

Practical Action Project Proposal Form

Principle Liaison: Steven Hunt

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Address: Practical Action Consulting, The Schumacher Centre for Technology and Development, Bourton Hall, Bourton-on-Dunsmore, Rugby, Warks, UK

Telephone number: 01926 634497

Website: www.practicalactionconsulting.org, www.practicalaction.org

Work of Your Organization (department specific):

International development consulting services on technology issues to NGOs, Governments, Donors, International Organisations and the Private Sector

Size and Age of Your Organization:

Practical Action Consulting was established in 1968 and has around 20 staff in 6 offices internationally and is the consulting arm of Practical Action which was established in 1966 and has around 500 staff in 8 international offices.

PROJECT TITLE: Developing the next generation of solar lantern

KEY QUESTIONS: To what extent has the Glowstar Solar Lantern been a success? How sustainable have installations of the lantern been? Which configurations of the lantern have been most successful in which market segments. What specifications and general design (considering LEDs in particular) would a next generation model have to better address the need for rural lighting in Africa, and Kenya in particular.

What can the student expect from PA:

Initial face to face meeting, document/contacts exchange, interim review, feedback on final report, presentation of report at Practical Action.

Local Situation:

The project will focus on the situation in Kenya where a number of lanterns were sold and distributed under a Rotary Club supported project.

Full Description of Problem/Need:

In the late 1990's and early 2000's PAC developed a solar lantern product with support from DFID to address the challenge of lighting in off-grid situations in the developing world. The Glowstar product was a ground breaking project, won a number of design awards, was transferred into manufacture with a private company for global distribution and spawned a wide range of similar products. The product continues to be produced and sold worldwide but with sales in the 10's of thousands rather than the hundreds of thousands, it has not spread as far as the need and new technology options now present themselves including improved LEDs. This project aims to assess the success of the

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project to date at international level and at the local level with a particular emphasis on the Kenyan scenario. The researcher will then recommend a specification for a next generation lantern and delivery mechanism which might more broadly address the rural lighting needs globally.

How will the local community use/implement the proposed technological solution?

If this is not the outcome desired, please describe the desired outcome.

The outcome would be a usable analysis of what has been positive and negative about the Glowstar development and what type of product and mechanism may address the wider lighting need. If successful this project may lead to a new lantern development or modification of the existing delivery system of the Glowstar to developing communities, particularly in Kenya.

What Benefit will this provide for the community? Will the benefit be dependent on receiving training?

This is a research project which would provide information as an input to a possible future programme design.

Project Time frame:

Flexible

Funding available:

Currently none but a possible application could be made with the input of a successful student applicant.

Travel Required?:

Ability to travel to Kenya would be a significant advantage.

Level/Discipline of Student required:

Masters Level or exceptional final year undergraduate. Any discipline with a technical and design component. Marketing and social science interest an advantage.

Selection Process:

Apply to Engineers without Borders in conjunction with supervisor.

Please recommend useful background reading or resources:

www.glowstar.net

<http://lightingafrica.org/>

http://www.practicalaction.org/?id=solar_power

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PROJECT TITLE: Developing a Micro-hydro Franchise Model for rapid scale-up

KEY QUESTIONS: Can lessons from global franchise models be incorporated in developing a package for scale-up of micro-hydro installations globally, and in particular in Africa. Could this approach accelerate scale up, focus and leverage financial support, lower system cost, improve system quality and reliability, and lower the barriers to scheme development by? Could this approach address barriers to scale-up in Latin America where strong Practical Action capacity exists but new delivery models to spread successful models and build support for scheme funding are needed?

What can the student expect from PA:

Initial face to face meeting, document/contacts exchange, interim review, feedback on final report, presentation of report at Practical Action.

Local Situation:

The project will focus on the situation in Latin America, particularly Peru while considering other countries in the region.

Full Description of Problem/Need:

Practical Action has been a leading proponent of micro-hydro since the 1980's and has had considerable success with the technology in Peru, Sri Lanka and Nepal in particular. With the technology at a reliable and known level, the economics proven and with management models now tried and tested - there is a huge potential to push out with this technology into all rural areas in which the appropriate water resources are available. In Latin America in particular, strong capacity

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exists in the Practical Action office in Peru but still scale up is at a rate of 5-10 schemes per year. A new type of delivery model may be required to spread the technology faster and wider now it has been proven through the NGO model. This project will explore whether a franchise business model could be applied to the micro-hydro models developed by Practical Action with a view to engaging more individuals and institutions in the development of these systems.

How will the local community use/implement the proposed technological solution?

If this is not the outcome desired, please describe the desired outcome.

