



SAMOA'S IMPRESSIVE FEAT IN BUILDING CAPACITIES FOR NDC IMPLEMENTATION

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ACTION AREA: ——— Mitigation

FOCUS AREA: ——— Delivering

COUNTRY: ——— Samoa

SECTORS

INVOLVED: ——— Energy

TIMEFRAME: ——— 2017 - 2022 (5 years)

CASE SUMMARY: ——— To achieve its global commitment given via its Nationally Determined Contributions (NDCs), Samoa has undertaken efforts to adapt to and also mitigate the negative impacts of climate change. A key aspect of Samoa's NDC is the transition of its diesel-dependent power sector to renewable energy (RE). As part of this, Samoa has initiated the Improving the Performance and Reliability of Renewable Energy Power Systems (IMPRESS) project, which will be implemented by the Government of Samoa with support from the Global Environmental Facility (GEF) and the United Nations Development Programme (UNDP).

The goal of this five-year initiative is to improve the sustainable and cost-effective utilisation of RE resources for energy production, to be implemented through RE development and demand side policies and actions. The project will directly contribute to the achievement of Samoa's goal of 20% of all energy services to be supplied by renewable energy resources by 2030, as stated in the Strategic Action Plan of the National Energy Policy, and its NDC target of achieving 100% of power generation from RE sources by 2025.



Figure 1: IMPRESS secures GEF funding of USD 6 million (MNRE, 2018)

To enhance transparency and be able to track and support the project's objectives, Samoa's Ministry of Natural Resources and Environment (MNRE) has developed a RE project registry and a monitoring plan, and has implemented wide-ranging awareness-raising exercises on its NDCs. The awareness campaigns aim to increase younger generations' support for Samoa's global climate change commitment and improve community-based efforts and involvement to achieving the NDC, so as to create a sustained enabling environment for climate actions.

The case study qualifies as a good practice as it implements pioneering approaches for power generation and financing in the country, is characterised by a strong stakeholder engagement (inter alia with youth and women) and enjoys the strong political buy-in by the highest levels of government.





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BACKGROUND: ————— The small island developing state (SIDS) Samoa is an island archipelago, with two main islands – Savaii and Upolu (where about 75% of its population resides) – and 8 smaller islands. Samoa is one of 43 members of the Climate Vulnerable Forum, as it is extremely vulnerable to the impacts of climate change, facing serious impacts ranging from tropical cyclones to long dry spells (COP23, n.a.). This impacts the economy of Samoa, which is dependent on its natural resources and ecological biodiversity.

According to the last Samoa Energy Review (Ministry of Finance, 2017), a significant amount of Samoa's energy demand (83%) is still met by petroleum products, while renewable energy (RE) sources, excluding biomass, form a small portion of the energy mix (3%). Biomass accounts for 13% of the energy mix and is mainly used for cooking. Further, the expanding energy consumption in the transport sector has pushed up the import demand of fossil fuels by 21% from 2014 to 2015. The transport sector, which accounts for 53% of total energy supplied, predominantly relies on petroleum and accounts for 68% of national petroleum consumption. Considering foreign exchange and fuel price fluctuations, petroleum consumption not only presents a burden for the environment, but is also costly for the economy. By recognising both the environmental, financial, and socio-economic risks of its fossil fuel dependency, Samoa has prioritised the development of its RE capacity and the promotion of energy efficiency (EE) measures.

To showcase the country's commitment to mitigate climate change and its negative impacts, Samoa pledged its conditional intended nationally determined contribution (NDC) in 2015 with the very ambitious target of reaching and maintaining 100% RE electricity generation by 2025 (see Samoa, 2015). To reach the target, Samoa developed policies, strategies and plans in line with existing ones such as the Samoa National Energy Policy, the National Infrastructure Strategic Plan (NISP), the National Policy of Combating Climate Change, the Greenhouse Gas Abatement Strategy, and the Electricity Act.

In August 2016, Samoa launched the Strategy for Development of Samoa (SDS), its development strategy, for the period 2016 to 2020, with an overarching focus on improved quality of life for all, highlighting the environment as one of four priority areas. The SDS outlines key development strategies across sectors in line with global agendas such as the Sustainable Development Goals Agenda 2030, Samoa Pathway (Small Island Developing States Accelerated Modalities of Action), the Paris Agreement and the Pacific Framework for Regionalism. The SDS discusses how national planning and budgeting mechanisms integrate the aim to mainstream climate and disaster resilience along with gender and human rights. These commitments and mainstreaming of actions have given rise to more efforts to address both climate change mitigation and adaptation.

