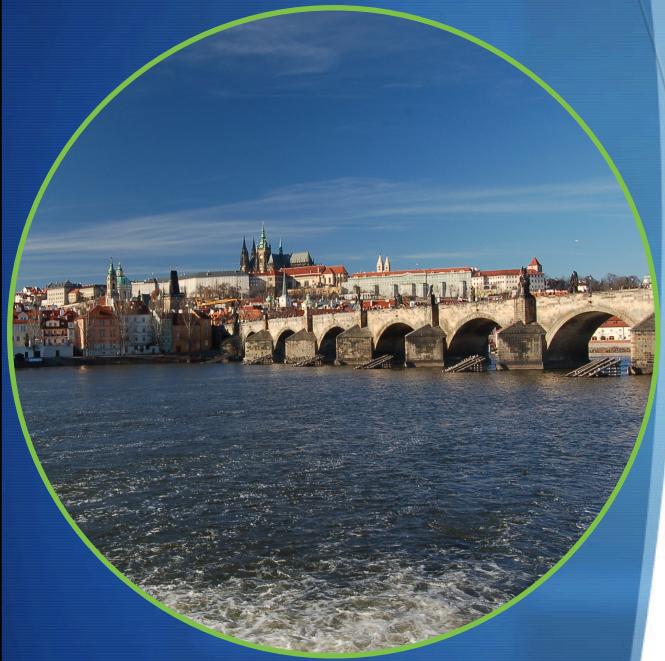


5P for RES

Prague Project Portfolio Planning Platform
for
Renewable Energy Sources

We are a team of International experts aimed to dissemination and sustainability of Self-Powered Communities in Philippines.

www.5PforRES.eu

1. Introduction

Sustainable Energy for All: A challenge to all of us.

Core issue: Population growth and global warming. Technological advancements are now making socio-economic development based on decentralized electrification feasible. But there are still some systemic bottlenecks. This presentation tries to identify some of them and propose solutions.

Examples:

- Access to money for producers of electricity who produce electricity for themselves and can offer excess production to others (electricity has a monetary value).
- Policy consensus concerning identification and adoption of simple socio-economic drivers that truly reflect actual needs and capabilities of target communities that are to use sustainable electric power generating facilities.
- Needs of electrification in Philippines (plans of electrification, building of local energy infrastructure, and investment in national and local energy industrial base and human resources).

Quality of Life (QL) in a community:
Core issue: The need for more jobs, food, health care, and education. The problem: Deficit in understanding of relationship between a national growth of GDP and energy demand in individual communities.

The solution:

- Decentralized electrification (e) based on renewable locally available energy sources and, Sustainable Energy for All principles.
- Simple and transparent socio-economic development drivers are presented by a simple formula: QL => (e) & (w + m) where water (w) and materials (m) are a parallel drivers to a decentralized electrification (e).

2. Community-level solution

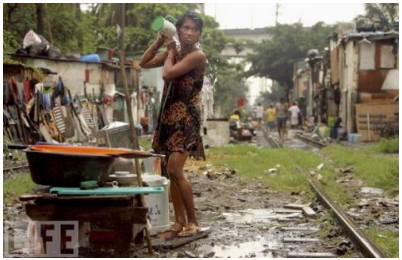
Communities (villages, towns, agglomerations) are target groups for the Sustainable Energy for All:

- Utilizing a natural sense of cooperation within a community (while also using business practices for public-private partnership) and business rules so that community leaders/managers are well equipped for their roles in mobilizing the support and acceptance of decentralized electric power generating system and ensuring its sustainable operation

- Effectively motivating community members and leaders in perceiving the benefits and becoming stakeholders with a long-term commitment to success of a project of decentralized, community-based electric power generation, distribution and consumption.

Self-Powered Community (SPC) concept: Renewable energy sources (RES) and new, already proven technologies open new opportunities resulting, for example attractive cash flow for entrepreneurs, households while they are not depended on centralized power-grid. Decentralized electrification based on renewable sources of energy helps creation of jobs, micro- and small enterprises and building of a middle class.

Sustainable decentralized electrification also allows for gradual development of industrial infrastructure and know-how and knowledge-based sectors of economy, further expanding economic opportunities including exports potential thus supplementing expanding agricultural production made possible by electrification.



3. SPC Units and SPC Utilities

From economic development and engineering design standpoint we can identify two ranges of electric power generating projects: a) Large power plants with a capacity of about 100 MWe with transmission and distribution grid and b) Small power plants with the capacity of about in 100 kWe with small/micro distribution network (off grid solutions).

