Existing Studies on Rural Electrification & Energy Demand Forecasting in Cambodia

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ABSTRACT

Presently, about 85% of Cambodia's population lives in rural areas with subsistence agriculture as the main occupation. A large portion of the rural population, approximately two million households, currently does not have access to urban-quality electrical services. However it is a known fact that increased access to electricity in rural areas is a crucial factor for the economic development of the country, as well as, having a direct impact on the quality of life of its people. This paper examines the policies and initiatives that can be taken by the government and various stakeholders to bring about a more desirable rural electrification program that can cater to the strategic energy demand of the nation.

Keywords: *Economic development, Rural electrification, Energy demand.*

1. INTRODUCTION

Cambodia, a nation with a great history and enthusiastic and enterprising people is rapidly rebuilding itself. Emerging from years of strife and civil war, that caused irreversible damage, devastation and degradation of its developmental capacities, the country has taken up the challenge of reconstruction, sustained economic development and integration with the global community. Continued misery and suffering resulting from war and poverty may not have disappeared entirely but is receding rapidly with the Royal Government of Cambodia and the people showing great eagerness and interest in implementing developmental strategies. International meets such as ASEAN in Phnom Penh are an effort in the direction of integrating the regional and global communities.

Despite the devastation suffered, the country is making a valiant effort to rebuild the nation and the economy. Today, about 85% of Cambodia's populations are in rural areas, with subsistence agriculture as the main occupation. An enabling environment for economic development of the country is yet to emerge. Increased access to electricity in rural areas is crucial for economic development of Cambodia. Access to electricity has a direct bearing on development and creation of some of the other crucial facilities and infrastructure such as education, health, water supply and rural industrial base. Consequently, access to electricity also has direct implications on the quality of life and income generation opportunities. Cambodia has no modern energy resources with the exception of renewable, in particular hydropower, which is completely unexploited. Fossil fuels are imported. The existing domestic markets for electricity are extremely small and mainly concentrated in Phnom Penh and a few other provincial towns. Expanding the rural markets for electricity in a sustainable manner and exploiting the considerable renewable energy resources are two major challenges before the Royal Government of Cambodia.

There are several private entrepreneurs operating these generating stations under license from the government. Per capita electricity consumption is among the lowest in Asia. Only about 7-10 percent of the rural population (85% of the total people) has access to lighting services through diesel generators and imported batteries. Small sized generation units, dependence on oil-based generation and large distribution losses render the unit cost of electricity in Cambodia very high, 25 to 50 cents per kWh. Further, these operations are conducted in unregulated highly unsafe conditions. Kerosene is extensively used for lighting in rural areas.

2. POWER SYSTEM OPERATION

Power generation

Presently Cambodia has no national grid, and electricity is generated by 22 isolated diesel generating systems. The total installed capacity (Phnom Penh city and other provincials) of 142.45 MW and the maximum output is 117.60MW or 82.60 percent in year 2001. Phnom Penh accounts for 112 MW of Installed Capacity with the maximum output of 95.1MW. The main consumption is in Phnom Penh's system counted for 82.60% of the maximum output within EDC's coverage area. The increase of total installed capacity and maximum output result from re-operating of 18MW thermal power plant and the other purchased power from private company. For detailed information see Table 1.

Table 1 EDC and private installed capacity and its power output.

