Guide to the EU-GIZ ACSE programme

Annex 1 - Template for concept notes

General guidance and instructions

1. The template is the same for CCA or SE or combined projects and should follow the structure given below;

2. Project concept notes will be assessed based on the criteria and points system provided in the Guide;

3. The questions included as a checklist in each section are the same as those that will be used in the assessment of the concept notes;

4. The assessment is based on a one question = one point scoring principle but the assessors may also use their discretion;

5. Include answers to all questions in the concepts notes. Short explanations are acceptable. Long paragraphs are not always needed;

6. Guidance on length of each section is given in the template to indicate how much detail is needed to answer each question and assist in keeping the concept notes to a maximum 4 pages length;

7. The **concept note cover page does not count** towards the 4 pages maximum length of the concept note;

8. **Once the sections have been filled in, please delete the instruction boxes (in blue).**

Concept Note Cover Page

Country (ies): Tuvalu

Location within the country(ies): National – all island groups

Concept focus:

☐ Climate change adaptation

☐ Sustainable energy

X Both

Project type:

☐ Type 1 – 200,000 Euro maximum budget

X Type 2 – Maximum budget is the country allocation

Total requested budget: 400,000

Duration of project: 24 months

Contact point:

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Support for PDD development:

Yes,

☐ No

x Undecided – suggested consultant(s) or organisation(s) to be engaged: Sarah Hemstock and Teu Manuella – PACE-SD

Concept Note – Description (4 pages maximum)

1. Project title: Sustainable Community-Based Biogas Schemes for Domestic Energy and Improved Livelihoods

2. Background and rationale (max ¾ page)

Summary:

Problems: Inequity of domestic energy access (outer islands compared with Funafuti), waste disposal problems across Tuvalu (including poor sanitation and animal husbandry practices and methane production), no food or energy security, energy poverty, fuelwood scarcity, waste disposal and landfill problems,inefficient use of "traditional" biomass energy, barriers to the expansion of cheap and effective RETs. During community consultations with all Tuvalu's island communities, the NGO Alofa Tuvalu highlighted that a "lack of training" was identified by communities as a reason for failure of many community projects.

Solutions:a) *Install small-scale biogas digestersin all islands of Tuvalu as a fuel substitute for domestic firewood, kerosene & LPG*. Why? Households will save money on the purchase of fuel which reduces energy poverty;they will improve energy security – transport of fossil fuels to outer islands is costly and unreliable; they provide a residual organic waste (digestate) which can be used as fertiliser – so set up family gardens to use this resource and improve food security. Provide sanitary housing for pigs. Digesters are a waste disposal system for organic wastes and thus prevent potential sources of environmental contamination. Digesters support small-scale industries (pig rearing, selling "fertilizer" and horticultural produce are 3 directly linked income sources). They improve quality of life –particularly for women – by reducing time collecting fuelwood and indoor smoke. Reduce methane emissions up to 70% - thus reducing GHG emissions.b) *Research the barriers to implementation of biogas technologies and research methane availability from landfill to enable its use as an energy source*. This will lead to a regional growth in the use of sustainable biomass technologies and an improvement of waste disposal problems. c) *Provide specific training on all aspects of community RET/CCA project activities* – this will tie into ASCE Component 3 (TEVET) and is a community requested intervention to enable project activities to remain sustainable.

All the activities undertaken by this project will contribute to Tuvalu's efforts to be 100% renewable by 2020.

Rationale:

The proposed project is very timely for Tuvalu and important nationally and regionally, for the following reasons:

Energy security and access are key issues relative to the activities of this project. For example, currently Tuvalu is close to being a totally oil dependent economy as 83% of its total primary energy consumption of 5.8ktoe is supplied by fossil fuels. Energy security is dependent on its ability to pay international oil companies and costs are exacerbated by geographical isolation. Oil consumption is non-negligible for essential inter-island transport (26% of primary energy consumption) and electricity generation is around 31%. The production cost of electricity for the outer islands has been estimated to be between AUS$1.64 to 1.96 per kWh (Hemstock, 2008). On Funafuti average annual household electricity consumption is between 3-8 times greater than on the outer islands. Biomass provides for around 60% of domestic energy use in Funafuti and up to 90% in the outer islands, and accounts for 0.8ktoe (14% of primary energy supply). (Hemstock & Smith, 2012).

