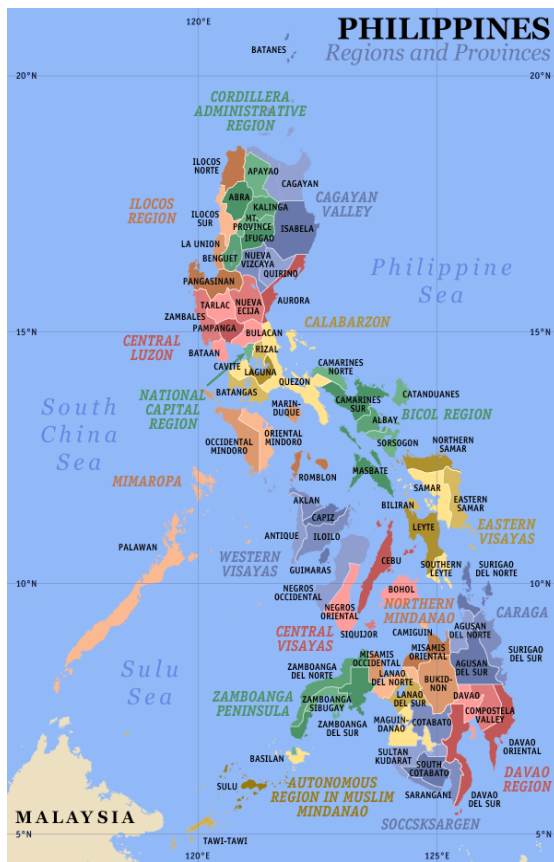




Self-Powered Communities for Philippines The Initial Paper



Contents:

Summary

1. Introduction

2. Characteristics of Business

3. Electrification in Philippines

4. Propositions

5. Conclusion

Summary

Electricity is an instrument for poverty reduction, economic growth and social stability. We are referring to electricity for households and entrepreneurs living in areas served by decentralized electric power which we call **Self-Powered Communities (SPC)**. Their electric power should come from renewable energy sources (RES). Besides providing a reliable supply of life-changing electricity, SPC are the right tool for creation and sustainability of a more investment-friendly environment in given community.

Propositions:

a) At strategy level:

Application of SPC methodology for specific needs of rural and peri-urban areas in Philippines

b) At implementation level:

Delivery and services for the following projects:

- Construction of a Thin-Film PV panels making facility in Philippines
- Thermal Turbine energy units
- Pyrolysis system
- Hydro energy application (see Czech Renewable Energy Association - CREA)

c) At the level of transfer of know-how, education, and skills development:

To assist a pragmatic approach to education and skills:

- entrepreneurship
- financial literacy

We had an opportunity to open a dialog concerning decentralized electrification and SPC at the Philippine Embassy in Prague and we would like to follow-up by discussing specific details with relevant bodies in Philippines. Our team from 5P for RES and CREA would like to get in contact with colleagues at the Philippine Department of Energy (DOE) and in the ER Program Team.

The Philippines, like the rest of the world, are facing decision concerning expanded use of renewable sources of energy. We understand that the Philippine energy (power) system is built to achieve the following three major objectives (see also www.doe.gov.ph):

- Ensure power accessibility and sustainability
- Achieve optimal power pricing
- Develop a consensual power plan

1. Introduction

Energy sector in Philippines is guided by its vision, "Energy access for more people," which strives to make a reliable and affordable RES-based energy services available to a larger segment of population in order to enhance local productivity and development of the countryside.

At the Prague Project Portfolio Planning Platform for Renewable Resources (5P for RES), we specialize in transfer of business know-how and development of Business Rules for SPC and selected RES technologies in rural, peri-urban, and urban areas in developing countries. Currently, we are preparing projects in Africa (see our website) and would like to apply similar approach in Philippines. This approach will take into account specifics of the Philippines - a country spread over thousands of islands. Starting with a SPC pilot project is an opportunity to test policy and decision making processes with possible application of SPC projects in some of the almost 42,000 barangays (see Chapter 3.2).

Proposals for both the continental and the island pilot projects and their implementation should be benchmarked and lessons learned disseminated. We want to open a wider dialog among European and Philippine partners who are active in development of decentralized electrification.