Location	Capacity, MW	2001	2000	1999	1998	1997
	▪ Total Installed Capacity	112.00	112.00	98.20	77.80	116.12
	Max Output (O/P)	95.10	100.50	85.00	66.60	81.00
	▪ EDC's installed capacity	62.00	62.00	63.20	42.80	85.62
PHN's	Max O/P	52.10	55.50	59.00	41.60	60.00
	▪ IPP's-I Installed capacity	35.00	35.00	35.00	35.00	35.00
	Max O/P	28.00	30.00	26.00	25.00	21.00
	▪ Jupiter Installed capacity	15.00	15.00	-	-	-
	Max O/P	15.00	15.00	-	-	-
SHV's	▪ Installed capacity	10.39	10.00	10.00	10.56	5.56
	Max O/P	8.28	7.80	7.80	8.94	3.94
SRP's	▪ Installed capacity	8.62	4.04	4.04	2.96	2.96
	Max O/P	4.42	2.80	2.80	2.40	2.40
	▪ EDC's Installed capacity	8.70	2.50	2.50	2.96	2.96
	Max O/P	1.49	1.35	1.35	2.40	2.40
	▪ Priv. Gen. Installed capacity	5.92	1.54	1.54	-	-
	Max O/P	4.42	1.45	1.45	-	-
KGC's	▪ Installed capacity	3.59	2.03	2.03	3.30	3.30
(Priv. Gen.)	Max O/P	2.90	1.66	1.66	1.44	1.44
Takeo	▪ Installed capacity	0.90	1.12	-	-	-
(Priv. Gen.)	Max O/P	0.90	0.90	-	-	-
BTTBG's	▪ Installed capacity	6.85	1.12	-	-	-
	Max O/P	6.00	0.90	-	-	-
	▪ Installed Capacity	142.35	129.20	114.63	94.62	127.94
TOTAL	▪ Max O/P	117.60	113.66	97.26	79.38	88.78
	▪ Percentage	82.60%	87.98%	84.85%	83.89%	69.39%

Energy generation

The total energy generation in year 2001 is 478.23GWh by purchasing 339.23GWh from IPP and 139GWh from it own generators. In Phnom Penh's energy generated

426.97GWh or 77% was supplied by IPP, while the provincials were very small amount. This seems to be known that the rural electrifications are constrained. Table 2 lists the detail information of energy production by different years.

Table 2 Total energy generation produced by EDC and other private companies in GWh.

Location	2001	2000	1999	1998	1997
▪ Phnom Penh's	426.97	379.99	358.22	341.53	286.58
- EDC's	97.38	158.46	146.00	161.48	167.74
- IPP's	329.59	208.28	212.22	180.05	118.85
- Jupiter	-	13.25	-	-	-
▪ SHV's	17.146	15.90	13.96	11.50	11.58
▪ SRP's	16.045	12.18	9.46	10.02	8.25
▪ KGC's	5.921	5.39	5.13	4.40	3.85
▪ Takeo	1.835	1.68	-	-	-
▪ Battambang	10.317				
- EDC's	0.829	-	-	-	-
- IPP's	9.487				
Total	478.23	415.14	386.77	367.45	310.26

Energy generated in the city comparing to other areas

The production of energy in PHN's had been increased to 12.36% in 2001 comparing to the year 2000. The increment of amount energy produced comes from the increasing of living standard of peoples. Otherwise, the amount of energy produced in provincials were 51.26GWh or 45.83% increased in year 2001 by comparing to the 35.15GWh of year 2000. Even the records of amount energy produced in the provincials were increased with high percentage but in reality these amount were very small measure. Fig.1 indicates the amount of energy produced by the both sectors.

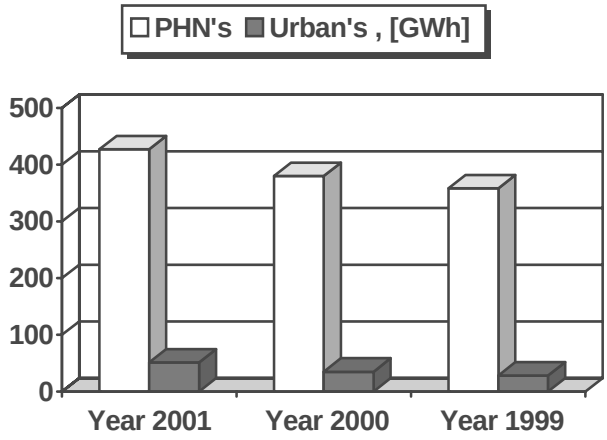

Fig.1 Diagram of energy production in PHN and other areas.

Peak power demand

The amount of power demand in the year 2001, 2000, 1999 and 1998 is shown in the following Table 3. Through this information we can say that the demand of power in year 2001 is rapidly increasing from 70.30MW to 77.60MW in Phnom Penh city. At the same

time the amount of power demand in some provincials are also increasing from 7.45MW to 11.08MW of respectively year.