Their **environments are under pressure from climate change** related rising sea levels and drought with obvious impacts for food and energy security. In an attempt to improve food and energy security for the Tuvalu Maritime Training Institute, the NGO Alofa Tuvalu installed a pig manure digester to provide cooking gas for a community kitchen and use the digest ate as a soil ameliorator for the school vegetable garden. Since most researchers agree on the value of biogas technologies, the Alofa Tuvalu case study and trial in the outer island of Nanumea, and the USP-EU GCCA project in Nanumaga successful examples of this type of activity in Tuvalu, project outputs should ensure the successful expansion of appropriate biogas installations across the outer islands of Tuvalu.

Reliance on aid for electricity. Due to isolation, lack of markets and reliance on aid for electricity, Tuvalu does not follow the same market and economic "rules" prevalent in the wider world (50% of Tuvalu's Aus$32 million GDP in 2008 was aid, which is tied to specific projects). For example, JICA (Japan bilateral aid) supplied 3 new 600kW diesel electricity generators and grid to Funafuti in 2005 and continue to supply AUS$1-2 million annually to pay for the diesel used by the generators. Without this annual subsidy, the people of Funafuti would not be able to afford electricity; even with this subsidy around 16% of households in Funafuti do not have an electricity supply as they cannot afford it. Gas and kerosene supplies in outer islands are expensive and unreliable. Biogas digesters will improve energy and food security in outer islands. The Best Practices and Toolkit approach proposed here should reveal market barriers/failures and the links between the economy, aid, market and business models in order to promote the use of biogas nationally and regionally. (Hemstock, 2008; Smith & Hemstock, 2011).

Linked closely to point made above, is the **policy context and international/regional context**. The proposed activities will provide "Best Practices" for the expansion of biogas technology throughout the Pacific SIDS in consideration of the following… At the World Summit on Sustainable Development in 2002, the Pacific Island Countries (PICs) launched a regional energy sector umbrella initiative: Pacific Islands Energy for Sustainable Development (PIESD). The main objectives of this were aligned with the objectives of the Pacific Islands Energy Policy (PIEP) (Rarotonga Declaration, 2002) namely: "i) Increased availability of adequate, affordable and environmentally sound energy for the sustainable development of all Pacific islanders; and ii) Accelerated transfer and adoption of clean and renewable energy technologies in the Pacific". During a joint mission in 2003, the EC and Danish government identified two priority areas for co-operation under the EUEI. One of these was PIEPSAP and the other was capacity building and energy efficiency for PIC electric power utilities – recognising the high electricity generation costs & low efficiency throughout the region. PIGGAREP was approved by GEF late August 2006 but practical RET projects have yet to gain a firm footing throughout the region and Tuvalu has developed energy policy and strategies via PIEPSAP.

The lack of access to energy for the rural poor of Tuvalu in practical terms appears to indicate that there are inherent difficulties with previous strategies. The "Biogas Toolkit" developed as part of this initiative - for local government and their planners - willaccount for these factors and should lead to the wider implementation of biogas technologies across the Pacific SIDS. The practical installation of 64 digesters should ensure "concrete" action for domestic energy services, improved energy and food security and livelihood opportunities for communities. All activities are in line with the policy context outlined above.

