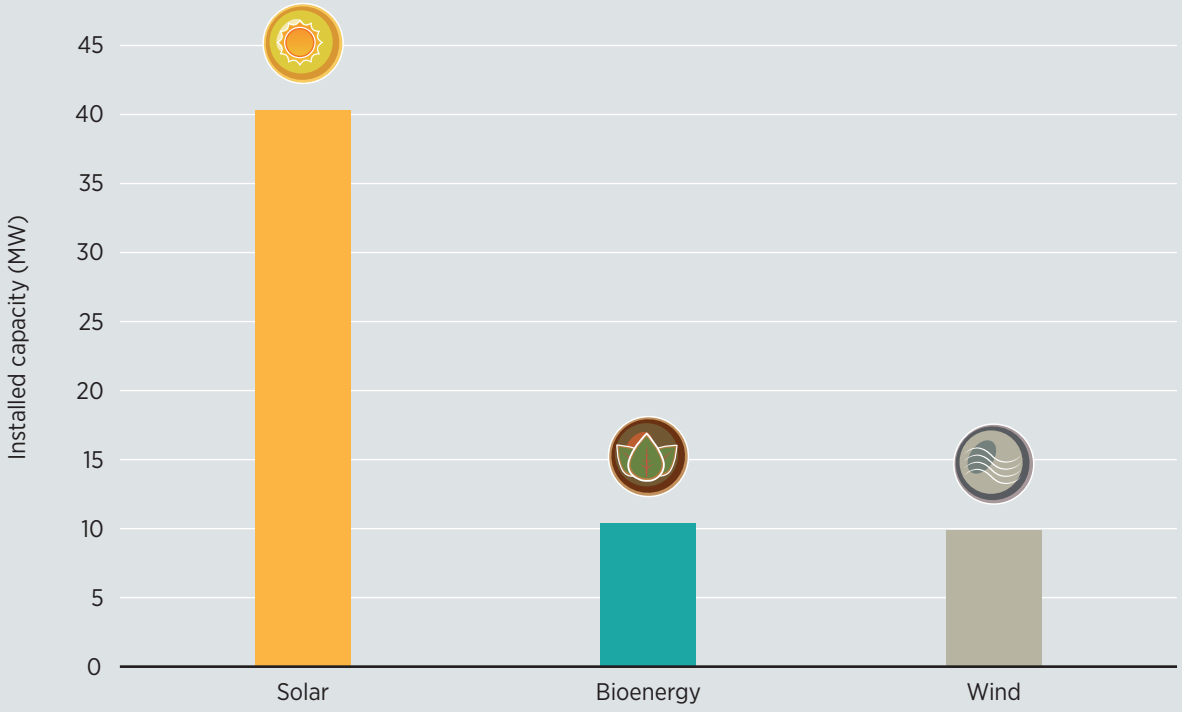
In the 2014-2018 period, solar power has seen significant growth among the SIDS LHI partners in the region, with around 40 MW of newly installed capacity: 27 MW in Mauritius; 7.7 MW in the Maldives; and 3.2 MW in the Seychelles. Newly installed biopower was installed exclusively in Mauritius, and new wind capacity added in Mauritius and Capo Verde (See Figures 11, 12 and 13).

Figure 11 **Total renewable energy installed capacity in the AIS partners of the LHI, 2018**



