5P for RES

SPC PILOT PROJECT ADVOCACY IN PHILIPPINES

BLUEPRINT

We have borrowed a blueprint and vision from legendary aviators, Wright brothers. They demonstrated a will to build and operate the first airplane for future of powered flights everywhere in the world. The goal of our Blueprint is to open access to electricity as a basic human right of the 21st century everywhere in the world

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5P for RES

Abstract

ANALYSIS

SYNTHESIS

PROPOSAL

Dear Reader,

The 5PforRES international team in cooperation with Embassy of Philippines in Prague and with partners from public and private sector in Philippines, and with other partners has prepared an open working document for advocacy of an idea to prepare, implement and evaluate Self-Powered Communities (SPC) Pilot Project on Philippines.

We identified 12 reasons why to do it (see below). The Philippines is an island country with a future (1), good reputation with international banks (2), has working people, prepared legislative environment and is rich in renewable energy sources; solar, hydro, biomass, wind, geothermal (3). The Philippines has the most expensive electricity in Asia and nevertheless has lack electricity, electricity outages and the goal is to guarantee electricity on all (relevant) islands (4). Decentralised electrification by SPC Concept is a pragmatic solution how improves competitiveness and strengthen position of Filipinos in ASEAN countries.

The Blueprint is focused on opportunities in cost-effectiveness ($ / kW, $ / kWh) of the SPC solutions (5). Proposed modular system composed from 100kWe units mixed from RES technologies for 24/7 all year services (6). Electricity is a key driver for economy and social development. The Blueprint explains synergy effect for quality of life improvement (7). Proposes project portfolio methodology for decentralised electrification by network of modular units and proposes SPC Utility network in parallel with existing network Electric Cooperative (8). In summary the Blueprint proposes SPC Concept how to build strong centralised (on-grid) and decentralised (off-grid) domestic infrastructure of electricity for all islands of Philippines.

The Blueprint describes the most important questions on financial sources and financial tools. This document is ready to open a dialog with international financial institutions, banks, donors and private sector. Respects absorption capacity of clients from peri-urban and rural areas and offers revolving loan fund (9) and methodology for business approach in practice (10). The Blueprint proposes SPC Pilot Project (11) up to $30m (from in 2014 to 2017). The goal is to prepare, implement and evaluate the SPC Pilot Project (project portfolio and public procurement, revolving financing, SPC Utilities, synergy effects, SPC Factories and Workshops) and to open door for a massive decentralised electrification not only on Philippines. The Blueprint is now in a stage of Advocacy (12) and improvements will continue. Steps are described in Navigation section (see below).

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12 Good reasons for the SPC Concept Implementation

1. **The Philippines (PHL) Fact Sheet**: 90 millions of inhabitants on more then 7,000 islands; the PHL are the 43rd (2011) largest economy in the world, predicted to be 14th in 2050; economic growth 6.6% per annum (2012), prediction 6-7% (2014); PHL stock market now has the world's fifth-best performing index; inflation is below 3%, unemployment rate 6.8 % (2012). The 2013 is expected to be a "super year" for the Philippines because the election year spending would boost government spending. Foreign reserves have increased to US$ $86 billion as of January 2013.

2. **Bank references, central, provincial, and local governments:** PHL enjoy positive banks' references (e.g. Hong Kong and Shanghai Banking Corporation), PHL are investing almost $300 million at annual rate of $58.7 million into rural electrification projects. Investments starting from a low base, and local government, private sector and consumers group have a significant volume of potential rural electrification projects ahead of them. The past rural privatization efforts have seen mixed results. PHL's Renewable Energy Act of 2008 is the best and the most comprehensive renewable energy aw in South-East Asia.

3. **Legislation and RES capacity**: PHL legislation opened energy market (e.g. Renewable Portfolio Standard assuring that the retailers have incentive to use renewable energy at approved feed-in tariff rates). Under the same law, a submarket of the Wholesale Electricity Spot Market will created for trading Renewable Energy Certificates. PHL's potential for RES is significant: about 4,500 MW (geothermal); 13,000 MW (hydro-power), 5.0-5.1 kWh/m^2/day (solar); about 75,000 MW (wind) and 170,000 MW (oceanic currents). The goal is strengthening of least-cost integrated development planning.

4. **Pricing of electricity**: There are two significant facts concerning pricing and availability of electric power: the price is relatively high and there is a shortage of it. The government maintains that higher prices have been necessary to keep the sector viable and attractive to investors. But with average residential rates already at $0.18 per kWh and $0.13 per kWh for businesses, the rates are generally perceived as too high. Currently, Napocor's effective tariffs are: Luzon ($0.1378kWh), Visayas ($0.1109kWh), Mindanao ($0. 0721kWh). The goal is to achieve a better integration between the grid and off-grid electrification.

5. **RES Project Costs ($/kw, $/kWh):** It is wrong to suggest the structure of prices, or conditions for which the price is valid (overnight or levelized capital costs, fixed or variable O & M costs, fuel and transport costs, on-grid or off-grid connection costs, etc..). But that is not the Blueprint! The Blueprint calls for a solution to finding the price structure through closer contacts with suppliers. Provinces, Cities, Municipalities and Barangays are on the demand side and demand must be able to properly prepare a tender. Here are the highest savings! Provinces, Cities, Municipalities and Barangays must find savings in the system of their work, in that properly prepare, manage and control cycle of the tender. The result must be transparent, multiple orders demand modular units. This then proceed further savings from other financial-synergistic effects that you should look.

6. **Modular 100kWe System and Decentralized Electrification**: The SPC Concept proposes a "Product Space" network (cluster of products) financing of a small modular system serving needs of decentralized electrification. 100kWe is symbol of output of small power-generating units with a range from 1 to 1000 kWe. They are modular offering flexibility fitting the needs of projects in peri-urban, rural and outlaying areas. They supplement energy delivery services provided by “big energy” namely on large islands (Luzon, Visayas, Mindanao) and they can replace diesel power generators which are expensive to operate (besides requiring ongoing fuel deliveries, being noisy and pouting environment) on smaller islands while providing 24/7 electric power year around.

7. **Synergy Effects:** Two drivers are derived from access to electricity: water retention both for its economic value and preservation of life and economical use of materials (new and used) for a better quality of life (QL) in rural and peri-urban areas. Synergy effects are expressed by an equation: QL => (e) & (w & m). The equation is based on the fact that electricity (e) creates jobs, water (w) is a necessary condition for life, and material (m) is a mirror of QL in a community. Synergy effect is measured by ratio of benefits (B), opportunities (O) and costs (C), risks (R). The goal is examine demand side interventions, such as access to electricity, consensus to use of synergy effects, energy efficiency, and load management on a level playing field with supply options.

8. **SPC Project Portfolio**: The Blueprint navigates decision-making leaders in energy sector in their search through various solutions using SPC approach and how individual projects fit within the entire portfolio. It offers pragmatic approach to leveraging advantages of decentralized electrification and how to integrate them with socio-economical objectives of development in barangays (bottom up approach). Project portfolio is a better base for public procurement and more effective generator of new job opportunities (SPC Utilities, Factories, Workshops). It is recommended that projects within the portfolio of the SPC Pilot Project are financed through Revolving Loan Fund (RLF).

9. **Financial Sources and Tools**: Most of the banks love – for good reasons - financing of energy sector projects. The objective is to have “smart” public procurement aimed at building the country’s own energy infrastructure and to do so at an acceptable price. Revolving Loan Fund (RLF) is a good instrument for financing of such effort. The Blueprint proposes to found a RLF as a smart tool at the Provinces governance level with a professional assistance from a strong Philippines banks (e.g. Development Bank of the Philippines). This the most pragmatic way how to operate bottom up approach for electric infrastructure services; how to get, increase, manage, control, protect and motivate real cash flow for sustainable development.

10. **SPC Business Model**: SPC Concept respects business model rues: interconnections of business process (transparency of sales and profit from services of decentralized electrification), competencies of organizations involved in distribution and sale of electricity (within their own customer base as well as to the state EC (Electric Cooperatives). The most important segment of the business model is its approach to motivation. The Blueprint recommends operating Business Motivation Model (BMM), originally introduced by authors of the Analytic Hierarchy and Analytic Network Processes (AHP/ANP). Author of the Blueprint is focused on an application of the BMM how to assist consensus on life cycle financing of a portfolio project.

11. **SPC Pilot Project**: To secure financing for the SPC Pilot Project, to implement it and evaluate the final results it is one of the purposes of the Blueprint. The objective is to make the Pilot Project (project portfolio and public procurement, revolving financing, SPC Utilities, synergy effects) introduction of the 100kWe electric power system into economic infrastructure of the Philippines as smooth and effective as possible. Cost of the preparation stage up to $1.0 mill, implementation stage up to $30 mill, and the evaluation stage $0.5 mill. The preparation stage is planned for 2014 and implementation and evaluation stages are planned for three years with the entire Pilot Project to be completed and evaluated before the end of 2017.

12. **The Blueprint Advocacy**: This approach allows us to apply multi-disciplinary and multi-functional approach including technical and financial solutions. It is expected that the Pilot Project for the Philippines might be subsequently applied in other countries. Therefore we have invited other – non-Philippine – banks, financial and non-financial organizations and suppliers of technology, etc. into the Blueprint Advocacy efforts.

Blocks:

Analyses - Box 1: Synergy	The old Business Rules for Synergy
Syntheses - Box 2: Motivation	Business Motivation Model
Proposal - Box 3: Financing	Revolving Loan Fund - Example

Navigation

ANALYSIS

SYNTHESIS

PROPOSAL

The Blueprint is initiated, coordinated and prepared by the international team of the 5forRES and owned by the Prague Project Portfolio Planning Platform for Renewable Energy Sources, 5P for RES s.r.o. It is a follow-u on the 5PforRES activities between 2008 and 2012, its reports, studies, bilateral meetings, and business trips to Ethiopia, Kenya, Malaysia and the Philippines.

The brief checklist of recommended workflow presents a survey of activities presenting the goals and contents of the Blueprint, its advocacy, and some notes on the SPC Pilot Project Implementation in Philippines.

No	Recommended Workflow	2013
1.	The final agreement on the Blueprint start up (signed LOIs between Sorsogon Province and 5PforRES in Sorsogon, and between MAPÚA Technology Institute and 5PforRES in Manila)	January
2.	The Blueprint Theses discussion with internal international team of 24 experts from Philippines, Hong Kong, USA, and the Czech Republic.)	February March
3.	The Blueprint preparation (inputs data collecting, key innovative segments (drivers, synergy, procurement) and financial models development	January April
4.	Draft of the Blueprint completed; its distribution to the consulting team for comments; reparation for the Blueprint Advocacy	May
5.	The Blueprint Advocacy of the two key issues: the SPC Concept for the Philippines and the Pilot Project preparation, implementation, and evaluation (central and local governments, banks, financial institutions, private sector partners)	May August
6.	Research work on the provinces, municipalities and barangays by the Mapúa Technology Institute and by local universities	June September
7.	Small solar PV power plant project in capacity from 1 to 2 MWe preparation and implementation (financing by czech private financial sources)	June September
8.	The final version of the Blueprint modified as the result of feedback from the Advocacy; its presentation to all partners in the Philippines and then at the 2013 International Conference on Sustainable Environmental Technologies in Manila	September October
9.	Decision on the SPC Pilot Project's Financing	Still open for discussion
10.	SPC Pilot Project preparation, implementation, evaluation	

The analysis uses inputs from international organisations, central and local governments, local sources and years of professional experience. The validity of inputs is subjected to verification throughout the Blueprint Advocacy (see the Blueprint Navigation).

Objective of the Analysis:

2.1 To identify the key drivers for sustainable growth of and improvement of quality of life (QF)
2.2 To introduce social and economic dimensions of the Self- powered Community (SPC) solutions for decentralised electrification projects
2.3 To point-out the need of achieving consensus in cooperation on Public Private Partnerships (PPP)
2.4 To sum-up characteristics of Renewable Energy Sources (RES) for decentralised electrification
2.5 To note the quality of information concerning decision making about financing of energy infrastructure
2.6 To sum-up absorption capacity and competitiveness of projects using the SPC approach
2.7 To identify approaches to sustainability, utility, effectiveness of investments into SPC projects.

Assumptions:

- Accessible databases and information sources are sufficient for preparation of the Blueprint
- Decentralised electrification based on RES is a feasible solution for rural and peri-urban areas
- Effects of synergy of SPC solutions are available if project implementation is done with a consensus of all key stakeholders.

2.1 SPC Social and Economy Drivers

Globally, access to electricity is a symbol of sustainable development and can be even seen as a basic human right. The Blueprint analyses some the issues that have proven to be critical in practical experience gained from Sub-Sahara Africa (Kenya, Ethiopia) and from the South East Asia (the Philippines).

It also points-out the relationship between Quality of Life (QL) and drivers of social and economic development derived from access to electric power. Besides the electricity (e) we identified two other drivers: water (w) and material (m). (For more details see Box 1)

2.2 SPC and Decentralized Electrification

Self-Powered Community (SPC) is a community that is electrified and value of electricity is understood and accepted as a commodity with monetary value that can improve QL. SPC is a comprehensive way of addressing decentralized electrification on a wider scale in many rural and peri-urban areas in tropical and subtropical country throughout the world.
Results of the analysis are in Synthesis and Proposal sections. In the Blueprint we present SPC's competitiveness, sustainability, and development-encouraging environment for the Philippines (their provinces, cities, municipalities, and barangays).