Table 3 Breakdown of yearly peak power demand, in MW

EDC	2001	2000	1999	1998
PHN	77.60	70.30	64.00	61.00
Provincial	11.08	7.45	6.1	5.89

Distribution networks

Voltage levels of 115kV, 22kV are using in PHN's systems and 22kV and 6.3kV are using in another provincials system. EDC's design standard requires upgrading from the medium voltage levels to 22kV from 15kV and 6.3kV levels, in order to increase the system reliability, minimize the system losses and to adapt the voltage level with neighboring countries.

A 23cct-Km of 115kV ring bus line has been link to its three grid substations, which have been energized since late 1999. Also in year 2002 the EDC has the transmission line 120Km from Hydro Power Plant with the capacity 11MW link to grid substation GS1.

3. ENERGY RESOURCES

Renewable energy

In terms of energy resources, Cambodia does have significant potential for renewable energy use that can be tapped to supply clean energy. Solar energy, available in abundance, can be used to meet various energy needs, prominently lighting, at the village level. Cambodia also has significant hydropower potential, which is largely unexploited. Biomass based energy generation is a great possibility.

In the case of renewable energy though there is some interest at the policy level, and also a fledgling industry in solar energy, major market barriers exist in large-scale promotion. The current extremely low access to electricity services notwithstanding, a comprehensive rural electrification strategy is yet to emerge. In recent times, the Royal Government Cambodia (RGC), with assistance from the World Bank and other donors (ADB, JICA, etc.), has undertaken to bring about some reform to improve electricity services. An Electricity Law has been prepared and is expected to be passed soon by the National Assembly. An Electricity Authority of Cambodia (EAC) has been set up to deal with sector development and regulation. Donors are also working with EDC, the public utility under the aegis of the Ministry of Industry, Mines and Energy (MIME), to develop a transmission and distribution network in the provincial towns. In early 2000, the RGC and the World Bank reached an agreement on the broad scope of a Rural Electrification and Transmission Project. The rural electrification part also has a significant renewable energy sub-component.

Biomass fuels, mainly for cooking, meet nearly 85% of the energy requirements in rural Cambodia. Only around 10-12% households have access to electricity, which is generated by isolated diesel power generators (range from 300 kW to 5 MW capacity) or rechargeable batteries (imported from China, Singapore and Malaysia). The energy cost in Cambodia is among the highest in the region (25-50 US dollar cents/kWh). Huge energy losses (30-40%), non-standardized operations, and absence of laws and regulations to protect the interests of both the consumers and the private electricity suppliers characterize this informal electricity market. Most other households use kerosene for lighting purposes, paying

on an average, 30 US dollar cents per liter. Kerosene, like all other petroleum products, is imported. In spite of the low access, the policy on rural electrification and renewable energy utilization is yet to be formulated.

Micro-hydro power plant

A Renewable Energy Action Plan (REAP) has been developed in consultation with different stakeholders. The REAP stakeholders workshop, held in January 2002 in Phnom Penh, summarized and further discussed various aspects of Cambodia Renewable Energy and Rural Electrification initiative. REAP workshop included presentations on Rural Electrification and Renewable Energy Policy for Cambodia (under development), a market survey on Solar PV systems, Pre-investment study on mini-hydro project, Rural Energy use survey etc. Fig.2 and Table 4 indicate the locations and future project implementation of micro-hydro plants in rural areas of Cambodian territory.

