Pacific SIDS Regional Preparatory Meeting for the Fourth International Conference
16-18 August 2023
Nukuʻalofa, Kingdom of Tonga

SIDS DOCK's Perspective & Contribution to the Agenda:
Session 2: Responding to Shocks, Assessing Economic, Environmental and Social Development Priorities: Round Table 3: Harnessing the potential of its natural capital and pursuing nexus approaches, 17 August 2023

INTRODUCTION & BACKGROUND

The Fourth International Conference on Small Island Developing States (SIDS4) will be held in Antigua and Barbuda in 2024. To prepare for the Conference, a regional preparatory meeting in each of the three regions of SIDS, as well as an interregional preparatory meeting for all SIDS will be held in 2023. These meetings will seek to identify and develop inputs for the Conference. The Pacific SIDS Regional Preparatory Meeting is scheduled for 16-18 August 2023, in Nuku'alofa, Kingdom of Tonga, where the meeting is expected to adopt a Draft PSIDS Outcome Document. The Kingdom of Tonga's contribution to this draft document is two-fold, firstly, as Chair of the PSIDS Preparatory Meeting and secondly, as President of the sixth session of the SIDS DOCK Assembly.

This background document provides SIDS DOCK's perspective and contribution to Agenda Item: *Session 2: Responding to Shocks, Assessing Economic, Environmental and Social Development Priorities - Round Table 3: Harnessing the potential of its natural capital and pursuing nexus approaches*, scheduled for 17 August 2023, and recommends SIDS DOCK's contribution to the Draft PSIDS Outcome Document. The discussion is to focus on three areas: *Climate change and disaster resilience nexus, Oceans and biodiversity, and Energy transition*, with perspectives on opportunities to enhance climate change mitigation and adaptation and protecting oceans and environment, with a focus on oceans and seas, and sustainable energy transition, disaster risk reduction (e.g., Fossil fuel free Pacific, Early-warning systems, and Global Biodiversity Framework). The discussions should also identify priorities, new and existing, for inclusion in the Draft Outcome Document discussions.

The Third International Conference on Small Island Developing States was held from 1-4 September 2014 in Apia, Samoa. The Conference resulted in the adoption of the Small Island Developing States Accelerated Modalities of Action – or SAMOA Pathway and the announcement of 300 multi-stakeholder partnerships in support of SIDS. It also established a unique intergovernmental SIDS Partnership Framework, designed to monitor progress of existing, and stimulate the launch of new, genuine and durable partnerships for the sustainable development of SIDS. Paragraph 22 of the Samoa Pathway, underscores "the urgency of finding additional solutions to the major challenges facing small island developing States in a concerted manner so as to support them in sustaining the momentum realized in implementing the Samoa Pathway," the basis for action in the agreed priority areas. Within this context, paragraphs 47 to 50 of the Samoa Pathway notes "useful frameworks" regarding sustainable energy, highlighting the Barbados Declaration on Achieving Sustainable Energy for All in Small Island Developing States, and the

Sustainable Energy for All initiative of the Secretary-General, which focuses on access to energy, energy efficiency and renewable energy, complemented by international commitments.

The Barbados Declaration on Achieving Sustainable Energy for All in Small Island Developing States recognized SIDS DOCK, a SIDS-SIDS Initiative, as "a valuable tool" to support "efforts of SIDS to develop and implement national, regional and interregional energy policies, plans and strategies to address the special vulnerabilities of SIDS, while ensuring supplies of secure, reliable, affordable and environmentally friendly energy and power." Paragraph 50 (c), of the Samoa Pathway supports actions to "support investment in initiatives by and for small island developing States, in particular the "SIDS DOCK" indicative project pipeline of renewable energy and energy efficiency and conservation projects, as well as in the areas of capacity-building and human resources development and public education and awareness."