2.3 Collective Cooperatives and Public Private Partnership (PPP)

In the Philippines, the Collective Cooperative is a widespread way of enterprising. PPP applications use both top down and bottom up approaches. The top down approach is of priority value in transfer (sale) of the necessary financial tools and managerial skills. On other hand, the bottom up is not that easy to transfer (purchased for money). Local customs and practices and intersection of the private and public interests are important.
The bottom-up approach requires time and patience if the objectives (such as sustainability) are to be achieved. The bottom-up approach is effective and can meet the top-down approach as long as it is understood all key stakeholders. The Blueprint suggests the value of Collective Cooperatives value for implementation of PPP projects.

2.4 Renewable Energy Sources (RES) for Rural and Peri-urban Areas

The RES such as sunlight, hydro-energy, wind, biomass, geothermal heat, etc. are subject of interest of all countries through the world. The Philippines are no exception. An entire range of opportunities to use RES for most of the rural and peri-urban areas. Individual technologies are available and proven in real-life applications. The focus is on usefulness, effectiveness, and efficiency of individual applications and their combinations.

Therefore the analysis examines the opportunities for a broadly-based increase in electric power generation in the Philippines with impact on the main drivers of socio-economical development. The analysis it thus looking into synergy effects. The Blueprint emphasizes synergy effects for two drivers derived from having an access to electricity:

1. Water retention as an economic value and a pre-condition of life sustainability;
2. Economical use of (construction) materials (new and used) for a higher quality of life in rural and peri-urban areas.

2.5 Financial Sources and Financial Tools

The global financial framework (international financial institutions and other organizations, private investment capital), and financial sources of the Philippines (public budgets, local banks, funds and private capital) perceive the SPC-based project as a great opportunity.

The Blueprint analyses potential for financing for both the SPC Concept and the Pilot Project. The SPC Concept proposes a network (cluster of products) leading to financing of a small (up to 100kWe) modular system serving the needs of decentralized electrification of communities with an ambition to be an energy independent and have a sustainable operation independent of energy markets.

The Blueprint demonstrates the feasibility of project portfolio financing for SPC Projects on the Philippines' islands and proposes Pilot Project financing using specific example of the Sorsogon Province.

2.6 Competitiveness and Public Procurement

The issue of being competitive and the issue of public procurement are interconnected. In every country, problems with competitiveness and transparent public procurement often lead to bankruptcy and corruption.

The Blueprint advocates project portfolio approach (i.e. a more sophisticated project preparation and project portfolio implementation) as an efficient tool for achieving – among other things – the two above-mentioned objectives. Transparency and amount of available information are directly linked to the ultimate outcomes.
One phenomenon is clear: new IT tools – available in developed and developing countries alike - allow for better disclosure and review thus improving quality of the process.

2.7 SWOT Analyses

The Blueprint presents results of the analysis reflecting multitude of socio-economic criteria. The analysis is divided into six individual parts and each of them separately addresses technology and social issues. All six parts are independently evaluated by SWOT analysis.

This approach allows for a structured discussion concerning the objectives and findings of the analysis and at the same time offers – at the level of the entire Blueprint – identification of evidence in support of the assumptions mentioned above, thus providing a foundation for consensus building.

2.7.1 Quality of Life, SPC's Socio-economic Drivers				
Social	S	Structured sustainable development for majority of population	O	Improvements in quality of life can help using small (family) businesses to build a middle class
Technology		Positive impact from the growing global markets of RES technologies		Wider global technology transfer and better understanding of needs for access to electricity
Social	W	Requirements for a strong leadership in a community	T	The need for communication between the "rich and poor"
Technology		Lack of standards & rules for business cooperation		Negative impact of a mixture of new and old technologies on a project implementation
Inputs for the Synthesis: Improvement of quality of life in a community depends on the ability of leaders to capture, manage and control drivers of socio-economic changes.				

2.7.2 Self-Powered Communities and Decentralized Electrification				
Social	S	Opportunity and motivation to work together	O	Decentralized electrification opens door for new crafts and skills to local businesses
Technology		Renewable Energy Source used by small (family) business owners		Ownership of new RES technology uses newly created jobs and skills for local needs
Social	W	Different social roots and benefits to the final beneficiaries	T	Lack of information and limited cash on hand to fulfil financial liabilities
Technology		The old-fashioned technique of life of some of the final beneficiaries		Deficiencies in transfer of smart technology know-how to SPC projects
Inputs for the Synthesis: Self-Powered Communities are working when people in a community achieve a consensus about the electricity need and declare their will pay the bills for electricity consumption.				

2.7.3 Collective Cooperatives and Public Private Partnership (PPP)				
Social	S	Clear vision and trust to do business at a community level	O	Added value to PPP at a community level gained by (better) access to electricity
Technology		Global market growth and product price decline		Collective cooperatives ownership could be used for sustainability of the projects
Social	W	Local entrepreneurs will not be motivated to participate in PPP	T	Poor performance of public administration, internal financial control, and corruption
Technology		Sale of „second hand" technologies		Misunderstanding and loss of trust, loss of motivation to participate
Inputs for the Synthesis: Collective cooperation rules open door for Public Private Partnership (PPP) when both side (public and private) are ready to declare accounting procedures transparent and open to both of them.				

2.7.4 Renewable Energy Sources (RES) for Rural and Peri-urban Areas				
Social	S	Competitive advantage of common ownership of RES in a community	O	Participation in the growth of a domestic industry growth; sustainability of local jobs
Technology		Global Know-how and skills transfer growth by ICT tools		Growth of a middle class (blue collar mostly) at rural areas will have a realistic base
Social	W	Lack of local capacity for sustainable consensus	T	Disorder in public administration and no will of community leaders to solve it
Technology		Lack of local capacity for engineering services		Unfinished project or many mistakes and troubles during project implementation
Inputs for the Synthesis: Renewable energy sources can add socio-economic value to everybody in a community in rural and peri-urban areas everywhere through the world.				

2.7.5 Financial Sources and Financial Tools				
Social	S	Direct financial participation in small capital expenditure projects	O	The role of drivers in project portfolio planning and implementation is apparent
Technology		Multifunctional SPC Projects open new business opportunities		Access to revolving loan financing for project portfolio will have a bona-fide basis
Social	W	Lack of financial literacy concerning global business	T	Inability to solve impacts of disturbances on the global financial markets
Technology		Identification of high-tech technologies and their pricing		Loss of trust of producers and suppliers and termination of contracted services
Inputs for the Synthesis: Financial sources (public, private) for SPC solutions exist. What is missing are flexible financial tools such as Revolving Loan Fund available to communities. Similar efficiency as for “banks - corporations" is needed for "banks - communities" relationship.				

2.7.6 Competitiveness and Public Procurement (Calls for Project Portfolio)				
Social	S	More jobs gained through calls for small and micro business proposals	O	Risk of corruption in procurement at the local level will be subject to public control
Technology		Feasible technologies open the room for decentralized procurement		Modular solutions and public procurement of complex “packages” will reduce cost
Social	W	Lack of a policy experience for acceptance public procurement rules	T	Inefficiency (corruption) in procurement and no will of community leaders to solve it
Technology		Global interface (rules) for entrepreneurs		Collapse of services of public administration and procurement and loss of trust needed for participation
Inputs for the Synthesis: The issue of competitiveness and public procurement must not be separated.				

BOX 1. Synergy - Old Business Rules for Synergy

After reading one example of principle of synergy, practiced by Native American it was an extra reason for thinking about synergy yet. The example concerns itself with a brilliant combination in planting technique practiced by Native Americans. The principle of synergy is ending up with the whole gaining more than what the sum of individual parts otherwise would be.

Native American called this agricultural planting practice „Three Sisters“: The First sister: Production of maize (aka corn); the Second sister: Production of beans; the Third sister: production of squash. They knew that corn grows tall but it has shallow roots and needs nitrogen to support the growth. Bean plants need something to climb on in order to produce more beans and to fix nitrogen captured from the air into the soil. The corn provides the stalk for climbing and beans provide the nitrogen for corn to grow tall.

Then squash is a low-growing plant that keeps out weeds, shades plant roots to retain moisture, and benefits from the shade provided by corn stalks. For generations they were doing things this way to obtain higher yields than it would be otherwise possible from a single crop planting. Farmers had known how to mix biological features of plants and used very simple method of trial and error to arrive to a perfect, synergic solution.

A synthesis is focused on presentation of simple SPC solutions for the Philippines based on the findings in the Analysis section and it also presents the justification and reasons behind the SPC Pilot Project Proposal. The conclusions of the Synthesis are tested in the Blueprint Advocacy process (see the Blueprint Navigation).

Conclusions of the Synthesis for:

3.1 SPC Methodology
3.2 Consensus, Decision Making and Business Rules
3.3 Macro Cash-flow Model, SPC Pilot Project, Blueprint Advocacy
3.4 SPC 100kWe Model, Drivers of Quality of Life
3.5 Services Model (SPC Utilities and SPC Factories)
3.6 Financial Tools
3.7 Public Procurement
3.8 BOCR pre-Assessment

Initial assumptions:

- Sorsogon Province is the reference sample for preparation and advocacy of the Blueprint
- The Blueprint Advocacy is an acceptable tool to demonstrate the acceptability and feasibility of SPC solutions for a decision concerning the SPC Pilot Project preparation and implementation.

3.1 SPC Methodology

The SPC Methodology distinguishes three levels:

1. SPC Concept – presents core ideas and principles;
2. SPC Model – creates alternatives and selects priorities;
3. SPC Project – proposes project portfolio.

All three levels have its own project life cycle in project portfolio (SPC Solution). The role of the SPC Methodology is to serve a competitive, sustainable, and development-encouraging environment for complex solutions initiated by decentralized electrification of a specific region. The Blueprint is focused on provinces, cities, municipalities, and barangays to be subject of an of off-grid (decentralized) electrification of the Philippines.

3.2 Consensus

Consensus is accepted as the best approach to achieving socio-economic harmony among multifunctional projects. In the Blueprint we see the consensus as a positive environment for acceleration of access to electricity in the communities.

It is about self-participation, business rules supportive responsibility for production and/or consumption of electricity in a specific geographical environment.

3.2.1 Consensus and Decision Making

Decentralized electrification, renewable energy sources and motivation for utilization of synergy effects not only bring new players into energy sector but they also dramatically increase number of decisions to be made mostly at rural and peri-urban levels.

Voting will have stronger impact on quality of the final decisions. Simple policy pressure on a decision will have to be substituted by motivation to look for alternatives, weighting their impacts, and using consensus building for flexible prioritization of financial sources allocation and spending.

3.2.2 Consensus and Business Rules

What should be done? Split research and analytical work at two levels.
The first is consensus building at the end users' side: to get their commitment to participate and adhere to the SPC business rules.

The second level concerns itself with decision making on investors' side: to have the confidence in sustainability of the local electric power market.

Business rules guide electric bill payers through the SPC project portfolio and assist electricity sellers' decisions. Business rules not just as a written document (regulation) but day-to-day agenda assisted by smart techniques on client's side (e.g. wall chart techniques) and by advanced techniques on seller's side (e.g. alternative solutions and priorities reset by AHP/ANP approach).

The Blueprint prefers flexibility against rigidity in processes that are transparent and just-in-time measurable (e.g. electricity payments measured by electricity meters).

3.3 Macro Cash Flow Model

Several ways exist in approaching the Macro Cash Flow Model. In a nutshell it is about an idea what the volume to be financed is and the way how to secure the ultimate volume and implement it.

The Blueprint presents two views: preparation and implementation of the Pilot Project and justification of the project. This approach allows us to apply multi-functional views at technical and financial solutions. The Pilot Project for the Philippines is presented with the understanding that it is replicable in other parts of the country as well as in other countries.

Therefore we have invited more banks and financial organizations from the public and the private sectors to participate in Blueprint Advocacy.
We intentionally put the Pilot Project into multi-function positions with the objective to seek synergy effects.

We do not see the needed financial resources as a simple addition of the cost linked to generation of the certain number of kWhs but we work with other measurable indicators. The objective is to implement targeted (revolving) financing for mid-length time frame (20 to 30 years.)

3.3.1 SPC Pilot Project Preparation and Implementation

The Blueprint opens the discussion between and with banks and financial institutions about cooperation in a syndicated co-financing scheme (e.g. the Asian Development Bank, the World Bank, the Development Bank of the Philippines, the Korea's Official Development Assistance, the European Development Fund, and other banks and financial institutions).

The Blueprint offers Business Motivation Model (BMM) to financing institutions to procure their interest to finance the Pilot Project preparation, implementation and evaluation.

The Pilot Project's stages are calculated to have the following costs: preparation stage - up to $1.0m; implementation stage up to $30m; and evaluation stage up to $0.5m. The preparation stage is planned for 2014.

Implementation and evaluation stages are planned for three years. The Pilot Project should be completed and evaluated before the end of 2017 (for more details see 4.2).

The first draft of a detailed Pilot Project Cash Flow Model is part of the Blueprint Advocacy.

