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International Renewable Energy Agency

SIDS LIGHTHOUSES INITIATIVE

Progress and way forward

JULY 2022

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Abbreviations

ADB	Asian Development Bank	LHI	Lighthouses Initiative
ADFD	Abu Dhabi Fund for Development	MEPS	minimum energy performance standards
AIS	Atlantic, Indian Ocean and South China Sea	MOU	memorandum of understanding
AOSIS	Alliance of Small Island States	MRV	monitoring, reporting and verification
°C	degree celsius	MW	megawatt
CAEP	Climate Action Enhancement Package	NDC	nationally determined contribution
CARICOM	Caribbean Community	OECD	Organisation for Economic Co-operation and Development
CARILEC	Caribbean Electric Utility Services Corporation	OPERA	Office of the Pacific Energy Regulators Alliance
CFR	Country Financing Roadmap	OSW	offshore wind
CIF	Climate Investment Fund	OTEC	ocean thermal energy conversion
CIP	Climate Investment Platform	PICTs	Pacific Island Countries and Territories
CO₂	carbon dioxide	PPA	power purchase agreement
COP26	26 th UN Climate Change Conference of the Parties	PV	photovoltaic
ECOWAS	Economic Community of West African States	RAC	refrigeration and air conditioning
ECREEE	ECOWAS Centre for Renewable Energy and Energy Efficiency	RRA	Renewables Readiness Assessment
ETAF	Energy Transition Accelerator Financing	S.A.M.O.A	SIDS Accelerated Modalities of Action
FESRIP	Framework for Energy Security and Resilience in the Pacific	SCR	Seychellois rupee
GCF	Green Climate Fund	SDG	Sustainable Development Goal
GGA	Global Geothermal Alliance	SDIP	Sustainable Development Investment Partnership
GHG	greenhouse gas	SEforALL	Sustainable Energy for All
GW	gigawatt	SIDS	Small Island Developing States
GWh	gigawatt hour	SPC	Pacific Community
IOC	Indian Ocean Commission	UAE	United Arab Emirates
IPP	independent power producer	UN	United Nations
IRENA	International Renewable Energy Agency	UN-OHRLLS	UN Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States
IRIE	Initiative for Renewable Island Energy	UNDP	United Nations Development Programme
ISSI	Islands and Small States Institute	UNFCCC	United Nations Framework Convention on Climate Change
JICA	Japan International Cooperation Agency	USD	United States dollar
kWh	kilowatt hour		



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Way forward for the energy transformation in Small Island Developing States

At the 26th United Nations Climate Change Conference of the Parties (COP26), Small Island Developing States (SIDS) emphasised the crucial importance of using renewable energy investments as a policy mechanism to cope with climate change, both in mitigation and adaptation. Solutions will inevitably have to be innovative and tailored to reflect SIDS' varying geographies, cultures, political systems and economic structures.

The mobilisation of funds and the streamlining of processes to obtain these funds are direct responses to these needs. SIDS will continue to advocate for energy transition priorities in all global forums, maintaining continuous dialogue and engagement with investors and the private sector. SIDS and development partners have identified the points below as urgent areas of intervention to support the energy transformation in SIDS:

- Build capacity in local SIDS financing institutions to assess risk and identify funding of bankable projects, as well as strengthen SIDS capacity in the monitoring and evaluation of funds and increase project bankability.
- Encourage the bundling of projects, when applicable, to increase their scale and appetite for investments.
- Differentiate and customise approaches to access financing dependent on the SIDS' economy size and project scale.
- Reduce bureaucratic procedures and red tape to access finance and investment.

The last 12 months have brought to the fore two main problems afflicting SIDS: the economic devastation wrought by the COVID-19 pandemic and the intensification of climate disasters and phenomena. Vital economic sectors such as tourism were hard-hit by the collapse of international travel. Fuel supply chains were subject to sudden constraints, which proved to be particularly damaging for import-dependent nations such as SIDS. The COVID-19 pandemic has also dramatically exacerbated the problems faced by SIDS as they try to implement their energy transition plans. Both renewable energy financing and capacity additions have slowed in the past couple of years after achieving record growth during the previous decade.

Despite these challenges, SIDS and development partners continue to put forth solutions and ways forward to simultaneously accelerate the energy transition and boost economic recovery during the ongoing COVID-19 pandemic:

- Deploying renewables is the best remedy to address the ongoing climate and COVID-19 crises. This will strengthen resilience to future shocks and propel the economy forward.
- International public finance actors have a critical role to play in facilitating access to finance and leveraging opportunities for foreign direct investments, especially by eliminating cumbersome bureaucratic procedures.
- A mixture of measures and actions could be integrated to stimulate green recovery and meet SIDS' needs. These could include tailored climate financing packages to suit the needs of SIDS, support for low-carbon and climate-resilient investments, and better access to data to enable the studies and research needed to access financing.
- Debt relief or suspension measures, blended finance initiatives, and risk mitigation solutions are crucial but must be accompanied by transparency and accountability.
- Ensuring an integrated approach between SIDS and the international community, strengthening regional collaborations and partnerships, addressing institutional inequalities, and leadership will be essential.

In parallel to tackling the devastation wrought by the COVID-19 pandemic, SIDS view climate resilience as an additional urgent focus of action. SIDS are looking at ways to address issues pertaining to financing for adaptation measures, as well as the role of the energy-Sustainable Development Goal (SDG) nexus and how it can foster resilience and decentralised renewable energy solutions to “build back different” after climate disasters.

It is also important that regional frameworks are put in place to implement solutions to increase climate resilience, notably information sharing, capacity building, financing, and a strong and strategic engagement with partners.

About the SIDS Lighthouses Initiative

The SIDS Lighthouses Initiative (LHI) was launched at the United Nations (UN) Climate Summit in 2014 in response to the SIDS' call for action for support to achieve the objectives laid out by the SIDS Accelerated Modalities of Action (SAMOA) Pathway. The initial LHI targets for 2020¹ and 2023² have been met and exceeded ahead of schedule. The partners of the Initiative have now agreed to a new target of having installed renewable energy capacity of 10 gigawatts (GW) by 2030.

Taking into consideration the commitments of SIDS and development partners and the evolution of the energy context, new priority areas and targets were identified and endorsed by partners in a high-level meeting held at the UN General Assembly in New York in September 2018. The initiative brings together 38 SIDS from the Caribbean, the Pacific, and the Atlantic, Indian Ocean and South China Seas (AIS) regions, as well as 31 other partners, including developed countries, regional and international organisations, development partners, private companies, research institutes and non-profit organisations.

Two new SIDS joined the initiative in 2021: Saint Kitts and Nevis, and Singapore, as well as one additional partner, the Islands and Small States Institute (ISSI) at the University of Malta.

As the LHI's co-ordinator, the International Renewable Energy Agency (IRENA) facilitates and enhances dialogue at all levels, including through the operationalisation of the initiatives led by the Alliance of Small Island States (AOSIS) and the IRENA-AOSIS Energy Compact. Through this energy compact, the two organisations re-affirm the SIDS Climate Action Summit Package, which includes ambitious political action to support the achievement of as much as 100% renewable energy and energy efficiency targets in the power sector by 2030.

Joining the SIDS Lighthouses Initiative

The SIDS LHI 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 energy transformation to bolster climate resilience and sustainable development. All SIDS and development partners are invited to join this initiative. More information is available at islands.irena.org or by contacting islands@irena.org.

The SIDS Lighthouses Initiative is the framework of action for energy transitions and climate action in SIDS. It seeks to achieve a target of 10 gigawatts of total renewable energy installed capacity in all SIDS by 2030. This objective has been enshrined within the IRENA-AOSIS Energy Compact.

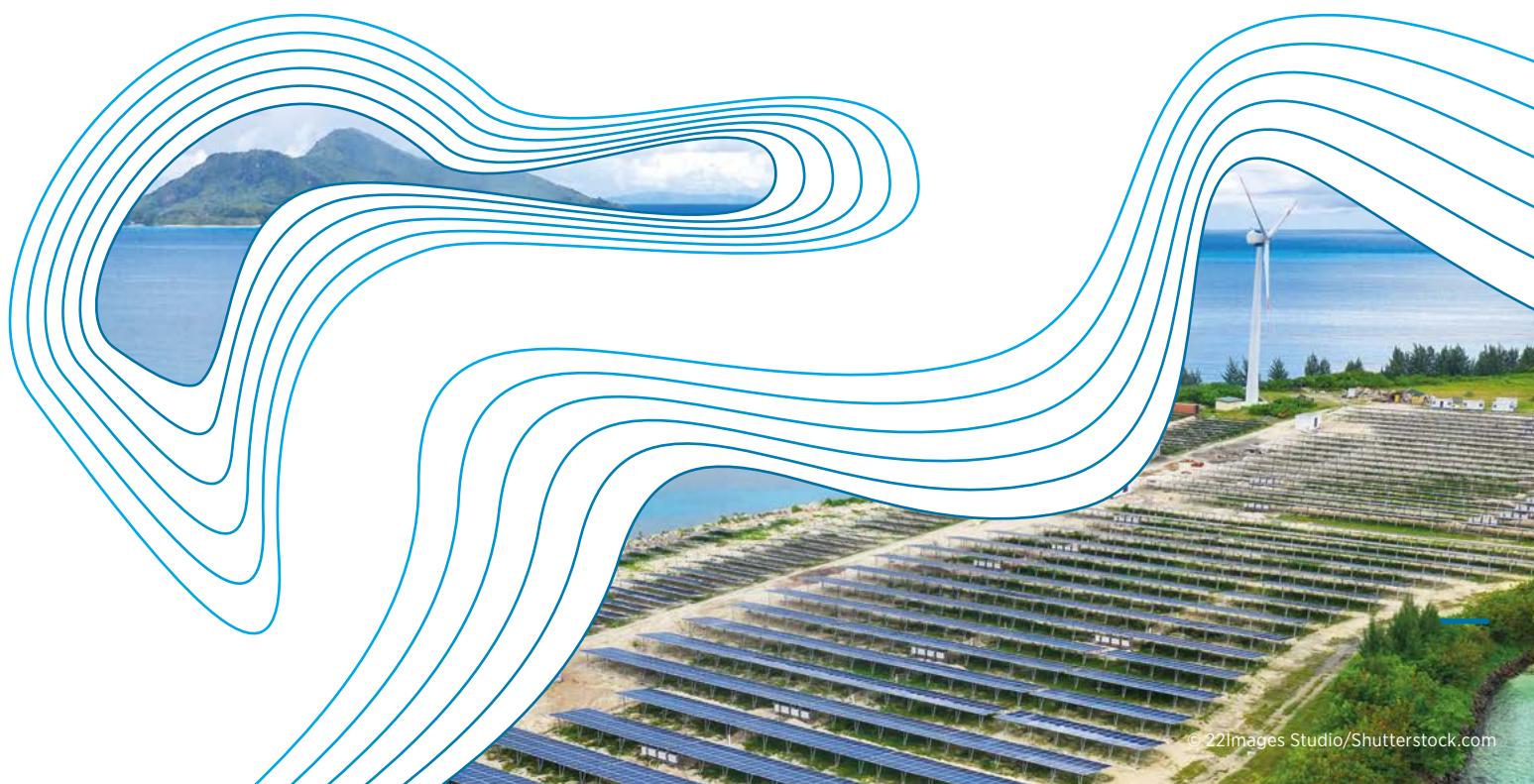


Figure 1 Total installed renewable energy capacity (MW) of SIDS that are LHI partners, 2020

Caribbean	Installed capacity (MW) 2020
• Antigua and Barbuda	17
• Aruba	38
• The Bahamas	2
• Barbados	50
• Belize	103
• British Virgin Islands	1
• Cuba	1252
• Dominica	7
• Dominican Republic	1428
• Grenada	4
• Guyana	53
• Montserrat	0.3
• Saint Kitts and Nevis	4
• Saint Lucia	4
• Saint Vincent and the Grenadines	8
• Trinidad and Tobago	4
• Turks and Caicos Islands	1



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, Caribbean Electric Utility Services Corporation, Clean Energy Solutions Center, Clinton Climate Initiative, ENEL, European Union, Greening the Islands, Indian Ocean Commission, International Renewable Energy Agency, Islands and Small States Institute, Organisation of Eastern Caribbean States, Pacific Islands Development Forum, Pacific Community, Pacific Power Association, Rocky Mountain Institute - Carbon War Room, Solar Head of State, Sustainable Energy for All, Sur Futuro Foundation, United Nations Development Programme, United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States, World Bank.

¹ The initial SIDS LHI targets set in 2014 to be achieved by 2020 were:

- USD 500 million mobilised
- 120 megawatts (MW) of new renewable energy generation of which: new solar PV (100 MW), new wind (20 MW), significant quantities of small hydro, geothermal, and marine technology
- All participating SIDS develop renewable energy roadmaps

² The target set in 2018 was 10 GW of total renewable energy installed capacity in all SIDS by 2023.