Population pressures have an increasingly negative effect on SIDS causing additional environmental degradation from stresses such as: municipal solid waste (MSW) and sewage disposal. Funafuti lagoon is used as a bathroom for around 2000 people (just under half Funafuti's population) leading to algal blooms; lack of infrastructure for sewage disposal and lack of space for landfill (Tuvalu's

largest landmass is 520ha and smallest inhabited is 42ha) combined with increased imports of packaged and non-renewable goods all mean that there are huge waste disposal problems. PaCE-SD has already conducted a study on the use of algae from Funafuti lagoon as biogas digester feedstock. MSW as a feedstock has promising potential for biogas generation and should be considered as a viable resource of methane for electricity production in line with the policy/regional context outlined above.Research carried out by this initiative could be used to support applications to EDF 11, as waste disposal and energy have been highlighted as priority areas. All activities are in line with the Tuvalu National Energy Policy, the Te Kakeega II and the Tuvalu Governments desire to be 100% renewable by 2020. Although there is no comprehensive waste management strategy for Tuvalu, the proposed action does fall in line with the National Environment Management Strategy and the National Integrated Water Resource Management : Diagnostic Reports, and the 2 ADB, 1 EU, 1 RoC Taiwan and 1 UNEP waste management assessment reports published since 2006.

3. Objective (s) (two to three sentences)

The project aims to strengthen the capacity of Tuvalu's outer island communities' to adapt to the adverse effects of climate change and to enhance the use of appropriate biogas technologies regionally.

Expected project outcomes (max ¼ page)

Outcome 1. Enhance sustainable livelihoods in the outer island communities of Tuvalu;
Outcome 2. Improve outer island energy security;
Outcome 3. Improve outer island food security;
Outcome 4. Reduce problems caused by waste disposal;
Outcome 5. Enhance the take-up of biogas technologies nationally and across the region.

1. Targeted outputs (max ½ page)

Output 1. Domestic scale digester operations – delivery, installation and operation
Delivery, installation and operation of small-scale biogas units to be sited in a minimum of 5 communities across Tuvalu (feedstocks to include animal waste, human waste, algae from Funafuti lagoon). (contributes to all outcomes).
Delivery and installation of water tanks and catchment collection to support the use of the installed digesters, improved animal husbandry, and to support horticultural production. (contributes to all outcomes).
Set-up of a minimum 8 family/community gardens for horticultural production. (contributes to outcomes 1 and 3)
Output 2. The production of a "Biogas Toolkit" and "Best Practices" report.(contributes to all outcomes with particular reference to outcome 5)
The "Biogas Toolkit" (in local language) should provide local planners (Tuvalu) with a guide to implementing successful biogas installations. The toolkit will include information such as lists of materials, materials suppliers and tank manufacturers, information on shipping companies and routes. Appropriate regional businesses, industrial suppliers and shipping companies will be consulted as to what they can offer. The focused scope of this output should ensure that the toolkit will break down barriers linked with the actual purchase and supply of required materials.

The production of a "Best Practices" report. Biogas digestion technology has been demonstrated across the project ambit with varying degrees of success. This is intended to support the use of biogas technology by communities across the region by investigating site specific solutions for site specific issues. Case studies will examine all identifiable factors that may influence success or failure (technical, social, environmental, financing, institutional and governance issues – and including impacts of livelihoods, food security and health).

Output 3. Development and Delivery of 3 TVET Courses.

Courses will be developed in consultation with communities to support the installation, operation and maintenance of the digesters and associated infrastructure. Possible courses may include: digester construction, installation, operation, maintenance, horticulture, composting, animal husbandry, health and nutrition. These will be developed and delivered in consultation with ACSE Component 3. The courses developed under this project are specifically for the activities outlined in this proposal. Once the PACTVET project is further developed, it is hoped that the benchmarking and accreditation strategies developed under PACTVET will be able to be applied retrospectively to provide meaningful qualifiers/benchmarks to the knowledge and skills acquired from participating in the courses developed and run under this project.

Output 4. Assessment of Methane Emissions from Landfills in Tuvalu (contributes to outcomes 2, 4, and 5)

To determine the amount of methane generated and to assess the viability of landfill methane recovery which can be further explored as a biogas renewable energy option.

M&E - Initial studies will be carried out in selected communities to set a baseline for monitoring & evaluation. Baseline data (including gender analysis) will be used to estimate any improvements to household income from biogas implementation activities. Research studies will also examine both energy related & downstream economic activities (livelihoods) associated with the biogas production activities and will for part of M&E.