3.3.2 Blueprint Advocacy and SPC Pilot Project's Stages

The Blueprint sums-up results of the analysis and good practices in a form which will help decision makers at the provincial and the central government levels to review and decide on how to proceed (see also the Blueprint Navigation).

For that purpose the key decisions for the SPC Pilot Project stages are described in more detail with the understanding that they will be augmented and specified during the Blueprint Advocacy:

Preparation Stage: final decision on the Pilot Project's location, number of inhabitants of in the sample (1.0 mil inhabitants is suggested), and on acceptance of the Blueprint version completed by the 5PforRES.

Implementation stage: final decision on financing and project portfolio competences and responsibilities, financing of Business Concept preparation, financing of the Organizational and Financial Schemes, Business Motivation Model preparation for project portfolio of the Pilot Project. These documents should be prepared before the first project is implemented.

Evaluation stage: The Blueprint Advocacy will convert into the Preparation Stage in October 2013 (after the 2013 International Conference on Sustainable Environmental Technologies, ICSET 2013, Manila, Mapúa Technology Institute).

3.4 SPC100kWe Model

100kWe is a designation of an output of power stations which are used in the SPC Concept. These small power stations with the output in a range from 1 to 1,000 kWe are perceived as modular units which in their combinations (usually using a mix of RES) satisfy the required forecasted capacities of a client (owner).

He will either use the electric power generated for his own needs (families, cooperatives, workshops, and small enterprises) or he will sell it – in part or in its entirety – into the power grid of the appropriate Power Cooperative.

In those instances when it is economically feasible to build in given location a power plant with 20 MW output (for example a hydro-power station) an investor will use as much electricity he can use and sells the rest to a grid run by a Power Cooperatives at a rate set forth by a regulatory agency, the Energy Regulation Commission.

3.4.1 Drives of Quality of Life

SPC Concept drives electricity production by a bottom-up approach. Introduces quality of life (QL) improvement measurable by very simple indicators.

Electricity (e) in kWe and kWh, water (w) in m^3, and material (m) in tons, all per capita.

Synergy effects are simply expressed by equation: QL => (e) & (w & m).

The equation is based on an assumption that electricity (e) creates jobs, water (w) is a necessary condition for life, and material (m) is a mirror of QL in a community.

The Blueprint presents that jobs relay on access to materials; new material reflect vision for future, old material presents history of a community.

To apply this approach in practice a methodology of control and measure indicators must be known.

The Blueprint uses four criteria: benefits (B), opportunities (O), costs (C), and risks (R) of the AHP/ANP methodology. QL is expressed by the ratio (B&O)/(C&R).

3.4.2 (e) Driver Content

Electric power is undoubtedly a driver of economical and social development and it is not necessary that electric power generation and use of electricity have negative impacts on environment. The so-called “Big energy”, while often criticized, has been for a long time a key driver of a lifestyle in all developed and developing countries.

Small energy (decentralized electrification) is today seen as a parallel supplement to large energy projects. While it might be too early to speculate how quickly the importance of decentralize electrification will rise, it is already clear that it will be substantial and that is where the future lies.

We need to give this development the necessary framework. The Blueprint sees such framework in the SPC Concept. It proposes modular set-ups of small-scale technologies (100kWe for solar PV, small hydro-power, biomass, wind, geothermal, diesel) including small modular power station of the future (wave energy, pyrolisis, fuel cells, thermal turbine, etc.).

Efficiency and economy of these solutions is demonstrated in SWOT and BOCR analysis.

3.4.3 (w) Driver

The life on islands in the Philippines is strongly affected by access to water coming from clouds (when it rains a lot, threats of floods and landslides arise; when it doesn’t rain enough, drought comes as most of the fresh water flows into sea.

This is a classic scenario for islands of volcanic origin in tropical regions. Previous generations dealt with these swings in various ways. See the rice fields on the mountain slopes in northern Luzon. The solution to water retention and regulation of water flow into sea minimizes floods and landslides. These are demanding, long-term, and expensive projects.

The Blueprint proposes a synergy of three drivers: water retention (small dikes represent electric power-generating potential and the electricity is a source of income for the communities. Synergy of key drivers has the potential to initiate sustainable income for the SPC project portfolio.

Communities in a valley can joint their effort and create new jobs in implementation of retention projects, construction of cascades of small hydropower plants, strengthening of dikes and slopes with bamboo fields, building and operating biomass-fired power plants, etc. Provinces will manage and control all through the SPC Utility and financing via Revolving Loan Fund. Feasibility of such synergy will be demonstrated by SPC Pilot Project.

3.4.4 (m) Driver

Like anywhere else, people in the Philippines need jobs, expansion of domestic market as well as exports. This is addressed by the (m) driver; access to materials with a link to production and consumption of electric power.

Both new and used (recycled) materials are being used. Among new materials the priorities include bamboo and post-harvest waste. Priority sources of material (m) include communal waste, used tyres, and batteries. Bamboo is of a great value for job creation; it is a material serving as a foundation for new industry and exports opportunities.

Bamboo is not only a post-harvest biomass as it is used in construction, furniture making, food processing and it being used in floodplain forest etc.). The issue is how to use (bamboo, post-harvest and communal) waste in optimal ways to include electric power (and heat) generation.

Feasibility of various specific technologies for particular application in the Philippines will be demonstrated by the Pilot Project.

3.5 Service Model

In the world a number of examples of decentralized electrification exist. (e.g. solar technologies places on roofs and balconies, etc.) Expansion of solar PV applications is a dynamic process which is also subject of competition with traditional electrification based on a large, primarily fossil fuel-fired power stations and high voltage power grid.

New kinds of relationships between electric power generator, distributor, and end user are taking place and new technical standards and regulatory measures are trying to adapt to these developments. The Philippines are – for many reasons, including its size, geography (thousands of islands), climate as well its dynamic economic development an ideal environment for pilot applications of comprehensive (SPC-based) solutions based on decentralized electrification using locally available renewable sources of energy.

3.5.1 The role of SPC Utilities

The role of energy utility companies is well known and proven, yet it is open to new approaches and arrangements. The issues are – above all – accessibility of electric power on a continual (24/7, year around) basis and the ability to react in competitive ways to surges in demand for electric power.

The Blueprint addresses the issue of synergy of production and business processes in project portfolio, organizational solutions based on SPC Utility and on motivational support of cash flows between electric power generator and users (see details in 3.6). We see SPC Utilities as a stand-alone enterprising units established by the province with the mission to provide consulting in selection, implementation, and operation of an optimal electric power-generating system (i.e. 100kWe) selected from the available and possible modular set-ups of power plants and micro-grids.

SPC Utilities use external contractors for research, on-site surveying, and component procurement, installation of power plant systems and their maintenance and servicing. In a province, the SPC Utility also plays a role of a local government's oversight. SPC Utility can be also viewed in the context of a Segregated Portfolio Company.

Segregated Portfolio Companies have several potential functions. They are most commonly owned in the formation of collective investment schemes for the formation of captive insurance companies. They are also sometimes used as asset holding vehicles (characteristically where each portfolio holds a single unit – such as a RES-based power plant). This type of company can also be used in capital markets debt issuances.

Examples of SPC Utility proposed for the SPC Pilot Project are listed in section 4.4.

3.5.2 Role of SPC Factories and Workshops Network

The SPC Concept is addressing priorities of socio-economic development based on improvement of the national (or local) energy infrastructure and achievement of sustainability. There are no reasons to relay only on import of RES technologies, as it is more efficient and desirable to build own energy infrastructure industry to satisfy domestic needs and have opportunities for value-added exports.

SPC Utilities need services for construction and maintaining of modular units of 100kWe power plants. This is beyond the SPC Pilot Project but it is an important issue for future.

SPC Factories should serve SPC Utilities by specific products and services and in all country operates through franchised Workshops (for a sustainable maintenance of modular units under operations).

SPC Factory should buy services and components for its semi-products (tailor-made) for a specific locality on global market (e.g. PV panel production, small biomass, hydro or geothermal modular unit production, etc.). SPC Factories and workshops network can be seen as well like a Segregated Portfolio Company based on a collective investment scheme (this a following a shot comments for an Enterprise Architect).

3.5.2 Role of SPC Factories and Workshops Network

A collective investment scheme is a way of investing money alongside other investors in order to benefit from the inherent advantages of working as part of a group. These advantages include an ability to hire a professional investment manager, which theoretically offers the prospects of better returns and/or risk management and benefit from economies of scale - cost sharing among others diversify more than would be feasible for most individual investors which, theoretically, reduces risk.

3.6 Financial Tools

The Blueprint operates with standard and frequently used financial tools (grants, loans, venture capital) on the financial market side, and on the SPC side the Revolving Loan Funds mechanism is introduced.

Selected instruments of financing should – above all – fit the best to all parties involved. Selection of instrument of financing reflects how mature the partnership in the project being prepared is. Selection and application of a particular instrument of financing also predetermines what financial settlement is to take place after the project is completed (e.g. project's construction phase and its transition to production stages).

SPC Concept prefers elimination of subsidies in construction and operation phase and prefers subsidies being made by grant for project preparation stages and being split into less than five milestones.

The grant should be split into wage cost expenditure and success fee premium. The specific approach to selection of instruments of financing will be fine-tuned during the preparation of the Blueprint Advocacy.

3.6.1 Revolving Loan Fund (RLF) - General Characteristic

For RLF is characterized by periodic repayment schedule (monthly, quarterly or semi-annual), consisting of equal principal payments plus interest. Another feature of the RLF are the annual operating expenses: cost of capital (donor's ROI) plus administrative expenses, plus contribution to loan loss reserves.

However, unlike grants, the RLF generates loans, and they must be paid by the borrowers back into RLF. The objective is continuing issuance of new loans. Therefore, it is imperative that the administration of the RLF undertakes due diligence analysis in underwriting and monitoring the loans.

Administration of the RLF has to verify that borrowers have economic and financial capacity to repay a loan over the repayment schedule. Loss on a loan diminishes the original capitalization of the RLF. There are some unwritten criteria, which should be considered important.

3.6.2 Revolving Loan Fund and Case Example

A Revolving Loan Fund (RLF) is a sustainable mechanism to finance SPC Infrastructure capital projects. The Blueprint focuses on decentralized electrification projects but the universality of the RLF's applications can be seen in Box 3. RLF is a suitable instrument of financing which not only maintains the its initial amount available to financing and at the same time has the flexibility to respond to borrowers' degree of financial obligations by modifying terms of loan payback.

RLF advantages are obvious from the example:
Projects in the SPC Pilot Project portfolio will be financed through RLF. Initial funds in the RLF – about $30 mill - will be given by consortia of banks with the fund lifespan being 20 years. A loan for is single project will be about $3 mill. With payback period of 5 years the fund then extends 40 loans totaling $120 mill. If the payback period is 10 years, the fund can issue 20 loans totaling $60 mill, etc.

This very simplified example indicates that the fund can have the flexibility to respond on the degree of debt burden of borrowers and attract additional funding from other banks and financial institutions or activate other guarantees.

3.7 Public Procurement

Modern public procurement has more than one hundred years of history yet in every country it struggles with often insufficient capacity to resist strong pressures of corruption. Thus public procurement is a tip of an iceberg of an entire array of problems in outlays of public budgets.

To address problem of corruption only at the procurement level is not enough. If this is the case, the usual conclusion is: We have good procurement legislation but the reality is not so good, it is often something different.

Among the solutions to this never-ending challenge is the ability to really understand what in the end takes place. In order to be able to do so, preparation and execution of public tenders must be transparent and simple and sanctions for violations really effective. The Blueprint in particular recommends use of the best practices of procurement from Australia.

3.7.1 Public Procurement Reform

In recent years, the government of the Philippines has introduced reforms of its procurement system. The reforms focused on fostering competition, increasing transparency, standardization of procedures, enhancement of end-product quality and contractor reliability, ensuring proper planning and budgeting, combating corruption, and strengthening accountability. Nevertheless problems with corruption are not always prevented.

How the SPC Concept can help? The core idea is to operate in a "Product Space" network (e.g. public procurement in a cluster of products for portfolio of projects). The Blueprint proposes project portfolio of small 100kWe units (a modular system) under control of the final user – i.e. specific communities. A transparent global market represents a Product Space with a broad benchmarking opportunity.

SPC Concept presents this new structure for public procurement. At the same time the SPC Business Rules will reflect the procurement law of the country.

3.7.2 Project Portfolio and Calls for Project Proposals

The Blueprint proposes the Pilot Project using a population sample of one million inhabitants with the average annual consumption of electricity at 593 kWh per capita.

An investment of $ 30 million will increase the installed power-generation capacity of Sorsogon province by about 5%. We expect that the Pilot Project will generate subsequent building of many small (about 100KWe) electric power stations and a series of other capital improvement investments, with replication factor for the entire Philippines about 100 (for more detail see 3.6, 4.2 and 4.3).

With such large volume of orders (up to one hundred-times $ 30 mil) it is necessary to take a close look and make sure that the process of public procurement meets the highest standards.

That includes electronic management and controls of procurement process, adherence to the SPC Business Rules with effective enforcement of the law and the rules in case of violations and damages subjected to state administrative and judiciary system (see the law on public contracts.) An advantage of this approach is that the Business Rules can be multi-functional.

