Project Plan

IPRO 303 – **Portable System to Generate Potable Water and Power**

Project Objectives

Develop a plan for a business that delivers infrastructure and/or services to provide potable water and energy to remote and underdeveloped communities and other appropriate customers around the world using the Stirling Engine system developed by DEKA Research and Development Corp. (http://www.dekaresearch.com/coreTech.html)

To support the initial development of this business the team shall provide recommendations for implementing initial business trials in Native American reservations in Southwest United States by

- researching and specifying trial sites,
- developing appropriate infrastructure and service requirements for the sites, and
- proposing business models that are suited to the specific needs of the local community.

Project Background

DEKA Research and Development Corp. of Manchester, NH has been developing a highly efficient Stirling engine for the past seven years. Though the Stirling engine concept was invented in 1816, an efficient system had not been developed before due to many technological challenges. DEKA has now accomplished this using precision machining and sophisticated electronic technology.

The engine can be used primarily to generate electricity and the principal waste product from the engine is heat, which could be used to build a very efficient water distillation system. By coupling the two systems together DEKA hopes to provide a solution to one of the critical issues facing much of the developing world - the need for fresh water and electrical energy. The system could also serve as a platform for a multitude of other services like telecom and media.

In order to develop this product further, DEKA plans to conduct initial on-site system trials in the Native American reservations in the Southwest.

Research Methodology

The initial focus of this project will be on developing recommendations for the business trials. As discussed in the project objectives, this shall be achieved by

1. researching and specifying trial sites,
2. developing appropriate infrastructure and service requirements for the sites, and
3. proposing business models that are suited to the specific needs of the local community.

Each of these three aspects will be addressed by three different teams and these teams will collaborate with one another to develop the overall recommendations for the trials. The research in this phase will involve both secondary research, through literature reviews and interviews with experts and also primary research, through surveys or telephonic interviews or direct observation as deemed necessary.

The learnings from this phase shall be then used to research and further recommend markets for this system all over the globe.

Expected Results
The two major outputs of this project are the business plan and the recommendations for the initial trials. In order to produce these, each of the three teams shall create intermediate reports on specific topics that help document the team's work and to help ensure proper communication and co-ordination between the teams. These intermediate reports shall form the basis of each team's final recommendation for the initial trials and for the final business plan.

Team 1. The User and Site Research Team
This team shall research potential trial sites and communities to understand the different legal, political, social, economic, cultural and physical factors at play that could affect the successful deployment and operation of the business. Team 1 shall also recommend at least two sites where the initial trials may be conducted. Team 1 shall also finally identify possible opportunities world-wide for the product.

Team 2. The Infrastructure and Services Team
This team is responsible for specifying all the infrastructure and services required for the site including water and electricity distribution systems, raw material sourcing and waste management systems, maintenance and communication systems and other systems that are necessary to make the system useful for the community. They shall also propose efficient and cost effective ways to deploy the specified infrastructure and services.

Team 3. The Business Team
This team shall identify appropriate business models for the specific site and also conduct a thorough financial analysis of the proposed business. Team 3 shall also conduct a detailed competition and risk analysis and recommend ways to mitigate them. The team shall also identify potential funding for the program as well.

The Business Plan
The work done by each of the three teams shall be used to build a business plan for the DEKA Stirling Engine based potable water and electricity system. This business plan will be presented at the IPRO day conference and a business plan document will be produced as a record. To support the business plan, other artefacts will be produced as well, including

- a professional poster and presentation booth for the IPRO day presentations and also
- a one-page abstract about the business plan.

Website – Records and presents work done by team for external audience.
Photo/Video – Documentary of work done by team throughout the semester.

Project Budget
Travel Expenses
- to visit DEKA in New Hampshire = ???
- to visit the Native-American reservations in the Southwest = ???

Surveys = ???
Telephonic Interviews = ???

Project Schedule

Schedule of Deliverables

	20-Jan	27-Jan	3-Feb	10-Feb	17-Feb	24-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	6-Apr	13-Apr	20-Apr	27-Apr
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Project Plan Team			Project Plan												
Mid Term Report Team						Text Draft Due	Updates	Midterm Rpt - 1							
Final Report Team											Text Draft Due	Layout & Updates	Final Design & Production	Business Plan Report Due	
IPRO Records Team														Compile Records	IPRO Records Due
Final Presentation Team													Presentation Draft Due	Presentation Rehearsal	Final Prez & Abstract Due
Poster & Booth Team													Initial Layout & Design	Draft Layout & Design Due	Poster/ Booth
Website Team					Update		Update		Update		Update		Update		Final Website Due
Video/ Photo Team														Video Edits & Photos Due	Video/ Slideshow Due

Schedule of Research Activities

Team 1: **User & Site Research**			Secondary Research:			Secondary Research Report	Site Proposal	Primary Research		Primary Research	Global Markets/ Opportunities	Final Research Report			
Team 2: **Infrastructure & Services**			Secondary Research: Current Situation - Infrastructure & Services			Research Analysis	Initial System Definition	Water Storage & Delivery Systems		Waste Management Systems	Telecom Systems	Evaluation & Final System Definition			
Team 3: **Business**			Competition Analysis		Financial Analysis/ Cost Analysis					Business Risk Analysis		Profit & Growth Projections	Identification of Potential Investors		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	20-Jan	27-Jan	3-Feb	10-Feb	17-Feb	24-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	6-Apr	13-Apr	20-Apr	27-Apr

Individual Team Member Assignments

The three research teams include:

Team 1. The User and Site Research Team
Imtiaz Musaliar, Joyce Tan, Neva Wheeler, Seon Woo Yoo

Team 2. The Infrastructure and Services Team
Colleen Chapman, Elmarie Gula, Greg Stachurski, Tristan Wilson

Team 3. The Business Team
Andres Cuevas, Shaun Edrington, Aaron Hopkins

In addition to the 3 research teams, there are 9 other teams that are responsible for the production of the deliverables. These include:

- *Communications Team* Shaun Edrington, Neva Wheeler
- *Project Plan Team* Andres Cuevas, Imtiaz Musaliar
- *Website Team* Elmarie Gula, Greg Stachurski, Seon-Woo Yoo
- *Photo/Videographer* Aaron Hopkins, Joyce Tan, Elmarie Gula
- *Mid-Term Report Team* Andres Cuevas, Shaun Edrington
- *IPRO Records Team* Colleen Chapman, Neva Wheeler
- *Final Oral Presentation Team* Greg Stachurski, Joyce Tan, Tristan Wilson
- *Poster/Booth Team* Colleen Chapman, Imtiaz Musaliar, Seon-Woo Yoo
- *Business Plan Report Team* Aaron Hopkins, Tristan Wilson