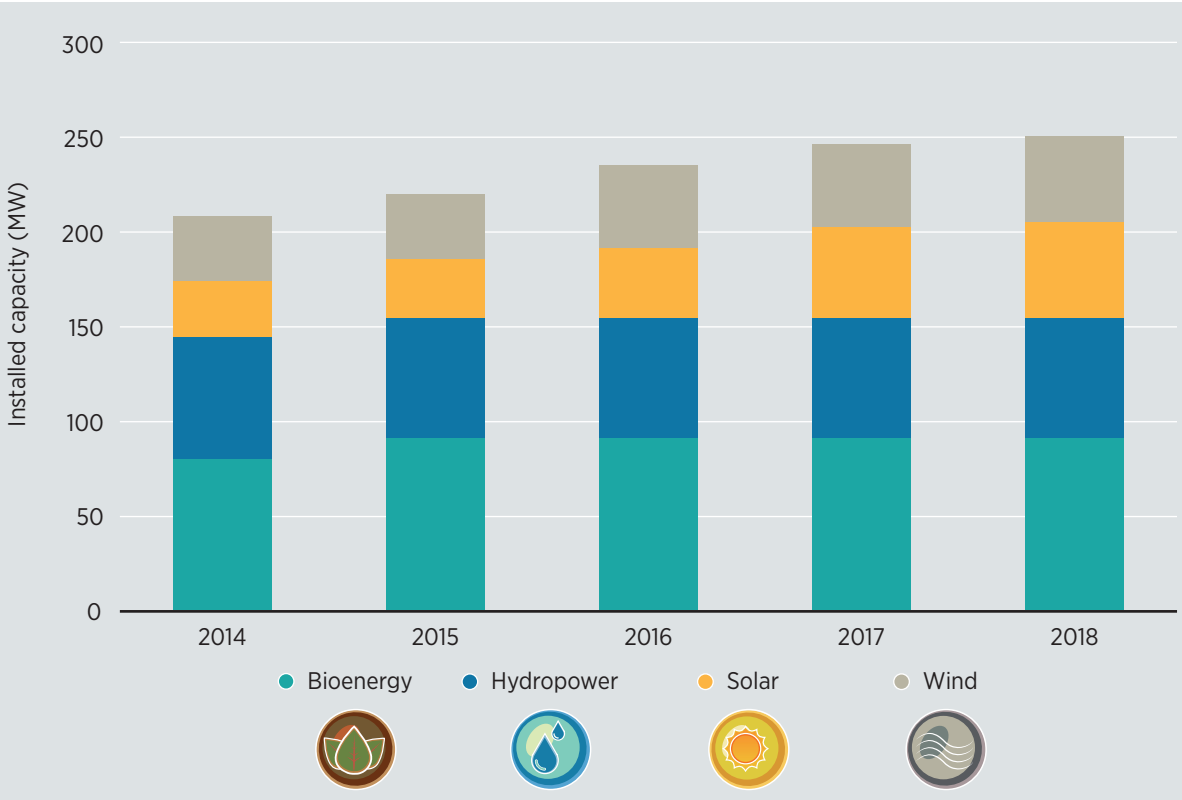
3 Cabo Verde, Comoros, the Maldives, Mauritius, São Tomé and Príncipe, Seychelles.

Figure 12 **New renewable energy installed capacity by technology in the AIS partners of the LHI (2014-2018)**



Source: IRENA statistics

Figure 13 **Total renewable energy installed capacity in the AIS partners of the LHI**



Source: IRENA statistics

Box SIDS LHI knowledge-sharing platform

IRENA launched a dedicated LHI website in 2018 as part of a knowledge-sharing platform: **www.irena.org/islands**

The SIDS LHI website features tools, studies, videos, key events and a wealth of information on the energy transformation in SIDS.

The website's Country Profiles section, provides an overview of key indicators, renewable energy developments and recent initiatives/programmes in each of the Initiative's SIDS partners.

Initial LHI targets for 2020 were met ahead of schedule and even considerably exceeded

MAXIMISING IMPACT:

THE NEXT PHASE IN THE SMALL-ISLAND ENERGY TRANSFORMATION

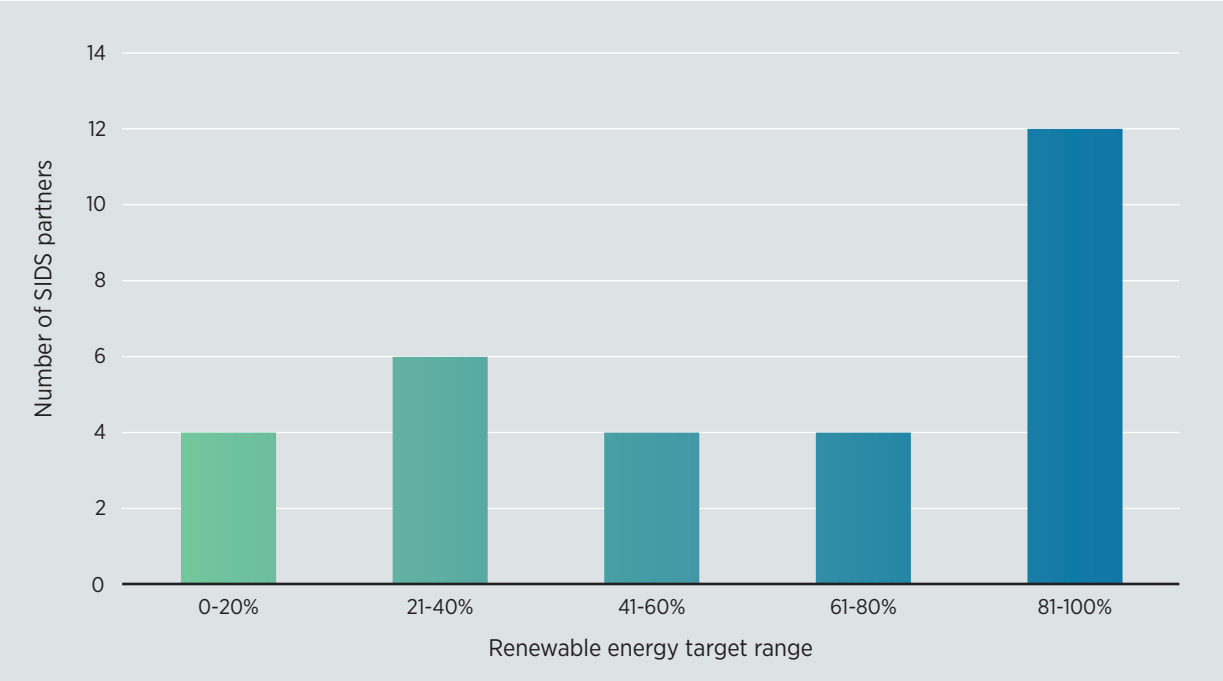
Initial LHI targets for 2020 were met ahead of schedule and even considerably exceeded. Yet renewable energy still only accounts for about 10% of total installed capacity in the power sector for SIDS, leaving most of their potential untapped. Further efforts are needed to accelerate the SIDS energy transformation.

The political commitment to renewables among SIDS remains unwavering. Almost all SIDS have set indicative national renewable energy targets. Twelve SIDS partners in the LHI have set significant targets, aiming for more than 80% renewable penetration in the power sector, and ten of those have set 100% renewable energy targets (see Figure 14).

Given this commitment by SIDS, as well as their evolving energy needs, IRENA has consulted regularly with LHI partners. Their input, obtained through both technical workshops and high-level discussions, helped to identify priority areas for the Initiative's next phase. Key meetings in this process have included the SIDS Energy Day and High-Level Dialogue held in December 2017 at COP23 in Bonn, Germany, and the High-Level Meeting on Scaling up Renewable Energy Deployment in SIDS, held in January 2018 during the Eighth IRENA Assembly.

During the consultation period, a consensus emerged around key areas for action. These were captured in a discussion paper prepared by IRENA and shared for feedback with LHI partners in August 2018. SIDS and other LHI partners subsequently endorsed a new set of priority areas. These are clearly reflected in the LHI's second phase, officially launched in September 2018 at a High-Level Roundtable meeting on the side lines of the United Nations General Assembly in New York.

Figure 14 **Range of national renewable energy targets in the power sector of SIDS partners of the LHI**



Geothermal drilling operations in Saint Vincent and the Grenadines

SIDS LIGHTHOUSES INITIATIVE: NEW PRIORITY AREAS

The action areas endorsed in 2018 for the Initiative's second phase are as follows:

- Support SIDS in reviewing and implementing NDCs, extending technical assistance and capacity building where needed to meet climate goals.
- Expand from assessments and planning to implementing effective, innovative solutions, with continued technical and regulatory advisory services addressing the particular challenges faced by SIDS.
- Promote all renewable sources, including geothermal and ocean energy, and step up work to integrate solar PV and wind power.
- Support the development of bankable projects, fostering access to finance and closer co-operation with the private sector.
- Strengthen institutional and human capacity development in all segments of the renewable energy value chain.
- Look beyond power generation and focus also on transport and other end-use sectors.
- Leverage synergies between renewables and energy efficiency.
- Reinforce links between renewables and non-energy sectors – including agriculture, food, health and water – to foster broad socio-economic development, while also raising awareness about job creation, gender equality and women's empowerment through renewable energy development.
- Link renewable energy uptake to climate resilience and more effective disaster recovery.
- Enhance the collection and dissemination of data and statistics, particularly to ensure informed decision-making and effective monitoring.
- Reinforce and expand partner engagement, leveraging synergies with existing SIDS initiatives and other IRENA-facilitated platforms, such as the Global Geothermal Alliance, the International Off-Grid Renewable Energy Conference, and the IRENA Coalition for Action.
- Boost renewable power deployment, aiming for total installed capacity of 5 GW in SIDS by 2023.