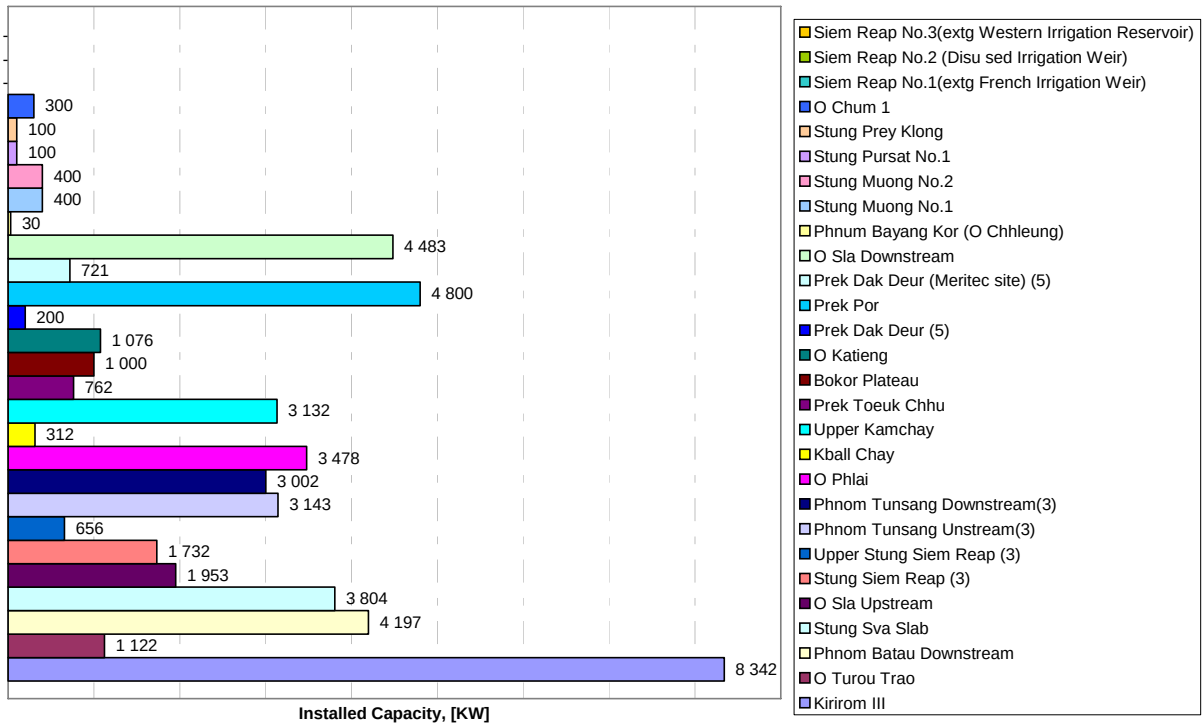

Fig.2 Diagram of micro-hydro power plant installations.

Table 4 Locations of micro-hydro power resources in Cambodia[4]