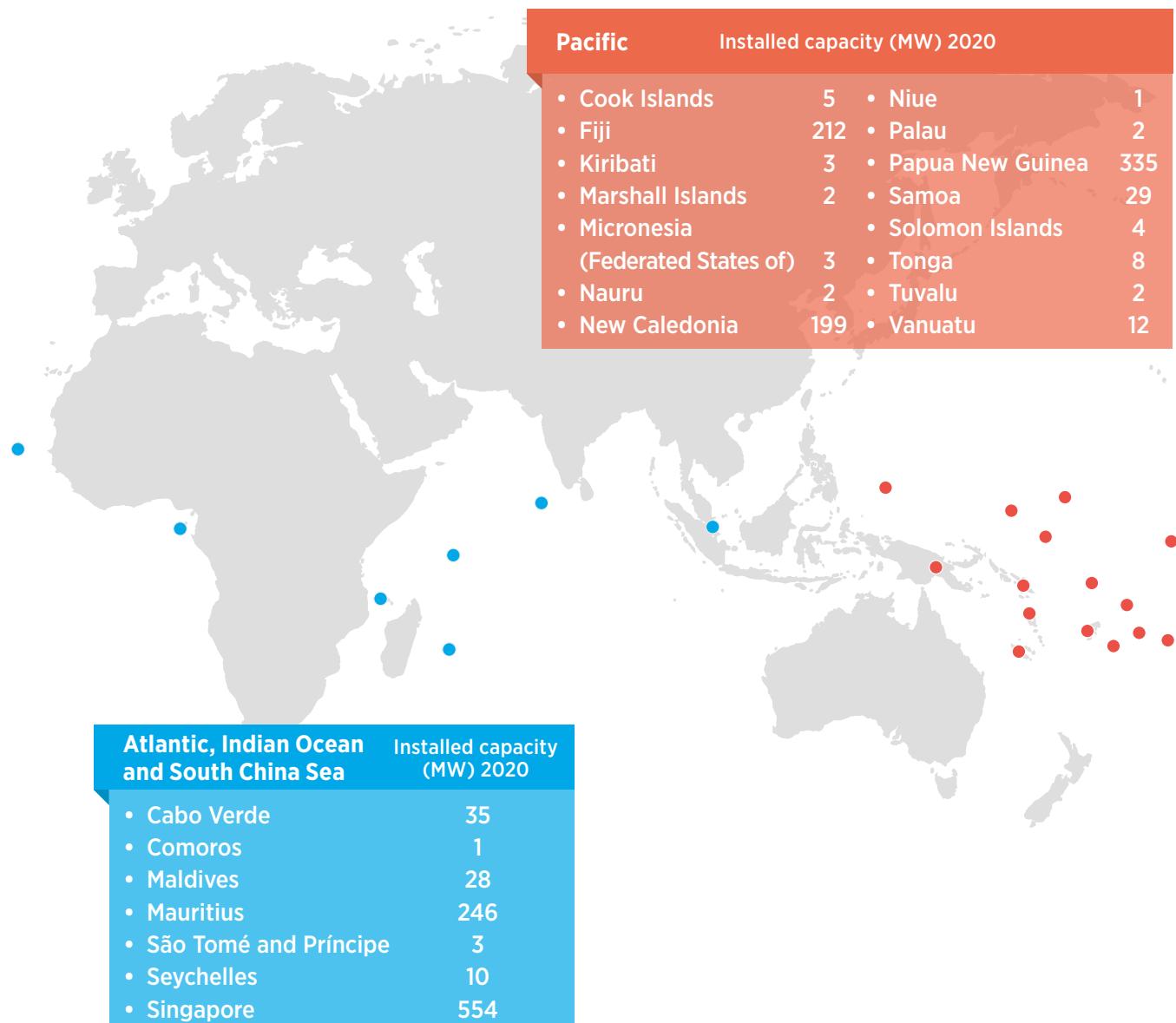
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Uptake of renewable energy in SIDS

Since the launch of the SIDS LHI in 2014, the uptake of renewable energy in SIDS has grown consistently, with remarkable acceleration in the years before the COVID-19 pandemic. Installed renewable energy capacity in SIDS grew from 3.5 GW in 2014 to 5.9 GW in 2020, hitting record growth of 19.5% between 2018 and 2019.

Growth in renewable energy installed capacity, however, slowed to 5.3% between 2019 and 2020, marking the lowest year recorded since the SIDS LHI was established. Similarly, more intense natural disasters and phenomena related to global warming have impacted existing infrastructure.

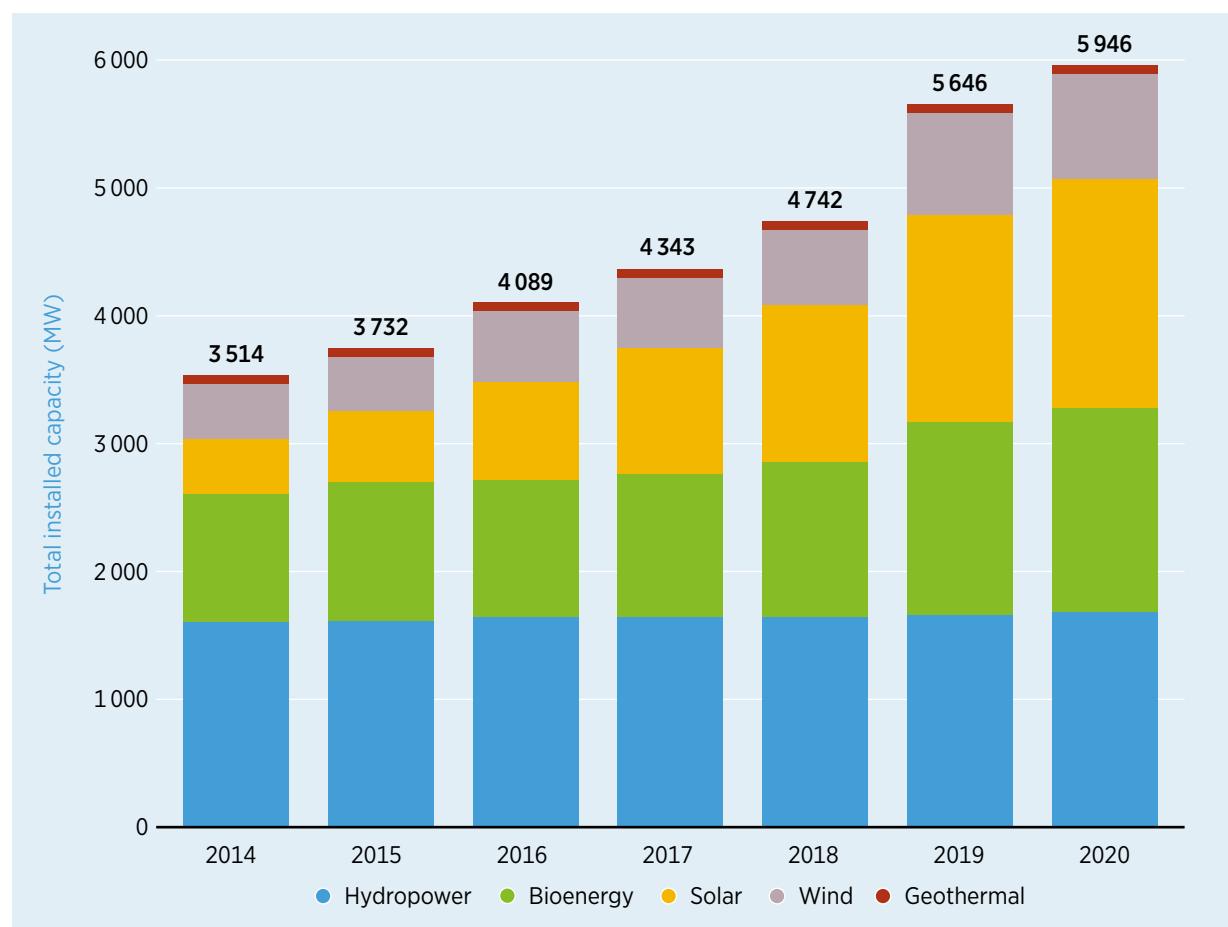
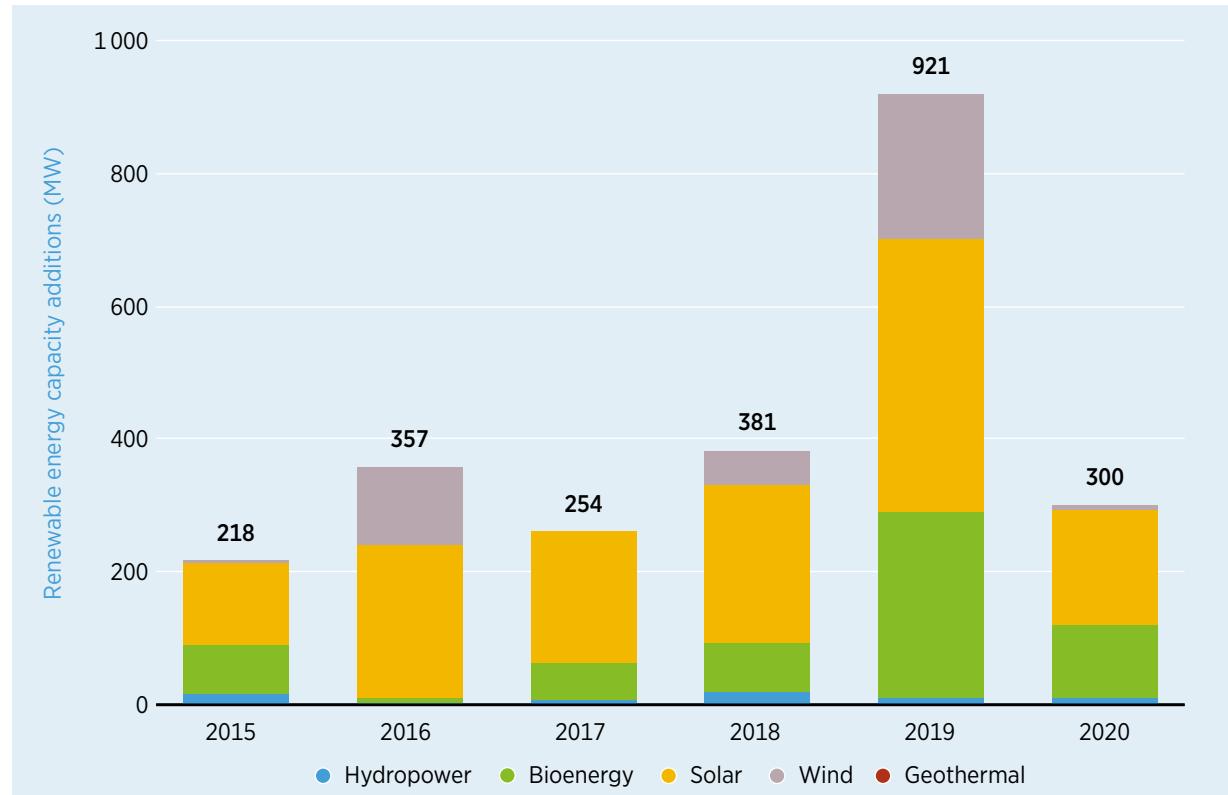
Figure 1 Total installed renewable energy capacity (MW) of SIDS that are LHI partners, 2020



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SIDS leaders have stepped up to the challenges of this new era, raising their voices in key COP26 summits, at international forums in the lead-up to the climate summit and in their new nationally determined contribution (NDC) submissions. They have thereby maintained the momentum of their efforts and taken advantage of the evolutions in technology, cost reductions and the support of a wide range of partners that together make renewables an affordable and reliable energy option.

According to IRENA data, new installations in 2020 compared to 2019 included 180 MW of solar photovoltaics (PVs) and 110 MW of bioenergy. Growth in other renewable sources – such as hydropower, wind and geothermal – was stagnant, reflecting a dearth in new capacity additions during the pandemic.

Figure 2 Total installed renewable energy capacity by technology for all SIDS (2014-2020)**Figure 3** Yearly new renewable energy capacity additions for all SIDS (2015-2020)

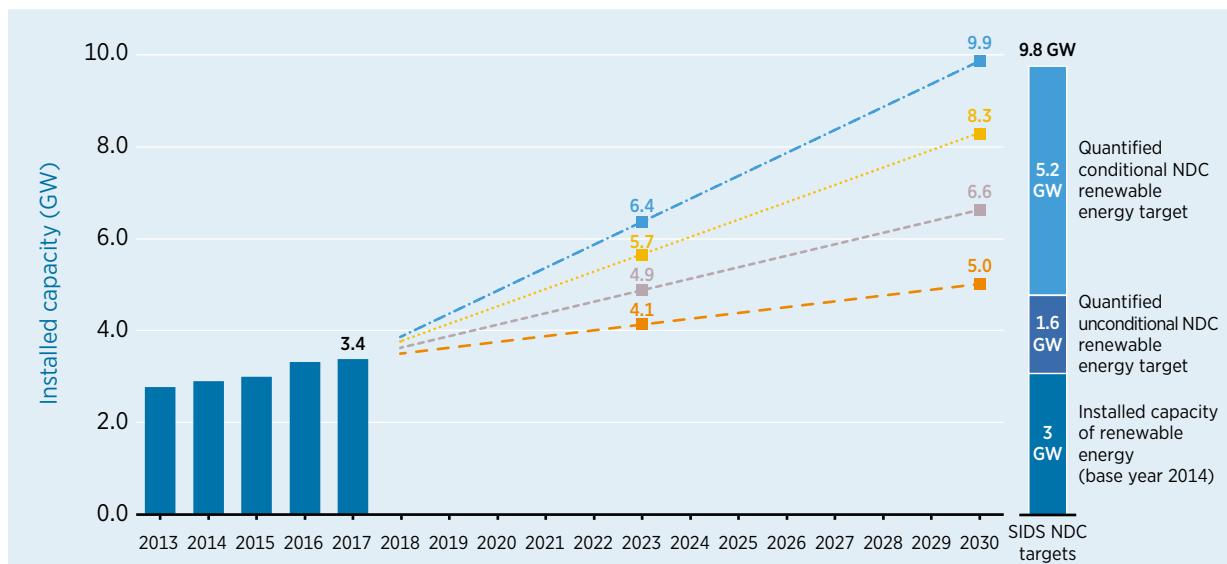
Summary of SIDS LHI priority areas

Since the launch of the second phase of the SIDS LHI in 2018, IRENA has continued to support SIDS' energy transition efforts in alignment with priority areas.