PATHWAYS AND PARTNERSHIPS FOR CLIMATE RESILIENCE AND SUSTAINABLE DEVELOPMENT

SIDS and development partners converged at the Climate Action Summit 2019, held in parallel with the United Nation's General Assembly. SIDS rallied support to hold the line on global warming at 1.5°C (degrees Celsius) and paarticipated in the High-Level Mid-term Review of the S.A.M.O.A (SIDS Accelerated Modalities of Action) Pathway. The review assessed the current implementation status of the S.A.M.O.A. Pathway, highlighted existing gaps, proposed actions in response, and reaffirmed international support for SIDS.

At Climate Action Summit 2019, IRENA Director-General Francesco La Camera joined the President of the Republic of Maldives, H.E. Ibrahim Mohamed Solih, the Prime Minister of Saint Lucia, Hon. Alan Chastanet, the President of Palau, H.E. Thomas Remengesau Jr. and the Prime Minister of Barbados, Hon. Mia Mottley to discuss SIDS energy and climate challenges.

IRENA, the Alliance of Small Island States (AOSIS), the Republic of Palau, and the UN Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and SIDS (UN-OHRLLS) took this opportunity in September 2019 to co-organise a high-level meeting on pathways and partnerships for SIDS to achieve greater climate resilience and sustainable development.

The Secretary General's Envoy for the 2019 Climate Action Summit conveyed the Secretary General's unwavering commitment to the SIDS energy transition. Renewables can help SIDS to mitigate climate change, mobilise climate finance, and implement and enhance their NDCs under the Paris Agreement. This discussion led further to concrete follow-up plans at the subsequent climate conference, COP-25, held in Madrid, Spain, and chaired by Chile.

SIDS rely heavily on imported fossil fuels and are uniquely vulnerable to natural disasters. But for SIDS to implement their NDCs and fulfil United Nations-endorsed Sustainable Development Goals (SDGs), some financing gaps need to be closed. To this end, development partners have committed to increasing financial support and making climate action central to their co-operation with SIDS.

Supporting renewable energy transition beyond the power sector to include end-use sectors such as transport, buildings, food, agriculture, water, education, waste and health also provides a unique opportunity for SIDS to act as testbeds and innovation hubs for emerging technologies such as floating solar farms, geothermal and ocean energy technologies.

IRENA's Director-General Francesco La Camera addressed a High-Level Breakfast Meeting on pathways and partnerships for SIDS attended by the UN Secretary General's Special Envoy for the 2019 Climate Action Summit, Luis Alfonso de Alba, Belize's Minister of Foreign Affairs the Honorable Wilfred Peter Elrington, and the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States, Ms. Fekitamoeloa Katoa 'Utoikamanu.

ON THE FRONT LINE AGAINST CLIMATE CHANGE:

ACTIONS TO SUPPORT SMALL-ISLAND AMBITIONS FOR RENEWABLES

SIDS are among the world's most vulnerable countries to the effects of climate change. They are also among the most ambitious in terms of commitments to climate action.

Through the SIDS Lighthouses Initiative, IRENA provides a platform to support SIDS with:

- establishing suitable policy frameworks;
- identifying renewable energy resource potential;
- project facilitation;
- capacity building;
- finding financial and project-development support

The shift to renewable energy technologies must also reflect small-island socio-economic structures. Deployment must happen in a sustainable manner, fostering positive systematic changes, strengthening human capacity and ensuring that no one is left behind.

At COP-25, IRENA and the United Nations Development Programme (UNDP) agreed to jointly support NDC revisions by 100 countries. The UN Secretary General's Climate Summit report highlights IRENA's support via the SIDS Climate Action Summit Package, which will be implemented through the SIDS Lighthouses Initiative.

The newly activated joint Climate Investment Platform, meanwhile, promises to unlock vital finance for the transition of SIDS to renewables.

Understanding the connections between climate mitigation, adaptation and development objectives will be crucial for SIDS. As IRENA's COP-25 side-events highlighted, such aims can be realised through the sharing of knowledge, along with expanded co-operation between policy makers, the private sector and other stakeholders spanning energy, agriculture, development, water, health and other sectors.

SIDS are determined to overcome their climate and energy challenges. In the decisive decade for climate action begins, Through the LHI platform, SIDS can acquire the capacity they need through dedicated project facilitation, access to climate finance and the steady support of development partners.

UNDP Administrator Achim Steiner and IRENA Director-General Francesco La Camera took part in the SIDS High-Level Event hosted by UN-OHRLLS and AOSIS at COP-25, entitled "SIDS at the forefront of climate action: Ambitious NDCs to halt warming at 1.5 degrees".