SPC Units (solar, biogas, geothermal, hydro-energy etc.) of power about 100 kWe are power plants suitable for "energy island"solutions:

- Natural islands (e.g. electrification of small islands in Asia and the Pacific)
- Virtual islands (e.g. electrification of Province of Sorsogon, project in Ethiopia)
- Roofs and balconies of buildings (applicable to most of the locations in rural, peri-urban and urban areas)

SPC Utility assists, manages and controls SPC Units network. SPC Utility operates as a Special Purpose Company and performs the following roles:

- Consulting services to SPC Clients (financing, construction, operation, maintenance, transfers of SPC Units in the framework of services of the SPC Utility)
- Administrative services for owners of SPC Units (monitoring, evaluation, financial closings, business results and benchmarking).
- Cooperation in a framework of the National Energy System (e.g. cooperation on investment in on/off grid systems together with Power Cooperatives operating in all provinces in Philippines)
- Management and financial control of SPC Units in a scope of a Special Purpose Company
- Financial service to SPC Clients through Revolving Loan Fund (RLF) in ownership of SPC Utility. For back office operations of the RLF the SPC Utility retains professional services from of a local bank.

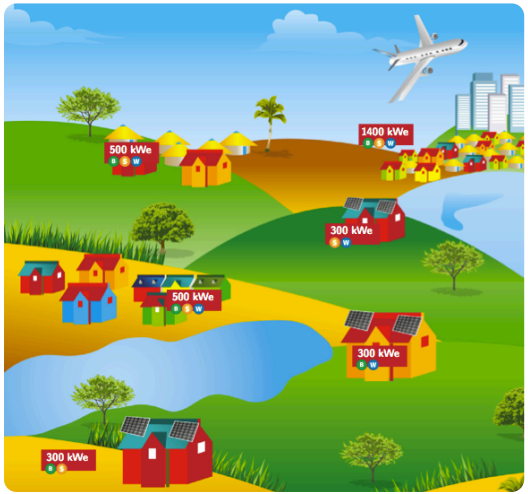
4. Where are we now?

We introduce the principles, engineering, and methodology of the SPC to communities (villages, towns or regions and provinces) to potential SPC Clients who have the need and the ambition to have an around the clock, year-around access to locally generated electric power as waiting for the power being available from centrally-operated grid is not a feasible option:

We are work on two groups of pilot projects in Sorsogon Province:

- Pilot Individual Projects (PIPs) based on bottom up approach (construction of two SPC Units: solar power plant (1MWe) and biogas power plant (0.6 MWe).
- Pilot Portfolio Project (PPP) based on top down approach (an investment of $30m represents a mix of about 100 units with a capacity of 100kWe based on an efficient combination of solar, biomass, and hydro-energy and equipped with a central monitoring system (in total about 5.46 MWe).
- A conservative engineering and financial estimates for investment in the project were presented in our Blueprint "SPC Pilot Project Advocacy in the Philippines."

For detailed discussion we developed a Financial (business) model for demonstration and simulation of business principles. Implementation of the business model is a role of proposed SPC Utility, which coordinates processes of investment, organizes services and administration, and motivates families and entrepreneurs to participate on growth of quality of life in their-own community.



5. Drivers of Quality of life

Social life and economy growth in a community require to be driven by simple and transparent drivers. The key driver is electrification (e). But we see also two other parallel drivers; one is retention of rainwater (w) and one in utilization of new and used materials (m). We call this approach "Measurable Strategy in Practice." Internal relations of these three drivers are expressed in a formula: QL => (e) & (w + m).

Parallel driver (w): It represents investment in rainwater retention and for subsequent activities of water management (e.g. access to drinking and service water), or building and operating of a hydro-power plant. The indirect role of this driver is reduction of safety risks coming from floods, earth slides, and impacts of earthquake (e.g. to hold more water in the landscape and create a so-called dry polders and water retention tanks, and swampy bamboo woods).

Parallel driver (m): It represents investment in utilization of new and used materials both for energy production and for removing of waste in situ:

- New materials: (e.g. growing a multi-use bamboo; using other post-harvest materials: sugar corn, rice, etc. and other bio waste from domestic, animals and poultries) should be used for energy production and for landscape cleaning (to start earning money for agriculture waste liquidation by a community).
- Used material (e.g. plastic, used tires, communal waste etc.) should be used for energy production and to contribute to clean peri-urban regions and liquidate industrial waste by the way of earn own money for this purpose anywhere where it is feasible).

Driver's role is aimed on Sustainable Energy for Quality of Life Growth for all in a community. Role of the Revolving Loan Fund is collect, manage, and control earned money for these small investment activities in situ (mostly for salaries of poorer inhabitants and for creation of sustainable jobs for them).

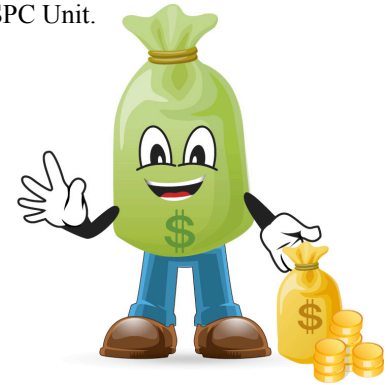
6. Financial Framework, Public Procurement and Financial services

Financial framework for standard investment projects using revolving loan financing is, in general, 15 – 20 years. For financial model of the PPP with synergy effects we proposed 30 years (thus reflecting, for example, the approach taken by a program of the Korea's Official Development Assistance).