They should address and guide procedures in preparation and implementation of synergy effects (see, for example, those under the authority of SPC Utility, section 4.4).

This is fitting the broader contexts of reforms necessary for maintaining the economic growth, social peace, and protection of environment. The Pilot Project should make its contribution in following these objectives.

3.8 BOCR pre-Assessment

Recommendations in the Blueprint build on a productive business dialog in the country. The goal is not only to select the best technology for implementation of SPC Projects but also transfer of the best organizational solutions in day-to-day operational management and controls.

SPC Pilot Project is a positive challenge and opportunity to provinces (and cities, municipalities, barangays) that might also arise in the coming four years after May 2013 elections. Related to the SWOT analysis we offer to present expanded evaluation based on Benefits (B), opportunities (O), costs(C) and risks (R).

3.8.1 SPC Methodology

B	*Consistency* – a common SPC solution for rural and peri-urban areas of tropical and subtropical countries.	O	*Understanding* – a broad topic both a chat show and a professional discussion face to face or by mobile and through internet.
C	*Savings* – necessity to think about effective, efficient and economical financing with utilization of multi-functional approaches.	R	*Competitiveness* – a common use of best practices and risks analyses for minimising frauds, corruption, and red tapes.

3.8.2 Macro Cash Flow Model

B	Transparent demand for financial resource from international financial institutions (IFI), local banks, and governmental programs	O	Dissemination of best practices of the SPC Project Pilot for better navigation of families and entrepreneurs in menu offered by the project
C	Stability of cash flow stability and cost savings are matter of proper project control	R	Formal approach to SPC Concept by ensuring that decision makers and end users are committed to project sustainability

3.8.3 100kWe Model

B	Access to information from a global market of decentralized electrification to all clients from rural and peri-urban areas	O	Business opportunities at a global market of decentralized electrification are opened to every project's client in rural and peri-urban areas.
C	Prices of technologies (solar, hydropower, biomass, wind, geothermal) are falling down, and synergy effects can multiply project's benefits	R	Limits on community's participation in Pilot Project are usually caused by a restrictive nature of a decision not to expand their absorption capacity to take advantage of global markets potential

3.8.4 Service Model

B	Sustainability of decentralized electrification enhanced by the SPC Utility network servicing guarantees	O	New jobs and professional growth in barangays generated by higher demand for services within the new and growing SPC infrastructure
C	Saving costs by domestic (local) production and services, standardization, and unification of decentralized modular assembly system	R	Sustainability of SPC project can be threatened with imports that prevent making them locally at lower cost or by poor or no services extended by SPC Utility

3.8.5 Revolving Loan Fund			
B	Access to electricity is available to a broad range of consumers as the electric power is generated under the umbrella of the SCP Utility	O	Opportunity of Pilot Project to introduce and disseminate best practices of the Revolving Loan Fund to other communities.
C	Revolving Loan Fund redistributes money in a market basket of a family and/or entrepreneurs on acceptable level and sustainable needs	R	"Tunnelling out," i.e. strip assets from one's own community is the worst contrived act that has the power of destroy the hope for community cooperation through the Revolving Loan Fund

3.8.6 Public Procurement			
B	"Smart" public procurement are under discussion so that they are available to small entrepreneurs operating at the bottom of the social pyramid	O	Democracy in public procurement is an opportunity for issuing smaller scale public calls with stronger participation of smaller bidders taking advantage of participation in SPC projects
C	Transparent public procurement saves costs and supports competitiveness	R	Corruption in public procurement in a community is a snapshot of unhealthy practices

BOX 2. Motivation - Business Motivation Model

The Business Motivation Model (BMM) is a product of Object Management Group (OMG), and Business Rules Group (BRG). The BMM provides a scheme or structure for developing, communicating, and managing business tasks in organised manner.

The BMM identifies factors that motivate the establishing of business plans (business concept), identifies and defines the elements of a future business, and indicates how all these factors and elements inter-relate. There are two major areas for a consensus about common business:

- The first is the Ends and Means of a business. Among the Ends are things the owner of a business wishes to achieve internal and external consensus on the business (e.g. its Goals and Objectives). Among the Means are things that owners of the planned business use to achieve those Ends (e.g. Strategies, Tactics, Business Policies, and Business Rules).
- The second are the Influencers that shape various elements of the business, and the Assessments being made about the impacts of such Influencers on Ends and Means (i.e., Strengths, Weaknesses, Opportunities, and Threats and Benefits, Opportunities, Costs, Risks).

The Ends, Means, and Influencers are related to each other in order to answer the following two fundamental questions: What is needed to achieve what owners of the business wish to achieve, and why does each element exist?

The answer comes from identifying the particular Ends that each of the Means serves, and the Influencers that underline the choices made in this regard.

The proposal of the Pilot Project respects the LOI signed by Governor of the Sorsogon province and the 5PforRES Managing Director. Visits to the Sorsogon province and the assistance provided by the Mayor of St. Magdalena helped us in identifying the "Province Unit" with a one million inhabitants.

Electricity consumption for this Province Unit is a working figure using 593kWh of annual consumption of electricity per capita (based on the 2009 average per capita electric power consumption in the Philippines).

Other inputs for the Pilot Project financial background are explained in 4.5.

SPC Pilot Project Characteristics:

4.1 Pilot Project Description

SPC Pilot Project addresses the electrification needs of rural and peri-urban areas – both on and off-grid. It introduces small power plants (100kWe) based mostly on renewable energy sources with capacity to produce electricity 24 hours/7 days per week /year around with an acceptable price, reliable service and with sustainability over the entire life cycle of SPC projects.

Feasibility of the Pilot Project depends on SPC Utilities delivering their day-to-day services reliably and on Revolving Loan Fund providing sustainable financing.

The SPC Pilot Project should be a core subject of the Blueprint Advocacy.

4.1.1 Pilot Project pre-preparation stage

Before the final decision on the SPC Pilot Project will be made it is recommended that an initial research in the province takes ace, and gathering and completing input data for assistance of the decision making process on the Pilot Project financing.

The Blueprint proposes to start this activity at the second half 2013. Research should work on business model, use questionnaires and direct contacts with several barangays.

The LOI signed between the Mapúa Technology Institute and the 5PforRES, and the SPC Concept presentation at the 2013 ICSET in Manila in October 2013 should be used for this early preparation stage.

The Blueprint Advocacy questions:

1. How the local universities might help.
2. When is the most suitable time for conducting research in the province?

4.2 Pilot Project Financing and Management

Financing of the project (what, when and how requires financing) and how the financing is to be managed. These questions will be addressed in the Blueprint Advocacy.

This task (as well as other) will generate questions, which the authors of the Blueprint will answer on the basis of informal consultations. Summary of comments on the Blueprint and answers to them will be then submitted to the following:

- Municipalities, barangays (Mayor of St. Magdalena, Sorsogon)
- Provinces (Governor of the Sorsogon province)
- International financial assistance (Ministry of foreign affairs)

4.2.1 Financial Opportunities

The Blueprint proposes for the Pilot Project preparation costs of $1mill, for project portfolio implementation $30 mill, and for evaluation $0.5 mill.

This is a financial framework of the proposed Pilot Project.

The Advocacy stage will open working contact with financial institutions: e.g. International financial institutions (IFI), agencies for international development, international commercial and local banks, national and local budgets, and private investors.

The Blueprint opens un-official contacts on the SPC Pilot Project financing. Finally, the Blueprint should be transformed in a handout of the official request of the Philippines for the SPC Pilot Project financing.

The Blueprint Advocacy questions:

1. How to present results of communication with unofficial contacts?
2. Who will authorize 5PforRES to work with financial institutions?

4.2.2 Management Assumption

Management framework of the SPC Pilot Project will be discussed during the Blueprint Advocacy stage. But there are some business assumptions that should be taken in an account:

- Project's internal and external hierarchy (Public Private Partnership)
- Project portfolio management and internal financial control
- Financial control of results of individual project of the project portfolio
- Structure of the profit for business performance of a multi-functional project
- Motivation for dissemination of project results

The Blueprint Advocacy questions:

1. Who will decide about localization of the Pilot Project?
2. Would it be feasible to follow-up on the LOI already signed and based the following work on a MOA, for example?

4.3 Pilot Project Portfolio for a Province unit

The "Province Unit" is based on characteristics of the Sorsogon province. The province of Sorsogon is located in the Bicol region. It is the southernmost province in Luzon. All 750 thousand inhabitants have opportunity to be on the Luzon power-grid but not all have an access to electricity.

Province of Sorsogon is a case of mixture of on-grid and off-grid solutions, example of a strong local electricity producer (geothermal energy), and example of a region located at a margin end of a big island. The province has one city (Sorsogon City), 14 cities/municipalities, 24 districts, and 541 barangays. More detailed view at the municipality level was obtained from Santa Magdalena Municipality (14 barangays, 2 districts with 16.5 thousand inhabitants).

A Pilot Project portfolio composed from two groups of technologies using RES is proposed to suit the particular conditions. The first group are currently used technologies (available on the market) and the second group are technologies of the near future. Diesel generators, now frequently used, are not used at this stage.
We see their role as supplementary. Any extend of their use will be above all determined by the cost of oil and transportation/delivery cost for the particular location. All technologies presented are suitable for mixed applications using locally available sources and delivering electric power 24/7. For the needs of the Blueprint we set-fort Range of Capacity Cost in $/kW (more see in section 4.6).

4.3.1 Solar

Both thermal and photovoltaic solutions are available. For example, solar thermal for drying food, solar PV for electric power generation. For the above-average overcast skies and precipitation we recommend using less expensive alternative to crystalic-based PV panels, thin film which respond better to diffused light.

Their disadvantage is lower efficiency and because of it they need more surface area of installed panels. In 2011, we offered a solution for building a thin film panel-producing factory in the Philippines and we believe that is still a suitable production line focus for the future SC Factory (see 3.2.5).

Despite of the fact that solar power plants have a low efficiency in converting soar into electric energy, they are attractive supplement in mixed sources power-generation solutions.

The Blueprint Advocacy questions:

1. The cost structure of PV "roof/balcony" power plant is based on: PV panel $1.8/kW (2010) and $0.5(2013, etc. Can we, for example, reduce construction cost by using bamboo bars? The labor cost might be also lower than what cost structure based on US or EU suggests.
2. Range of Capital Cost in $/kW for solar in section 4.6 is conservative in a comparison with the scenario described above. How to get realistic inputs for the SPC Pilot Project?

4.3.2 Hydro-Energy

The Blueprint recommends both water retention solutions (for drinking water purposes, for irrigation, floods control), and hydro-energy powers installation (for hydroelectric energy production) in one package (more details see in 3.4.3 and 4.5.1). There are four types (sizes/ranges) of hydro-electric power generation stations: large hydro-power (more than 50 MW), medium (less than 50 MW) and small and micro hydro-power.

The definition of a small hydropower is generally accepted up to be up to 10 MW. This level is further subdivided into mini-hydro, usually defined as less than 1 MW, and micro-hydro, which is less than 100 kW. Micro-hydro applications might serve single households or small enterprises, while mini-hydro might be appropriate for small communities. Number of companies offers standardized turbine generator packages in the approximate size range of 200 kW to 10 MW.

4.3.2 Hydro-Energy

The installation is often just a small-dam (pool), at the top flow of a river, with several hundred feet of pipes leading to small generator housing. These water-to-wire packages simplify the planning and development of the site, since one vendor delivers most of the equipment.

Micro-hydro plants may use purpose-designed turbines or industrial centrifugal pumps connected in reverse to act as turbines. Plenty of examples of installations of standardized or modular hydro-power stations have been already publicized.

The Blueprint Advocacy questions:

1. Who is the responsible body in Philippines for water management/retention and hydro energy package business development that we use in the SPC Concept?
2. How will SPC Utility manage such a broad spectrum of different projects?

4.3.3 Biomass

Biomass is a natural product of solar energy. It is a stored energy for use at will; biomass is both renewable energy source and waste. There are various kinds of biomass use: direct use (burning), indirect use (biological and thermo-chemical conversion, pyrolysis and gasification). For the pilot SPC Factory we prefer simple direct burning option when the oxygen from the atmosphere combines with the carbon in the plant to produce CO2 and water (both are again available and the cyclical processes can continue). Low levels of sulphur and ash in biomass prevent acid rain formation.

Biomass is a fuel (agriculture waste, crops residues, wood and wood waste, organic waste) that is available in a majority of geographical locations. Direct thermal application (burning), steam production and power generating are proven technologies already available with minimal capital outlays, operated with present manpower and material sources.

Biomass technologies are reasonably priced. They meet the basic needs of people in rural and peri-urban areas and have positive influence on land use. Electricity can be produced on a large scale and generate rural employment.

Electrification of peri-urban areas can stimulate production and services for the entire urban areas. For municipal solid waste there are new technologies on the global markets. The concept of “energy plantation” can help as well. In this scheme, selected species of tree are planted and harvested over regular intervals of time in a phased manner so that wood is continuously available for electricity production and cooking.

The Blueprint is focused on bamboo and its synergy effects (mere details se in section 3.4). It was in October 2012 when Senator Francis Pangilinan urges the government to provide the country’s farmers with the necessary technology and support to boost the Philippines’ bamboo industry for domestic use and export.