Site No.	Hydro Project names	Province	Distance from Demand Centre to Power House	Distance from Existing Transmission Line	Catchment Area	Mean Annual Rainfall	Mean Annual Evapotranspiration	Mean Annual Flow	Power Flow	Net Head	Installed Capacity	Annual Generation	Development Cost (USD/kW)			Production Cost
			Km	Km	Km^2	$l/s/km^2$	$l/s/Km^2$	m^3/sec	m^3/sec	m	KW	KWhr/yr	Hydro	Trans	Total	USD/KWhr
1	Kirirom III	Koh Kong	140	40	98	2500	1000	4.7	5	250.36	8342	38792449	1344	48	1392	0.039
2	O Turou Trao	Kampot	13.1	2.7	20	3500	1100	1.5	1	134.73	1122	5488956	1629	13	1642	0.041
3	Phnom Batau Downstream	Koh Kong	140	44	105	2500	1000	5.0	5	100.78	4197	21302049	1188	100	1288	0.031
4	Stung Sva Slab	Kampong Speu	80	30	205	2200	1000	7.8	8	56.66	3804	20296185	1634	54	1688	0.055
5	O Sla Upstream	Koh Kong	140	3	54	2800	1000	3.1	3	78.15	1953	10208534	1662	14	1676	0.058
6	Stung Siem Reap (3)	Siem Reap	47.9	44	115	1600	1000	2.2	3	69.25	1732	6639554	2120	212	2332	0.074
7	Upper Stung Siem Reap (3)	Siem Reap	52.7	48.8	86	1600	1000	1.6	3	26.22	656	2036354	1709	88	1797	0.055
8	Phnom Tunsang Upstream (3)	Koh Kong	140	2	32	2500	1000	1.5	2	188.66	3143	15853167	1406	6	1412	0.054
9	Phnom Tunsang Dowstream (3)	Koh Kong	140	7	53	2500	1000	2.5	4	90.11	3002	14315893	1704	21	1725	0.071
10	O Phlai	Mondul Kiri	27	27	95	2800	1000	5.4	4.5	92.78	3478	12377213	1586	75	1661	0.057
11	Kball Chay	Sihanoukville	17.1	8.5	45	3500	1100	3.4	3	12.49	312	1180583	2844	144	2988	0.097
12	Upper Kamchay	Kampot	26	13	243	3500	1100	18.5	10	37.60	3132	12001374	1886	46	1932	0.061
13	Prek Toeuk Chhu	Kampot	15.6	4.8	710	3500	1100	54.0	5	18.28	762	5139974	3391	33	3424	0.071
14	Bokor Plateau	Kampot	13.1	2.7	44	3500	1100	3.3	3	40.00	1000	3821728	1800	44	1844	0.07
15	O Katieng	Ratanak Kiri	10	10	44	3000	1000	2.8	3	43.05	1076	4025338	2593	90	2683	0.087
16	Prek Dak Deur (5)	Mondul Kiri	11.3	11.3	53	2600	1200	2.4	1.6	14.30	200	1000578	5645	296	5941	0.14
17	Prek Por	Mondul Kiri	30	30	198	2800	1000	11.3	15	38.53	4800	12710928	1290	62	1352	0.073
18	Prek Dak Deur (Meritec site) (5)	Mondul Kiri	13	13	102	2800	1000	5.8	5	17.52	721	2408226	2510	115	2625	0.095
19	O Sla Downstream	Koh Kong	140	7	75	2800	1000	4.3	5	107.64	4483	13851211	2022	15	2037	0.048
20	Phnum Bayang Kor (O Chhleung)	Takeo	40	40	5	1481	1000	0.1	0.067	60.00	30	-	-	-	-	-
21	Stung Muong No.1	Battambang	34	34	546	1800	1000	13.9	4	20.00	400	-	-	-	-	-
22	Stung Moung No.2	Battambang	18.8	18.8	550	1800	1000	14.0	13	4	400	-	-	-	-	-
23	Stung Pursat No.1	Pursat	40	40	700	1600	1000	13.3	4	2	100	-	-	-	-	-
24	Steung Prey Klong	Pursat	20	20	555	1600	1000	10.6	3	2	100	-	-	-	-	-
25	O Chum 1	Ratanak Kiri	8	3	0.3	-	1200	3.8	3.8	10	300	-	-	-	-	-
26	Siem Reap No.1 (extg French Irrigation Weir)	Siem Reap	15	11.9	600	1200	1000	3.8	0	0	-	-	-	-	-	-
27	Siem Reap No.2 (Disu sed Irrigation Weir)	Siem Reap	0	0.2	670	1200	1000	4.2	0	0	-	-	-	-	-	-
28	Siem Reap No.3 (extg Western Irrigation Reservior)	Siem Reap	17.7	7.8	600	1200	1000	3.8	0	0	-	-	-	-	-	-

4. EXISTING SCENARIO

In the current circumstances, however, there are several opportunities to promote sustainable energy alternatives like Micro-Hydro Power Plants, Renewable in rural Cambodia. Some of these are:

- The Cambodia Renewable Energy & Rural Electrification project is envisioned as the model for the development of renewable energy projects worldwide. It enjoys active government support and has effective national policy and regulations. Through effective strategies and a work plan, the renewable energy market has developed and all people are aware of renewable energy. The success of the renewable energy development program is in-turn attracting more donor assistance.
- The active partnership between the public and private sectors creates a favorable environment for market and investment opportunities for renewable energy.
- The private sector has become the major supplier and service provider of local, reliable, clean, and competitively priced electricity, particularly in rural areas. Tax rationalization and improved technologies are also responsible for making renewable energy more efficient and affordable.
- Renewable energy, including hydro and solar power, contributed greatly to the electrification of the rural areas, fulfilling the social and economic needs of communities and resulting in significant improvement of the living standards of Cambodian people, as well as improving and sustaining the integrity of the natural world.

Mission

The project mission is to improve the living standard of Cambodian people, especially to peoples who are living in rural communities, by working together, sharing knowledge and information to formulate effective strategies and a work plan for the development of affordable and reliable electricity from renewable energy.

Challenge

More than 2 million households without "urban quality" electricity, mainly rural creation of institutional and physical infrastructure to provide the people of Cambodia, particularly the rural communities, with access to clean and affordable electricity. To achieve above in partnership with private sector in an environment lacking in:

- On-going policy initiative
- Weak financial sector
- Weak legal and regulatory environment
- Limited technical and management capacity
- Limited renewable energy business experience.