The SDS initiatives are supported by Samoa's Energy Sector Plan (2017-22). The plan advocates for targeted public awareness and education programmes, such as introducing the topic of RE to school curricula at all levels in order to holistically understand the costs and benefits of RE for the national economy. It also advocates for partnerships with communities and RE stakeholders, and outlines the need for a centralised RE project database, stating the challenges of reliability and timeliness of data availability and collection. These have informed the outcome indicators for Samoa's RE sector.

However, considering its national circumstances, Samoa is unlikely to meet its highly ambitious RE NDC target. Simultaneously, it is also important to address the reliability issue of RE generated electricity relating to technological improvements and storage. These challenges highlight the need for facilitating an intervention that connects the existing strategies and plans to incremental activities that would augment Samoa's chances to achieve its RE target.

In response to this, the IMPRESS project was developed by UNDP (UNDP, 2017). The project, co-funded by the Government of Samoa and the Global Environmental Facility (GEF), is being implemented by the RE Division of the Ministry of Natural Resources and Environment (MNRE-RED). With the objective of developing an improved, sustainable and cost-effective utilisation of renewable energy resources in Samoa and displacement of diesel electricity generation, IMPRESS directly contributes to the achievement of Samoa's NDC and its planned energy sector development. The key components of the project are outlined in Table 1. It is to be implemented over a period of 5 years (August 2017 – August 2022).

IMPRESS COMPONENTS
1. Enhancing RE policy formulation and implementation
2. Improving RE-based energy systems
3. Financing electricity saving, productive and social uses of RE electricity and electricity system performance improvement initiatives
4. Productive and social uses of RE
5. Enhancing awareness on the applications and benefits of RE and EE

Table 1: The main objectives of the IMPRESS project (Ministry of Natural Resources and Environment, n.a.)

ACTIVITIES: ————— The IMPRESS project implementation entails the following activities:

- BARRIERS AND BASELINE ANALYSIS:** To gauge what was hindering RE adoption and investment in Samoa at a rate required to achieve its goals, a comprehensive barrier analysis was undertaken under the IMPRESS project on the performance and reliability of existing RE power systems in Samoa. The barriers were segregated into policy and regulatory barriers, technical barriers, market barriers, financial barriers, and awareness and capacity barriers. Current and planned interventions and project activities whose objectives are aligned to that of IMPRESS were assessed, particularly the ones supported by international donor agencies and the Government of Samoa, to understand their ability to achieve Samoa's RE goals.
- DEVELOPMENT OF AN 'INCREMENTAL' IMPRESS SCENARIO:** To complement and supplement the ongoing efforts of the government towards achieving its global commitments and development priorities, an incremental RE scenario for the IMPRESS project was developed, based on assessments of the current policies, activities, legislations and institutions in Samoa. Based on the requirements of this incremental IMPRESS scenario, the prevailing technical capacity gaps which can hamper the achievement of the targets were identified. This scenario directly contributes to the energy services goal (according to which 20% of all energy services shall be supplied by RE resources by 2030) as per the National Energy Policy and Strategic Action Plan as well as the NDC goal.

To strengthen the sustainable and cost-effective utilisation of RE, the IMPRESS scenario developed five key components (see Table 1) with their own targets, planned activities and outcomes, which are in the process of implementation. These have been outlined below.

- Enhancing RE policy formulation and implementation by conducting comprehensive quantitative and qualitative analysis of key policies, analysing the RE resource potential, revision of RE targets for the national RE policy, and proposing a plan of action to meet the target. Under IMPRESS training programmes for stakeholders to develop their skills for the formulation of national energy fra-



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meworks for a robust integration of energy in development plans are being conducted. Further, based on international experiences and learnings, regulations to incentivise the private sector and communities to adopt RE will be developed through stakeholder engagement.