2024-2034: LOOKING THROUGH THE 10-YEAR LENS OF THE YOUTH & FEMALE-HEADED HOUSEHOLDS & "THE INFLUENCES THAT SHAPE OUR REGION" AS LARGE OCEANIC COUNTRIES AND TERRITORIES

The Outcome Document is directed at the SIDS leadership to provide them with a blueprint for sustainable development over a 10-year period. The current SIDS average population age is 30 years and under, therefore, the Outcome Document must provide the leaders with the information and actions required to address this unique demographic situation, which also sees women heading more than half of the households and consequently, the population is becoming more and more vulnerable. Within the context of the 2050 Strategy for the Blue Pacific Continent that recognizes the Pacific SIDS as large ocean states and custodians of almost 20 percent of the earth's surface, and that the strategy is people-centred, then it stands to reason that based on the demographics, the youth should be major beneficiaries with a majority of women playing key roles in the implementation of the SIDS4 Conference Outcome Document.

A joint, 2020 landmark report by the World Health Organization (WHO), United Nations Children's Fund (UNICEF) and *The Lancet*[1], evaluated 180 countries, and found glaring deficiencies that hurt children and the environment. The report notes that climate change is threatening children's future. SIDS being the most vulnerable group, means they're the most vulnerable group globally, and their needs must be addressed appropriately. The report also found that no country is doing enough to protect children from the impact of climate change. Furthermore, children are passionate about environmental issues and climate change. According to a UNICEF[2] poll of children conducted in more than 60 countries, 77 percent think that climate change is one of the most pressing issues for young people, and 98 percent think that governments need to take urgent action to tackle this issue. SIDS Leaders therefore need to devote more of their efforts to young people. The Pacific has some of the youngest population in the world, e.g., in the Kingdom of Tonga, the median age is 23 years old, and more than one-third of the population is 14 years old or younger; in Samoa, the media age is 20 years old; and in Tuvalu, 26 years old.

---

[1] The *Lancet* began as an independent, international weekly general medical journal founded in 1823 by Thomas Wakley. Since its first issue (Oct 5, 1823), the journal has strived to make science widely available so that medicine can serve and transform society, and positively impact the lives of people.

[2] https://www.unicef.org/media/72561/file/Are-climate-change-policies-child-sensitive-2020_0.pdf

The Children of the Pacific SIDS have a special kinship living in a “one world ocean” - they are all connected by the waters flowing freely between them. Energy from the Ocean, we firmly believe, will provide a path for all children to benefit economically and environmentally from the vast endowment of clean energy in the oceans. SIDS are going to need to significantly increase availability of energy to school our young population, and to prepare a new cohort of Children of the Blue Economy, to oversee the transition to the new SIDS energy sector, minimally dependent on fossil fuels, depending on renewable sources of energy, particularly the ocean, the largest solar collector on planet earth. Who, in the next five, ten, to 20 years, is going to manage this blue transition and climate resilience?

There is a need to plan and prepare our youth for future challenges and provide training that equips them for jobs in the Blue Economy, which are connected to the ocean, such as engineers, marine biologists, marine engineers, marine technicians, ship captain, marine manager, commercial diver, ecologist, ocean preservation, and hydrologist. And, interacting with members of the Coast Guard and experts from the Ministries of Energy, Water, and Fisheries Directorates, one area that the youth of the world are set to dominate, and which should be a priority in preparing SIDS youth adequately, is the area of **blue technology and digital skills**, an area where future job demand will be greatest. Failure to nurture and prepare our young people to adequately participate in this blue digital revolution will make them and our countries more vulnerable, and opportunities capitalize on the new ocean energy technologies, which can transform our economies and make us more resilient, will be delayed or lost.

Blue technologies, which drive sustainable innovation across the blue economy, include a broad spectrum of industries promoting sustainable ocean-based activities. We need to ensure that SIDS has the human capital to manage and maintain the Blue Economy and keep pace with innovation to build our climate resilience. With continued technological growth in information and computing, and fascinating trends including artificial intelligence (AI), means that children are developing computer expertise at younger ages. Many primary school children are doing classes on computers, and for most of the Children of SIDS, for the first time, many of them began using tablets at home because of the COVID-19 Pandemic. As our children are learning at an early age about technology, they are making huge strides in their preparation for future careers.

We know that in general, women tend to be under-represented in capacity building initiatives, particularly those activities focused on sustainable energy and climate change adaptation. Women and men play different roles in household livelihoods, and therefore they experience the impacts of climate change differently. Possibly more importantly, women and men have differing abilities to respond to the threat that climate change poses to their lives and livelihoods, and it is often women who are at a disadvantage when it comes to adaptation. This is not to say that all women are particularly vulnerable - there are also many examples where women are using their knowledge and capacities to protect their families and communities from the adverse impacts of climate change.