2. Characteristics of Business

2.1 General notes

We can see specific markets growing around the world (e.g. <http://www.globalissues.org>, <http://www.worldometers.info>), and at the same time there is the poverty described in the book "The Fortune at the Bottom of the Pyramid," by C.K. Prahalad). Solutions to the dilemmas and challenges described there can be, for example, better understood (e.g. www.socialprofitnetwork.org) and addressed by specific tools (e.g. www.project-impact.net).

2.2 Business process

The Initial Paper is focused on supporting development of domestic industry and building its capacity to serve expanding decentralized electrification and to that related production of goods and services at a country/regional and national levels. Today's science and technologies offer opportunities to achieve such goals.

The Initial Paper is built on an assumption that financial sources for decentralized electrification exist. But there has been lack of good projects with a potential for acceleration of investment inflow into more integrated functions and into stronger motivation among SPC Stakeholders and SPC Clients.

2.3 Business motivation



Business motivation involves SPC Stakeholders and SPC Client (for more see our website www.5pforres.eu). SPC Stakeholders represent local, national and international public and private organizations with motivation to add value to SPC Clients (Final Beneficiaries). SPC Clients come from rural, peri-urban and urban areas. They are mostly householders and local micro-entrepreneurs (interested in business success and sustainable income for themselves and their communities). The process also involves local and international public and private

organizations interested in decentralized electricity production and services. Local communities should be interested in purchasing products from SPC Factories (e.g. PV panels for lighting, equipment for cooking) and welcome new job opportunities created by SPC.

3. Electrification in Philippines

3.1 Energy sector's plans and program

We understand that the Philippines Energy Plan (PEP) 2009-2030 is based on three broad policy issues: Ensuring energy security; Pursuing effective implementation of energy sector reforms and, Implementing social mobilization and cross-sector monitoring mechanisms. The PEP falls under responsibility of Department of Energy (DOE), Rural Electrification Program Team (ER Team) and other agencies.

Solar PV system is focused on various innovative mechanism of service delivery including the Sustainable Solar Market Package (SSMP) approach and introduction of a new business model for households. Renewable energy resources for decentralized power generation are a top priority.

3.2 Rural/Missionary Electrification

We are interested in making our SPC Program compatible and beneficial to the Rural/Missionary Electrification program and to its context within the EPIRA and ER Team. EPIRA and acceptance of an Expanded Rural Electrification Program (ER Program) are of our priority interest.

We see the Philippines with over 7000 islands to be an ideal place for application of decentralized electrification systems. Alongside with the specific political and administrative system encompassing the above-mentioned almost 42,000 barangays we see it as a great opportunity and challenge to implement the SPC program. Subsequently to that we can together with our Philippine partners duplicate these successful solutions in other parts of Asia, Africa, and the Middle East.

4. Propositions

We consider the concept of Self-Powered Communities (SPC) based on locally available, affordable, and clean renewable energy sources to be the primary solution to dramatically improved quality of life anywhere in the world.

WE are proposing assistances at the following three levels:

a) At strategy level:

4.1 SPC Methodology and international consulting services

We propose the SPC concept to open an international dialog on how to improve quality of life for people living in rural and peri-urban areas in any less developed countries using this program of decentralized electrification based on RES. Analyzing present situation we have find the same case and effect; we found poverty and limits to add value, we saw poor families and entrepreneurs and we cannot see their internal motivation to improve it. Present situation is the same through world.

When the causes have common characteristics then we should be also seeking a common approach to resolution of their consequences. Concerning technique of life such common and universally appropriate approach and solution is electrification. It is important that the public which sees multitude of benefits of electrification and is ready to take advantage of progress which it represents. Thanks to modern technologies technical feasibility and economy of electrification of remote or scarcely populated areas far away from centralized power grid are now really within a reach.

We propose the following:

1. To open a dialog concerning application of SPC methodology for specific needs of rural and peri-urban areas in Philippines.
2. To participate in creation of an international team (Task Force) by providing development and assistance with benchmarking program of best practices gained from implementation of SPC projects in Africa and Asia.
3. To take part in dissemination of lessons learned from projects using RES technologies in the ASEAN member states.

b) At implementation level:

4.2 Photovoltaic energy

General description:

We propose building a thin -film photovoltaic (PV) modules manufacturing facility in cooperation with local business partners. The technology is based on silicon thin-film layers (amorphous and/or proto-crystalline). It is one of the most innovative technologies for production of economical effective and environmental friendly solar cells.