- ii. Improving RE systems, through a comprehensive analysis of the operating performance and reliability of RE systems (particularly biomass), and designing implementation plans for the application of technologies to enhance power system reliability and performance, and the application of biomass for both power and non-power uses. Technologies and technical capacities currently lacking will be developed.
- iii. IMPRESS will support the design of public schemes and private sector incentives to facilitate and finance feasible RE and EE technology application projects.
- iv. Feasibility studies for the potential productive and social uses of RE and for RE technology service providers are to be conducted in order to develop new business ideas for the same. Thereon, the capacities of different stakeholders such as communities, entrepreneurs and institutions will be assessed and, as required, specific trainings and workshops for strengthening their capacities will be undertaken (such as trainings on biogas system design and operation; and on efficient cook stoves).
- v. To enhance awareness on the applications and benefits of RE and EE, training courses for schools, universities, trainers, entire communities, local authorities and other relevant authorities will be developed and deployed. Further, stakeholder consultations and meetings will be conducted to form a network for information sharing and interventions on regulatory frameworks, such as the draft national RE target. Surveys are then to be conducted to gauge the awareness levels

- **OUTLINING KEY STAKEHOLDERS' ROLES AND RESPONSIBILITIES:** To oversee the development of Samoa's energy sector, a Project Steering Committee (PSC) was established under IMPRESS, which is to be chaired by the Minister of Finance, and which comprises representatives from various relevant ministries and government agencies and organisations. As the strategic decision-making body of the project, the PSC was assigned the responsibility for guiding and directing the IMPRESS project to ensure effective and efficient alignment of IMPRESS with the existing policy framework. It is also responsible for approving Annual Work Plans and monitoring and evaluation (M&E) reports, amongst others. It was decided that PSC meetings are to be held annually. The project management unit is housed under MNRE under the guidance of the PSC. It is led by the National Project Director of MNRE.

INSTITUTIONS

INVOLVED:

- **MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT (MNRE):** CMNRE is the implementing partner and responsible for communication and coordination with the Global Environment Facility (GEF) and UNDP on project management, the liaison with relevant national government agencies/ authorities and in charge of project management and implementation.
- **THE IMPRESS PROJECT STEERING COMMITTEE:** Comprises representatives from the Ministry of Finance (MOF), the Ministry of Works Transport and Infrastructure (MWTI), the Ministry of Women Community and Social Development (MWCSO), the Ministry of Agriculture and Fisheries (MAF), Ministry for Revenue (MFR), the Ministry of Commerce, Industry and Labour (MCL), the Samoa Electric Power Corporation (EPC), the Land Transport Authority (LTA), the Scientific Research Organisation of Samoa (SROS), the Samoa Trust Estates Corporation (STEC) and the Office of the Attorney General (OAG).

- **DIFFERENT GOVERNMENT DIVISIONS:** Government divisions, including the RE Division (RED), the Planning and Urban Management Agency (PUMA), the Forestry Division, the Energy Policy Coordination and Management Division (EPCMD), the Economic Policy and Planning Division (EPPD) and the Aid Coordination and Debt Management Division will be responsible for providing required data, guidance and information.

COOPERATION WITH: —

- **GEF:** Support and funding for the project and its various components comes primarily from the GEF.
- **UNDP:** As an implementing agency of the GEF, UNDP is responsible for providing technical, operational and management support for the IMPRESS project implementation phase.
- **OTHER DEVELOPMENT PARTNERS AND DONORS** are also providing financial technical assistance for components which are aligned to its objectives. These include the European Union and the Gesellschaft für Internationale Zusammenarbeit (EU-GIZ) (through the Adapting to Climate Change and Sustainable Energy programme), the International RE Agency (IRENA), the Asian Development Bank (ADB), the New Zealand Ministry of Foreign Affairs and Trade (NZMFAT) and the International Union for Conservation of Nature (IUCN).

FINANCE: —

At the project initiation stage, the budget of the IMPRESS project was estimated to be approximately USD 52 million for the entire five year period.

Of this, nearly three-quarters (~USD 40 million) were to be financed by the Government of Samoa, with the private sector contribution projected to be USD 6 million. The remaining USD 6.1 million funding were made available from GEF-UNDP.