Pre-existing gender-related patterns of inequalities and vulnerabilities can block women’s ability and capacity to effectively engage in eco-friendly technologies, natural resource management and early warning systems. Sources of these vulnerabilities range from lack of secure land rights

(which are inter-related with access to credit and livelihoods), to gender gaps in the ownership of productive assets, higher illiteracy rates among women than men, unpredictable and less favourable access to employment and income, and inequalities in decision-making[3]. At the same time, risks associated with climate change threaten to reinforce gender inequalities and even erode progress that has been made towards gender equality and the Sustainable Development Goals (SDGs) in several SIDS. Poor women's limited access to resources, restricted rights, limited mobility and voice in community and household decision-making can make them much more vulnerable than men to the effects of climate change. This is unfair and can lead to unfortunate consequences for all, as women play a unique role in the stewardship of natural resources and pillars of support to households and communities.

Women's contribution, both towards ocean-based livelihoods and conservation efforts, are invisible and the declining health of our oceans threatens their lives, livelihood and food security. SIDS are heavily dependent on food imports thus a world of wars makes food availability unpredictable. In addition, no cereals are cultivated on these islands. Countries are prone to natural hazards such as floods and landslides, which negatively affect crop production and road access as well as destroy houses and household assets.

The increasing frequency of natural disasters, financial, energy and food crises, SIDS are facing increasing challenges to growing their economies, and requires increased innovative and efficient practices to remain relevant in the globalized economy. SIDS would derive significant benefits by becoming less reliant on a single or limited economic sector, through diversification. They could also become more resilient to external shocks by reducing dependency on high foreign exchange expenditures such as imported energy.

SIDS, due to small populations, are limited in the range of activities that their economies can support. SIDS rely heavily on environmental services and international trade to drive growth, hence the volatility of their growth. Promoting diversification and innovation in SIDS economies is relevant as the majority of SIDS depend heavily on the tourism sector, which accounts for 25 percent of GDP and upwards of 70 percent of foreign exchange earnings used to purchase petroleum fuels. Promoting diversification in SIDS economies into new sustainable energy-related industries, as well as encouraging greater education and understating of the critical role of the energy sector in helping to address issues of waste management, freshwater resources, employment generation, agricultural diversification, biodiversity conservation, and sustainable land use will help to offset reduced earnings from tourism when the industry experiences re is a global downturn.

A gender perspective does not solely address women's practical needs; it also looks at the responsibilities of men and women and the relations between them. It is therefore vital that gender equality considerations, as well as men's and women's different needs, with their knowledge, women can shape adaptive mechanisms in vulnerable areas, be taken into account in the Outcome Document.

PERSPECTIVES ON OPPORTUNITIES TO ENHANCE CLIMATE CHANGE MITIGATION AND ADAPTATION AND PROTECTING OCEANS AND THE ENVIRONMENT

[3] http://www.undp.org/content/dam/undp/library/gender/Gender%20and%20Environment/EngendCC_7.pdf

CLIMATE CHANGE AND DISASTER RESILIENCE NEXUS PERSPECTIVE

In 2015, SIDS DOCK, with support of the Swedish Energy Agency (SEA), under a project titled, "Building Resilience to Climate Change in Islands through the Energy Sector," involving a group of SIDS, defined resilience building in island states as "the ability of a small island to become less vulnerable and more capable to respond and recover from the disruptions and destruction associated with increasing greenhouse gas concentrations, including more ferocious and frequent hydro-metrological events, severe impacts from sea-level rise, and increasing ocean temperature and acidity, by development and efficient use of the natural resource endowment. The ability to respond and recover is linked to national capacity which determines the ability to extract and efficiently utilize energy, food and water from the natural resource base."