The Blueprint Advocacy questions:

1. Biomass is both renewable energy source and waste. What is the core driver for biomass business: waste liquidations or energy plantation?
2. Are both biomass waste and bamboo plantations a business for SPC Utility? The Blueprint suggests that YES, they are. We know that biomass may be expensive, and biomass conversion to is expensive. So we recommend the SPC Utility to own bamboo fields.
3. *Cost of biomass transportation and manipulation represents almost 50% of the total price $/kW in biomass direct burning power plant. On the other side it a source of jobs for poor people in peri-urban and rural areas. How we can involve it in the SPC Pilot Project?*

4.3.4 Other Conventional and Advanced Technologies

Conventional wind and geothermal conventional technologies are included in section 4.6 Pilot Project Financial Framework. Wind technology is very advanced a broadly used around the world. The islands of the Philippines are windy areas suitable for this technology both onshore and offshore solutions. Similarly, geothermal technologies as the Philippines are in seismically active area with a large potential for geothermal energy. Energy sector is changing dramatically.

Decentralized electrification open new opportunities. Many studies (e.g. in References) identified advanced technologies following this trend. The most promising are Fuel Cell Mechanical Equipment and Systems (the fuel cells convert chemical energy directly into electricity from natural gas and air vapour and produce heat and water vapour as by products with electric output from 400kW to 20mW), Thermal Turbine (performs conversion of the accumulated heat reaching 90 °C into electric power with output 20kW per single unit). Other interesting technologies are for electricity production by advanced diesel/gasoline generators or future sea wave energy, and for energy accumulation water pump storages and/of advanced battery systems.

The Blueprint Advocacy questions:

1. Wind technologies are now imported. Can the domestic, Philippine industry start producing their own?
2. Geothermal energy potential is almost the highest in the world on the islands of the Philippines. What might be done so that the Philippines might be in the future the leader in advanced geothermal power plants constructions? Is there an opportunity for 100kWe unit to use geothermal energy (compare this idea with the progress in heat pumps applications)?

4.4 SPC Concept for Pilot Project

The Pilot Project will introduce and propose a SPC Utility and Workshops network for a Province Unit representing good governance in the Philippines. SPC Utility is type of a new company implementing the SPC Concept in socio-economic development (more details see in section 3.5). The Pilot Project will implement and test functions of SPC Utility for a territory with one million inhabitants. They are now served by two or more Electric Cooperatives.

The Sorsogon province with two Electric Cooperatives (SORECO I & II) is a real and specific sample of good governance for the SPC Pilot project. The SPC Pilot Project must respect energy reality in Province, and look for a economical and social space for decentralized electrification.
Current economic impact on people in Province is demonstrated by energy charges of Electric Cooperation, SORECO I, from June 2012.

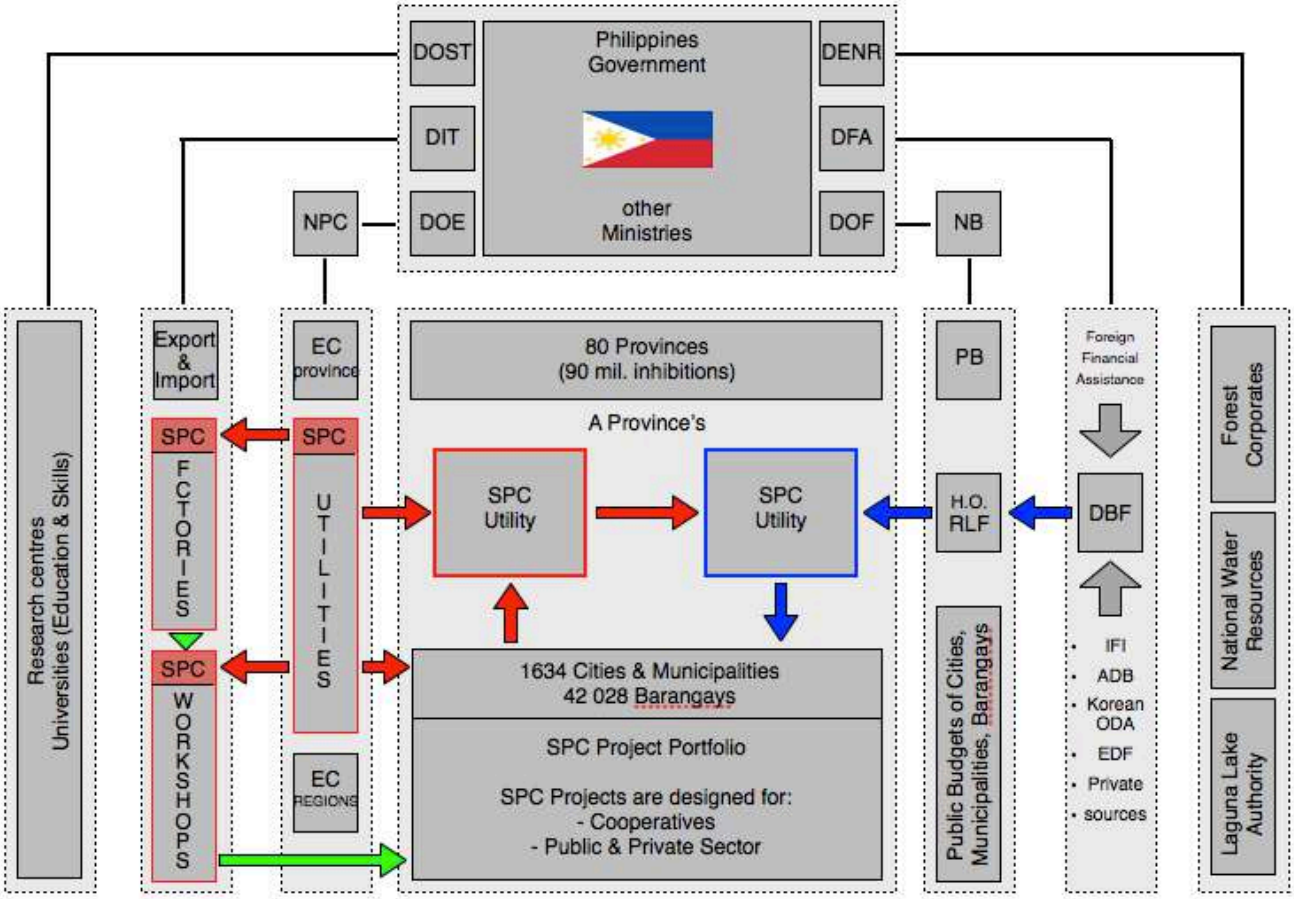
Charges structure:	PHP/kWh	USD/kWh
Generation	5,7167	0,1386
Transmission	2,0510	0,0497
System loss	0,9411	0,0228
Distribution*	2,3778	0,0576
Subsidies**	0,1506	0,0036
Government Taxes***	0,9165	0,0222
Total energy charges	12,1537	0,2945

*Includes Distribution, Supply and Metering Charges, ** Includes Lifeline and Senior Citizen,*** Includes Universal Charges and Value Added Tax

In following sections the SPC Concept is described with charts and graphs.

4.4.1 SPC Concept for Philippines

In the context of renewable sources of energy (RES) and technologies for electric power generation the chart illustrates application of Business Model focused on Business Organization (who is who in the SPC Concept) suitable for the Philippines (1,634 Cities and 42,028 barangays).



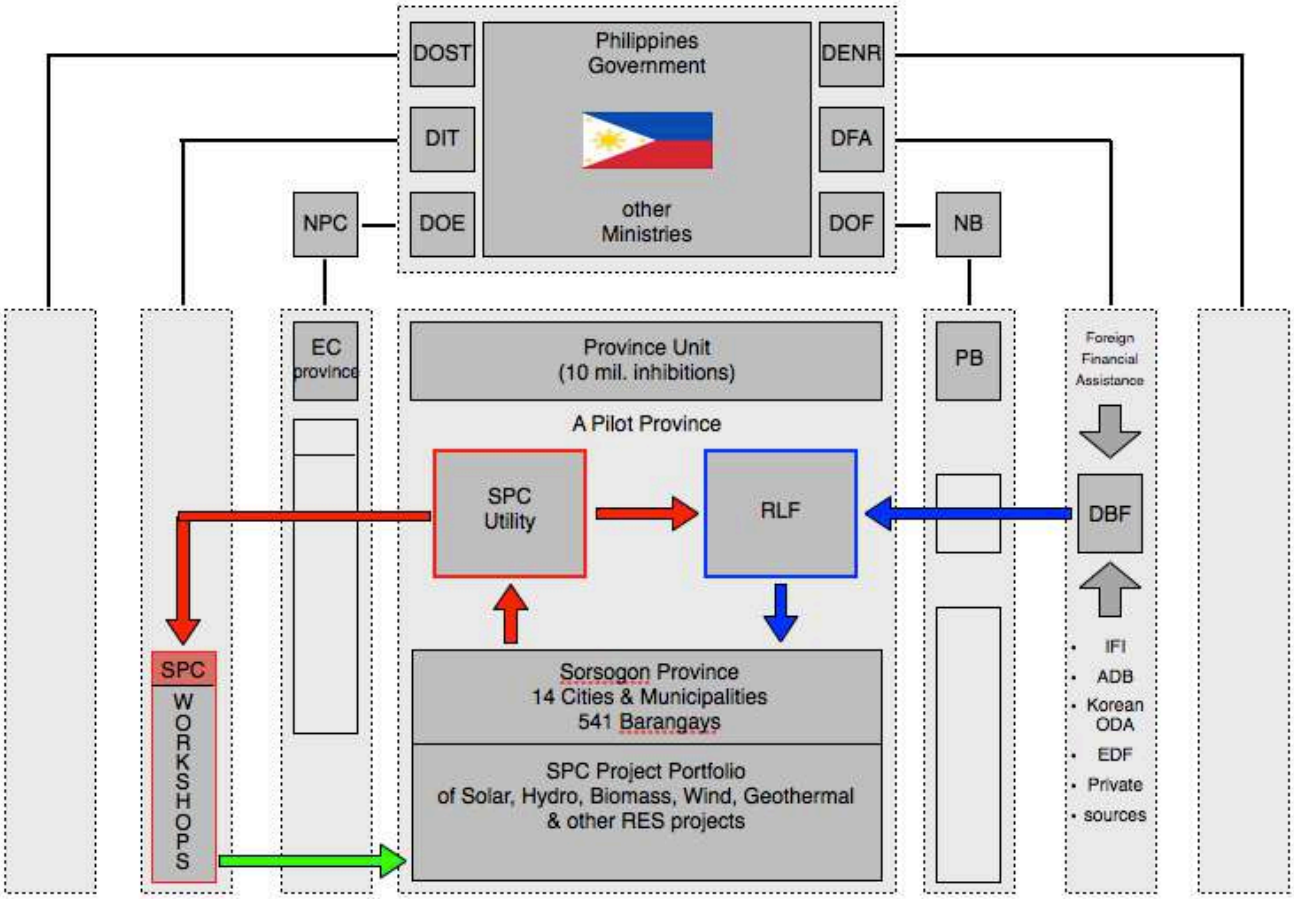
Table's Legend: DOE (Department of Energy), DTI (Department of Trade and Industry), DOST (Department of Science and Technology), DOF (Department of Finance), DFA (Department of Foreign Affairs), DENR (Department of Environment and National Resources), NB (National Budget), PB (Province Budget), NPC (National Power Corporation), EC (Electric Cooperative), DBF (Development Bank of the Philippines), IFI International Financial Institutions), ADB (Asia Development Bank), ODA (Official Development Assistance), EDF (European Development Fund), RLF (Revolving Loan Fund), RLF H.O. (proposed network for Philippines), SPC Utilities (for Pilot Project of for Provinces), SPC UTILITIES (proposed network for Philippines), SPC WORKSHOPS (initiation of existing industry base for services for SPC Utilities and SPC Clients), IA (Internal audit).

The Blueprint Advocacy questions:

1. To assist the government on this decentralized electrification-based Pilot Project a Task Force might be organized. What do you think about it?
2. High professional quality is apparent even from the way how the roles of individual governmental agencies are broken-down and presented on the respective websites. It alone indicates a comprehensive and thoughtful approach to governance and decision-making. With that in mind, can we hope that a comprehensive and efficient approach the SPC Concept represents we might hope for a good reception and full support from the various governmental agencies? We certainly like to think so.

4.4.2 SPC Concept in the Pilot project

The following chart is in the same arrangement as in section 4.4.1 and it illustrates the Business Organization aspects for SPC Pilot Project of a Province Unit (based on the Sorsogon province with 14 cities/municipalities and 514 barangays).



Table's Legend: DOE (Department of Energy), DTI (Department of Trade and Industry), DOST (Department of Science and Technology), DOF (Department of Finance), DFA (Department of Foreign Affairs), DENR (Department of Environment and National Resources), NB (National Budget), PB (Province Budget), NPC (National Power Corporation), EC (Electric Cooperative), DBF (Development Bank of the Philippines), IFI International Financial Institutions), ADB (Asia Development Bank), ODA (Official Development Assistance), EDF (European Development Fund), RLF (Revolving Loan Fund), RLF H.O. (proposed network for Philippines), SPC Utilities (for Pilot Project of for Provinces), SPC UTILITIES (proposed network for Philippines), SPC WORKSHOPS (initiation of existing industry base for services for SPC Utilities and SPC Clients), IA (Internal audit).