SIDS LHI priority areas

- Support SIDS in reviewing and implementing **NDCs** with **technical assistance** and **capacity building**.
- Expand from assessment and planning to **implementing** effective, innovative solutions.
- Promote **all renewable sources**, including geothermal and ocean energy, and step up work on wind and PV.
- Support the development of bankable projects, **access to finance** and co-operation with the **private sector**.
- Strengthen **institutional and human capacity** in all segments of the renewable energy value chain.
- Expand focus beyond power generation to include **transportation and other end-use sectors**.
- Leverage synergies between renewables and **energy efficiency**.
- Create a **nexus** for renewable energy and agriculture, food, health and water to foster broad **socio-economic development**.
- Raise awareness about **job creation, gender equality** and **women's empowerment** through renewables.
- Link renewable energy uptake to **climate resilience** and more effective disaster recovery.
- Enhance the collection and dissemination of **statistics** supporting informed decision making.
- Reinforce and expand partner engagement, leveraging **synergies with other SIDS initiatives**.

In addition to the above-mentioned priority areas, IRENA, in consultation with all the partners of the SIDS LHI, set a new target amount of 10 GW of total installed renewable energy capacity by 2030 for all SIDS. IRENA's analysis of SIDS' NDC submissions revealed that they would entail additional renewable capacity additions of 6.8 GW, which would allow SIDS to achieve 10 GW of installed renewable energy capacity by 2030, as shown in Figure 4. This would be equivalent to a quadrupling of the average capacity growth observed in the past seven years. The update of the LHI target was prompted by the fact that the previous target, amounting to 5 GW of total installed renewable energy capacity by 2023, had been achieved and exceeded three years in advance.

Figure 4 Renewable energy installed capacity and scenarios**Notes:**

- Installed capacity data source: IRENA Resource Database (<http://resourceirena.irena.org/>). The data refers to SIDS UN members.
- The scenarios are based on the continuation/doubling/tripling/quadrupling of annual average renewable energy growth of around 125 MW observed in the period 2013-2017.
- NDC renewable energy targets' source: Based on *Untapped potential for climate action: Renewable energy in Nationally Determined Contributions*, International Renewable Energy Agency, 2017.
- The target year for the NDC targets is 2030 in most cases. However, in some cases, the target year is 2025.
- Not all SIDS have quantified NDC targets. The figure includes SIDS that have quantified targets for NDC. Some SIDS have national renewable energy targets that may or may not coincide with the NDC targets.

“For many years we have placed special emphasis on assisting developing countries. We see it as our global responsibility. We believe that renewables can be a real game changer in mitigating climate change challenges and providing access to affordable energy.”

**HE Mariam bint Mohammed Saeed Hareb Almheiri, Minister of Climate Change and Environment,
United Arab Emirates**

Strategic engagement and partnerships

IRENA's strategic engagement with developed countries and partners through the SIDS LHI has led to increased partnerships and collaborations that contribute to strengthening SIDS' capacity and accelerating the deployment of renewables.

Further engagement with regional organisations, the private sector, financing institutions and other development partners has led to joint recovery efforts in the midst of the ongoing COVID-19 pandemic. These efforts include energy transformation knowledge sharing, capacity building, analytical work relating to the update of SIDS commitments to the Paris Agreement, and the facilitation of developing bankable projects as well as accessing finance. To this end, in operationalising the memorandum of understanding (MOU) that was signed between IRENA and the Pacific Community (SPC), the SPC agreed to host the IRENA Pacific Focal Point in its Suva (Fiji) office commencing in 2021. Furthermore, IRENA and other development partners also actively participated in the finalisation and the implementation of the Framework for Energy Security and Resilience in the Pacific (FESRIP) 2021-2030, which is being co-ordinated by the SPC.

IRENA and AOSIS strengthen co-operation through an MOU

After the joint submission of the IRENA-AOSIS Energy Compact to the UN committing to support SIDS' achievement of a target of 10 GW of total installed renewable energy capacity for all SIDS by 2030, the two agencies further strengthened their collaboration through the signing of the MOU on the margins of COP26. The Honourable Molwyn Joseph represented Antigua and Barbuda as the chair of AOSIS, and the partnership agreement was co-signed by IRENA Director-General Francesco La Camera.

The partnership agreement will be operationalised through the SIDS LHI and will focus on the following areas of activity:

- Demonstrate high-level leadership and commitment to accelerate and increase the ability to adapt to the adverse impacts of climate change and foster climate-resilient and low greenhouse gas (GHG) emission development towards the energy transition in SIDS.
- Strengthen co-ordination of the SIDS agenda and action through information and knowledge exchange; tailored capacity-building activities; assessment opportunities for renewable energy use and applications; and organisation of and participation at high-level events, conferences and technology expos.
- Promote access to finance in SIDS through advocacy for direct access modalities to climate finance, engagement with the partners of the SIDS LHI and the Ambitious SIDS Climate Action Summit Package.
- Inform SIDS of existing and upcoming project facilitation and investment opportunities and share experiences, information, lessons learned and best practices on the various climate financing modalities.



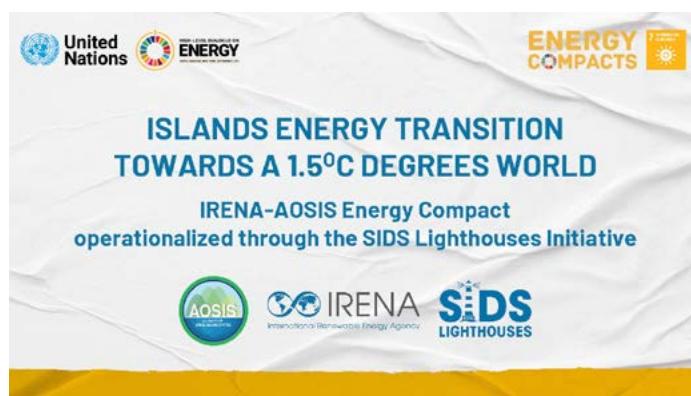
The Honourable Molwyn Joseph, Minister of Health, Wellness and Environment of Antigua and Barbuda and Francesco La Camera, Director-General of IRENA, display the signed IRENA-AOSIS MOU.

Islands energy transition towards a 1.5°C world: IRENA-AOSIS Energy Compact operationalised through the SIDS LHI

AOSIS and IRENA submitted an energy compact to the UN in September 2021. The energy compact, which will be operationalised through the SIDS LHI, supports SIDS' energy transition towards a 1.5°C world and aims to achieve a total renewable energy installed capacity of 10 GW by 2030. Furthermore, through the energy compact IRENA and AOSIS re-affirm the Ambitious SIDS Climate Action Summit Package³, including SIDS' increased ambition to reach 100% renewable energy targets in the electricity sector.

Some intended outcomes of this energy compact include but are not limited to:

- Support for NDC implementation related to energy transition and climate action efforts.
- Provision of policy, regulatory and technical advice on the uptake of renewables.
- Provision of capacity building related to all aspects of energy transition and climate action at the national, regional and global levels.
- Support for technical analysis for grid stability, resource assessment, a renewable energy roadmap and project facilitation that includes research and development for emerging renewable energy technologies that are applicable to SIDS.
- Support to access affordable finance through the Climate Investment Platform (CIP), Green Climate Fund (GCF), Climate Investment Fund (CIF) and other funds that are available to SIDS.
- Access to the Knowledge Sharing Platform of the SIDS LHI, the Ambitious SIDS Climate Action Summit Package, and the Initiative for Renewable Island Energy (IRIE).
- Provision of an avenue for sharing information, advocacy, best practices and lessons learned on the energy transition and climate action in SIDS.
- Strengthening of partnerships and collaborations to support SIDS' energy transitions and climate action.



³ Known in full as the Ambitious SIDS Climate Action Summit Package: Accelerating Sustainable Energy in SIDS to achieve Enhanced and Ambitious Energy Transition Targets by 2030.

Greening the Islands Observatory

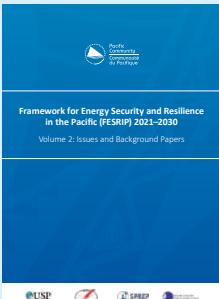
Since 2020, IRENA has been a member of the Greening the Islands Observatory, which is a structure aggregating key island stakeholders to match island needs and innovative sustainable solutions, produce reports and studies to address strategies, and advocate for policies to advance the energy transformation in SIDS. The observatory also originates projects, business models and financing opportunities, and promotes co-operation between governments and corporate entities.

IRENA is also a member of the Strategic Scientific Committee, which is tasked with transposing island needs from key island stakeholders (local authorities, business, citizens, academia) to the observatory's working groups and task forces.

"Our need to adopt renewable energy is an opportunity for us to take advantage to work together to thrive in a new era of fossil fuel-free energy production."

HE Charles Obichang, Minister of Infrastructure, Palau Pacific NDC Dialogue, Enhancing and Implementing the Pacific SIDS Commitments to the Paris Agreement through Energy Transformation

Update from partners on co-ordination and strategic engagement: Framework for Energy Security and Resilience in the Pacific



The SPC has developed a new regional energy framework in collaboration with the Pacific Islands Forum Secretariat, Secretariat of the Pacific Regional Environment Programme, University of the South Pacific, Pacific Power Association, Pacific Regional Infrastructure Facility, United Nations Development Programme (UNDP) and the Pacific Island Countries and Territories (PICTs). The Framework for Energy Security and Resilience in the Pacific (FESRIP) 2021-2030 is a vehicle for accelerated progress on the SDGs, the SAMOA Pathway, NDCs and respective country energy roadmaps. FESRIP will also support regional efforts in relation to the 2050 Strategy for the Blue Pacific Continent. Officially launched at the 51st Pacific Islands Forum Leaders virtual meeting in August 2021, FESRIP enjoys strong support. Successful implementation of this ambitious agenda on energy access, security and resilience at the country level will require a co-ordinated plan of action involving all stakeholders.

In a September 2021 regional workshop, "Strengthening Partnerships for Energy Security and Resilience in the Pacific", partners (*i.e.* PICTs, development partners, the private sector, power utilities, academia and civil society organisations) discussed enhancing their collaboration through the implementation of the FESRIP. Several priority initiatives were identified for pursuit in the next three years. The SPC, in collaboration with relevant Council of Regional Organisations in the Pacific (CROP) agencies and other partners, is already co-ordinating efforts in support of the PICTs' energy transition and tracking progress against targets. This will enable the SPC to prepare regular progress updates that will assist policy and decision makers to make informed decisions. These joint efforts will be translated to tangible outcomes and impacts in the next decade to fulfil FESRIP objectives.

Support for NDC enhancement and implementation in SIDS

The political commitment to renewables among SIDS remains unwavering despite the setbacks generated by the ongoing COVID-19 pandemic. Given SIDS' evolving energy needs and the development partners' commitments to advancing the energy transformation through the implementation of NDCs, strengthening collaborations and establishing durable and genuine partnerships are essential goals. In this regard, through joint collaborations and partnerships, 23 SIDS continue to lead by example in submitting their second NDCs to the United Nations Framework Convention on Climate Change (UNFCCC): Antigua and Barbuda, Barbados, Belize, Cabo Verde, Comoros, Cuba, Dominican Republic, Fiji, Grenada, Jamaica, Maldives, Marshall Islands, Papua New Guinea, Saint Kitts and Nevis, Saint Lucia, Samoa, São Tomé and Príncipe, Seychelles, Singapore, Solomon Islands, Suriname, Tonga and Vanuatu.

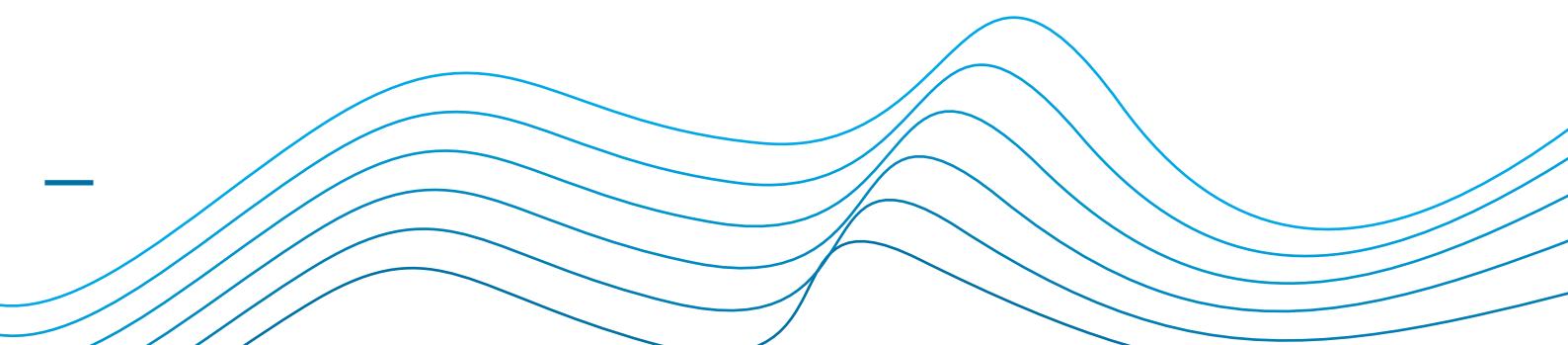
Many SIDS have set significant targets for the uptake of renewables in their national energy policies and strategies in addition to SIDS' commitments to the Paris Agreement. SIDS LHI partners stressed the importance of moving beyond the power sector and looking at adaptation measures that address food and water security, healthcare, and tourism while also helping to achieve multiple economic, social and climate priorities. This is reflected in the priority areas that were developed and adopted by all the LHI partners in September 2018.

IRENA is supporting 18 SIDS in their NDC enhancement and implementation: Antigua and Barbuda, Belize, Cuba, Dominica, Dominican Republic, Fiji, Grenada, Mauritius, Palau, Papua New Guinea, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, São Tomé and Príncipe, Seychelles, Solomon Islands, Tonga, and Trinidad and Tobago.