All the countries need to improve disaster risk management related to extreme weather events, including both droughts as well as storms and floods. During the past 10-15 years, water-related disasters have not only struck more frequently, but also have been more severe. Water-related disasters such as floods, droughts, storm surges and tsunamis, account for 90 percent of all disasters in terms of number of people affected. For SIDS, a single extreme weather event, like a hurricane, cyclone or flood, can wipe out an entire year's GDP. This is not possible in larger nations. The wealthier countries or sectors have more mechanisms to cope with the impacts, like insurance or building climate-hardened infrastructure, but adaptation to climate change represents a new burden for many, in addition to small islands, in particular to fragile or failed states, as well as to all developing countries. Under changing climatic conditions, climate scientists say that floods will be more frequent and more destructive. Communities in flood prone areas can minimize damages if they can collectively address issues of land use to minimize soil erosion and maximize water infiltration and minimize run off. Land with vegetative cover has greater infiltration and suffers less erosion than soil that is bare or sparsely vegetated.

The poor, living in higher risk areas and lacking resources to face these shocks are also disproportionately affected. At the same time, the impacts of climate change, many times the result of extreme weather events such as droughts, can also threaten food security and act as a powerful pressure for migration. An overwhelming proportion of the physical impacts of changing climate are transmitted through water, either by increasing the frequency of extreme weather events (both droughts and floods), changes in weather patterns, sea level rise. Water scarcity and droughts have a considerable impact on food security and internal displacement of vulnerable groups; on average, it takes 1,000 tons of water to produce a ton of cereal. Countries need support understanding how the impacts of climate change affect the different sectors of society, and how they interact (negative or positive). Based on the understanding, sustainable energy strategies can be formulated that reflects the nexus between provision of energy services and disaster resilience and the integration across management of waste, protection of freshwater resources and biodiversity, and sustainable agriculture.

Based on availability of clean energy technologies, SIDS are now well positioned to derive increasing amounts of energy from its ocean energy resources at competitive cost, and when nexus sectors are integrated through consideration such as ability to increase food production, provide reliable freshwater through desalination, and produce fertilizers to meet agricultural needs, the advantage of a nexus focused energy strategy helps meet both mitigation and adaptation goals and

increases resilience to become less vulnerable and more capable to respond and recover. Enhancing resilience to climate change impacts is quintessential to creating sustainable development and socio-economic growth, including poverty alleviation. Another major advantage of a nexus focused energy strategy is its efficient use of finance and the potential for combined intersectoral investments to get the biggest bang for each investment dollar.

SIDS have committed to reducing and eventually phasing out fossil fuels in electricity generation by 2030[4]. This is an essential component of the mitigation effort proposed by their National Determined Contributions (NDCs) , which addresses electricity, waste management and land use actions. SIDS are in the process of implementing their NDCs, and the main policy deals with replacing diesel generation with renewable energy and energy efficiency. The objective of these plans is to provide affordable, efficient and sustainable energy from endogenous sources and decrease and eventually replace fossil fuels. Most SIDS have approved legislation to enable the process and recognize that renewable energy and energy efficiency projects can help countries build climate resilience.

The Pacific SIDS have the highest ambitions under the 2015 Paris Agreement, but tiny compared to the rest of the world, due to their small size. According to a 2021 International Renewable Energy Agency (IRENA) analysis, the Pacific Region's first National Determined Contributions (NDC) showed that all 14 Pacific SIDS mentioned renewables, whilst 13 of the Pacific SIDS had quantified renewable energy targets in their NDCs that equated to 1.979 GW. A total of USD 5.2 billion will be needed by 2030 to implement these NDC renewable energy targets, of which 93 percent will be conditional that would need external investment. Tonga's energy ambition is a thirteen percent [13% (16 Gg)] reduction in greenhouse gas (GHG) emissions by 2030, compared to 2006, through a transition to seventy percent (70%) renewable electricity as well as energy efficiency measures[5]. At the COP 27 climate talks in Egypt, the commitment to the Paris goals was reaffirmed and it was recognized that limiting global warming to 1.5 degrees Celsius requires rapid, deep and sustained reductions in global greenhouse gas emissions of 43 percent by 2030 relative to 2019 levels. COP 27 resulted in the establishment of a Loss and Damage Fund to be financed by wealthy nations to help vulnerable countries cope with climate change-induced disasters.