The Blueprint Advocacy questions:

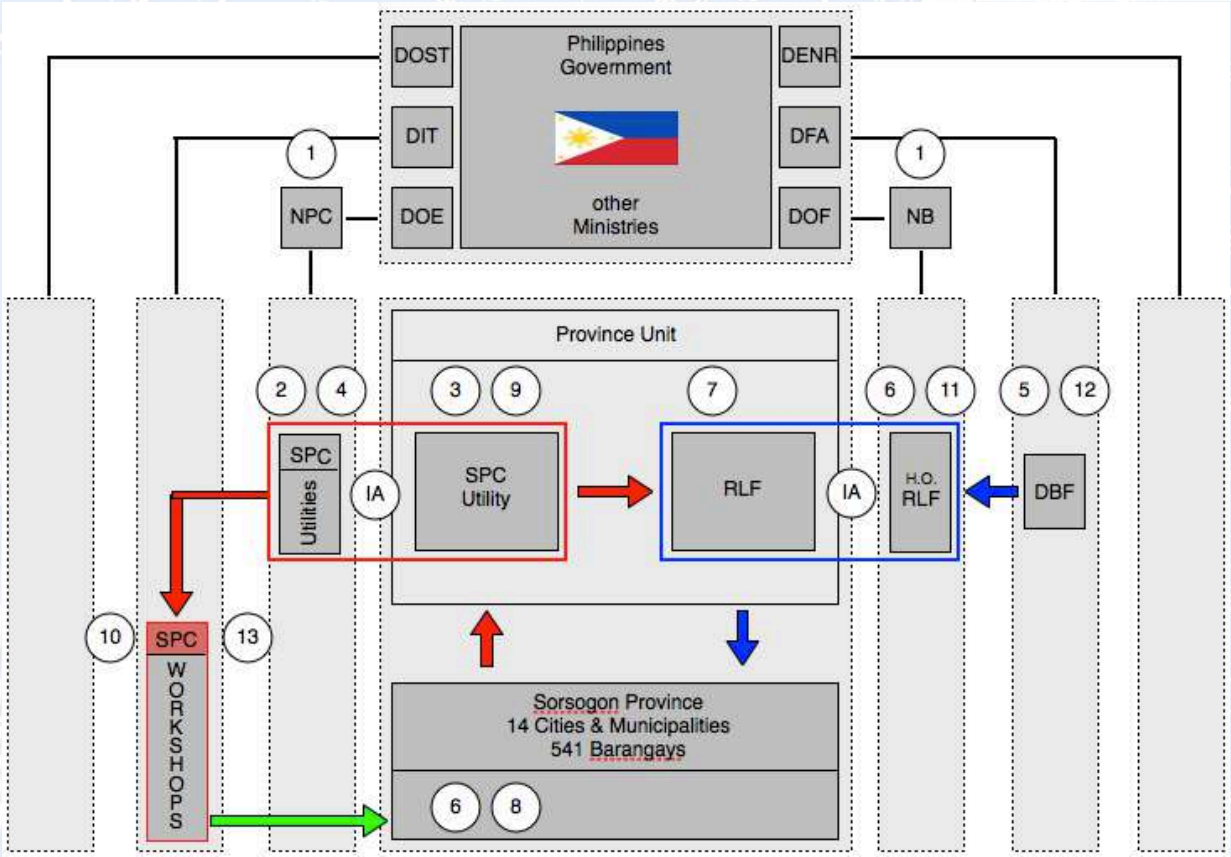
SPC Pilot Project is a good opportunity to test mixed RES technologies. We are proposing two activity before approval of the financing of the pilot project:

1. Implement research work on situ (socio-economical research) by Mapua and local Universities (financing by Filipinos financial sources)
2. Implement a small project solar PV power plants in capacity from 1 to 2 MWe (financing by czech financial sources)
Who is responsible for a decision to start up proposed projects?

4.4.3 SPC Concept workflow for project portfolio life cycle

On the background of the previous charts the project portfolio life cycle workflow is illustrated with positions of the individual steps:

1. Project portfolio planning (research, analytic and strategic works)
2. Agreement on project portfolio implementation (a wider consensus)
3. Tender for a Framework Contract (for a Project Portfolio Services)
4. Calls (with flexible prioritization of projects in the project portfolio)
5. Financing scheme for Revolving Loan Fund and other opportunities
6. Project Contracts (City/Barangay, RLF and a project Contractor)
7. Project financing by Revolving Loan Fund (project by project)
8. Projects implementation and monitoring (on the spot of each project)
9. Project portfolio evaluation (a complex view on all spectrum of projects)
10. Supply, services for projects (benchmarking and evaluation)
11. Project financing closing (project by project)
12. Project portfolio closing (all project in from portfolio)
13. O&M and others services



Table's Legend: (see 4.4.1)

The Blueprint Advocacy questions:

1. There many examples of best practices of project's workflow management throughout the world. Which ones we might adopt and use?
2. Smart public procurement, professional management and consistent control are important. Are there any risks to sustainability of these tools over the life cycle

4.5 Project Portfolio (100kWe) Value of Synergy

Synergy in the SPC Concept means productive and value-adding interactions among energy sources, power plants (100kWe) construction and electricity production, sales, services and their impact on the three drivers of social and economy changes in barangays and municipalities.

Using measurable indicators (see section 3.4.1) it is simple to compare the overall effect on a community (barangay or municipality) expressed as the sum of each individual effect.

The synergy is an additional value of a broad spectrum of components and relations among them (e.g. organizations and firms of public and private sector). For understanding of "Value of Synergy" the Blueprint recommends:

- Mapping out and study structural and technical assumptions for synergy
- Define SPC project portfolio from the point of view of synergy indicators
- Categorize results of SWOT and BOCR analysis into:
    - Operational synergy effects, and
    - Financial synergy effects.

The SPC Pilot Project and most of the research at barangay and municipal level should monitor the value of synergy opportunity and bring-up substantial arguments for integration of multifunctional tasks into any future regional projects.

4.5.1 Synergy for Barangays

This level is the basis for understanding what "Value of Synergy" means in specific details. Nevertheless, the weight of impacts of such details on the final results might be small or not readily apparent. In barangay we should follow and evaluate opportunities for synergy effect caused by the three drivers described in 3.4.

The Blueprint Advocacy questions:

1. By whom and how the research done by the university should be leveraged?
2. What is an absorption capacity (human resources) of barangays to participate in the synergy research?

4.5.2 Synergy for Cities and Municipalities

At this level we are still looking into specific details but new opportunities for "Value of Synergy" can be seen in searching and evaluation relations between details that were analyzed and evaluated at barangay level.

The research work planned for the universities should be focused on studying synergy effects from the beginning (see Pilot Project pre-preparation stage in section 4.1.1)

The Blueprint Advocacy questions:

1. How the province can assist the research of a synergy potential at municipal level (e.g. municipalities co-operating on water retention project in a specific valley)?
2. How to get financing for universities and municipalities so that they can conduct an ongoing or periodical research of "Value of Synergy" on the SPC Pilot Projects which will be already operational?

4.5.3 Benefits from Central a Local Governments

Taking advantage of synergy effects in various activities in social and economic life and in improving environment is not always easy or obvious thing to do but it is part of the journey toward independence, lesser reliance on imports, loans and other external obligations. The objective is the most effective use of resources: human and natural as well. In order for this effort to succeed we need to add and identify the Benefits. We will mention the following:

a) Keep the subsidies to decentralized electrification until the last month of the fiscal year and pay them into the RLF in the amount linked to actual performing of activities planned for the given year.

b) Pay out the subsidies to small islands only when their start participating in some decentralized electrification developmental projects, which shows operational profit. The objective is to support acquisition of decentralized sources of electric power in the way that subsidies will no longer be needed.

The Blueprint Advocacy questions:

1. Success of synergy depends on the know-how, and on management and control sustainable over the entire life cycle of business operation (see Box Old Business Rules for Synergy - "The Three Sisters".
2. Are the public budgeting rules in the Philippines adaptable for fit the proposed ways of public expenditures?

4.6 Pilot Project Financial Framework

Outcomes of the Analysis and the Synthesis helped to focus consultations and collection of data for the Financial Model. In section 3.3 (Macro Cash Flow Model) we listed the basic assumptions for communication with banks and financial institutions concerning financing of the SPC Pilot Project. At the same time we consider to be essential to provide the approximate idea about the amount of financing required for implementation of the SPC Pilot Project.

For the initial orientation we selected a simple model. The Province Unit will invest into the SPC Project $10 million from the RLF. Anyone can get general information for x-time larger investment into the Province Unit (with a simple correction for any specific Province) and for any number of Province Units. Detail figures are in the sections below.

4.6.1 100kWe units (mixed modular solutions) characteristic

Fife RES technologies are discussed (solar PV, Hydro-power, Biomass, Wind, Geothermal). Three following tables demonstrate: capacity factors, range of capital cost, selected capital cost, O&M cost, and market rates. Standard financial calculation was done (orientation results are dynamic payback and Internal rate of return, IRR) for two case situations: on-grid and off-grid solutions.

For on-grid solutions we used two values of market rates, and for off grid solution we calculated cost rate (it is the minimum price that can be set to cover investment and operating cost; used to compare the profitability of electricity consumption on grid and off grid solutions).

Finally in Table C we are presenting a calculation savings between on-grid and off-grid solutions. We believe that we are on the conservative side and there is big space for finding of future saving (compare with 4.4).

The Blueprint Advocacy questions:

1.Both range of capital cost, selected capital cost and others characteristic are open for discussion. Do you have any more information that can give a more realistic prediction?
2.We are sure that the most exact and pragmatic input data collection for a decision on investment has to come from suppliers through procurement. What do you think about it?

4.6.1 100kWe units (mixed modular solutions) characteristic

Table A: On-grid solution - 5 types of RES units and market-tariffs (0,14 $/kWh and 0.18 $/kWh)

VAR	100 kWe units - access to a power grid		Capacity factor	Range of capital cost $/ kW	Capital cost $/ kW	O&M cost $/year	Market rates $/ kWh	Dynamic payback	Internal Rate on Return
Price 1	S	Solar PV	25%	1500 - 2500	1 800	2 000	0,14	9	8%
	H	Hydro-power	45%	1000 - 3500	2 200	1 000	0,14	6	14%
	B	Biomass	80%	2000 - 6000	4 200	15 000	0,14	9	10%
	W	Wind	30%	1000 - 2000	1 500	1 900	0,14	7	13%
	G	Geothermal	90%	2500 - 6500	4 600	10 000	0,14	8	12%
Price 2	S	Solar PV	25%	1500 - 2500	1 800	2 000	0,18	7	13%
	H	Hydropower	45%	1000 - 3500	2 200	1 000	0,18	5	20%
	B	Biomass	80%	2000 - 6000	4 200	15 000	0,18	6	16%
	W	Wind	30%	1000 - 2000	1 500	1 900	0,18	5	19%
	G	Geothermal	90%	2500 - 6500	4 600	10 000	0,18	5	18%

Table B: Off-grid solutions - 5 types of RES units and cost-tariffs (calculated separately for each unit)

100 kWe units – Off grid solution		Capacity factor	Range of capital cost $/kW	Selected capital cost $/kW	Capital cost of mini grid* $/kW	O&M cost $/ year	Cost rates $/kW/h	Dynamic payback	Internal Rate on Return
S	Solar PV	25%	1500 - 2500	1 800	578	2 000	0,14	13	4%
H	Hydro-power	45%	1000 - 3500	2 200	578	1 000	0,10	13	4%
B	Biomass	80%	2000 - 6000	4 200	578	15 000	0,11	13	4%
W	Wind	30%	1000 - 2000	1 500	578	1 900	0,11	13	4%
G	Geothermal	90%	2500 - 6500	4 600	578	10 000	0,10	13	4%

* 20 % of average of power plant capital cost

Table C: Comparing annual savings between on-grid and of-grid solutions (market rates 0,14 $/kWh)

100 kWe units (Small power plants of a SPC Utility)		On grid price USD/ year	Off grid price USD/year	Comparing annual savings USD/year
S	Solar PV	30 660	30 660	0
H	Hydropower	55 188	40 208	14 980
B	Biomass	98 112	79 891	18 221
W	Wind	36 792	29 959	6 833
G	Geothermal	110 376	91 104	19 272

4.6.2 SPC Utility (An Investment Unit of $10m)

This part of financial preliminary calculation is about SPC Utilities. We proposed three "mixed" solutions composed from five RES technologies (4.6.1). It a model solution with one limit; investment price (overnight capital cost) should be up $10m. "Mix" solution is composed from 100kWe units. Real modular unit can be in multiple value (e.g. 10x100We = 1Me modular Unit). Preliminary calculation was done for both on-grid and off-grid solutions. Finally Table F demonstrate savings based on the same principle like in Table C (with the same commentary).

The Blueprint Advocacy questions:

1.We know that we presenting a very general approach how to get a better quantitative view on SPC Utility. What do you think about the modular system based on 100kWe units?
2.We are convinced that our pre-calculation are on a conservative side, and we are sure that the saving in Table C and F must be higher. What do you think about it?