IMPACT OF ACTIVITIES: —

The incremental scenario developed under the IMPRESS project has taken a holistic approach, outlining strategies, activities and intended impacts of these, while accounting for Samoa's circumstances and baseline policy and regulatory frameworks. Thus, a comprehensive and convincing strategy could be developed. The eventual impacts will be aligned to the project components (see Table 1), and are planned to result in the following:

- Clear and consistent policy and legal frameworks for RE development and implementation;
- Comprehensive energy integrated development plans formulated by government development planners;
- Policy measures to incentivise communities and the private sector for RE production;
- And strategic plans comprising of incentives and regulations for implementing EE in Samoa procedures for RE projects.

The achievements to date are as follow:

- **DEVELOPING TECHNICAL CAPACITY THROUGH TRAININGS:** Over 30 stakeholder meetings and workshops on greenhouse gas (GHG) abatement through EE and biofuel applications in the land transport and electricity sectors have been conducted. These include the inception meeting for IMPRESS, technical working group meetings for the 5 project components conducted quarterly, and a technical advisory group meeting at the end of every quarter.



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- **RAISING AWARENESS THROUGH STAKEHOLDER OUTREACH:** Awareness raising activities around RE were conducted as part of the IMPRESS project, directed at schools and colleges in Savaii reaching over 1000 students. Innovative approaches were leveraged to raise awareness amongst students, such as science fairs and mainstreaming the topic into ongoing curriculums.
- **ESTABLISHING A COMPREHENSIVE DATABASE FOR RE:** In order to create a robust and transparent tool for communication and sharing information, MNRE developed a RE project registry, that comprises all initiatives and activities aligned with the IMPRESS objectives, which directly contribute to the national RE goal of achieving 100% RE for power generation by 2025. Each year, a target is set for a number of projects to be implemented and captured in the registry.

WHY IS IT GOOD

PRACTICE:

- **STAKEHOLDER ENGAGEMENT:** The school awareness programmes under IMPRESS were kick-started in conjunction with a national event (the annual National RE Day) which encouraged creating communication materials such as posters. Since then, science fairs in schools have introduced the thematic focus area of RE. RE and the NDC were also introduced into the school curriculum (where permitted) as a demonstration. Further, to expand its reach, the project will leverage the findings from the Youth Employment Program (YEP), Samoa Business Incubator (SBI) initiatives and from the Samoa Women Shaping Development Program, to develop uses of RE for enhancing productive and social benefits, and contribute these to the ongoing work and activities being undertaken by YEP and SBI.
- **INNOVATION:** With an aim of demonstrating community-based business models for the implementation of biomass projects, a biomass gasification-based power generation facility is being developed under IMPRESS, with supporting innovative financing schemes for RE transition, making this a pioneering approach for the country. Further, the biomass gasification facility that is being developed under this project showcases the deployment of cutting-edge technology for power generation and grid stability support in Samoa, including the design, engineering, planning, financing, construction, commercial operation, and maintenance of this facility. Also, emphasis is put on recording all performance data to construct a data bank of key biomass-based power generation operations, such as fuel use in harvesting, processing and drying, and thermal and electrical efficiency of a gasifier. The economic and environmental impacts are also documented to support the replication of such practices in other small island countries.
- **POLITICAL BUY-IN:** The project planning and development was conducted in conjunction with the MNRE and a wide-range of local stakeholders and international experts, with its goals aligning directly to Samoa's NDC. The project activities are being coordinated via the government's RE Division on the ground, under direct oversight of the MOF in their role as leading organisation of the Project Steering Committee (PSC). The other members of the PSC are also from the relevant ministries, ensuring the project's objectives, activities and strategies have political acceptance and support.

SUCCESS FACTORS:

- **IMMEDIATE RELEVANCE AND IMPACT:** The IMPRESS project is directly contributing to Samoa's national energy plans as well as its international commitments (achieving 100% RE generation by 2025), addressing the barriers being faced in their achievement. For instance, in the IMPRESS project's assessments, it was found that there is limited data on RE resource availability and technical and human capacities for setting and achieving realistic national RE targets. Also, no specific existing policy measures were available to incentivise development of RE applications.

To address these gaps, IMPRESS developed a plan with appropriate implementation measures, including capacity building and awareness raising through stakeholder engagements. Thus, the work undertaken is highly relevant for Samoa, with the project outcomes impacting the country's development.