The outcome would be a systematisation of the Practical Action micro-hydro model, an assessment of the market for this type of scheme, an assessment of the success and weakness of franchise models (including in restaurants etc) against other business models and propose an approach to scaling up Practical Action's micro-hydro model on this basis with a focus on Latin America.

What Benefit will this provide for the community? Will the benefit be dependent on receiving training?

This is a research project which would provide information as an input to a possible future programme design.

Project Time frame:

Flexible

Funding available:

Currently none but a possible application could be made with the input of a successful student applicant.

Travel Required?:

Ability to travel to Peru and/or another Latin American country would be a significant advantage.

Level/Discipline of Student required:

Masters level or exceptional final year undergraduate. Any discipline with a component of business planning. Technology Innovation relevant MBAs encouraged to apply. Spanish skills essential.

Selection Process:

Apply to Engineers without Borders in conjunction with supervisor.

Please recommend useful background reading or resources:

http://practicalaction.org/?id=micro_hydro

http://practicalaction.org/?id=smallscale_hydro

<http://www.solucionespracticas.org.pe/>

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PROJECT TITLE: Enabling connection of Micro-hydro installations to the Grid

KEY QUESTIONS: How can technical, organisational and regulatory barriers be overcome to connect previously off-grid micro-hydro installations to the grid? In the Sri Lankan context in particular, what are the prospects for connecting micro-hydro systems to the grid and what are the potential solutions? Will the new net metering proposal in Sri Lanka actually enable this on its own?

What can the student expect from PA:

Initial face to face meeting, document/contacts exchange, interim review, feedback on final report, presentation of report at Practical Action.

Local Situation:

The project will focus on Sri Lanka where some well functioning micro-hydro systems are in villages now being connected to the grid. In these cases the system and the social institutions around them can fall out of use and fossil fuel based power can replace them.

Full Description of Problem/Need:

Practical Action have been involved with promotion of Micro-hydro internationally since the late 1980's. In some cases the grid has reached the villages with these installations and the systems fall out of use. As a locally generated zero carbon form of energy there are strong arguments and interests in connecting these systems to the grid as micro-generators. This would then also act as income generation for the community and a source of green power for the grid. As in many

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countries, including the UK, there are perceived technical, institutional, regulatory and financial barriers amongst others to this connection.

How will the local community use/implement the proposed technological solution?

If this is not the outcome desired, please describe the desired outcome.

The outcome would be a process and approach to grid connection of micro-hydro systems in the Sri Lankan context in particular which if promising would be considered for promotion in Sri Lanka. Such communities could establish themselves as Independent Power Producers supplying to the grid via new provisions put in place to apparently assist in this type of situation.

What Benefit will this provide for the community? Will the benefit be dependent on receiving training?

This is a research project which would provide information as an input to a possible future programme design.

Project Time frame:

Flexible

Funding available:

Currently none but a possible application could be made with the input of a successful student applicant.

Travel Required?:

Ability to travel to Sri Lanka would be a significant advantage.

Level/Discipline of Student required:

Masters Level or exceptional final year undergraduate. Preferred Electrical/Electronics Engineering Specialism.

Selection Process:

Apply to Engineers without Borders in conjunction with supervisor.

Please recommend useful background reading or resources:

http://practicalaction.org/?id=micro_hydro_expertise

http://practicalaction.org/?id=region_south_asia

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PROJECT TITLE: **Developing the production and use system for locally produced Ethanol** (could be one or two linked projects on production/distillation and stoves/appliances)

KEY QUESTIONS: **Is it practical and cost effective to produce ethanol as a household fuel in micro-distilleries? What are the international experiences and best practice technologies for distillation and stoves? In Kenya in particular, what are the prospects for ethanol use as a household fuel using the GAIA stove in Ethiopia as a model? Is it possible to only use waste molasses from sugar cane so as to avoid conflict with food and agricultural use? Can this fuel be cost effective enough to be available to the poor and what policies/regulations are required to ensure that it does not end up as a transport fuel for the rich?**

What can the student expect from PA:

Initial face to face meeting, document/contacts exchange, interim review, feedback on final report, presentation of report at Practical Action.

Local Situation:

The project will focus on the situation in Kenya and draw on the experience from Ethiopia.

Full Description of Problem/Need:

Practical Action Consulting is a leading partner in the DFID PISCES Energy Research Programme Consortium which is developing technologies and policies which will support the development of improved energy access and livelihoods in rural areas through bioenergy. A proposal has been made by Kenyan partners for the development of an ethanol as a household fuel pilot project to assess the suitability of the award-winning GAIA Ethiopia ethanol stoves model in Kenya. The proposal is to use

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waste molasses to distil ethanol and distribute the Cleancook ethanol stoves via a system where stoves are subsidised against future fuel purchases. PISCES proposes to consider in particular the delivery model and value chain aspects of this proposed project with a view to how they can support improved energy access and rural livelihoods.