The synthesis report[6] on the state of adaptation efforts[7] and on the overall effect of Parties' NDCs and overall progress made by Parties towards the implementation of their NDCs, provides an overview of the state of adaptation efforts, experiences and priorities, summarizing the most recent information in the identified sources This synthesis report reaffirmed the reason why SIDS are a special case for sustainable development. . The analysis shows that SIDS were placed in a different category because warming will be dominated by changes in sea surface temperature. Further, looking ahead to different warming scenarios, the Intergovernmental Panel on Climate Change (IPCC) projects that above 1.5 °C of global warming, some ecosystems will reach hard limits to

[4] IRENA News Article. "Islands Aim to Phase out Fossil Fuels and Build Climate Resilience," 11 October 2020. Available at: < Islands aim to phase out fossil fuels (irena.org)>
[5] Tonga: Key Highlights from the second NDC in December 2020. UNDP. Tonga | Climate Promise (undp.org)
[6] This synthesis considers the information provided in the 166 latest available NDCs, representing all 193 Parties to the Paris Agreement
[7] https://unfccc.int/documents/470435

survival, thereby causing ecosystem-based adaptation measures to lose their effectiveness, and limited freshwater resources will pose hard limits for SIDS and regions that depend on glacial and snow melt.

Opportunities: (a) There are options both on the demand side and the supply side to enhance resilience of the energy system itself as well as the resilience of the larger society. Thus, low carbon energy systems can contribute to enhancing societal resilience and to the attainment of the Sustainable Development Goals (SDGs). (b) The existence of regulated markets for the sustainably produced biomass can stimulate national revegetation, which will enhance freshwater resources, and reduce intensity of flooding events, thus reducing vulnerabilities and increasing capacity to respond and recover.

Priorities, New and Existing: (a) Support investment in initiatives by and for small island developing States, in particular the "SIDS DOCK" indicative project pipeline of renewable energy and energy efficiency and conservation projects, as well as in the areas of capacity-building and human resources development and public education and awareness. (b) Support the financing and implementing of NDC renewable energy targets to contribute to enhanced societal resilience and to the attainment of the Sustainable Development Goals (SDGs).

OCEAN & BIODIVERSITY PERSPECTIVE

Ocean energy is poised to become a major source of energy in the Small Island Developing States (SIDS) energy mix as the ocean represents SIDS largest renewable source of energy. SIDS governments in partnership with the private sector and development partners are now pursuing the commercialization of SIDS-Appropriate Ocean Energy Technologies, and several SIDS will include ocean energy in their 2025 Nationally Determined Contribution (NDC) Reports. As the largest renewable energy resource endowment for SIDS, ocean energy does not require conversion of limited land area to install Grid-connected PV and wind farms. SIDS are blessed with many renewable energy resources, and most of them are already competitive with fossil fuel-based generation (e.g., diesel, heavy fuel oil [HFO]). The decreasing technology costs for SIDS - Appropriate ocean energy technologies is a powerful option for consideration in the SIDS energy transition. The Global Ocean Energy Alliance (GLOEA), launched in June 2022 on the margins of the UN Ocean Conference in Lisbon, Portugal, is a mechanism intended to minimize the information and knowledge gaps, and helping to foster climate resilient economies in Small Island Developing States (SIDS), Least Developing Countries (LDCs) and Coastal Nations, support the global deployment of ocean energy technologies, and provide the leadership for high priority ocean energy development in SIDS and coastal LDCs.

Following several technical meetings, the Global Ocean Energy Alliance (GLOEA[8]) was officially launched by UNIDO and SIDS DOCK during joint side events at the UNFCCC Conference of Parties (COP26), in November 2021, in Glasgow, Scotland, and the 2022 UN Ocean Conference in Lisbon, Portugal. The initiative is being supported by various Prime Ministers, Presidents and Ministers from the Pacific, Caribbean and Africa. Recently, UNIDO was invited to submit an ocean energy policy paper for consideration by the Fifth Pacific Regional Energy and Transport Ministers' Meeting, which took place from 8 to 12 May 2023, in Port Vila, Vanuatu. The meeting gave the Secretariat of the Pacific Community, the Pacific Centre for Renewable Energy and

[8] Home - Global Ocean Energy Alliance (GLOEA)

Energy Efficiency (SPC/PCREEE), UNIDO and SIDS DOCK, a mandate to develop an ocean readiness programme preparing the Pacific Islands Countries and Territories (PICTs) for future ocean renewable energy technologies, which aims to mitigate barriers and brings latest innovations to the Pacific, including cooperation with the Global Ocean Energy Alliance (GLOEA) and other centers of the Global Network of Regional Sustainable Energy Centers (GN-SEC), to attract investment from donors, private sector and other financing instruments. The GLOEA intends to build a bridge between applied research, the emerging ocean energy industry, which needs to test new solutions in various climates and contexts and SIDS and coastal LDCs, which have the interest to get access to technology and expertise.