Renewable energy policy

The renewable energy project will focus on capacity building of various stakeholders to facilitate market development, and assisting the government in formulating a renewable energy policy and action plan that would contribute to enhancement of rural access to sustainable energy services.

Specific tasks in capacity building would include

- Strengthening the capacity of the government at national and provincial level to plan and promote efficient development of the rural renewable energy sector including training, decentralized rural energy planning, techno-economic

feasibility of various renewable energy options, project monitoring and evaluation, institutional coordination, etc.;
- Build the capacity of the domestic private sector developers to implement rural renewable energy projects including mini-grid and off-grid projects; and
- Enhance the capacity of micro-finance institutions and commercial banks in evaluating and financing renewable energy projects.

The policy level would support

- Development of a policy and action plan that would create a level playing field for private sector investors;
- Establishment of a regulatory framework (in conjunction with the Electricity Law of Cambodia) to ensure public-private partnerships with well-defined responsibilities including decentralization for promotion of small systems;
- Determination of energy tariffs based on full cost recovery principles that would take into account regional differentiation in willingness to pay, resource endowments and institutional capabilities; and
- Establishment of financing and subsidy mechanisms based on logical, explicit rules and regulations so as to ensure good governance.

Capacity building

- An important aspect of the Renewable Energy development strategy is capacity building. A component of the technical assistance from World Bank and other donors will focus on training programs and capacity building initiatives.
- The focus of the capacity building exercise shall be at different levels including policy level decision-making, planning, management, implementation, consumer orientation and entrepreneurial development. The capacity building exercise to a large extent will also help improve awareness about renewable in general. Therefore, it will also be a component of the outreach strategy of the project.
- The exercise will target government at various levels, private sector players, Financial and Micro Financial Institutions, Academic Institutions, Trainers, consumers, Non-government Organizations and International Non-government organizations. Scheduling of capacity building exercises and their synchronization with the project activities is an important aspect. The organization of these programs shall have the participation and involvement of Government departments and agencies at different levels.

5. POWER SECTOR EXPANSION AND FUTURE DEVELOPMENT PLANS

Power demand forecasting

According to the previous study, electricity demand is expected to face a significant increase for the next 18 years. Electricity generation in Cambodia is likely to grow from 129MW and 415GWh in year 2000 to 746MW and 2634GWh in year 2016. The majority of this growth will occur in Phnom Penh. The Table 5 depicts the expected power and energy output for Cambodia. To meet the future demand the RGC has developed a generation and the National Transmission System Master Plan.

Table 5 Power demand forecasting.

Year	2000	2002	2004	2006	2008	2010	2012	2014	2016
Power, MW	129	212	273	331	404	477	558	651	746
Energy, GWh	415	956	1036	1215	1454	1700	1968	2292	2634

Generation master plan has been developed on the following criteria

- Base thermal generation
- Small medium size diesel units for base and peak load generation in the provincial towns and cities
- Expand hydro development based initially on smaller size hydro power plants.

National power station & transmission plan – 1999 to 2016:

- Cambodia power sector strategy, i.e., Hydro with Gas Turbine and Trade Option are shown in Table 6.

Table 6 Cambodia power sector strategy – 1999 to 2016.

Power stations					Transmission		
Year	Capacity (MW)	Location	Investment $M-1997	GWh Estimated	Year	Transmission lines & New Consuming	Capital costs T/L & Centers
2001	60 CCGT	PNH	72.8	773	2001	IPP2-GS1-GS3 in PNH	2.9
2002	29 Hydro	Kirrirom & Trade	36.6	871	2002	Kirrirom-PNH Thailand-Bateay Meanchey	19.9 7
2003	Trade	Vietnam		1065	2004	Takeo-Vietnam (Impt/Expt) In East Phnom Penh-KGC	6.9 19.7
2004	90 SCGT	SHV	70.8	967	2003	SHV-Takhmau-PNH (impt.)	
2005	90 CCGT	SHV	81.8	1181	2005	SHV	4.5
2006				1284	2006		
2007				1396	2007	GS1 to North PNH	6.3
2008	47-127	Kamchay	61.9	1517	2008	Kamchay-Kampot Banteay Meanchey-SRP	6.9 17.4
2009				1658	2009	Battng – Bateay Meanchey	9.2
2010				1802	2010		
2011	60 Hydro	Battambang 1&2	122.9	2073	2011	Battng 1&2 - Battng	11.8
2012	110 Hydro	Stung Atay	179.9	2252	2012	Stung Atay-Pursat	75.6
2013	Trade	Vietnam		2439	2013	In PNH (West)	14.1
2014	90 SCGT	SHV	69.7	2646	2014	SHV	3
2015				2843	2015	In PNH (Central)	18.6
2016	125 Hydro	Mid Stung Reusey Chrum (SRC)	315.9	3073	2016	Mid SRC-Steung Atay Kampong Chnang connected Battng-Pursat	12.7 6.2 19.7
TOTAL	695		1012.3				363.5