Table D: On-grid solution - SPC Utility in capacity 1.855 MW (an Investment unit of $10m)

SPC Utility (An Investment Unit of $10m)	Number of power plant	Common capacity kW/year	Selected capital cost $m	O&M cost $/year	Marekt rates $/kW/h	Dynamic payback	Internal Rate on Return
Geothermal -solar 1,2 MW	6 G + 6 S	690	3 .840	0. 72	0,14	9	10%
Hydro-biomass 1 MW	5 H + 5 B	625	3 .200	0.80	0,14	9	11%
Solar-biomass-wind 1,3 MW	4 S + 4 B + 4 W	540	3 .000	0.75	0,14	9	10%
Total ($m)		1 855	10 .04	2.27	**Composition of 100kWe units:** 6 G + 10 S + 5 H + 9 B + 4 W		

Table E: Off-grid solution - SPC Utility in capacity 1.855 MW (an Investment unit of $10m)

Utility (An investment Unit of $10m)	Number of power plant	Common capacity kW/year	Selected capital cost $	O&M cost $/year	Capital cost of mini grid* $	Cost rates $/ kW/h	Dynamic payback	Internal Rate on Return
Geothermal – Solar 1,2 MW	6 G + 6 S	690	3 .840	0. 72	0.593	0,115	13	4%
Hydro-biomass 1 MW	5 H + 5 B	625	3 .200	0.80	0.593	0,117	13	4%
Solar-biomass-wind 1,3 MW	4 S + 4 B + 4 W	540	3 .000	0.75	0. 593	0,124	13	4%
Total ($m)		1 855	10,04	2.27	1.78	**Composition of 100kWe units:** 6 G + 10 S + 5 H + 9 B + 4 W		

* 20 % of average of power plant capital cost

F: Off-grid - comparing annual savings between SPC Utility of on-grid and of-grid solutions

SPC Utility (An Investment Unit of $10m)	On grid price $/ year	Off grid price $/ year	Comparing annual savings $/year
Geothermal -solar 1,2 MW	846216	695106	151110
Hydro-biomass 1 MW	766500	640575	125925
Solar-biomass-wind 1,3 MW	662256	586569,6	75686,4
Total of (6 G + 10 S + 5 H + 9 B + 4 W) savings:			352721,4

4.6.3 Number of Power Plants (100kWe) for s SPC Utility

First we define inputs indicators (population for a Province Unit, number of people for rural areas and number of families) to demonstrate energy added value in kW, kWh per a household in a rural area. This a simple tool to demonstrate how much big investment is before the rural people on Philippines.

Table H operates with 593 kWh per capita (it is a number from the World Bank statistics "Electric Power Consumption in the year 2009" (more see in 4.7/3), and presents a survey of numbers of 100kWe units that represent 34% of RES in Philippines in 2010 (see 4.7/9 is). The goal is to present a more realistic snapshot of a double increasing of RES in 2020, and 10 times higher increasing in 2050.

The Blueprint Advocacy questions:

We define and all calculations operate on a Province Unit. Province Unit is based on our contact with the Sorsogon Province. Do you have an idea how focus the Blueprint advocacy on final selection of one or more SPC Pilot Projects?

Table G: Number of final beneficiaries (households) and added value in kW and kWh

Indicator	People/kW/kWh
Number of people (a Province Unit)	1 000 000,00
Number of people in rural area	500 000,00
Number of household in rural area	83 333,33
Energy kW per household	0,02
Energy kWh per household	195,00

Table H: Expected electricity consumption in year 2014, 2020, 2050 per 1 000 000 inhabitants

Indicator	Year		
	2014	**2020**	**2050**
Percent of renewable electricity	32%	32%	32%
Number of people	1 000 000	1 000 000	1 000 000
Increasing of consumption	1	2	10
Number of kWh per capita	593 000 000	1 186 000 000	5 930 000 000
Number of kWh per capita from renewable electricity	189 760 000	379 520 000	1 897 600 000

Table I: Number of 100kWe units power plants to cover the electricity consumption in year 2014, 2020, 2050

Type of power plant	Number of kWh per year	Number of 100 kWe units		
		2014	**2020**	**2050**
Solar PV	219 000	866,48	1 732,97	8 664,84
Hydropower	394 200	481,38	962,76	4 813,80
Biomass	700 800	270,78	541,55	2 707,76
Wind	262 800	722,07	1 444,14	7 220,70
Geothermal	788 400	240,69	481,38	2 406,90
SPC Utilities	16 249 800	11,68	23,36	116,78

BOX 3. Financing - Revolving Loan Fund - Example

Project: A potable groundwater Municipal Water System serving 500 households

Project Assumptions:

- Municipal water system characteristic of small water systems in Rhode Island, USA
- Average household daily maximum water consumption: 150 gal/day
- Water use fee: $4.50/1,000 gal
- Capital investment using sustainable and renewable technology: $750,000
- Revolving Loan Fund Loan terms: 20 year repayment schedule at 5% interest

Project Description:

A small Village of Kingston with 500 households is having problems with the groundwater wells serving each of the 500 households. There have been numerous failures of these individual wells. It turns out that the problem is not the groundwater supply but mechanical failures of the well apparatus due to age.

The Kingston Village Council (Council) has determined that it would be more economical to install a new potable groundwater Municipal Water System (MWS) then to replace the 500 individual wells. The maximum water consumption per household is 150 gal/day so the MWS must have the capacity to produce 75,000 gal/day or 27,375,000 gal/year.

Through a competitive bidding process, the Council has contracted with Aaron Engineering to design and build the new MWS. Aaron estimates that the new MWS will cost $750,000, which consist of a new well, the treatment plant and a distribution system all powered by renewable energy sources.

The Council has determined that the users of the MWS should pay for the capital investment and the annual operating and maintenance expenses of the MWS. Since the village households do not have the $750,000 capital investment to construct the MWS, the Council has turned to the regional Revolving Loan Fund (RLF) to finance the MWS with a long-term loan.

The RLF extended $750,000 loan to be replayed over twenty (20) years with equal annual payments of $37,500 plus interest at 5% per annum. Since the Council does not have the management capacity to manage the MWS, they have contracted with Anja Water Management Company to operate the MWS. The annual Operating and Maintenance Contract (O&M) is $65,000. In order to pay the annual O&M and RLF Loan Debit Service for the MWS, the Council has set the Water Use Rate at $4.50/1,000 gallons consumed. Therefore, each household will pay $246.38 per year for their water use.

Project Annual Financial Analysis:

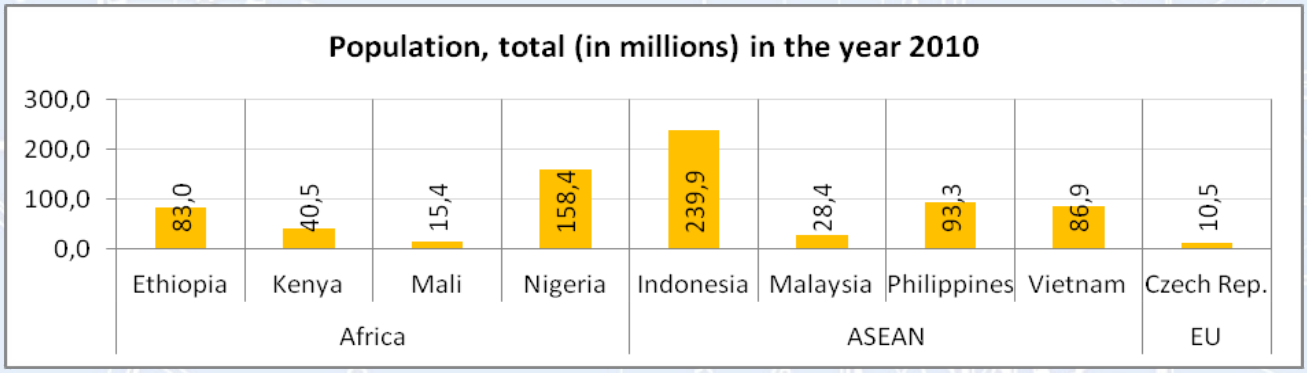
Water Consumption	27,375,000 gal
Household Water Use Fee	$246.38
Water System Revenues	$123,187
Operating and Maintenance Contract	$65,000
RLF Debit Service: Principal	$37,500
RLF Debit Service: Interest	$18,750
Total Water System Expense	$123,187
Net Operating Income	$1,937

4.7 Example of a Global Statistical Survey of the SPC Concept.

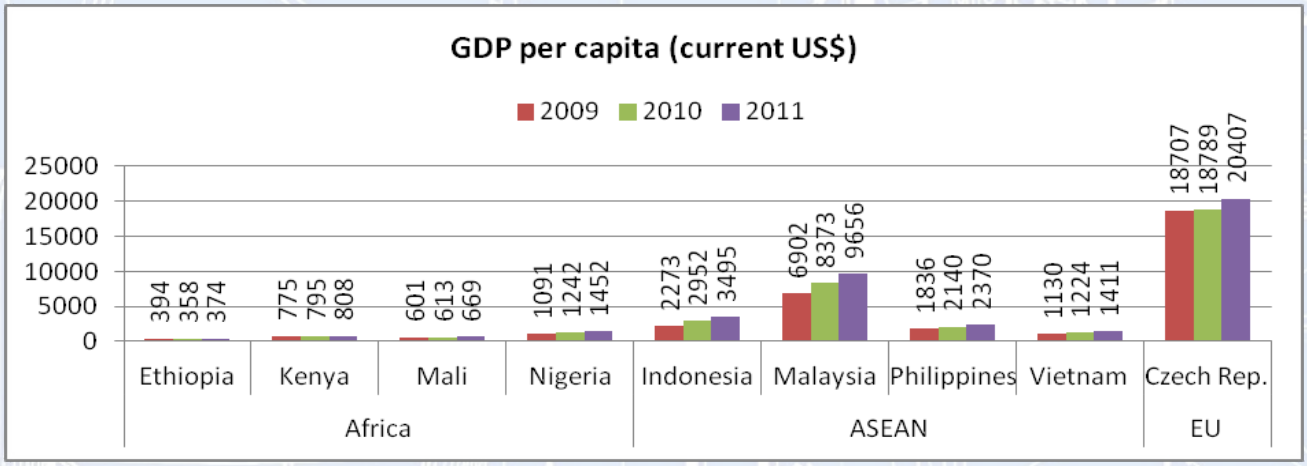
In 2010, we prepared introductory studies based on the SPC concept. The studies included data from the economy, energy sector, population characteristics, impacts on environment (CO2), etc. In the Blueprint we will refer to some suitable examples of these studies.

The Blueprint Advocacy questions:
1. In many countries it is not always easy to work with data relying only on publicly available sources. In this context, how to proceed in the Philippines?
2. The issue is supporting information and data entering the above-mentioned model indirectly or not at all and that they are not current.

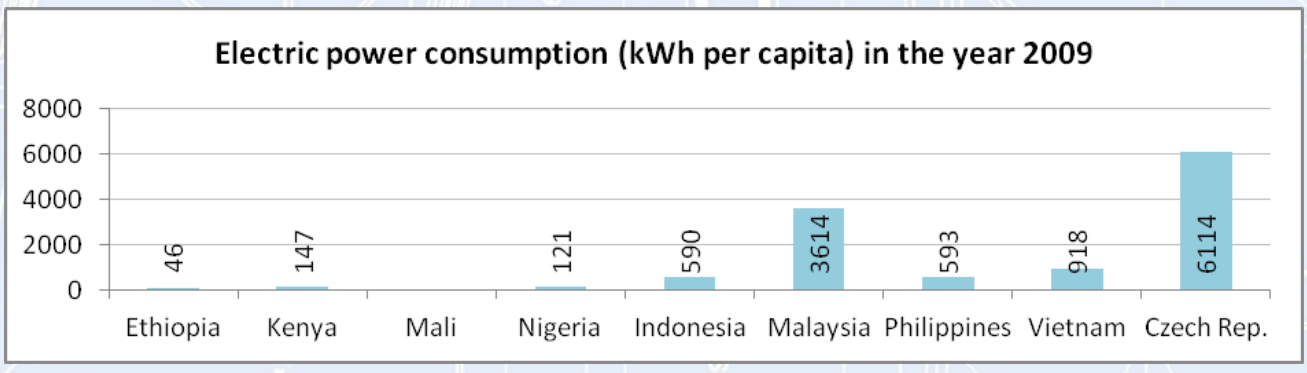
Population, total (in millions) in the year 2010:



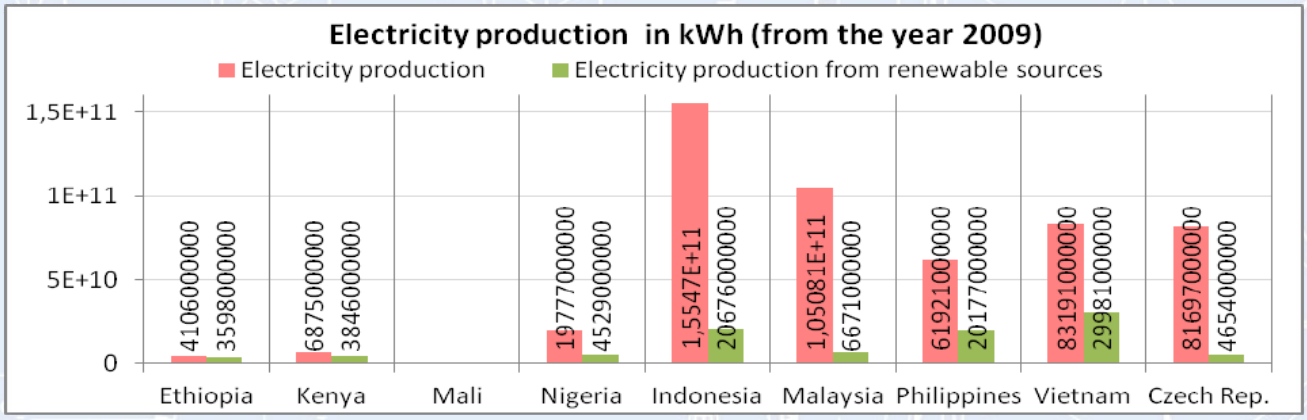
GDP per capita (current $US) in the years 2009, 2010, 2011:



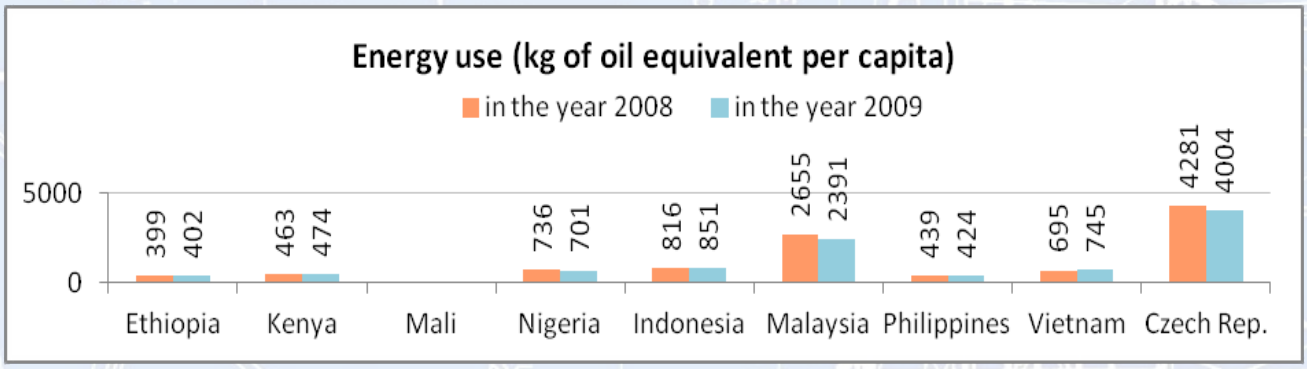
Electric Power consumption (kWh per capita) in the year 2009:



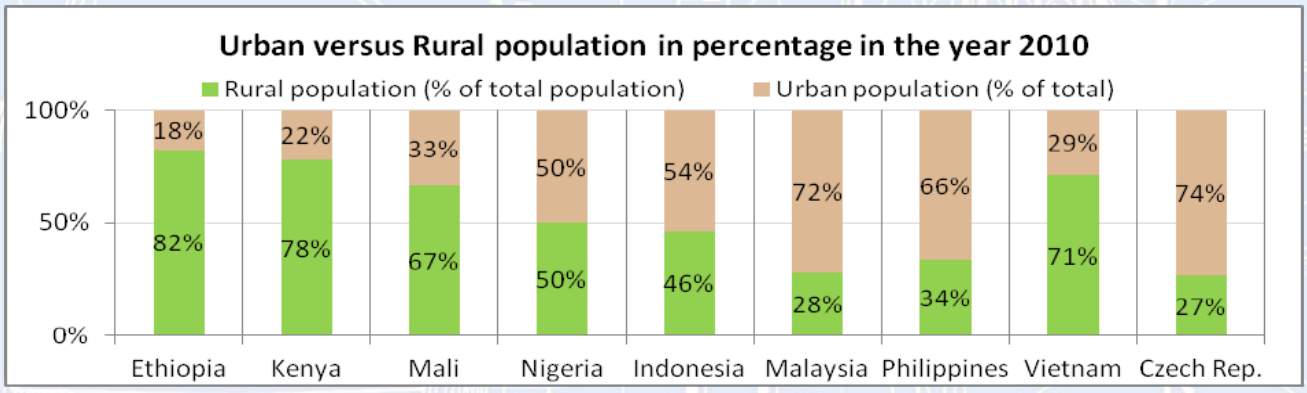
Electricity production in kWh in the year 2009:



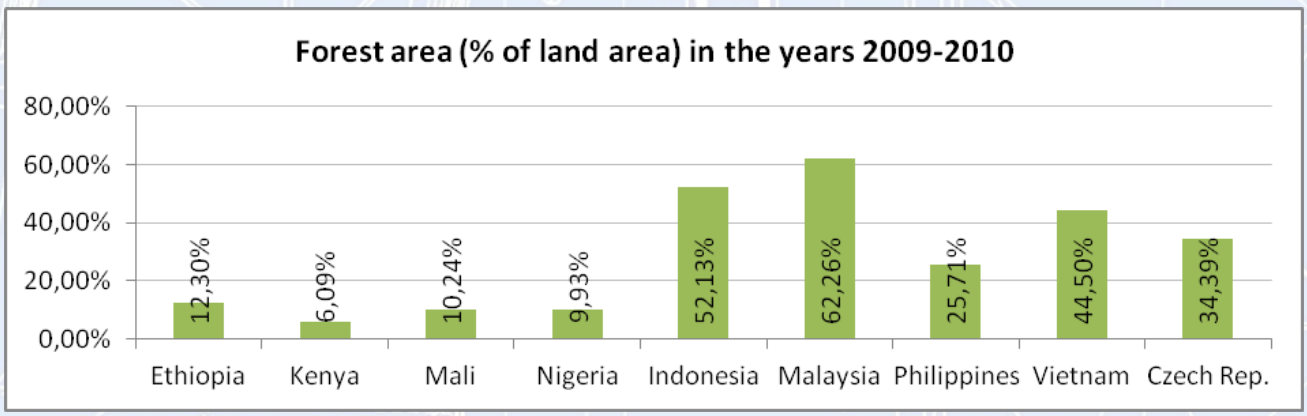
Energy use (kg of oil equivalent per capita) in the years 2008, 2009



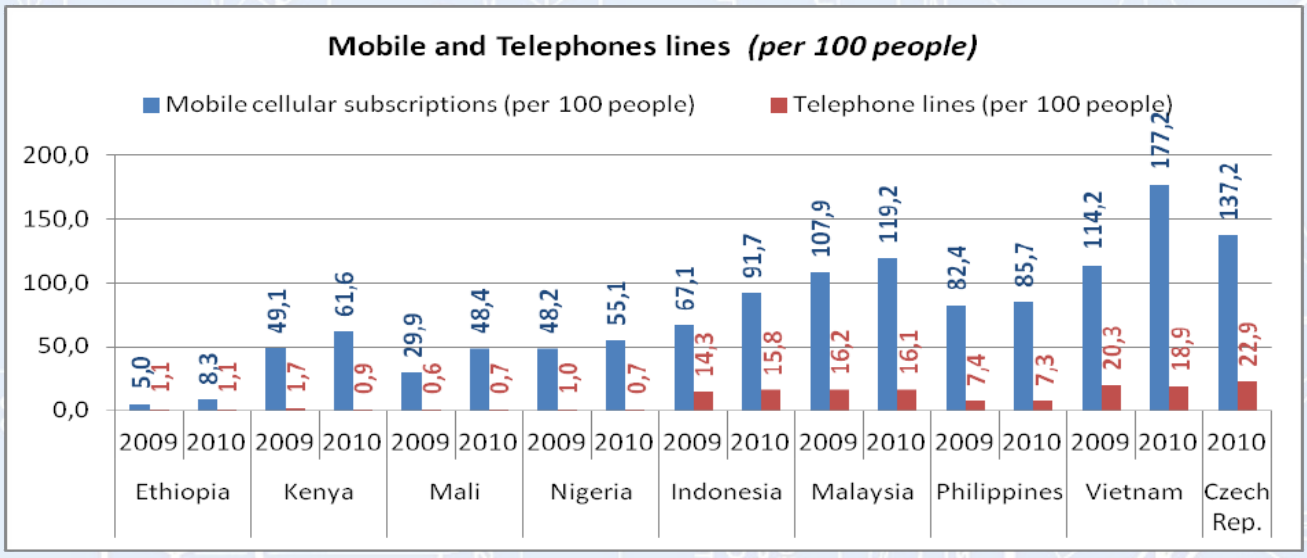
Urban versus Rural population in percentage in the year 2010:



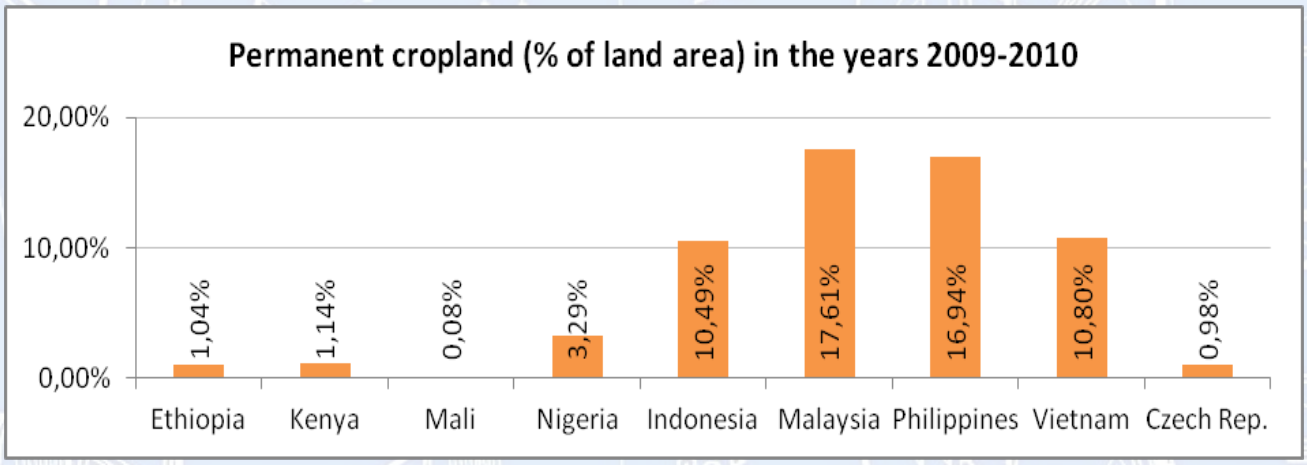
Forest area in percentage in the years 2009-2010



Urban versus Rural population in percentage in the year 2010:



Permanent crop land in percentage in the years 2009-201:



References	
The most actual for the Blueprint elaboration:	Theses for the Blueprint Elaboration, 5PforRES, Prague, June-February 2013 (The Blueprint content specification, questionnaire development for a dialog with 24 experts from Philippines, USA, Honk Kong, Korea, Norway, Dutch, and Czech Republic about theses of the analytical, syntheses and proposal parts of the Blueprint).
Supportive documents (D) and assistance (A):	• D: letter of Intent (LOI) with Raul Lee, Governor of Sorsogon Province • D: letter of Intent (LOI) with Dr. Reynaldo B. Vea, President of Mapua Institute of Technology, Manila • D: letter of Intent (LOI) with Antonio Miguelito Yoingco, Asia Pacific Resource Recovery Reuse and Development Co. (APRRRDC), Manila • Philippines Embassy in Prague and in Berlin, Korea and Norway Embassy in Prague, the Czech Republic Embassy and EU Delegation, European External Action Services (EEAS) in Manila. • Central: DOE, DOST, DENR, DFA and other public and private representatives • Regional: Sorsogon Province and St. Magdalena Municipality
5PforRES relevant studies (S), presentation (P) and offers (O):	• S: Self-Powered Communities for Philippines, The Initial Paper, 2011 • P: During business trips to Philippines from 2011 till now a set of presentation was done for partners in Philippines, and some of them were involved in the Blueprint theses discussion • O: Laguna de Bay case study proposal - background paper and offer, 2012 • O: Aurora Pacific Economic Zone (APECO) - background paper and offer, 2012
Others key publications:	• Technical and Economic Assessment of Off-grid, Mini-grid and Grid Electrification Technologies, ESMAP Technical Paper, the WB, 2007 • Thematic Program for Environment and Sustainable Management of Natural Resources including Energy – ENRTP, European Commission, 2008 • ASEAN Plan of Action for Energy Cooperation 2010-15; ASEAN Centre for Energy, 2009 • Energy for sustainable future; the Millennium Development Goals, UN 2010 • Renewable Energy in Philippines; DOE presentation, Cebu 2010 • Business Solutions for Sustainable World; WBCSD, Switzerland, 2012 • Renewable Power Generation Costs in 2012, IRENA Report 2013 • The Rural Electrification Program 2012 in Philippines (SEP&BLEP), NEA 2013

Thank you for your Cooperation and assistance

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