Output 5. Design and implement a biogas compressor (contributes to all outcomes)

This should immediately benefit project activities undertaken by the NGO Alofa Tuvalu and the Government of Tuvalu, Department of Home Affairs community biogas project, and the USP EU GCCA community biogas activities. An appropriate manual compressor and filtration system would account for the safe usage and easy and safe storage into "off-the-shelf" commercial gas bottles for later use. This would also be applicable to scale up.

2. Beneficiaries (max ½ page)

This project has the specific priority of focusing on energy service provision for the lowest income earners - **the rural poor in the outer islands of Tuvalu** and those in the expanding squatter areas of the larger settlements (Funafuti). Activities will benefit at least 200 households and all 8 local governments.*How will they benefit:*By facilitating improved access to domestic energy services and associated benefits via implementing and researching best practices that will lead to the expansion of the use of biogas technologies. Hemstock (2008) has shown that if biogas initiatives were to be widely implemented in Tuvalu, there would have significant economic impacts. For the lowest income deciles (75% of whom live on the outer islands), household expenditure on domestic energy services currently represents 21% of total current household income, and those in the lowest income deciles on Funafuti would spend 61% of their total income to purchase an average level of energy services. However, benefits from biogas-related income generating activities (such as pig

keeping, family gardens – using digestate as fertilizer, substituting LPG and kerosene), will offset this expenditure by a minimum 10% (Hemstock &Radanne, 2006; ADB Tuvalu Household Income and Expenditure Survey 2004/05). As a minimum bench mark, the community/ communities where best practices are implemented should at least achieve a 10% reduction of income spent on energy services.

This research will also benefit the **researchers** and **students** directly involved in the project. *How will they benefit:* Outputs will include: TVET courses; Research; Best Practices Report; and Biogas Toolkit - available on USP knowledge centre – facilitating learning and development across communities (including outer island communities and communities of researchers).

Local government (policy implementers) and **regional businesses** and **industries** should also benefit. *How will they benefit:* The "Biogas Toolkit" should provide local planners with a guide to implementing successful biogas installations. The research on methane availability and the development of compressors and filter units will benefit the scale up of the technology and local businesses and entrepreneurs.

The communications strategy will include contact with **national and regional governance structures**, who should benefit from the results of this research. *How will they benefit: W*ith a continuation ofpolitical support for "concrete" community actions, this technologycould have both national and regional significance in contributing to future policy strategy/activity development.

3. Indicative budget (max ½ page)

Item	Indicative budget (EUR)	*Notes*
Bio Digestor Unit Materials	153,925.20	*8 digestor units per island in 5 islands including freight*
Research Cost	39,000.00	*Research Cost*
Consultancy	29,250.00	*15,000 in consultancy fees per island for installation of biodigestor units*
Course Development	17,550.00	*3 course development in renewable energy*
Equipment	33,150.00	*Equipment costs for project activities*
Best Practice Field Work	19,500.00	*Costs associated with field work required to compile best practices report*
Project Management Costs		
Project Coordinator	23,400.00	*Project Coordinator Salary*
Monitoring and evaluation	11,700.00	*Costs involved with montioring and evaluation*
Travel and Subsistence	21,450.00	*Travel from Fiji - Tuvalu and within Tuvalu*
Communication and visibility	19,056.65	
Total Expenditure	**367,981.85**	
Indirect Cost (7%)	25,758.73	
TOTAL	**393,740.58**	

*Breakdown of "PER COMMUNITY" equipment costs – these costings are based on actual project costs for the USP EUGCCA project. Freight is included in the "Unit Materials and Freight" budget line as it is arranged by equipment suppliers, as evidenced by the attached purchase orders from the USP EUGCCA project. (Additional freight costs for transport of freight from Funafuti to outer islands is also included in the Unit Materials and Freight budget line in the "Indicative Budget" above).