6. TRAINING NEEDS ASSESSMENT

Training programs would have to be designed and structured after an assessment of the existing capacity and training needs of different stakeholders at different levels. Also an assessment would have to be made of the capacities required amongst the various target groups at different points of time in the project. This will help schedule and synchronize training programs with other project activities. An assessment of training needs is required to design and structure some of the training programs such as Trainers Training. A preliminary assessment of training needs shows training activities focusing on following areas would have to be designed:

General Renewable Energy Introductory training: The purpose of this activity would to be improve general awareness of all the stake holders and to add to their knowledge-base current and latest information about the need of implementation of the rural electrification in Cambodia.

Renewable Energy Policy and Planning training: The objective of this training program will be to enable Cambodia to take policy level decisions related to Rural Electrification and Renewable in keeping with the best international practices. This will add capacity to the country to create enabling environment to realize the objectives of the project and also to carry forward this initiative after the expiry of the project. To some extent, the program will also build capacity in the country to mobilize additional resources as and when required.

Renewable & Rural Energy Entrepreneurial Development training: It has been observed that there are several entrepreneurs already involved in providing rural electricity services. The renewable energy and rural electrification strategy should be implemented keeping in mind the interest and survival of these entrepreneurs. It is felt that they are an important link in the market mechanism for wider dissemination of rural electrification and renewable energy. One of the objectives of the training program will be to have the involvement of these entrepreneurs in the project. This can be achieved by building capacity amongst them to provide services through the use of possibility energy resources. The program will be an equally important opportunity to have the involvement of other stake holders and entrepreneurs including rice millers and other rural industrialists such as ice makers, small electrical/electronics and TV repairers etc., private sector players, NGOs equipment suppliers and finance and micro-finance institutions in the project and in facilitating evolution of market mechanisms for renewable energy.

Private Sector Renewable Energy Cambodia Orientation Training: Global and overseas private sector players in renewable energy, equipment suppliers and financial institutions could be interested in exploring the Cambodia market but may not have insights on various issues involved with regard to both, market characteristics of renewable energy in Cambodia and the policy, legal and regulatory framework.

Renewable Energy Trainers Training: Building capacity in Cambodia for an ongoing training initiative and also for the conduct of rural entrepreneurial and consumer awareness training programs in the current initiative. An assessment of training needs in this project and of the capacities of various agencies/institutions to impart training would have to be made prior to designing and structuring this program. Also an assessment of who can impart training at what level would have to be made. Consumer Orientation & Awareness Information dissemination, orientation and awareness improvements of prospective rural consumers.

7. CONCLUSIONS

Rural electrification was based on the belief that affordable electricity would improve the standard of living and the economic competitiveness of the family farm. But electric power alone was not enough to stop the transformation of Cambodian's farm communities. Rural electrification did not halt the continuing migration of rural people from the country to the city. Nor did it stop the decline in the total number of family farms.

Our goal is to support the agricultural community through effective representation with governments, Electrical Utility Companies (EUC), the Electricité du Cambodge (EDC) and the Authority of Electrical of Cambodia (AEC), and other industry stakeholders in order to insure fair and equitable electrical service for rural individuals and their families. The EDC and AEC must be responsible for the development of energy in remote communities and recognizes the needs of energy use in those areas. The AEC, EDC and other key partners must make a plan and give priority orders to the area targeted to be developed. The AEC provides essential feedback from the rural electricity user that is required by government to keep in touch with the needs of the farm community.

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