IRENA, in partnership with UNDP, the NDC Partnership and other partners, is supporting these SIDS in the development of energy management methodologies for GHG emissions, target tracking, roadmaps for the electrification of the transport sector, and emerging technologies such as green hydrogen and ocean energy, rooftop solar simulation, energy monitoring, reporting and verification (MRV), mitigation scenarios, project facilitation and access to finance.

“SIDS are not lacking political will or commitment to make this energy transition, this is reflected in the new and revised NDCs. What we are lacking are resources to overcome the barriers that we face in enabling this transition.”

Honourable Molwyn Joseph, Minister of Health, Wellness and the Environment, Antigua and Barbuda



Summary of IRENA NDC support activities for SIDS

Antigua and Barbuda

- Development of SolarCity simulator for North Antigua.
- Assessment of technical needs to achieve a just transition of the workforce to greener occupations and more wide-scale adoption of e-mobility.
- Technology plan and mitigation analysis to evaluate the early stage of transport sector decarbonisation with e-mobility.

Belize

- Technical inputs for renewable energy roadmap to determine the potential to scale up the country's use of renewable energy.
- Development of an MRV system for the energy sector.
- Recommendations on policy, legal and institutional frameworks for the development and implementation of an energy sector MRV.
- Design an MRV system to support tracking of GHG emissions as well as the impact of mitigation and adaptation outcomes.

Cuba

- Review and feedback on energy component of NDC.

Dominica

- Support in assessment of data gaps for emission calculation.

Dominican Republic

- Technical inputs for renewable energy roadmap to scale up renewable heating, cooling and transport technology options.
- Data gaps and development of local GHG emission factors for the energy sector.
- MRV analysis and implementation support.
- Capacity-building technical module to deploy climate-resilient energy solutions as part of national climate plans.
- Support with the energy sector climate action plan.

Fiji

- Review of climate change bill.
- Identification of data gaps and review of methodology for energy statistics to support the MRV process in the country.

Grenada

- Support energy-related data collection and management for GHG emissions and reporting.
- Capacity building on energy management and energy audits to improve energy efficiency.

Mauritius

- Development of SolarCity Simulator for Port Louis, Mauritius.

Palau

- Support development of a renewable energy roadmap, including green hydrogen and Ocean Thermal Energy Conversion (OTEC).

Papua New Guinea

- Develop a system to collect reliable energy data and develop integrated energy data management systems.

Saint Kitts and Nevis

- Technical study to support the identification of cost-effective mitigation options for the energy sector to support country officials in prioritising mitigation options focusing on the power and transport sectors.
- Implementation of an MRV system in the framework of the NDC revision.

Saint Lucia

- Support the adoption and deployment of rooftop PV systems.
- Development of SolarCity Simulator for Castries, Saint Lucia.

Saint Vincent and the Grenadines

- Review data needed for NDC enhancement and the tracking of energy-related targets, as well as data availability.

São Tomé and Príncipe

- Technical analysis of the cost-effectiveness of existing and future mitigation options in the power sector in support of NDC implementation phase. Assessment of renewable energy for primary healthcare.
- Assist on quantification of costing of the proposed measures that will be identified by the partners under the NDC updated proposal.

Seychelles

- Support capacity building on climate investment and financial flows in the energy sector.
- Development of SolarCity Simulator for Victoria, Seychelles.

Solomon Islands

- Perform readiness assessment of energy sector.

Tonga

- Provide capacity-building training on forestry inventory, GHG inventory system set-up and information and communications technology unit.
- Support data collection to inform the defining of adaptation goal and target and refining of subsector emission reduction targets for agriculture, energy, transport and waste.
- Strengthen and add sectoral GHG reduction targets and sectoral non-GHG targets.
- Integrate MRV system into Tonga's Joint National Action Plan.

Trinidad and Tobago

- Technical study to support the identification of cost-effective mitigation options for the power and transport sectors.

Enhance collection and dissemination of statistics supporting informed decision making

The initiative collects data and statistics on SIDS, tracking their progress on renewable energy capacity. The SIDS LHI website's regional and country profiles include a wide range of information on SIDS, from the percentage of renewable energy over total final energy consumption to information on energy trade. The SIDS LHI also collects and tracks data on SIDS' renewable energy targets, including targets enshrined in SIDS' NDCs. This is a crucial part of IRENA's support of SIDS' NDC enhancement and implementation.

Figure 5 SIDS LHI regional profiles

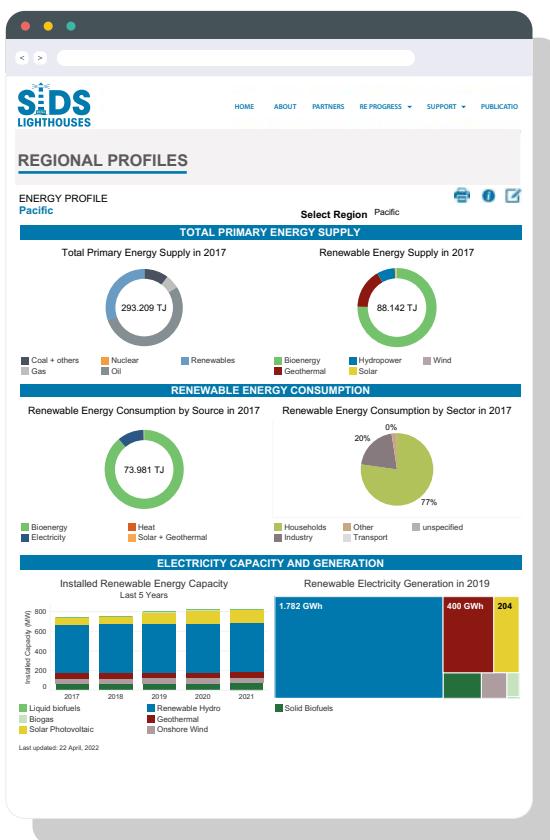
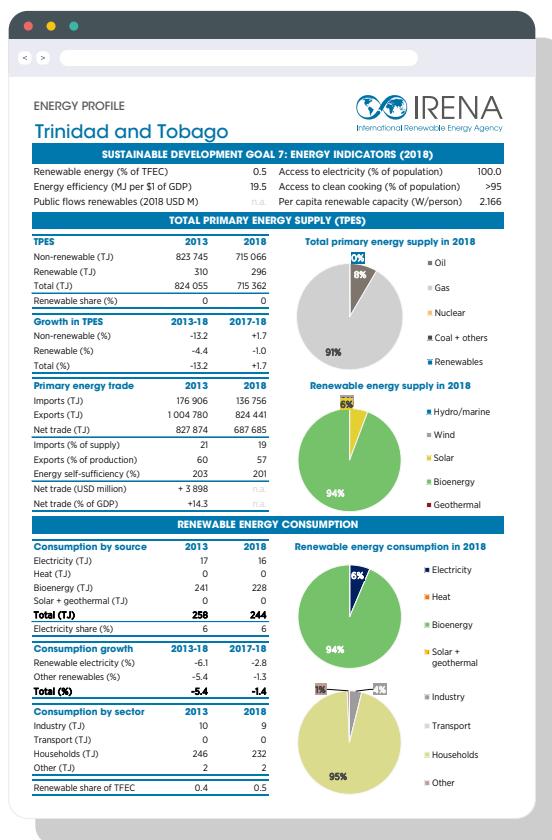


Figure 6 SIDS LHI country profiles



The regional and country profiles include a wide range of information on SIDS, from the percentage of renewable energy over total final energy consumption to information on energy trade

Pacific regional training on the assessment of GHG mitigation policies and projects in the energy and related end-use sectors

The SIDS LHI, through IRENA, is responsible for more than the collection of renewable energy data from SIDS. The initiative also works on aiding SIDS to improve methodologies for data collection, analysis, recording and reporting.

To ensure the emission reduction targets set out in SIDS' pledges under the Paris Agreement are achieved, it is important to estimate and track emissions from the energy sector, which constitute the majority of GHG emissions. To strengthen the ability of energy focal points in the Pacific SIDS to develop implementation plans to meet their climate commitments, IRENA and the SPC secretariat co-organised a training event for the Pacific region titled "Assessment of Greenhouse Gas Mitigation Policies and Projects in the Energy and Related End-use Sectors", which was held on 23-25 November 2021. The event, which was attended by 54 participants from the Pacific region, aimed to strengthen capacity in the following areas:

- Techniques and methodologies for appraising GHG mitigation policies and projects (including assessment of socio-economic benefits).
- Collection and use of energy data to estimate GHG emission reductions from policies and projects in the energy and related end-use sectors.
- Monitoring and evaluation of GHG emission reductions policies and projects.

In addition, the training workshop provided an opportunity for representatives from PICTs to highlight their capacity needs and priorities on the topics of data and information, which will serve as the basis for future capacity-building activities and technical assistance support.

The SIDS LHI knowledge-sharing platform

In 2021, IRENA continued to update the SIDS LHI website, which is an integral part of the SIDS knowledge-sharing platform: islands.irena.org. 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 and programmes in each of the initiative's SIDS partners.

During 2021, moreover, efforts continued to increase the SIDS LHI presence on social media. The dedicated page on [LinkedIn](#) provided updates on new projects and success stories.

High Level Panel at Transforming Energy: Spotlight on Small Developing States (SIDS) – Dubai Expo 2020, October 2021

Capacity Building on Climate Investment and Financial Flows in Seychelles

Grenada Capacity Building Programme

Support the development of bankable projects, access to finance and co-operation with the private sector

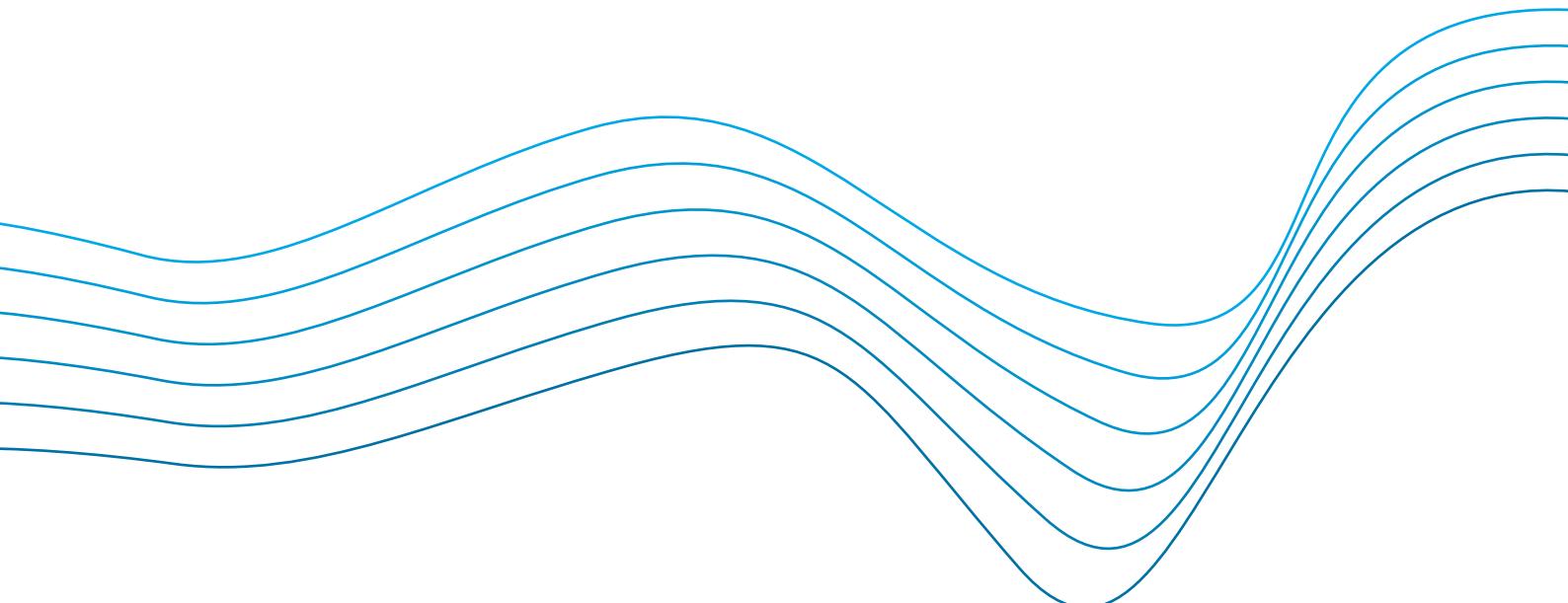
SIDS have articulated ambitious commitments in their NDCs, national policies and action plans. Nonetheless, renewable energy projects in SIDS face several barriers owing to their small economies, limited capacities and gaps in institutional, regulatory and policy frameworks that can hinder their development and uptake. This has resulted in a lack of bankable projects, which limits investors' ability to identify attractive projects and consequently reduces available capital for those that are ready to be financed. To address these needs, IRENA has established the IRENA for [Climate Investment Platform](#) (CIP) and the [Energy Transition Accelerator Financing](#) (ETAF) Platform.

IRENA for CIP

IRENA, in collaboration with UNDP, Sustainable Energy for All (SEforALL) and the GCF, established the CIP with the aim of mobilising capital to accelerate renewable energy deployment to meet developing countries' SDGs and climate objectives. Through this partnership, CIP provides services under four key elements of the climate finance value chain.

CIP services cover all the **four key building** blocks in the **climate finance value chain**:

- **Track 1** - Setting and scale up of climate and energy targets
- **Track 2** - Establishing enabling policies and regulations
- **Track 3 - Providing marketplace for projects and investors**
- **Track 4 - Mitigation and management of project risks**



Under the IRENA for CIP component, IRENA is taking the lead in Track 3 (providing the marketplace for projects and investors) and Track 4 (mitigation and management of project risks). IRENA facilitates matchmaking between renewable energy projects and institutions that provide financial and/or technical support for renewable energy projects. This function is operationalised on a web-based platform through which project proponents can register.