How will the local community use/implement the proposed technological solution?

If this is not the outcome desired, please describe the desired outcome.

The outcome (of perhaps two linked projects) would be a review of the state of the art in 1) micro-distillation technologies and delivery models and 2) Stoves technologies and delivery models: with a view to which would be most appropriate in the Kenyan context where the pilot will be undertaken. Analysis would also include review of the success of the Ethiopia case and it's relevance for Kenya. The sustainability of ethanol production from Sugar cane at the scales proposed would also be assessed and reported.

What Benefit will this provide for the community? Will the benefit be dependent on receiving training?

This is a research project which would provide information as an input to programme design under the PISCES Project. If investigations prove positive then funds are in place to initiate in 2009.

Project Time frame:

To start as soon as possible, not later than Mar-Apr 09. To be complete by Sept-Oct 09.

Funding available:

Some match-funding is available through the PISCES project for possible travel to Ethiopia or Kenya as required and/or equipment shipping and testing.

Travel Required?:

Ability to travel to Ethiopia (March 09) or Kenya would be a significant advantage. A more technical focussed project could import stoves required and conduct assessments in the UK.

Level/Discipline of Student required:

Masters level or exceptional final year undergraduate. Particularly suitable for Chemical Engineering or Process Engineering (Distillation) and mechanical/product design engineering (Stoves).

Selection Process:

Apply to Engineers without Borders in conjunction with supervisor.

Please recommend useful background reading or resources:

www.pisc.es.or.ke

http://practicalaction.org/?id=consulting_200655

<http://www.projectgaia.com/>

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PROJECT TITLE: Modelling Rural Bioenergy Markets in Sri Lanka using Systems Dynamics Tools

KEY QUESTIONS: Can Systems Dynamics be used to accurately represent the present and past dynamics of rural bioenergy markets? Can it model responses to possible policy approaches and in so doing assist in defining the most appropriate policy tools to support more sustainable and equitable production and consumption systems? Can these tools be used as a communication and advocacy tool to encourage more optimal and efficient planning in the Sri Lanka biomass context in particular, with a view to natural resource, financial/livelihoods and carbon emission outcomes.

What can the student expect from PA:

Initial face to face meeting, document/contacts exchange, interim review, feedback on final report, presentation of report at Practical Action. Feedback on models produced on an ongoing basis.

Local Situation:

The project will focus on the situation in Sri Lanka using document produced in a participatory market mapping at end January 2009 as the basis for modelling.

Full Description of Problem/Need:

Practical Action Consulting is a leading partner in the DFID PISCES Energy Research Programme Consortium which is developing technologies and policies which will support the development of improved energy access and livelihoods in rural areas through bioenergy. As part of this project we are developing understanding of rural markets for bioenergy including natural bioresources, bioresidues from agriculture and industry, and purpose grown biofuels. Practical Action participatory market mapping methods have been used to map rural bioenergy markets with the inputs of the

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participants themselves. It is hoped that by applying Systems Dynamics modelling to these maps a better understanding may be developed of how technology and policy choices may influence the system in order to develop more sustainable and equitable bioenergy markets in rural areas. In Sri Lanka there are high levels of natural biomass resources and plantation potential but no fossil fuel resources at all, so sustainable improved utilisation of biomass has great potential in the country.

How will the local community use/implement the proposed technological solution?

If this is not the outcome desired, please describe the desired outcome.

The outcome of this project would be one or more working Systems Dynamics models reflecting the Sri Lanka biomass market maps and their response to various policy stimuli. An assessment of the suitability of the tool and its limitations would also be provided. The model should be presented in such a way as to be accessible by policymakers and stakeholders in the sector in Sri Lanka.

What Benefit will this provide for the community? Will the benefit be dependent on receiving training?

This is a research project which will feed into a process through which information is provided to the Sri Lankan government and key stakeholders in the the Bioenergy sector in the country via the PISCES Policy Working Group. This body is chaired by the chairman of the Sri Lanka Sustainable Energy Authority, which is the relevant government body for policymaking on renewable energies.

Project Time frame:

To start as soon as possible. If Masters, not later than Mar-Apr 09 and complete by Sept-Oct 09.

Funding available:

Some funding is available under the PISCES project but no travel or expenses are anticipated in this project unless conducted at PhD level.

Travel Required?:

Not required.

Level/Discipline of Student required:

Masters level or PhD. Engineers with Systems Engineering backgrounds or those undertaking Systems Dynamics courses or Masters.

Selection Process:

Apply to Engineers without Borders in conjunction with supervisor.

Please recommend useful background reading or resources:

http://practicalaction.org/?id=consulting_200655

www.pisc.es.or.ke

http://en.wikipedia.org/wiki/System_dynamics