SDG 14 – Conserve and sustainably use the oceans, seas and marine resources for sustainable development - Life Below Water, is an important SDG for SIDS, especially the PSIDS who are Large Ocean States and depend on fisheries. They are also more affected by the impacts of climate change on fished species in areas where there is a higher proportion of fished species at risk to climate change. Yet, funding allocations to SDG 14 globally, remains lower than for any other SDG, while four targets of SDG 14, related to marine protection and management, expired in 2020; the corresponding indicators show that most nations have made very little progress, which can be related to a lack of capacity, funding, and commitment. In this context, small island developing States are highly vulnerable and would benefit greatly from a blue economy[9]. The COVID-19 crisis has re-emphasized the urgent need for SIDS and LDCs to diversify their economies, reactivate or strengthen traditional sectors and tap into the value chains of emerging ones. Increasingly, SIDS and coastal LDCs are embracing the expanding Blue Economy as a mechanism for realizing sustainable growth and mitigating local pollution and climate change, simultaneously. Endowed with vast ocean territories and exclusive economic zones (EEZs), these countries and territories have the opportunity to create new income streams and to diversify their economies. As part of their blue economy aspirations, SIDS and coastal LDCs are demonstrating increased interest to harness the opportunities of ocean energy technologies in the near future.

The closely-knit interlinkages between the domains of climate change, the ocean and biodiversity cannot be ignored given that addressing the existential challenges posed by climate change and biodiversity conservation hinge on a healthy and functional ocean. Global warming beyond the 1.5 degrees target risks triggering multiple tipping points in the climate system and causing planetary instability. From climate change and its diverse impacts on oceans, through to the destruction of and damage to marine ecosystems, the loss of biodiversity and the degradation of the natural environment, including from over- fishing and destructive fishing, human impact on the ocean has been profound. According to the World Meteorological Organization (WMO), the ocean contains the most varied biodiversity on the planet shaping the Earth's weather and climate and its variability. It mitigates climate change by absorbing almost all the excess heat (89%) and a quarter of the CO2 produced by human activities[10]. Target 3, of the Kunming-Montreal Global

[9] Global Sustainable Development Report 2023. Advance Unedited Version, 14 June 2023. The GSDR, which will be launched at the SDG Summit in September 2023, is meant to advance implementation of the Sustainable Development Goals (SDGs) and to serve as a major input to Member States' follow up and review of the 2030 Agenda at the half-way point. Advance unedited GSDR 14June2023.pdf

[10] *Ocean-Climate Nexus*. By Sabrina Speich, Professor, Ecole Normale Supérieure, and Weidong Yu, Professor, Sun Yat-Sen University. Ocean-Climate Nexus | World Meteorological Organization (wmo.int)

Biodiversity Framework[11] for urgent action over the decade to 2030, on reducing threats to biodiversity, says the sustainable use of the ocean should be fully consistent with conservation outcomes. Meanwhile, Target 8, actions on minimizing the impact of climate change and ocean acidification on biodiversity include deploying nature-based solutions and/or ecosystem-based approaches,

Opportunities: (a) The introduction of ocean energy has the potential to help SIDS meet their Nationally Determined Contributions (NDCs) and the Sustainable Development (SDG) Goals, particularly Goal 7: Ensure access to affordable, reliable, sustainable, and modern energy for all. The introduction of ocean energy can also provide an alternative source of energy for the population, industry, and transportation. Ocean energy has the potential to bring about massive reduction in greenhouse gas emissions (GHG) and represents the most available and likely the largest potential source of renewable energy in SIDS. SIDS now import, annually, more than 200 million barrels of petroleum fuels, which cost U.S. billions of dollars, annually, and is a major cause of debt in SIDS. The SIDS maritime Exclusive Economic Zones (EEZs) are very large (especially in the Pacific), and extend to approximately one-sixth of the earth's surface. Collectively, SIDS Oceans (EEZ and extended continental shelves) make them 15 times the physical size of the European Union (EU) – SIDS are Large Ocean States. In this system, the tropical ocean acts as a giant solar energy collector for the estimated 25,000 to 35,000 barrels of oil equivalent daily on each hectare of the tropical ocean surface, with the potential to produce more than 44,000 Terawatts of Electricity[12] (TWH)[13] hours of electricity annually. SIDS annual consumption is approximately 145 TWH , the global annual consumption of electricity is approximately 23,835 TWH. Ocean thermal resources are therefore greater than annual global demand, and represent far and away SIDS largest natural resource, and the world's largest source of renewable energy, and currently, in a few developed nations, ocean energy technologies are known and demonstrated.