- ESTABLISHING A 'ONE-STOP SERVICE' FOR RE DEVELOPMENT:** To facilitate an effective implementation and enforcement of RE policies and regulations, a virtual integrated platform was established as an integral part of the RE Division of the MNRE. This platform will be used to coordinate with the various agencies involved and provide advisory services and implementation support to RE developers and investors. The website will include relevant databases and communication tools to support monitoring and reporting of RE resource supply and consumption.
- EMPHASIS ON THE USE OF RE FOR BROAD-RANGE OF ACTIVITIES:** Besides the usual focus on RE for electricity generation or industrial processes, IMPRESS also emphasises RE for productive and social use, thus broadening its appeal and scope to the larger public. Productive uses of RE include solar dryers and heaters, wood-fired ovens, or food processing activities; whereas social uses of RE include the delivery of social services such as water supply using solar PV water pumps or solar PV powered telecommunications. This broader focus of RE can raise awareness and interest among students, entrepreneurs, farmers, and more and potentially lead to more engagement and involvement of such stakeholders in the country's energy transition.

OVERCOMING BARRIERS / CHALLENGES: _____

WHAT WERE THE MAIN BARRIERS / CHALLENGES TO DELIVERY?

FINANCIAL:

There was a lack of accessible and affordable financing for RE, with limited financial incentives or support measures for their promotion.

POLITICAL:

Policies and regulatory frameworks related to RE development and implementation are inconsistent, with multiple authorities and overlapping roles and responsibilities.

INFORMATIONAL AND CAPACITY:

There was a low level of awareness and capacity at the local level, resulting in a lack of demand for RE for a range of applications

HOW WERE THESE BARRIERS / CHALLENGES OVERCOME?

IMPRESS undertakes a cost-benefit analysis of RE technologies. On this basis, it develops draft policies and financial incentives for RE initiatives that focus on improving the viability of projects to make them bankable.

Under IMPRESS, a focus is laid on the development of policies and regulations to incentivise project developers and end-users to implement RE initiatives. To facilitate this, the project has planned for an inter-ministerial collaborative for implementation and enforcement of these regulations, with relevant training programmes for them to be developed under IMPRESS.

To enhance the demand for and the adoption of RE, community-based business models for the implementation of biomass power and non-power projects are being developed under IMPRESS. These are supported with required capacity building and financial planning. Technical working groups focused on building various capacities, including a task force to integrate power system reliability, are also to be established.



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- LESSONS LEARNED:** ———
- **NATIONAL OWNERSHIP IS KEY:** Institutional arrangements and project teams were designed to enable meaningful involvement of the relevant ministries, with their priorities being incorporated and adequately addressed in framing the IMPRESS' objectives. For example, the project objectives contribute to Samoa's Energy Plan and NDC.
 - **A TRANSPARENT AND ROBUST DATABASE PROVIDES A FOUNDATION:** In the initial stages, a one-stop database with the relevant information was designed and planned for. The database was housed under the MNRE, assuring the validity and acceptance of the information collected. This turned out to be a useful tool to support the monitoring and tracking of a wide range of project activities, facilitating their deployment and ensuring their effectiveness.

HOW TO REPLICATE

- THIS PRACTICE:** ———
- **ALIGN PROJECT GOALS TO NATIONAL PRIORITIES:** Develop broad objectives, which are aligned to the national development priorities and goals, through a robust stakeholder engagement process.
 - **FRAME IMPLEMENTATION MEASURES BASED ON NATIONAL CIRCUMSTANCES:** The framework of processes and activities workflow for the project implementation should be designed in a manner that takes into account the current capacity, financial and technical resources available in the country. Implementation measures should be planned systemically to enhance these through trainings and workshops to make the objectives feasible and realistically achievable.
 - **DESIGN SUPPORTIVE ADVOCACY AND OUTREACH:** Projects seeking to impact policies should emphasise on designing effective advocacy and targeted promotional measures to improve understanding of the measures being undertaken and the targets being aimed at. A broad outreach to make the public and ultimate beneficiaries aware of the challenges and positive impacts could also help in integrating the project to national initiatives.

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FURTHER KEY

- RESOURCES:** ——— · UNDP (2017). IMPRESS Project Document. Available at: http://www.ws.undp.org/content/dam/samoa/docs/UNDP_WS_ProDoc_Signed_IMPRESS_PIMS_%205669_Samoa.pdf

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CASE STUDY

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