Public procurement is the core rule for PPP implementation and for selection of suppliers for construction of individual SPC Units. After an interest of SPC Clients is expressed, the SPC Utility prepares and finalizes list of SPC Units for the procurement. SPC Utility cooperates with selected SPC Clients, local Power Cooperatives, and external consultants, and finalizes Terms of Reference (ToR) to address potential suppliers for the PPP, and opens tendering process. SPC Utility manages controls and evaluates tendering and contracting for all projects in project portfolio. After the project completion the SPC Utility continues in monitoring of all life cycle stages of individual projects and project portfolio until its financial closing.

Financial services from SPC Utility to SPC Clients are managed and controlled by a Special Purpose Company and the flow of finance (contracted loan for SPC Client) will be implemented and controlled by Revolving Loan Fund. Both Special Purpose Company and Revolving Loan Fund will be integral parts of the SPC Utility with independent roles:

- Role of the Special Purpose Company is in shielding assets of SPC Units in the SPC Utility from detrimental effects of a project failure within the project portfolio.
- Role of the Revolving Loan Fund is to finance preparation, construction and operation of projects of project portfolio upon application of loan from a SPC Unit.



7. New technologies and Pilot Individual Projects

Advanced and proven technological solutions for decentralized, renewable sources-based electrification already exist and becoming widely available. The most important criterion is a price for quality of final product completed on a given site.

Two Pilot Individual Projects (PIPs) are proposed for Sorsogon Province:

1. Solar power plant, first stage1MW
2. Biogas power plant till 0.6MW

Furthermore, the following suggestions are also made:

3. Micro hydro energy power plants opportunities
4. Central Supervision of SPC Units testing for the future SPC Utility

Proposed projects and demonstrations are based on technologies used in Europe (Germany, Denmark, Czech and Slovak Republics). Details can be discussed upon request.

Program of PIP and demonstrations are the key opportunity for working on deeper analysis and looking for solutions other current tasks: e.g. legal framework for the proposed project portfolio solution, procedures and limits of public administration in participation of public budgets in the PPP at the national, provincial, municipal, and barangay levels and getting more detailed understanding of impact of synergy effects on improvements in growth of quality of life in given communities. This is the reason why we offer to our partners in Sorsogon Province and the Mapúa Technology Institute to create an "Initial Team" of three junior experts and guide them in work on PIP and PPP activities.

8. Revolving Loan Fund and Pilot Project Portfolio

Revolving Loan Fund (RLF) is a standard financial tool with unappreciated options. RLF offers attractive balance between a) the opportunity to increase capacity of the investment source and b) acceptation of a broader spectrum of clients including those with lower incomes to participate. An example is a RLF with initial capitalization of $30m, with interest rate below market rates, with 15-20 year schedule of repayment, and its administration costs covered:

- The number of ten loans ($3m each one) can be increased over the 15 years to seventeen while the initial sum of $30m is still for available.
- Loan repayment to a commercial bank is generally 4 years; if RLF extends the payback period to 20 years the result is that monthly payments are reduced proportionally (thus households and micro-entrepreneurs with lower incomes can also ask private for private financial sector financing).

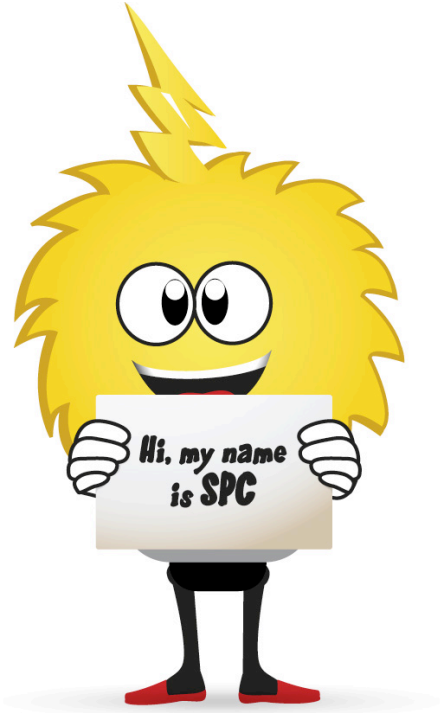
Sustainable Energy for All is an initiative started by the United Nations and now we can see many initiatives focused on improvements of the overall access to energy by 2030. Our Self-Powered Community solutions are one of these initiatives.

9. Pilot Project Portfolio and its added value

We developed a financial model for the Pilot Project Portfolio (PPP) with the following assumptions: financial framework for the RLF 30 years; initial loan of $35m ($30m in energy, $3m in bamboo, and $2m in other), two financial leverage $10m during 30 years in energy, interest rate 2% (4%), and tax holidays 7 years, insurance.

The financial model demonstrates feasibility and effectiveness of an investment in decentralized electrification and presents synergy effects induced by two parallel drivers (w) & (m).

The PPP is to be managed and controlled by SPC Utility (see slide 3), internally assisted by services of the Special Purpose Company and by the Revolving Loan (see slide 6). The SPC Utility will manage and control project selection and preparation, tendering, contracting, monitoring and financial closing of all projects of the PPP. SPC Utility will assist SPC Units for all life cycle upon rules in loan and services contracts between each SPC Client and SPC Utility.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