All registered projects are assessed to identify those that are eligible for further support and for their investment readiness. A comprehensive project information document incorporates all relevant project indicators that potential investors may consider when expressing their interest in financing. To be eligible for IRENA for CIP support, a project should contribute to the clean energy transition, be aligned with SDGs and national climate action priorities, and have completed preliminary studies that highlight its relevance and applicability. In co-ordination with the SIDS LHI, IRENA for CIP support has been shared with SIDS, and support is currently provided to some island states in the Caribbean and Pacific regions.

Scaling up renewable energy uptake in SIDS has been severely constrained by the comparatively high costs of renewable energy technologies in SIDS compared to costs in major economies. Significant investment is needed in SIDS to achieve their NDC renewable energy targets, which can be addressed through private-public partnerships. However, private sector involvement has been limited due to the high risks and small scale of renewable energy projects in SIDS and their limited access to finance. The SIDS LHI works to support the improvement of the investment climate in SIDS and the increased participation of the private sector to include concessional finance that will leverage private capital. IRENA has also developed project facilitation tools to help SIDS access innovative and appropriate financing for their renewable energy projects.

Updates from partners: Country Financing Roadmap for the SDGs: Saint Lucia



With the financial support of the European Union and the Ministry of Foreign Affairs of Denmark, the World Economic Forum and the Organisation for Economic Co-operation and Development (OECD) – through the Sustainable Development Investment Partnership (SDIP) – developed **Saint Lucia's Country Financing Roadmap (CFR) for the SDGs** in co-ordination with the government's Department of Economic Development.

Saint Lucia recognises the importance of having quality partnerships that are adequate, appropriate and with the scope to unlock the innovative and sustainable financing that is needed for the implementation of the CFR.

The CFR is intended to raise awareness of conditions for investments; stimulate dialogue on the regional, national and thematic financing agenda for greater impact; align stakeholders and address gaps and inefficiencies in mobilising investment to meet national priorities; inspire concrete action; and increase private sector and philanthropic organisations' participation in SIDS investment.

The renewable energy initiatives the CFR can access include the Caribbean Project Preparation and Investment Platform, the Caribbean Climate-Smart Accelerator, the Sustainable Infrastructure Financing Tool, RMI's Islands Energy Program, and the SIDS LHI, including the CIP managed by IRENA.

Scaling up the implementation of the renewable energy Entrepreneurship Support Facility in Southern Africa, including Indian Ocean SIDS

Through the SIDS LHI, IRENA is supporting the scaling up of the Renewable Energy Entrepreneurship Facility in South African countries, including SIDS in the Indian Ocean such as Comoros, Maldives, Mauritius and Seychelles. The facility enables the implementation of a technical support and mentorship programme that will strengthen the capacity of small to medium-sized enterprises to assess the business potential of sustainable energy, develop viable business plans and loan requests, and sustainably manage businesses in their respective countries. The facility will also contribute to increasing the confidence of financial institutions in sustainable energy systems and projects. Furthermore, this will strengthen the linkages among entrepreneurs, financial institutions, private sector participation in the energy transition and climate action efforts in the island countries in the Indian Ocean. The activity for this collaboration is earmarked to begin in 2022.

Climate Emergency Finance for SIDS Energy Transformation

At COP26, AOSIS and IRENA through the SIDS LHI organised the “Climate Emergency Finance for SIDS Energy Transformation” event. The event focused on attracting emergency finance for SIDS to combat the effects of climate change as well as to utilise renewable energy to face the economic issues generated by the COVID-19 pandemic. The discussions focused on key areas of action:

- The response and approach to climate change should blend adaptation and mitigation to build resilience.
- Targeted, innovative solutions are required because SIDS have unique geographical, cultural, political and economic conditions.
- The energy transition will not be possible without financial capacity and upfront capital. The lack of these key components must be tackled as soon as possible.
- Countries require technical assistance and offers of mentorship in areas such as capacity building, addressing issues related to lack of capacity and readying projects to attract the right kind of financing. Political stability and policy frameworks to unlock barriers to investment are also needed.
- The deployment of renewable energy across various sectors can reinvent SIDS’ economies and build resilience.
- Other economic sectors must be engaged, including the tourism and oil and gas sectors. The oil and gas sector, which has considerable financial capacity, must be part of the dialogue as it repositions its business model from fossil fuels to renewable energy.

Promote all renewable sources, including geothermal and ocean energy, and step up work on wind and solar

SIDS are well endowed with renewable energy options in wind, solar, hydropower, ocean, geothermal and biomass energy, but many have struggled to switch to renewables owing to technical, financial, policy and market barriers that hinder their deployment. As shown in Figure 3, solar and bioenergy accounted for the highest share of installed capacity in SIDS in 2021. Notably, ocean energy and geothermal energy – despite their significant potential to decarbonise SIDS' economies and meet domestic energy demand – have not seen substantial growth in installed capacity in the past ten years.

Ocean energy

SIDS – which are also known as Large Ocean States – have recognised the vast and largely untapped potential of harnessing ocean energy to transform their economies and provide a pathway to meet their SDGs and Paris Agreement commitments through the decarbonisation of the power sector and other end-use applications. Despite this, ocean energy technologies are still in developmental stages, with most technologies in the prototype phase and some just reaching commercialisation. For SIDS, the market introduction of these technologies faces numerous barriers: small market sizes and the high costs and risks associated with renewable energy investment. Other limitations are related to data availability, policy and regulation, research and development, capacity building, and access to finance.

SIDS Global Business Network Forum

IRENA recognises the important role that partnerships play in advancing the deployment of these technologies through knowledge exchange, technology transfer, and research and development, among other areas of co-operation. To address the challenges faced by SIDS, through the SIDS LHI and in collaboration with the United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS), IRENA hosted the 2021 SIDS Global Business Network Virtual Forum with the theme “Leveraging Partnerships for the Sustainable Development of Ocean Energy in Small Island Developing States” on 30-31 March 2021.

The event aimed to share best practices and lessons learned, as well as foster collaboration among SIDS regional and local private sector organisations to work towards strengthening inter-regional business alliances and encourage international businesses to focus on SIDS as potential market opportunities. At the forum, it was widely acknowledged that there is an urgent need for increased private sector engagement as well as financial and technical support to assess and develop their ocean potential from proven concepts to commercial or public power generation. The investment and capacity-building needs of SIDS will also have to be supported with the engagement of the private sector and international financial support. Critically, sufficient data, appropriate policies, climate-resilient infrastructure and enhanced viability of projects remain crucial for the successful development and sustainable use of ocean energy in SIDS.

Technical Webinar Series: Accelerating the development of offshore renewables/ocean technologies in SIDS

To build awareness and strengthen the understanding of various offshore renewables/ocean technologies among SIDS, development partners, private sector and other key stakeholders, IRENA, through the SIDS LHI, is hosting a three-part Technical Webinar Series on:

1. Offshore wind (OSW) and floating solar PV;
2. Ocean Thermal Energy Conversion (OTEC); and
3. Wave and tidal energy.

The first segment of the series, OSW and floating solar PV technologies, was attended by 147 global participants on 16 December 2021. It featured representatives from SIDS, financial institutions and development partners who have prioritised OSW and floating solar PV as viable offshore renewable technologies in the short to medium-term.

The discussion about OSW highlighted that the cost of electricity (in levelised cost of energy terms) has fallen dramatically in the last decade and is expected to continue declining. While there is potential in the Caribbean, Fiji, Mauritius, Papua New Guinea and Vanuatu, other SIDS require further scoping work. Fixed OSW is the most mature and best currently available option for large-scale deployment of offshore renewable energy, while floating OSW offers vast promise as a rapidly emerging technology for SIDS in the 2030s but requires immediate consideration and planning.

Key considerations for floating solar PV deployment include land (water body) ownership and the type and quantity of off-takers. For both technologies, environmental impacts on biodiversity and water quality are important concerns.

OTEC was featured in the second online seminar, held on 11 February 2022. Experiences and best practices from projects in various phases of development were presented by government representatives, project developers and researchers to provide an understanding of OTEC system designs, technical innovation, findings of feasibility studies and applications in the tourism sector, as well as other sustainable water use and food production opportunities. Wave and tidal energy will be the focus of the third webinar, scheduled to take place in Q3/4 2022.

Geothermal energy

SIDS face several challenges in developing their geothermal resources. These are the high investment and risk profile of geothermal projects, limited technical geothermal expertise, small and isolated power networks, limits to economy of scale, and inadequate political support for geothermal development. To accelerate geothermal development in SIDS, action and support are needed in areas ranging from access to financing, to technology assessment and deployment, policy and regulatory innovation, improved capacity building, business models, and governance structures.

Supporting geothermal energy in St. Vincent and the Grenadines

To support the energy transition and sustainable economic development in St. Vincent and the Grenadines, in 2016, IRENA, in partnership with the Abu Dhabi Fund for Development (ADFD), signed a USD 15 million loan agreement for the establishment of a geothermal power plant and solar PV system. The project is being funded as part of the [IRENA-ADFD](#), which supports replicable and scalable renewable energy projects in developing countries. The facility has committed USD 350 million to renewable energy projects recommended by IRENA in concessional loans over seven annual funding cycles.

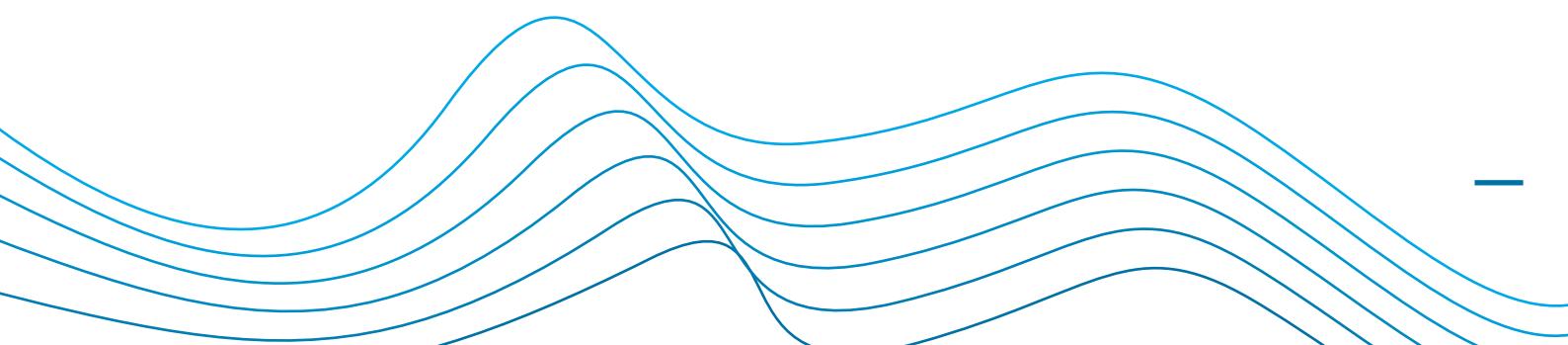
In 2020, the island continued to be impacted by the COVID-19 pandemic, which was compounded by the La Soufrière volcanic eruptions in April 2021. Notwithstanding, St. Vincent and the Grenadines Geothermal Company Limited, St. Vincent Electric Services Limited and Eavor Technologies Inc. have signed a joint agreement to advance the project using a closed-loop technology system. Eavor is expected to spend USD 2 million during the feasibility phase. The results of this study are expected to be completed by Q4 2022. In addition, the Eastern Caribbean Currency Authority has granted approval for the construction of the solar PV plant near the airport, and the land has been secured by the government.

Update from partners

Montserrat becomes the 47th Member of the Global Geothermal Alliance

Geothermal and solar PV energy development form a core part of Montserrat's Energy Policy (2016-2030) to achieve 100% renewable energy generation by 2020. To support the deployment of geothermal energy on the island, IRENA through the SIDS LHI has facilitated Montserrat's membership in the [Global Geothermal Alliance](#) (GGA), a platform for dialogue, co-operation and co-ordinated action among the geothermal industry, policy makers and stakeholders worldwide. This engagement aims to foster an enabling environment to attract investments in geothermal energy, provide customised support to Montserrat, and facilitate outreach and the exchange of insights and experience among key stakeholders in the geothermal energy value chain.

In December 2021, the government of Montserrat issued a prior information notice for an upcoming tendering opportunity for the maintenance of three geothermal wellheads. Two wells, Mon-1 and Mon-2, were successfully drilled and found to be capable of providing more than 100% of the island's current peak power demand and electricity consumption. A third well, Mon-3, is considered to have potential for future development. An invitation to tender is planned for 2022, which will invite proponents to submit proposals for developing a geothermal surface plant to meet the island's electricity needs. A multi-organisational working group has also been established to fast-track development and ensure best practices are followed in developing the resource locally. Other economic sectors must be engaged, including the tourism and oil and gas sectors. The oil and gas sector, which has considerable financial capacity, must be part of the dialogue as it repositions its business model from fossil fuels to renewable energy.