(b) An area that SIDS are now exploring is the use of Biorock technology and its ability to regenerate degraded reefs and provide protection for the coastline as well as enhancing fisheries, biodiversity, and capture and storage of carbon in the form of calcium carbonate. The estimated cost of the living breakwater technology is USD 5,000 per meter (maximum) versus more than USD 22,000 per meter for a traditional concrete seawall.

Priorities, New and Existing: (a) Support the Global Ocean Energy Alliance (GLOEA) as a valuable tool to support SIDS aspirations for a Blue Economy and encourage SIDS that have not yet done so to consider becoming members of the GLOEA. (b) Support the development of nature-based solutions that can help regenerate reefs, provide protection for the coastline as well as enhancing fisheries, biodiversity, and capture and storage of carbon. (b) Increase funding

[11] Conference Of The Parties To The Convention On Biological Diversity, Fifteenth Meeting – Part II Montreal, Canada, 7-19 December 2022. Decision Adopted By The Conference Of The Parties To The Convention On Biological Diversity, Kunming-Montreal Global Biodiversity Framework. <15/4. Kunming-Montreal Global Biodiversity Framework (cbd.int)>

[12] OES, 2017, IRENA 2020

[13] A terawatt hour of electricity is equivalent to a thousand-Gigawatt hours, or one million megawatt hours, or a billion-kilowatt hours. Twelve 60-watt light bulbs operating for 10 hours per day would consume 7.2 Kilowatt hours of electricity or would use about 2,628 Kilowatt hours for the year, equivalent to 2.7 Megawatt hours.

allocations to SDG 14 to help ensure the sustainable use of the ocean is fully consistent with conservation outcomes.

ENERGY TRANSITION PERSPECTIVE

The South's major need is for progress on global reduction of greenhouse gases responsible for climate change. Climate change is the dark side of fossil fuels. Recent analysis prepared by UN officials and scientists of countries' National Determined Contributions (NDCs) under the UNFCCC 2015 Paris Agreement, show that their plans are not strong enough to prevent temperatures rising above 1.5 degrees Celsius, the cut-off point at which the SIDS ecosystems begin to die. SIDS spend more than USD 25 billion plus, annually, for fuel imports, and face mounting challenges arising from climate change (reduction in freshwater availability due to changing rainfall regime, reduction on fish catch due to warning oceans and bleaching of coral, among others). In some SIDS, the import cost of petroleum fuels is greater than the total export earnings of the country.

The energy sector requires the largest portions of foreign exchange disbursement in the vast majority of SIDS, and represents the major source of economic vulnerability. Sustainable development of these SIDS is not possible in the absence of a highly integrated energy sector that not only has minimal dependence on imported fuel sources, but also has synergistic linkages with nexus sectors (waste management, water supply, agriculture, and biodiversity), tourism, transportation, and general employment. In a number of SIDS, the increased dependence on solid biofuel for direct heating has resulted in accelerated de-vegetation, increased soil erosion, loss of biodiversity, and reduced availability of freshwater resources. As with fossil fuels, current biomass usage is inefficient, and there is potential to sustainably increase availability. SIDS have limited land space, and there is growing attention to food security as a result of the negative impacts on agriculture and fisheries from changing climate, consequently, governments are implementing policies to encourage more agricultural production as food insecurity increases.