Per community equipment costs:

Items	Unit Price ($)	Quantity	Cost
Plastic Tanks 2000 liters	650.00	8	5,200.00
Plastic Bio-Digesters	1,500.00	8	12,000.00
Gas Stove (for bio-digesters)	220.00	8	**1,760.00**
Sand/gravel			**10,000.00**
Hardware items	2,000.00	8	**16,000.00**
Total (FJD)	4,370.00		**44,960.00**

Example Purchase order in FJ$ for freight and equipment:

Vinod Patel
complete home and building

VINOD PATEL & CO. LTD
GPO Box 14416
Suva
Fiji

Phone: +679 3397290
Fax : +679 3397049
E-mail: enquiry@vinodpatel.com.fj
Website: www.vinodpatel.com.fj

INVOICE

TIN: 50-04527-0-7
EXPORT

CUSTOMER:

THE UNIVERSITY OF THE SOUTH
PACIFIC
LAUCALA CAMPUS
SUVA
Cust # 118848

DELIVERY TO:

THE UNIVERSITY OF THE SOUTH
PACIFIC
FOR NANUMAGA COMMUNITY PROJECT
TUVALU
southern pearlv70
Order No: P0123127

INVOICE NO: 1066814
DATE: 27/08/13
PAGE NO: 5
DUE DATE: 30/09

Line #	Product No	Description	Qty	Uom	Unit Price	Total
		BRASS w/CP LEVER ARM #PEX-600				
00190	40203201	IPLEX PVC PRESSURE VALVE SOCKET 15mm #813.15	28	EA	0.68	19.04
00195	60110362	EW S/S BUCKET RING NO24 /SS-251	7	EA	39.00	273.00
00200	11917004	CEMESTIC 4LT	7	EA	24.00	168.00
00205	X9917502	OTHER CHARGES TIMBER FUMIGATION	1	EA	250.00	250.00
00210	X9917500	PACKING & DOCUMENTATION CHARGES	1	EA	400.00	400.00
00215	X9917400	FREIGHT CHARGES	1	EA	3500.00	3,500.00

4. Project management (max ½ page)

*Name the **lead national agency**:* Department of Energy, Government of Tuvalu (DoE)

*Name the **national implementing agency:*** Department of Energy AND Home Affairs (Local Government: Kaupule

*Name the **implementing partner**(s) :* Pacific Centre for Environment and Sustainable Development, The University of the South Pacific. (PaCE-SD)

Proposed steering structure. PaCE-SD will lead the project in consultation and collaboration with the DoE and Kaupule. All equipment listed under Output 1 will be property of the respective island Kaupule and will be managed by them (based on the successful experiences of the USP EUGCCA and Alofa Tuvalu biogas initiatives). An MoU will be developed and signed by the three agencies to comprehensively outline the role and responsibilities of each party and to capture the spirit of collaboration in jointly implementing and managing the project. The daily management of the project will be by a Project Management Unit. The PMU will be co-hosted by the partners and is responsible for the overall daily management of the project in terms of carrying out the project activities and the expectations of the project. The PMU will consist of representatives from DoE, Home Affairs, PaCE-SD and the Project Coordinator (part-time). The Project Coordinator will be a PaCE-SD employee, based at the USP Tuvalu Campus and will work in direct consultation with DoE, PaCE-SD and Home Affairs.

DoE and Kaupule (Home Affairs) have worked on similar projects with Alofa Tuvalu – "Small is Beautiful" – incorporating biogas units in TMTI Amatuku (funded by the French Agency of Foreign Affairs – Funds Pacifique); and with the Nanumea biogas project (funded by UNDP). Each island

Kaupule will have "ownership" of the project assets and make all decisions concerning the siting of equipment and long term management of equipment. This approach is described in the attached supporting document "Pacific Voices Chapter". Kaupule and DoE nominated personnel within each community will participate in all project trainings and would then be expected to contribute to the sustainability of project initiatives.

PaCE-SD has worked with the Kaupule to install biogas digesters in Tuvalu under the USPEUGCCA project. PaCE-SD also has significant experience with research on biogas technologies – including research on the use of algal bloom in Funafuti lagoon as a feedstock for biogas production.