Hydropower

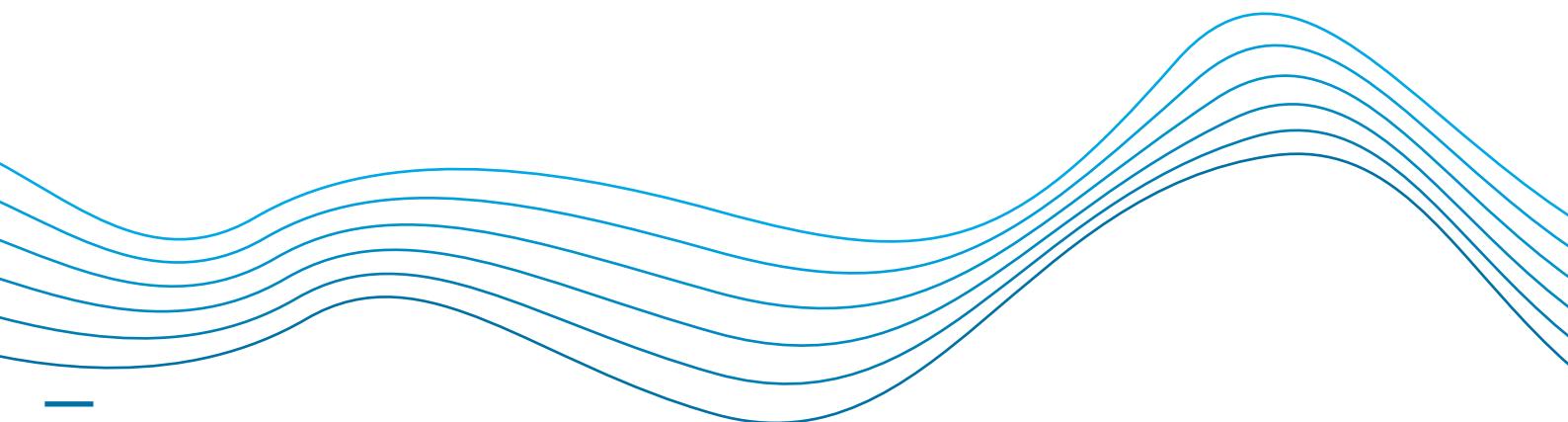
The Tina River Hydropower Project, located 20 kilometres southeast of Honiara and with a capacity of 15 MW, is the first large utility-scale renewable energy project in the Solomon Islands. Various government and international organisations along with the private sector have partnered up to design, finance and implement this large-scale project to help make electricity more affordable, accessible and reliable. The project, which is estimated at USD 240.48 million, is expected to increase the renewable share to 70% in the grid and have a net GHG emissions reduction of 2.48 million tonnes of carbon dioxide (CO_2) equivalent over the 50-year project life.

The project activities, which began in 2021, will be developed over five years. As of November 2021, construction work, environmental and social management plan clearance for the access road and plant, completion of raw materials procurement, and confirmation of the detailed component designs were ongoing. Even so, COVID-19 pandemic travel restrictions continued to pose challenges to the entry of skilled workers, causing many setbacks in the schedule.

Wind energy

The Port Victoria Wind Farm was constructed in June 2013 as a donation from the UAE to the Seychelles. It consists of eight wind turbines of 750 kilowatts-peak capacity each. Three are on Ile du Port and five are on Ile de Romainville. As of the end of 2021, the wind farm represented about 25% of the renewable energy generation capacity of Seychelles.

From commissioning in June 2013 to December 2021, the Port Victoria Wind Farm produced 56.5 gigawatt hours (GWh) of electricity. This is equivalent to about 7 GWh per year, or the equivalent of the electricity consumption of 2 000 households. Since commissioning, it has helped to offset the combustion of 13 million litres of heavy fuel oil. This is equivalent to 1.6 million litres per year. At current fuel prices, this is equivalent to a savings of SCR 13 million (Seychellois rupee), or USD 900 000 per year. It has also helped to avoid the emissions of 4 800 tonnes of CO_2 per year, or a total of 39 000 tonnes since commissioning.



Expand from assessment and planning to implement effective, innovative solutions

The SIDS LHI collaborates with regional partners who, with their deep understanding and expertise, help accelerate the development and deployment of renewable energy technologies in SIDS. The SIDS LHI serves as a platform for co-ordination of all these support efforts and brings focus to the deployment opportunities of new technologies in SIDS.

Update from partners

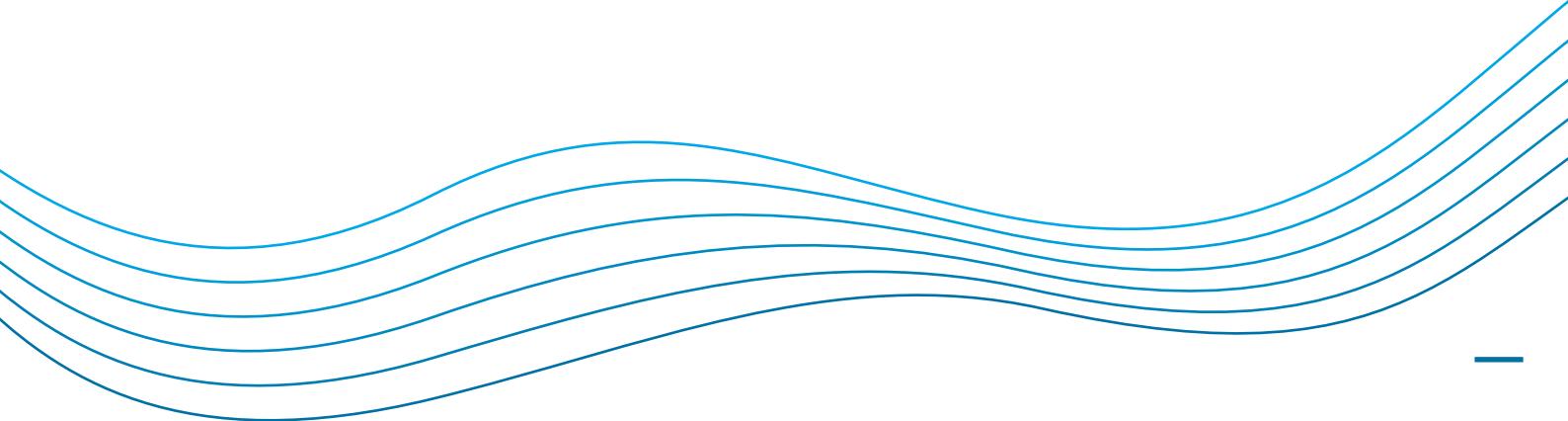
An overview of the Office of the Pacific Energy Regulators Alliance, co-ordinated through the SPC

With technical assistance from the Asian Development Bank (ADB), the Office of the Pacific Energy Regulators Alliance (OPERA) has been promoting regional co-operation in creating progressive regulation of energy utilities in the Pacific since 2016. OPERA strengthens and delivers capacity-building interventions, leads the generation and exchange of knowledge and skills, and leverages Pacific SIDS' limited resources to address common development issues and challenges. OPERA supports its members in developing robust energy regulatory regimes and policy development, co-ordinating capacity-building initiatives, providing mentoring, and facilitating information sharing both among members and with external partners.

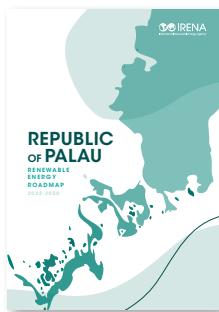
OPERA's technical assistance also supports tariff setting and women's empowerment and encourages the participation of non-OPERA members to further strengthen partnerships and collaborations.

The SPC, which acts as OPERA's host entity within the Geoscience, Energy and Maritime Division, promotes OPERA's role and function to development partners, even as it remains an informal network of regulators in the Pacific region. OPERA's current members are Cook Islands, Fiji, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga and Vanuatu.

At the 4th Pacific Regional Energy and Transport Ministers Meeting held in Apia, Samoa in 2019, the energy ministers commended ADB's technical assistance grant to support the establishment and operation of OPERA with an initial focus on electricity that will be further expanded to other sectors. OPERA's main objective is to effectively support its members in carrying out their mandate, strengthen their independence and contribute to achieving energy transformation in PICTs.



IRENA supports Palau in the development of its renewable energy roadmap



Through the SIDS LHI, IRENA has been supporting Palau to develop a renewable energy roadmap outlining options for the country to consider as it fully decarbonises its energy sector. IRENA has undertaken a detailed analysis of scenarios to accelerate the uptake of renewables, such as the deployment of solar PV and battery storage systems, with appropriate investment and technical assistance. For this roadmap to be effectively implemented in an enabling environment, it is imperative to put in place appropriate policy and regulatory frameworks and financing mechanisms for deploying the renewable energy technologies identified. The Palau Public Utilities Corporation must have the capacity for planning, operating and maintaining the various technologies, as well as adjusting the operations to the new mix of resources. In terms of Palau reaching its 100% renewable energy target in the electricity sector, green hydrogen production at least cost can be considered. The need for local green hydrogen production can be justified by a highly decarbonised power system that is reflected in Palau's roadmap optimal scenario, in which pilot projects can be developed for hydrogen speedboats, hydrogen storage and generators that will be operated on 100% hydrogen fuel.

Update from partners

JICA's renewable energy roadmap for the Solomon Islands

The Japan International Cooperation Agency (JICA) has worked with the government of the Solomon Islands to draft and provide a renewable energy roadmap for the country. In the report, JICA indicated that solar and hydro are the most promising resources for the nation to tap into to achieve 100% renewable energy by 2030, while identifying challenges such as a lack of data on the availability in the supply of sufficient wood biomass.

The report also identified other measures to be taken at a policy level: support for capacity building in power system operation with renewable energy at 100%, sector reform to introduce IPP (independent power producer) players into the market, preparation of the necessary land space for project development, organisation of land acquisition operations by a newly launched IPP office, and implementation of capacity-building programmes at the ministerial level.



Create nexus for renewable energy and agriculture, food, health and water to foster broad socio-economic development including jobs, gender equality and women empowerment

The COVID-19 pandemic has severely disrupted trade and supply chains connecting SIDS with the rest of the world. The supply of fossil fuels used to power SIDS' economies and transport services has been dented, and important revenue streams from tourism have been curtailed.

Renewable energy sources have been identified as a premium choice to provide power to SIDS while simultaneously freeing budgets otherwise allocated to importing expensive fossil fuel supplies. At the same time, they will enable the establishment and expansion of new opportunities in vital economic sectors, in addition to alleviating budget burdens on crucial social services such as healthcare and education.

Irena and the energy-health nexus

Irena supports its members in the deployment of renewable energy solutions to electrify their healthcare systems. Irena collects data to accurately assess the energy needs of unelectrified healthcare facilities or those lacking a reliable electricity supply. Data assessment is a necessary step in drafting recommendations and measures of support that are tailored to local healthcare services and aimed at providing sustainable electrification through renewable energy.

To this end, the SIDS LHI is currently undertaking work in São Tomé and Príncipe, where Irena and partners, in close co-operation with the country's health and energy ministries, will assess the energy needs of 45 healthcare facilities to provide a set of recommendations and technical solutions to support the government in its pursuit of international funding.

Symposium on the energy-water nexus for SIDS

The linkages between renewable energy and water are also being explored by the SIDS LHI. In October 2021, in the run-up to COP26, representatives from the SIDS LHI participated in a dedicated event organised by the government of Malta aiming to explore new partnerships and partnership frameworks to promote the use of renewable energy in water management practices in SIDS.

The panel discussion explored SIDS' major needs and challenges in their quest for deploying renewable energy use for water management, as well as which types of partnerships could be explored in this regard. It also focused on the disruptions caused by the COVID-19 pandemic in this sector and how these can be addressed through renewable energy deployment.

Update from partners

Pacific Energy and Gender Strategic Framework

The aim of the Pacific Energy and Gender Strategic Action Plan 2021-2030 is to increase participation by women in the energy market, including as entrepreneurs and energy professionals. The SIDS LHI has contributed to the review of the plan, which was developed by the SPC. The previous iteration of the plan (2014-2020) has been widely credited for having helped bring gender to the forefront of Pacific governments' development strategies for renewable energy deployment.

Building on the work initiated by the action plan, SPC, UN Women and Women Count published a report, **Gender equality and sustainable energy: Lessons from Pacific Islands Countries and Territories**, that provided an initial analysis for women and energy in Pacific SIDS. The report also identifies enabling factors to increase and sustain the presence of women in the Pacific renewable energy sector, including:

- Increase and sustain women's enrolment in science, technology, engineering and mathematics as well as technical and vocational training energy programmes.
- Improve access to finance by women-run businesses, working on women's financial literacy.
- Place women at the centre of energy-related plans, policies and projects by giving them an equal seat in decision-making settings.
- Mainstream the use of solar-powered generators among households.
- Enhance the availability of gender data on energy.



Strengthen institutional and human capacity development in all segments of the renewable energy value chain

SIDS continue to stress the importance of strengthening institutional and human capacity in the energy sector as they transition to renewables. Capacity enhancement will result in developing local expertise in the different types of renewable energy uptake, including policy, financing, and local financial institutions and technicians. Given SIDS' economy of scale, stronger collaborative networks of experts and practitioners should also be in place to share knowledge and experience at the global, regional and national levels.

Seychelles capacity building for climate finance flows

The SIDS LHI has been working closely with the government of Seychelles to increase the country's capacity to track climate investment and financial flows in its energy sector. The objective of the project envisages:

- Undertaking an assessment of investments and financial flows for all climate change activities in Seychelles related to different sectors, primarily focusing on the energy sector; and
- Strengthening the capacity of line ministries on tracking climate financing flows and incorporating these financing flows into the national budget exercise.

IRENA is organising a capacity-building workshop at the national level with the objective of training participants in tracking climate funding flows. Additionally, the workshop will present a potential opportunity for representatives from the AIS SIDS to also gain insights into and experience about this topic.

Pacific GHG emissions calculations training

Through the SIDS LHI, IRENA, in collaboration with the SPC, is organising training that aims to strengthen the Pacific SIDS' capacity to implement their NDCs and long-term low-emission development strategies by developing participants' skills in the following areas:

- Techniques and methodologies for appraising GHG mitigation policies and projects;
- Collection and use of energy data to estimate GHG emission reductions from policies and projects in energy and related end-use sectors; and
- Monitoring and evaluation of GHG emission reduction policies and projects.



The training will be based on the current uses of energy and emission profiles of Pacific SIDS and will focus on the types of policies and projects that are most relevant for reducing GHG emissions in these countries. It will also focus on the types of energy data and analysis that are necessary to build a strong business case for GHG emission reduction policies and projects, as well as simple and cost-effective ways to obtain these data.

