Scientific and Technical Advisory Panel

The Scientific and Technical Advisory Panel, administered by UNEP, advises the Global Environment Facility

(Version 5)

STAP Scientific and Technical screening of the Project Identification Form (PIF)

Date of screening: September 23, 2015 Screener: Virginia Gorsevski

Panel member validation by: Ralph E. Sims
Consultant(s):

I. PIF Information *(Copied from the PIF)*
FULL SIZE PROJECT GEF TRUST FUND
GEF PROJECT ID: 9251
PROJECT DURATION : 5
COUNTRIES : Samoa
PROJECT TITLE: Improving the Performance and Reliability of RE Power Systems in Samoa (IMPRESS)
GEF AGENCIES: UNDP
OTHER EXECUTING PARTNERS: In Samoa: Ministry of Natural Resources & Environment (MNRE)
GEF FOCAL AREA: Climate Change

II. STAP Advisory Response *(see table below for explanation)*

Based on this PIF screening, STAP's advisory response to the GEF Secretariat and GEF Agency(ies):
Concur

III. Further guidance from STAP

The key objective of this project is energy policy formulation and implementation to encourage further renewable energy (RE) electricity deployment for social development (in the aim to achieve 100% renewable electricity) along with the potential to deploy lessons learned to other small island developing states. Evaluating the performance of existing RE schemes is warranted as there are several key examples of failures in South Pacific Islands. Improving existing RE systems and their reliability is a commendable goal.

Assessing the biomass resource potential and supply chains for power generation is good, but the heat market (in the PIF termed "non-power applications" though this is more domestic scale than commercial scale) should not be neglected (e.g. for drying, food processing, sterilising, water heating, etc).

Integration of RE into the grid, linked with energy efficiency and demand side management (DSM) is complex as stated (page 8) but this is key to improving grid system performance and reliability where high shares of variable wind power and solar power exist in the mix. Dispatchable electricity from bioenergy and stored small hydro power can help make the grid more flexible. (Useful details can be found in the Integration chapter of the IPCC Special Report on Renewable Energy, (2011) (see http://srren.ipcc-wg3.de/report/IPCC_SRREN_Ch08.pdf).

Current power tariffs as presented, mostly based on diesel generation, include transmission and distribution costs. For local RE generation these can be reduced or avoided depending on the location since distribution varies between islands. At a lower world oil price, diesel costs are lower such that power tariffs based on diesel gensets may decline and RE options will become less cost-effective. However, delivered costs of diesel to the more remote islands will probably remain relatively high.

The barriers to RE systems are clearly outlined. Here financial barriers are inclusive of both energy efficiency (EE) and RE uptake whereas policy, technical, market and information barriers are only related to RE. It is not clear why this is, given that EE is integral in increasing the uptake of RE.

An impressive number of RE projects (mainly PV but some wind and hydro) have been constructed in recent years but biogas/bioenergy projects are still under development. Ensuring the biomass supply is sustainably produced is the aim of the current EU-GIZ project. The intention is to provide greater grid stability necessary if the 100% RE electricity target is to be achieved.

Technical barriers for bioenergy are mainly due to a lack of local knowledge of the various conversion system options available with the choice partly depending on the local biomass resource. Gasification appears to be selected as a main option but many small gasifier plants have failed due to tar formation, high moisture content, poor comprehension of the technology etc. Will a proven design be imported? If so, sending samples of the local biomass for pre-testing before shipping through the plant would be warranted. Will the producer gas be used to fuel an internal combustion engine to power a generator? If so how will the gas be cleaned? There is a need to select the most appropriate technologies and scale to match the local situation. Overseas experience should be sought (such as through IEA Bioenergy http://www.ieabioenergy.com/).

In many ways the aim to develop and integrate more bioenergy power generation is ambitious. The challenge of developing a reliable biomass supply system is seen as a moderate risk (page 18). It should not be under-estimated and suitably experienced personnel will need to be employed, as well as local training undertaken. The private sector will also need to be involved, for example with the collection, storage and transport of relatively large volumes of biomass. These are not included in the PIF. Will organic wastes be included, such as MSW or sewage sludge? What optimum moisture content is desired? How can nutrients removed in the biomass be recycled back to the soil?

The risk from natural disasters and potential adverse climate events is rated "low" in this project proposal; however, in Samoa's National Adaptation Plan (NAP) to the UNFCCC (http://unfccc.int/resource/docs/napa/sam01.pdf) and elsewhere, many sectors are highlighted as extremely vulnerable including infrastructure, which will add substantially to the cost of new construction. Given that many CC Adaption projects have been implemented in Samoa and the region at large, it seems there should be some connection made between this proposed effort and the numerous GEF-funded adaptation projects in order to specifically state how the risks will be mitigated. What type of systems or safeguards have the previous GEF-funded projects put in place?

How the 35 kt CO2 mitigation potential was assessed is unclear, but given the number of other related RE projects already in place, it is difficult to allocate emission reduction quantities. For the bioenergy projects, careful analysis of net carbon reduction is necessary which is always a challenge and somewhat controversial. Some helpful information can be found from IPCC analyses at http://srren.ipcc-wg3.de/report/IPCC_SRREN_Ch02.pdf and the Bioenergy Annex of Chapter 11 of the 5th Assessment Report â€“ Mitigation (http://ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter11.pdf).

With respect to Knowledge Management, how will information from this project relate to existing knowledge centres for the region such as SPREP (Secretariat of the Pacific Regional Environment Program) and the newly created Pacific Climate Change Portal (http://www.pacificclimatechange.net/)? Or the Clean Energy Information Portal â€“ REEGLE - (http://www.reegle.info/index.php?)

STAP advisory response	*Brief explanation of advisory response and action proposed*
1. Concur	In cases where STAP is satisfied with the scientific and technical quality of the proposal, a simple "Concur" response will be provided; the STAP may flag specific issues that should be pursued rigorously as the proposal is developed into a full project document. At any time during the development of the project, the proponent is invited to approach STAP to consult on the design prior to submission for CEO endorsement.
2. Minor issues to be considered during project design	STAP has identified specific scientific /technical suggestions or opportunities that should be discussed with the project proponent as early as possible during development of the project brief. The proponent may wish to: (i) Open a dialogue with STAP regarding the technical and/or scientific issues raised. (ii) Set a review point at an early stage during project development, and possibly agreeing to terms of reference for an independent expert to be appointed to conduct this review. The proponent should provide a report of the action agreed and taken, at the time of submission of the full project brief for CEO endorsement.
3. Major issues to be	STAP proposes significant improvements or has concerns on the grounds of specified major scientific/technical methodological issues, barriers, or omissions in the project concept. If STAP

considered during project design	provides this advisory response, a full explanation would also be provided. The proponent is strongly encouraged to: (i) Open a dialogue with STAP regarding the technical and/or scientific issues raised; (ii) Set a review point at an early stage during project development including an independent expert as required. The GEF Secretariat may, based on this screening outcome, delay the proposal and refer the proposal back to the proponents with STAP's concerns. The proponent should provide a report of the action agreed and taken, at the time of submission of the full project brief for CEO endorsement.