Project Profile

Waste-to-Energy, Apia, Samoa

Introduction

The Samoan Government has recognized that as Samoa develops so the solid waste issues challenging Samoa will grow. After a review of three potential Pacific Island countries in January 2000, SPM selected Samoa as the preferred site for a solid waste MC-PPP development. In addition to the development of an integrated municipal solid waste management system, SPM also proposed a pilot study to test the technical feasibility of low cost renewable energy from waste.

In addition to the innovative business structure for this facility in Samoa, the waste-to-energy trial was developed to test the viability of low cost in-ground anaerobic digestion without heating, sludge transportation or mechanical mixing. The project goal is to generate sufficient value from the bio-gas output to fund the disposal of solid waste in Apia and, in time, for all of Samoa. In addition to this core development, SPM is also promoting community awareness, waste reduction, recycling and community training.

Technology/Innovation component(s)

SPM sought proposals from technology suppliers globally and eventually settled on a New Zealand company that was established by the NZ Government in the early 1970s. Waste Solutions Ltd clearly understood what SPM were seeking and had sufficient confidence in their technology to pioneer the work. The technology for low-cost in-ground anaerobic digestion of putrescible waste is well understood. The trial is not examining if it will work but rather how it will best work and how viable it will be in a commercial sense.

The project has broken new ground in Samoa and will have wide application in the South Pacific by addressing a high profile environmental problem with innovative structuring, rigorous environmental standards and applicable innovative technology. The project also has significant South-South applications throughout the Pacific Islands and the developing world overall. In simple terms, it could change the way solid waste is treated. One of the interesting additional benefits is the high level of methane gas capture which has very significant green-house gas emission benefits making Carbon Trading a meaningful part of the business equation.

The private sector partners in this project are the New Zealand technology suppliers and a significant number of New Zealand contractors and manufacturers. All of the hardware for the trial is coming from New Zealand. As soon as the trial is proved viable, investors will be sought to develop and manage the integrated solid waste and waste-to-energy facilities. Spin-off projects include the following:

- Recycling
- Medical Waste Disposal
- Hazardous waste tracking/disposal
- Energy use from bio-gas production
- Environmental monitoring support to Government
- Urban infrastructure development support to Government
- Promotion of other forms of renewable energy

Beneficiaries

The beneficiaries of this project will be the people of Samoa in that a well managed and integrated waste collection, treatment and disposal system will be established using PPP principles meaning it will be sustainable long-term. There will be public health benefits in that the risks inherent in improperly disposed wastes will be greatly reduced. There will also be other poverty alleviation benefits such as the employment opportunities created by the new facility and the spin-off projects. The PPP will have local entrepreneurs in the partnership supporting the Government's efforts to foster the expansion of the local private sector.

Capacity building and institutional strengthening activities within the Government Departments that will be the public sector partners in this PPP are an integral and on-going element of this project. The Ministry of Natural Resources and Environment which is the principal public sector partner are closely involved with the project and have already provided public sector equity for the eventual PPP business in the form of land, power and water for the technology trial.

Community participation has also begun in that local NGOs are involved in the implementation of the recycling programme. These networks have been used to facilitate community consultation for SPM about the most effective way to introduce a comprehensive recycling scheme for Apia and, in time, Samoa.

It is anticipated that the waste collectors already providing this service will be incorporated into the new integrated system as local private sector partners in the project. Local contractors were used to construct the technology trial and local investors will be invited to be a part of the commercial partnership when it is developed. As mentioned, New Zealand technology providers and manufacturers are already involved in the project and other off-shore interests will be invited to invest in the PPP when it is established.

This project will provide for the first time in Samoa, and for any small island developing state in the Pacific, the ability for consumers to comprehensively recycle in a similar fashion to what is possible in developed nations like Australia and New Zealand. The Samoan Government already runs a number of annual environmental campaigns plus environmental curricula in the education system designed long-term to change people's attitudes towards waste. Providing a recycling scheme and a more efficient waste collection system will underpin these efforts and encourage more careful approaches to waste products at the household level.

Global long-term benefits

The capture of methane gas from the anaerobic digester process will have significant green-house gas emission benefits. As this technology is likely to be replicable in other small island states and developing countries in general, this will have long-term and far-reaching benefits globally.

Achievements

The Government of Samoa has made formal commitments to this project and has already provided the land for both the technology trial and the waste facility, plus power and water for the same. The recycling scheme and the associated community education programme has been designed and will be implemented by the end of this

year. This model of integrated waste management has been profiled at a variety of Pacific regional conferences, and was highlighted at the World Summit on Sustainable Development.

Problems addressed/overcome

Problems with the construction of the components for the trial were overcome and construction was completed January 2003. SPM are now seeking approval to import seed sludge into Samoa to kick start the anaerobic reaction. On-going consultation with the Samoan Government about the community awareness aspects of the project plus networking with the NGO community has ensured that the education campaign associated with the recycling scheme and later aspects of the waste project should proceed smoothly.

Verifiable indicators

1. The technology trial to provide scientific evidence that will prove the viability of the technology for anaerobic digestion.
2. Apia township to have a comprehensive waste collection system in place that is integrated with the waste to energy proposal.
3. The PPP to manage the waste facility.

Project Stakeholders

1. The Ministry of Natural Resources and Environment of the Government of Samoa is the main public sector partner but the Ministry of Health, the Ministry of Education and the Ministry of Tourism are also potential partners in the PPP.
2. SPM.
3. NZAID.

Scale of project site

The initial trial will occupy approximately 0.5 ha. It is expected that this will increase as peripheral activities (recycling, sorting etc) are developed

Economics/Finance, Cost of project
Achieved financing: SPM's costs funded by NZAID; Recycling trial funded by PIE (NZAID); Costs of technology trial funded by NZAID.

Self-Sufficiency / Longer-term financial plan

As the management and operation of the waste facility will be designed as a Mixed-Capital Public Private Partnership, it will be constructed as a commercially viable venture which will be sustainable long-term. Based on SPM's business plan for this partnership, if the Government of Samoa carried on with the current approach to waste management, it would cost them about USD17 million over 20 years. However by adopting the MCPPP business model, the facility will generate an internal rate of return of around 20 percent over the same time-frame. The spin-off projects mentioned earlier will also be set up as PPPs to ensure they too are sustainable long-term and commercially viable.

The Future

The immediate next stage is to construct the in-ground anaerobic digester for the technology trial. The trial will then run for approximately eight months to test the technology and to prove its viability for wide application. During this time, SPM would like to begin developing the spin off businesses under the MC-PPP principles and to review the applicability of this approach for other Pacific island countries.

Potential for replication

There is high potential for replication. In June 2002, SPM conducted a project evaluation mission to Fiji during which the Fijian government advised of their interest in developing a PPP to run a new waste facility for Suva. Based on the information provided, this facility could also use an anaerobic digester and the other treatment and disposal technology being planned for Samoa. It could also be managed as an MC-PPP business.

Pacific Island governments have become aware of this approach to the management of waste facilities and are interested in it principally because it obviates the need to take on more national debt to fund these sort of infra-structure projects. SPM has been asked to evaluate other projects in the Marshall Islands, and Palau.