This activity, undertaken by IRENA, originates from the SPC's realisation that the capacity to estimate GHG emissions from the energy sector is often limited. In many cases, SIDS have used outsourced experts rather than local talent to calculate GHG emissions in their NDCs and other UNFCCC reports, which makes it difficult for countries to develop, assess and implement climate-related policies and projects. This lack of local capacity has also constrained their ability to set more ambitious emission reduction targets.

[Power purchase agreements in the AIS and Caribbean regions](#)

Establishing bankable power purchase agreements (PPAs) can reduce the perceived risk of issues such as interconnection, guaranteed off-take, predictable long-term revenues and curtailment events within an appropriate regulatory framework. This is one of the components key to establishing the robust development of renewable energy projects. Electric utilities and regulators in SIDS have utilised PPAs for conventional power generation projects for a long time, often with contract periods of 20 years or more, and are starting to utilise PPAs for renewables. However, renewable energy projects require significant enhancements to existing PPAs to capture their unique characteristics and ensure their bankability.

Regional stakeholders in the Caribbean and AIS region, such as Caribbean Electric Utility Services Corporation (CARILEC), the Caribbean Community (CARICOM), the Indian Ocean Commission (IOC), the Economic Community of West African States (ECOWAS) Centre for Renewable Energy and Energy Efficiency (ECREEE), the World Bank and many other development partners have initiated projects to support the development of effective renewable energy PPAs. The projects so far have focused on establishing a clear understanding of the role of PPAs in creating a favourable environment for private investment in renewable energy projects. Based on input from regional organisations, the SIDS LHI observed a need for support to develop regional stakeholders' capacity to assess the financial aspects of PPAs.

The objective of the ongoing capacity-building initiative is to ensure that key stakeholders, such as government ministries and departments, regulators, and utilities, are better equipped to negotiate bankable renewable energy PPAs that facilitate private sector investment in renewable energy and secure excellent value for power consumers. Furthermore, these products will help analyse the impact of PPA design details on the financial outcomes of renewable energy projects.

The PPA financial model and the accompanying training and user manuals will be effective tools to enhance stakeholders' capacity to assess the financial aspects of renewable energy PPAs, such as project financing, PPA-related financial modelling, pricing, risk management and allocation, and complex negotiations for finalising these types of contracts.

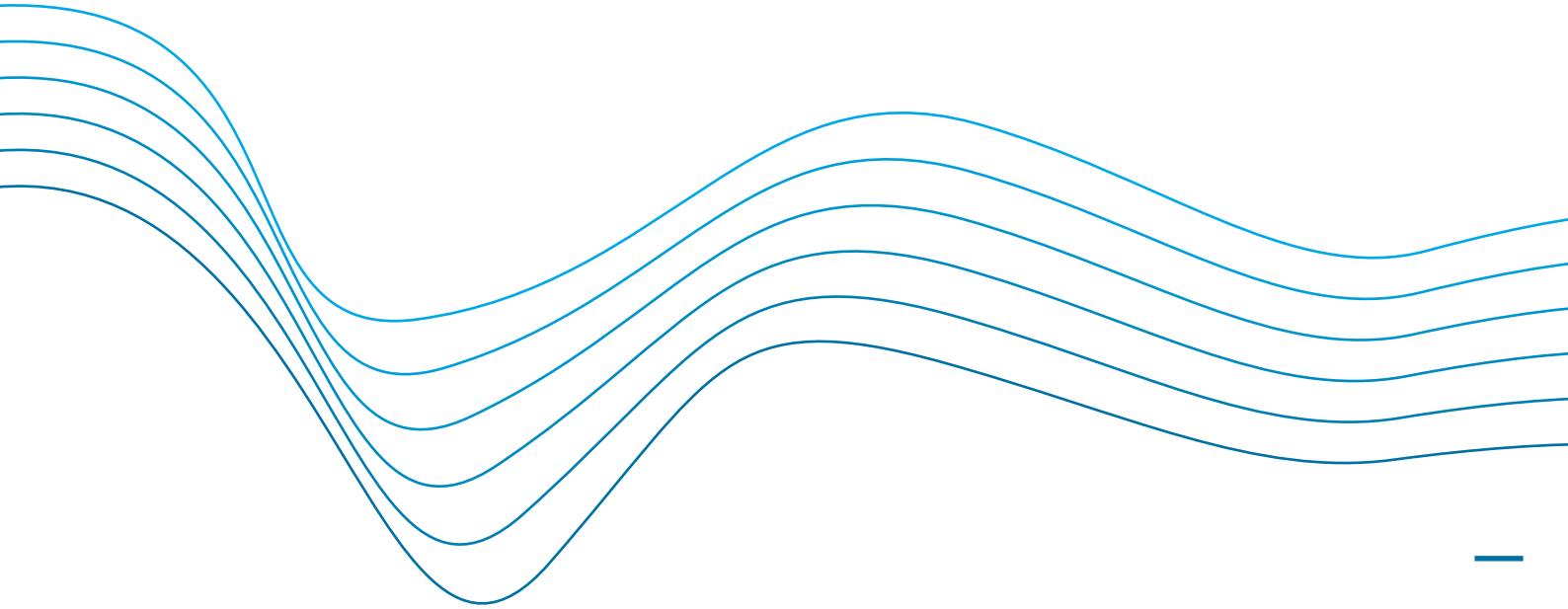
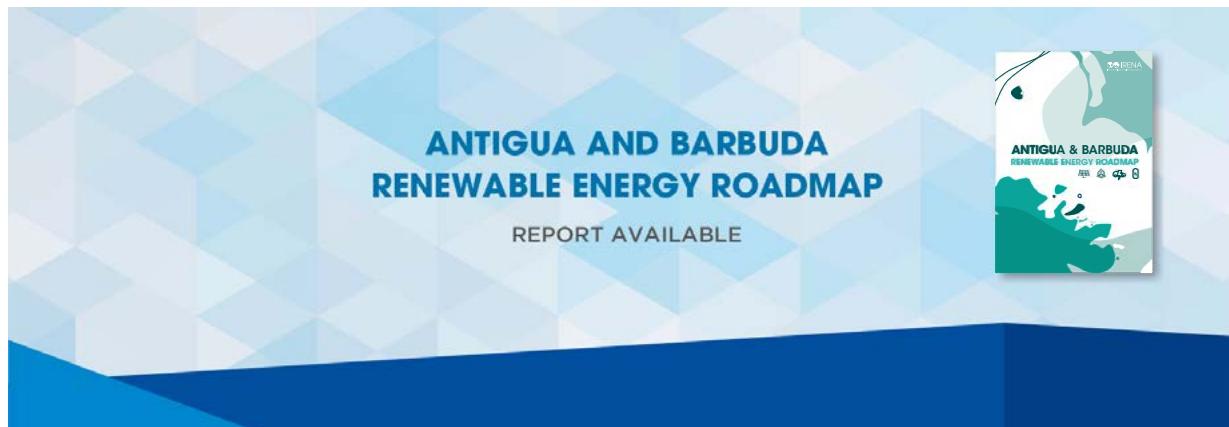
Expand focus beyond power generation to include transportation and other end-use sectors

The development of renewable energy in SIDS will be necessary not only to provide electricity, but also to power other end-use sectors. Transport accounts for a large share of fuel imports into SIDS, for example, and an increased reliance on electric vehicles could help SIDS governments foster economic activity while reducing their fuel import bills.

Antigua and Barbuda: Renewable energy roadmap

IRENA has worked on and published a roadmap in co-operation with the government of Antigua and Barbuda that aims to help the country achieve 100% of electricity generation from renewable energy sources by 2030, as well as 100% renewables-based electrification of the transport sector by 2040.

Based on an analysis of the current vehicle stock (51 500 vehicles in 2020), estimates for future car demand growth and current trends for new electric vehicle registrations, the study estimates a 100% renewables-based electrification of the car stock by 2037 and that electric vehicles will make up 100% of new car sales by 2030.



Leverage synergies between renewables and energy efficiency

Renewable energy and energy efficiency work in co-operation to accelerate SIDS' energy transitions and decarbonise energy-intensive end-use sectors such as transport, buildings and industry. When pursued together, they can result in increased renewable energy capacity, a faster reduction in energy intensity and lower energy system costs. Reducing energy consumption through energy efficiency, as well as conservation policies and measures, also plays a crucial role in climate change mitigation, improving energy security and socio-economic development in SIDS. Even so, limited access to information and data on energy consumers, as well as the limited availability and capacity of their human resources, poses a barrier to the promotion and implementation of energy efficiency policies, regulations and programmes in SIDS.

*“Energy conservation and energy efficiency must be considered as a national energy resource.
The greenest kWh is the one we have never consumed.”*

Honourable Gregory Bowen, former Minister for Finance, Economic Development, Physical Development and Energy, Grenada

Grenada's capacity-building programme for energy management and audits

Energy management is a continuous process for monitoring, controlling and conserving energy using the energy audit as a key decision-making tool. Using a systematic approach, the audit serves as the starting point for consumers to critically examine energy use and identify opportunities to improve energy efficiency in the short, medium and long term.

In December 2021, IRENA, through the SIDS LHI, launched a capacity-building programme aimed at developing training manuals and materials for energy auditing in Grenada complemented by webinars and face-to-face workshops. These activities were undertaken with the support of the NDC Partnership under the Climate Action Enhancement Package (CAEP) and in collaboration with the Ministry of Finance, Economic Development, Physical Development and Energy as well as the Ministry of Climate Resilience, the Environment, Forestry, Fisheries and Disaster Management, Grenada.

Recognising the need to adopt a multi-sectoral approach to reducing emissions, this programme prioritises training persons across the residential, public, financial, commercial and industrial sectors with an emphasis on target groups such as youth, fisheries and the hotel industry, which play a significant role in Grenada's sustainable development. This activity supports Grenada's economy-wide target to reduce emissions by 40% by 2030 and is expected to not only provide sustained personal and professional development of the Grenadian population in energy management, but also to encourage synergies across various organisations and sectors in the achievement of national objectives such as energy security, climate resilience, job creation and increased entrepreneurship opportunities.

Update from partners: Phasing out inefficient lighting in Barbados

Energy efficient lighting will play a significant role in meeting Barbados' goal of becoming a 100% renewable energy and carbon neutral island-state by 2030. In July 2021, Barbados passed the implementation of the Control of Inefficient Lighting Act, 2021, which aims to phase out the importation and sale of energy inefficient lights. The restrictions will be based on minimum efficiency performance standards (MEPS) established for lighting, starting at 15 lumens per watt with the objective of progressively reaching 55 lumens per watt over two years.

The implementation of the act, which will be managed by the Ministry of Energy, Small Business and Entrepreneurship in association with the Barbados National Standards Institute, is anticipated to result in significant savings on electricity and is central to increasing the country's energy security as well as mitigating the negative impacts of energy consumption nationally and globally.

Energy efficiency in SIDS' cooling sector

Energy efficiency is not only a key enabler for development but is also an important climate adaptation and mitigation measure in SIDS' NDCs. In the tourism sector, cooling accounts for a high share of energy consumption in hotels in SIDS. Specifically, refrigeration and air conditioning (RAC) systems impact global warming through both energy use and refrigerant emissions. To address this, countries such as Seychelles have prioritised emissions reduction in the RAC sector through measures such as:

- The implementation and enforcement of regulations that incentivise the transition to low-global warming potential refrigerants through a staggered levy system and value-added tax exemptions;
- The introduction of MEPS and labels to increase the EE of appliances, leading to a decrease in emissions from electricity consumption; and
- The development of skills enhancement programmes for RAC technicians and customs officials.

We stress the importance of access to affordable, reliable, sustainable and modern energy for SIDS. We welcome all initiatives, such as IRENA and SIDS DOCK, to support Small Island Developing States to fully exploit their renewable energy potential, improve energy efficiency and reduce dependence on imported sources of energy, noting the role of appropriate energy sources and technologies in the energy mix, and call for further work and enhanced support.

Political declaration of the high-level meeting to review progress of the implementation of the SAMOA Pathway, 2019

Link renewable energy uptake to climate resilience and more effective disaster recovery

SIDS continue to face significant economic, social and environmental challenges, including those arising from climate change, energy price and supply volatility, and energy insecurity stemming from an over-reliance on imported fossil fuels. Furthermore, recently SIDS have contended with increased risks – including extreme weather events, natural disasters such as volcanic eruptions, and the COVID-19 pandemic – which have consistently weakened their ability to achieve sustainable development.

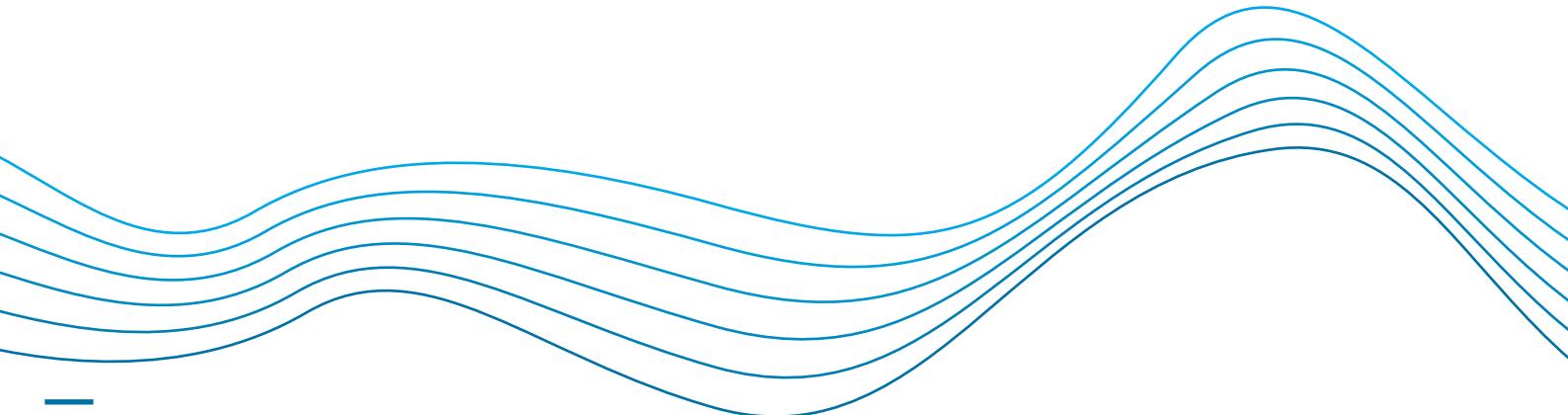
At the same time, SIDS also possess vast renewable energy potential that can support increased resilience and security in the energy sector. The main technical challenge to integrating renewables into island grids is accommodating variable renewable energy sources, like wind power and solar PV, which cause variations in supply. Energy planning tools such as the grid assessment study and long-term energy planning and the utilisation of distributed energy systems are instrumental in increasing the uptake of renewables to support climate resilience and disaster recovery efforts in SIDS.