The nature of the SIDS economy shows significant percentages of the population have livelihoods very dependent on agriculture or fisheries, and most SIDS are faced with freshwater stressed conditions during periods of the year. Climate change is already aggravating freshwater availability and access, and approaches are needed that help reduce the vulnerability of this large segment of the population, and society as whole. The current structure of the agriculture sector makes for increasing vulnerability. With increasing impacts for changing global climate, the SIDS are now forced to explore options for making the economy and population less vulnerable by pursuing climate resilient development. For the energy sector, which is dominated by petroleum fuels and its consequent negative impacts on climate resilience, improving climate resilience has to include as a priority, transformation of the current energy sector.

Achieving significant increase in ocean energy investments is critical to SIDS building climate and economic resilience. The war in Ukraine, overlapping with the ongoing COVID 19 Pandemic, has disrupted supply chains for imports of essential goods, and caused significant increases in energy costs, which is a constant threat to the prospects of economic recession in the SIDS, the longer the conflict lasts. SIDS need to replace some ten thousand (10,000) megawatts (MW)/ 10 Gigawatts (GW) of fossil fuel-powered electricity generating plants, over the coming decades, plants which consume more than USD5 billion dollars' worth of fuel, annually. Ten thousand

megawatts represent the vast majority of existing generating capacity in the SIDS, however, because the majority of these plants have reached or exceeded their economic life and are no longer efficient users of fuel, SIDS must ensure that they take collective action to replace these generators with Ocean Energy Systems.

Opportunities: Ocean energy is one near-to-midterm commercial option SIDS can use to support reducing long-term energy cost, generating employment and reducing GHG.

Priorities, New and Existing: (a) Support the Global Ocean Energy Alliance (GLOEA) and assist the small island developing States to develop and deploy all forms of ocean energy technologies and introduce small- and medium-scale technologies that are suitable to small island developing States. (b) Support the increase in ocean energy investments which is critical to SIDS building climate and economic resilience.

CONCLUSION

The projections from the Global Sustainable Development Report 2023 indicate that on the middle of the road pathway, the Sustainable Development Goals (SDGs) will not be achieved. Low carbon energy systems can contribute to enhancing societal resilience and to the attainment of the SDGs. The Samoa Pathway[14] promotes all energy sources, in particular renewable energy sources, but does not specifically mention ocean/marine energy, which in the case of SIDS, low-lying coastal nations and LDCs, holds the best opportunity to help achieve sustainable energy for all. Investment in and development of ocean energy technologies is urgently needed to provide reliable and affordable energy, enhance food security, conserve biodiversity, and provide freshwater access so SIDS have a statistical chance of surviving the expected higher that 2°Celsius increase in average global temperatures.

SIDS coastlines are the most valuable piece of ocean property and need defending to protect our tourism, fisheries industries, and public infrastructure. SIDS have identified technologies and received indication of interest in deployment of these technologies through public-private partnerships, in which there would be no budgetary cost to the government. Building back better and building resilience to climate change in SIDS begins with an economy which is more resilient to external shocks and natural disasters. SIDS' main economic/livelihoods pillars are tourism and agriculture; they are among the most vulnerable to global economic, political, and environmental shocks. For SIDS, the immediate challenges, which will determine their longer status, are what to do differently, and how to better incorporate nexus thinking into the how to address these challenges and unique vulnerabilities.

Across the industrialized countries, there are equipment manufacturers producing all the component needs for the deployment of integrated technologies that can convert the vast thermal and kinetic energy in our ocean into clean energy and reduce the need for imports. There are nature-based systems in village locations and a few tourist locations that are rehabilitating reefs and protecting coastlines using nature-based solutions that are significantly less costly than conventional ferrocement seawalls, which always eventually fall into the ocean. SIDS have limited time to act in deploying these and other integrated technologies at scale, to help address the negative impacts of climate change.

[14] Paragraph 50 (a)

The SIDS DOCK Assembly decided that demonstration pilots are critical to accelerating the rate of climate adaptation in SIDS, and consequently, in driving increasing manufacturing capacity of components to reduce cost and availability of equipment. The documented impact of the technologies on employment and gross domestic product (GDP) is very impressive and very fascinating for island leaders, seeking proven approaches to generating jobs, meeting international climate commitments, and achieving the SDGs. There are clear and proven opportunities for a viable economic future, free from petroleum fuels, with improved trade balances, jobs and entrepreneurial opportunities for young people, and a contribution to achieving the SDGs, through economic development that reduces climate vulnerability.