PaCE-SD will be the agency responsible for financial accounting, technical arrangements and reporting. Technical arrangement and reporting will be in consultation and collaboration with DoE. This is to ensure national capacity is not burdened by the administrative aspects of the project.

This project will also build on the community consultancy work, rapid assessments, vulnerability and adaptations assessment and community participatory adaptation plans already carried out by the Alofa Tuvalu Small is Beautiful and the USP EUGCCA project.

The proposed steering structure has been successful in implementing similar initiatives in Nanumea and Nanumaga communities. It is also the subject of 2 research papers which deal with local governance structures and climate change adaptation initiatives. (Chapter in Pacific Voices: Local Governance and Climate Change, USP Press, 2004; Chapter in Biomass Assessment Handbook, Routlidge/Earthscan, In press). Please note, that as this structure has proved successful in the past, it is proposed to maintain this structure for the proposed project. **Additionally, this structure has lead to "mainstreaming" similar initiatives into Kaupule (local government) plans and budgets, which should ensure future sustainability of the proposed initiatives. Additionally, all project partners are aware of the steering structure and are willing to work within the proposed structures.** Based on the structure of the highly successful USP EUGCCA project, at this stage it is envisaged that the Project Coordinator will be an employee of PaCE-SD USP and will be based at the USP campus in Tuvalu.

5. Complementarity and replicability (max ¼ page)

Nationally this builds on the projects implemented by Alofa Tuvalu and the USP-EU GCCA and is complementary to their climate change adaptation initiatives. Additionally, the TVET element of this initiative will complement ACSE Component 3, and will be carried out in conjunction with this.

Research elements of this project and the production of a Biogas Toolkit and Best Practices report are specifically designed to provide replication potential at local, national and regional levels (as appropriate). Additionally, Tuvalu's potential methane generation from waste and means of collecting, compressing, storing and transporting biogas will be researched specifically in a Tuvalu context.

6. Sustainability and risks (max ¼ page)

Training was the key to sustainability identified by communities as part of the Alofa Tuvalu "Small is Beautiful" project. This initiative contains training outputs that should ensure project sustainability. National implementation will provide "clusters" of similar installations, making maintenance and repair a viable business opportunity – particularly as training will be provided. Mainstreaming - ownership of installed equipment by the Kaupule has enabled the USP-EUGCCA biogas installations to be included in the Local Government budget schemes and active management ensures that if a household is not using the equipment, it is moved to a household where it will be used. Additionally, the USP EUGCCA project is building Locally Managed Climate Change Adaptation Networks

nationally and across the region that will also promote mainstreaming and long-term sustainability. The Biogas Toolkit and Best Practices report should also promote sustainability by providing enterprise routes. Research on landfill methane production may lead to further funding under EDF 11.

A Selection of Risks: **Insufficient time and resources to complete the project** – this has been worked out thoroughly at the project application stage and is based on previous initiatives. **Lack of capacity in country to implement project activities** – PaCE-SD have been identified as the implementing organisation.**Selection of implementation sites and activity focus politically influenced and insufficient ownership of the project by communities** – Kaupule will manage site selection. The units are mobile and can be moved if they are not being used.

7. Timeline for planned measures (max ¼ page)

Activity	Year 1				Year 2			
	1st Quarter	2nd Quarter	3rd Quarter	4thQuarter	1st Quarter	2nd Quarter	3rd Quarter	4thQuarter
PMU - Community Consultation								
Output 1 - Delivery and Installation								
Output 1 - operation								
Output 2								
Training needs (with ACSE Comp.2)								
Output 3								
Output 4								

8. Stakeholder engagement in concept note development (maximum three sentences)

Community consultations' and assessments carried out by Alofa Tuvalu Small is Beautiful and USP EUGCCA projects have been used in the development of this concept note.

This note has been developed by the 3 implementing agencies: Department of Energy, Home Affairs and PaCE-SD, USP.