Technical webinar on climate resilience and disaster recovery

In partnership with regional institutions, governments, utilities and technical experts, IRENA through the SIDS LHI will organise a technical webinar in 2022 to facilitate the exchange of knowledge on climate resilience and disaster recovery. The aim of the event is to address key considerations for disaster planning and recovery. Featuring findings from IRENA's grid integration studies in Caribbean and Pacific islands, it will present case examples of countries' efforts to rehabilitate critical energy infrastructure and restore electricity service following natural disasters as well as examples of renewable energy use to power recovery efforts in the midst of the ongoing COVID-19 pandemic.

“Being from SIDS, we are deeply and painfully aware of the realities of climate change. For countries like ours in special situations, there is added urgency to climate negotiations and efforts to adapt or expand renewables.”

Honourable Abdulla Shahid, President of the 76th Session of the United Nations General Assembly and Minister of Foreign Affairs of Maldives



Irena tools and advisory services available to SIDS

Climate Investment Platform (CIP)

The CIP is a joint initiative of IRENA, UNDP and SEforALL in collaboration with the GCF. The CIP provides tailored technical assistance and project support to facilitate the development and scale-up of renewable energy technologies, especially in developing economies. The platform also connects projects with registered financial institutions and other CIP partners.



Collaborative Frameworks

Collaborative Frameworks are multi-stakeholder platforms to engage public, private, intergovernmental and non-governmental actors in co-ordinated support and actions for the global energy transition. IRENA has established Collaborative Frameworks on Hydropower, Green Hydrogen, Geopolitics, Offshore Renewables/Oceans, Enhancing Dialogue on High Shares of Renewables in Energy Systems and Just and Inclusive Energy Transitions, which are serving as effective vehicles for dialogue, peer-to-peer collaboration and the exchange of knowledge.

Data and statistics

IRENA publishes detailed statistics on renewable energy capacity, power generation and renewable energy balances by collecting data from member countries using the IRENA Renewable Energy Statistics questionnaire, with desk research carried out in instances where official statistics are not available. Such data and statistics help analysts, policy makers and the public make informed decisions for renewable energy uptake. Renewable power generation capacity statistics are released annually in March, and renewable power generation and renewable energy balances datasets are released in July.

Energy Transition Accelerator Financing (ETAF) Platform

ETAF is a multi-stakeholder platform providing innovative climate financing solutions to advance the energy transition, implement NDCs and realise SDGs across IRENA's membership. The platform facilitates matchmaking of renewable energy projects with financing solutions from various funding partners, investors, the private sector and donors with the aim to mobilise approximately USD 1 billion of capital by 2030.



The United Arab Emirates through the Abu Dhabi Fund for Development (ADFD) has provided anchor funding of USD 400 million to promote climate finance partnerships between the Middle East and the world.

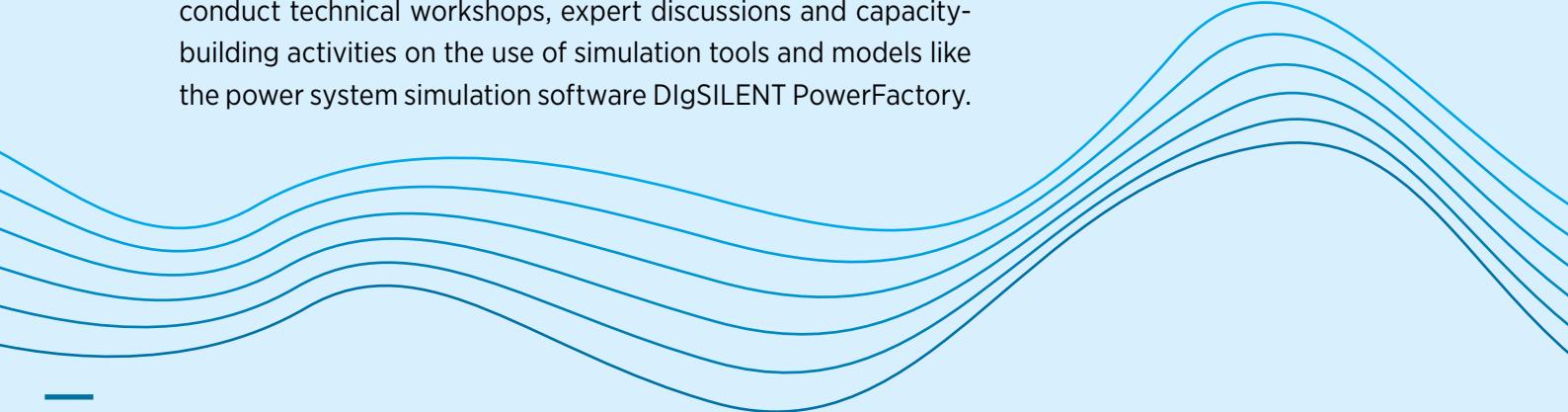
Global Atlas

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.



Grid integration analysis

Grid integration studies help in the transformation of the power system to integrate higher shares of renewables through co-ordination between long-term, policy-driven renewable energy integration targets and their actual deployment in power systems. They allow policy makers to plan the required resources more accurately while also helping power utilities to identify the most suitable technical measures to deploy increased variable renewables without affecting the system's stability and reliability. IRENA works along with designated focal points, local stakeholders, external experts and development partners to conduct technical workshops, expert discussions and capacity-building activities on the use of simulation tools and models like the power system simulation software DIgSILENT PowerFactory.



Investment forums

The investment forums' purpose is to strengthen the ecosystem for increasing renewable energy investments and to help developers prepare bankable projects and access relevant financing schemes. These forums, which work in 14 regional clusters, are a part of CIP and help realise project investments through a sub-regional approach. Each cluster is adjusted to the specific needs of its member countries and provides analytical, technical and project support, while also allowing countries to engage in one or more clusters.

Open Solar Contracts

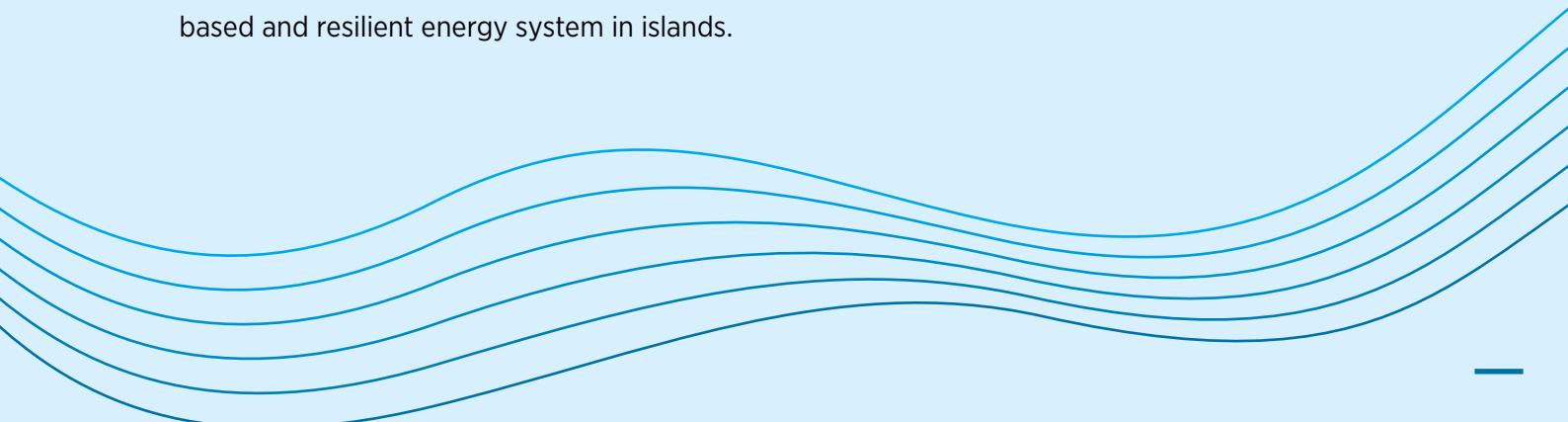
Open Solar Contracts is a collaborative initiative by IRENA and the Terrawatt Initiative to accelerate the scale-up of solar energy. It offers simple and universally applicable legal agreements that make contracting much faster and cost efficient to help streamline project development and finance processes.

Solar contracts are fine-tuned for small and medium-sized, grid-connected solar PV projects. Standardised contracts include PPAs, implementation agreements, operation and maintenance agreements, supply agreements, installation agreements, and finance facility term sheets. These are complemented by implementation guidelines.

Quickscan 2.0

Quickscan 2.0 is an enhanced tool and questionnaire encompassing eight critical factors – institutional frameworks; policy, legal and regulatory frameworks; knowledge base; planning; financing; deployment; capacity building; and co-operation – for the successful deployment of renewable energy in SIDS. This tool contributes to the decision-making process across the key stakeholders, working towards a renewables-based and resilient energy system in islands.

Quickscan^{2.0}



Renewable energy roadmap

Renewable energy roadmaps lay out a clear pathway for an island to transition to renewable energy. The roadmap provides a holistic overview of the technical, economic and policy readiness necessary for renewables deployment. The analysis helps to identify the least-cost power system and can additionally examine the scope of renewable penetration in end-use activities as well as other sectors, such as heating, cooling and transportation.

Renewables Readiness Assessment (RRA)

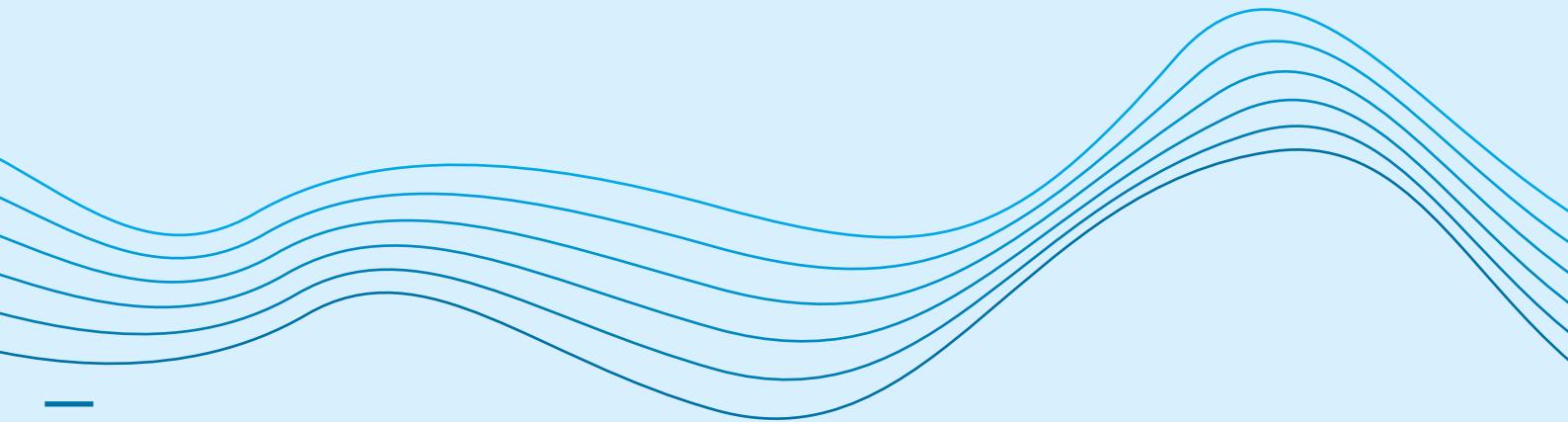
The RRA is a country-led, comprehensive tool for holistic evaluations and recommendations for actions to accelerate renewable energy development and deployment. A multi-stakeholder consultation analyses challenges and formulates key recommendations to address these challenges with the help of an international community.

SolarCity Simulator

The SolarCity Simulator is a web-based simulator application that combines ultra-high-resolution three-dimensional building footprints with solar irradiation data computed at 1-metre grid cells. The simulator can be used by end-users such as households, businesses and municipal authorities to evaluate the potential of rooftop solar PV systems. It helps to calculate the possible savings compared to other power sources based on a cash flow financing model. Municipal authorities can additionally assess the impact of different policy incentives. The SolarCity Simulator is part of the Global Atlas online resource developed by IRENA.

RENEWABLES READINESS ASSESSMENT

SOLAR CITY
SIMULATOR





About IRENA

The International Renewable Energy Agency (IRENA) serves as the principal platform for international 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. An intergovernmental organisation established in 2011, 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

About the SIDS Lighthouses Initiative

The SIDS Lighthouses initiative (LHI) is a partnership framework for action to support Small Island Developing States in their energy transition efforts from fossil fuel dependence to renewables. The Initiative brings together partners, including SIDS, developed countries, regional and international organisations, development and multilateral agencies, private companies, research institutes and non-profit organisations that support the development and implementation of the SIDS national, regional and inter-regional and global sustainable energy strategies. IRENA is the coordinator and facilitator of the Initiative. islands.irena.org