- It is not raw materials intensive, overall environmentally harmless, using abundant raw materials (glass, technical gases)

- It is free of dangerous or environmentally toxic contaminants (e.g. cadmium)
- It generates electric energy at low cost and with outstanding efficiency

Proposed manufacturing facility using the SPC Factory concept (engineering, production/assembly lines and sales support) represents a low initial investment. Number of production lines can be increased or additional manufacturing facilities built to fit changing needs of the energy industry (SPC Factory network). Technologies offered are proprietary and they were developed in cooperation with Czech scientist, industry experts and academia in Czech universities.

Benefits:

- Production process does not require special inputs and doesn't generate significant waste
- There is no need for sophisticated assembly process and less-qualified labor can be therefore employed
- Manufacturing technology of thin-film PV modules conforms to the highest environmental standard
- The thin-film PV panels are specially designed for "Sun-belt" countries and the efficiency of electric power production is stable and it is not reduced even at high temperatures or diffusive light

Propositions:

- Licensing PV production lines based on our proprietary technology to local manufacturing facilities
- Cooperation with local engineering companies active in construction of power plants
- Consulting and advisory services concerning our technology
- Training local engineers and semi-skilled labor force

4.3 Thermal Turbines

General description:

Thermal Turbines (TT) convert accumulated heat (reaching 90°C) into electric power. Two or more turbine units can be combined into one system to meet the specific requirements. TT can generate electric power or be used for heating or cooling of buildings. Development and implementation of TT technology is based on over 50 years of tradition in development, manufacturing, and operation of thermal turbines in power generation industry in the Czech Republic.

Benefits:

- Use of a low-potential (waste) heat for generation of electric power
- The source of waste heat are those industrial or commercial operations requiring cooling (such as power plants, refrigeration units, large enterprises, etc.)
- The technology of Thermal Turbine complies with the highest environmental standards
- Implementation and maintenance of Thermal Turbines require hired staff, thus helping reduce unemployment
- Direct deployment of Thermal Turbines within electric power generating and distribution systems anywhere in Philippines (e.g. grids owned by national electric power utilities)

Propositions:

- Thermal Turbine technology demonstration in the Czech Republic
- Assistance and cooperation with local engineering companies in Philippines which are involved in building some types of RES power plants (e.g. geothermal)
- Consulting and advisory services concerning our technology
- Training of local engineers and operation personnel

4.4 Waste Management & Pyrolysis systems

General description:

Pyrolysis system (PYS) performs conversion of the communal waste (e.g. plastics, used tires, garbage), biomass waste (e.g. from harvest of rice, sugar cane) and biomass (e.g. fast growing grass, timber). PYS units convert the load of waste using gasification with absence of oxygen into electric power. More units can be combined in one system. PYS technology builds on decades-long tradition of waste management and industrial technologies in the Czech Republic.

Benefits:

- Use of waste for generating electric power (e.g. plastic waste, used tires, sorted out communal waste, biomass)
- Pyrolysis system complies with the highest environmental standards
- The system might be deployed directly, independently of central power grid or to support it
- The system is not depended on outsider sources of electric power, therefore can be installed anywhere
- It is more efficient than burning of biomass and twice as efficient than burning communal waste
- Operation of pyrolysis system encourages and motivates development of waste collection yards and processing of waste in areas where issue of waste management in large urban areas and their suburbs is often seen as an impossible task to achieve.

Propositions:

- Demonstration of our Pyrolysis system and its operation in the Czech Republic
- Investments into renewable energy sources – namely in Pyrolysis technology – fit the specific needs of Philippines
- Import and installation of Pyrolysis System in cooperation with local partners
- Sharing of know-how with local partners in planning, installation, and operational stages of waste management
- Consulting and cooperation with local engineering companies which are involved in designing and installation of any contemporary technologies for RES-based power generating projects.

4.5 Hydro energy systems

General description:

Hydraulic Micro Turbine (HMT) is a compact electric power generating unit with asynchronous three phase alternator driven by mini water turbine. The unit is equipped with a fully automatic electric part to control output voltage and frequency. It is identified and designed as a source of electric energy for small farm, small village, group of houses, etc. HMT development resulted from cluster cooperation of Czech companies and universities using latest technologies in research, design, manufacturing and testing. Tradition of hydro energy systems in Czech Republic was founded by Mr. Kaplan more than 100 years ago.