This 10 MW solar photovoltaic project in Cuba was financed by the Abu Dhabi Fund for Development (ADFD) through the IRENA/ADFD Project Facility.

IRENA TOOLS FOR SIDS LIGHTHOUSES PARTNERS

Renewables Readiness Assessment

The Renewables Readiness Assessment (RRA) is a country-led, comprehensive tool for holistic evaluations and recommendations for action to accelerate renewable energy deployment.

RENEWABLES READINESS ASSESSMENT

IRENA Project Navigator

The IRENA Project Navigator is an online platform providing comprehensive, easily accessible, and practical information, tools and guidance to assist in the development of bankable renewable energy projects. The Project Navigator has introduced a component to assist project developers in Small Island Developing States (SIDS). Within this islands module, the Project Navigator will help islands assess and address project development issues, in order to enable stronger, economically sustainable development and smart integration of renewables.

IRENA PROJECT NAVIGATOR

IRENA/ADFD Project Facility

IRENA and the Abu Dhabi Fund for Development (ADFD) have collaborated to create a joint Project Facility to finance transformative and replicable renewable energy projects in developing countries. The facility involves IRENA selecting and recommending promising renewable energy projects in developing countries. ADFD offers concessional loans to projects ranging between USD 5 million and USD 15 million, with the loan amount for each project not exceeding half of the estimated project cost. ADFD is providing USD 350 million over seven annual cycles.

IRENA ADFD
Supporting Energy Transition

Global Atlas

The Global Atlas for Renewable Energy is a free online resource-assessment tool with maps on solar, wind, ocean and bioenergy resources. It also facilitates a first screening of sites and areas for renewable energy investment opportunities.

Global Atlas
FOR RENEWABLE ENERGY

IRENA ACTIVITIES WITH ISLANDS

National energy roadmaps

IRENA actively supports islands in their transition to a renewable energy future through the development of national energy roadmaps. These roadmaps provide clear pathways covering the technical, economic and policy elements that enable the large-scale, sustainable deployment of renewables.

Roadmaps are a result of co-operation between IRENA, national governments and key stakeholders. They feature analysis detailing transformation of current energy usage to least-cost energy systems with a significant contribution from renewables.

Roadmap analysis is centred on identifying renewable energy options for power generation. The analysis can also examine the potential for renewables in the heating, cooling and transportation sectors.

Grid integration studies

IRENA's grid integration work supports policymakers and public utilities from Small Island Developing States address and overcome technical constraints associated with the operation of electricity grids with high shares of variable renewables, such as solar and wind energy.

The work focuses on:

- Analysis of grid stability and grid operation for the integration of higher shares of renewable energy, particularly upon request from IRENA Member States;
- Development of grid integration assessment methodologies as the basis for IRENA country support;
- Provision of access to software tools, models and guides for grid integration studies, with a focus on small isolated systems;
- Training and technical workshops on grid operation and expansion planning for small isolated systems hosting high shares of renewable energy resources.

Site appraisal programme

IRENA's site appraisals simulate the financial viability of wind or solar projects at specific sites. The wind or solar resource potential and the possible costs, financing and revenue associated with the specific site are assessed. The appraisal generates scenarios of financial performance based on the confidence determined in the resource data or the power purchase agreement model. It uses hourly high-resolution wind and solar time series datasets within an IRENA custom-built model and can be applied to any location worldwide.

SIDS Lighthouses Initiative partners can apply for site appraisals.

Quickscans

The quickscan process allows islands to quickly assess their readiness to deploy renewable energy in the power sector. The quickscan is a government-led process, supported by analysis from IRENA or other partners of the Initiative. At the core of quickscan is a targeted questionnaire on seven elements that are critical to a successful transition to renewables.

The SIDS Lighthouses Initiative has been made possible with the generous support of Denmark, France, Germany, Japan, the Kingdom of the Netherlands, New Zealand, Norway and the United Arab Emirates.

About IRENA

The International Renewable Energy Agency (IRENA) is the intergovernmental organisation that serves as the principal platform for co-operation, a centre of excellence, a repository of policy, technology, resource and financial knowledge, and a driver of action on the ground to advance the transformation of the global energy system. 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**

Citation: IRENA (2020), "SIDS Lighthouses Initiative. Progress and way forward", (January 2020), International Renewable Energy Agency, Abu Dhabi.

ISBN 978-92-9260-216-1