Benefits:

- Use of traditional renewable source of energy through latest technology
- The compact energy generating unit suitable for parallel as well as off-grid operation
- The Hydraulic Micro Turbine combines high technical parameters with reasonable price
- The Hydraulic Micro Turbine represents a fully environment friendly technology
- Czech hydro energy systems already work reliably in some ASEAN member states, such as the Philippines and Indonesia

Propositions:

- Technology manufactured under European Standards in Czech Republic
- Assistance and cooperation with local hydro engineering companies in The Philippines
- Economical and technical consulting and advisory services
- Training of local engineers and operation personnel

4.6 Mixed technologies mentioned above, examples

Our proposal is to build SPC projects based on the above-mentioned technologies while inviting other suppliers of already proven technologies (such as wind or wave energy), universities, research institutions, and manufacturers who are working on development of the new RES technologies.

c) At the level of transfer of know-how, education, and skills development:

Technique of Life is changing: Population moving to urban areas (length of life is increasing); globalization has changed aspiration of the poor (their expectation will continue to grow); strong impact of technologies (such as the move from kerosene lamp to a mobile phone); real standard of living is of fundamental concern (social dimension: the world of TV program living on USD 2 per day or technical dimension: providing drinking water in a countryside and in rapidly growing cities).

Stakeholders and SPC Clients of Self-Powered Community (SPC) themselves should reflect on impact of new technologies on human resources involved in SPC Program and SPC Industry (e.g. a father is looking for a new job, mother taking care of household meals, children representing the future for both of them). Families form human resources for technique of life capacity building in technique of life (e.g. by education and dissemination of skills, being creative in using and sustaining the new roles).

We recommend a pragmatic approach to education and skills:

- To assist entrepreneurship
- To assist financial literacy

4.7 Entrepreneurship Capacity Building (Enterprise Architects)

Growth in micro-entrepreneurship is the best measurable indicator. Entrepreneurs capacity building is a strong challenge and a goal of implementation of SPC development. To enable and assist this process we propose use of an "Enterprise Architect". Enterprise Architect and Enterprise Architecture play critical role in complex or duplicated project portfolios such as those proposed under SPC Program.

*The role of an **Enterprise Architect** is to design and assist with implementation of entrepreneurship framework within Self-Powered Communities. He/she has to develop community master plan and assist entrepreneurs and the community in a process developing business plan and setting forth business rules.*

4.8 Business and Financial Modeling (Financial Engineers)

SPC development needs a business oriented financial management and control. Transparency and trust are the most important criteria. We propose re-definition of "Financial Engineer" to fit the specifics of the SPC Program. Business and financial modeling tools should be developed for SPC Stakeholders.

*The role of an **Financial Engineer** is to demonstrate financial feasibility of the specific SPC project. His/her role is also to bring money to the the project and to educate people in a community in undestanding positive cash flow and management of a financially sustainable operation, control and audit.*

5. Conclusion

We provide a comprehensive support in evaluating, planning, and actual implementation of Self-Powered Community projects. Specifically, this includes the following:

At strategic level:

- Development of SPC methodology for specific projects in rural and peri-urban areas in Philippines
- Task Force to establish benchmarks of best practices for implementation of SPC projects in Africa and Asia
- Present the SPC concept at conferences/workshops within the ASEAN member states

At project implementation level:

- Assisting building and expansion of a given country's RES industry which then supplies individual SPC projects built in a country (or even abroad). Helping with ensuring that development of SPC is sustainable. Four specific technologies are proposed:
 - Construction of a Thin-Film PV panels making facility in Philippines
 - Thermal Turbine energy units
 - Pyrolysis system
 - Hydro energy application (see the CREA)

At a level of transfer of know-how, education, and development of skills:

- Contributing to development of the training manual based on the best practices in the area of effective applications of Enterprise Engineering and Financial Engineering to benefit those who actually build or own and operate various SPC infrastructure and enterprises. Proposal is to assist:
 - entrepreneurship
 - financial literacy

We, Prague - Project - Portfolio - Planning - Platform (5P for RES) are a multidisciplinary and international team of qualified experts offering added value to rural, peri-urban and urban communities in Philippines by our assistance with implementation of Renewable Energy Sources and decentralized electrification of communities and subsequent economic development.

We, the 5P for RES and CREA, are looking forward representing us and other Czech organizations and companies at the upcoming Power Trends 2011 in Manila (September 28th, 2011).



Zdenek Chalus

Head of the 5P for RES