

**Appendix 5 Institutional Framework for Promotion of
PV Rural Electrification**

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5.1 Present Scheme for PV Rural Electrification

5.1.1 Organizations Involved in PV Electrification

Organizations directly involved in PV electrification. Major activities and functions of organizations related to PV electrification are summarized as follows:

- (1) The Ministry of Minerals, Energy and Water Resources (MMEWR)-The Energy Affairs Division (EAD):

Within EAD, the New and Renewable Sources of Energy (NRSE) Section has overall responsibility for identifying and promoting opportunities in renewable energy areas. This section has a particular focus on PV, and they have released codes of practice for PV systems. EAD has coordinated a household PV electrification Pilot Project in the Manyana village, National PV Rural Electrification Program (NPV-REP) started in 1997, and PV mini-grid Pilot Project in Motshegaletau village.

- (2) The Ministry of Finance and Development Planning (MFDP):

The functions of the MFDP include:

- 1) Coordination and preparation of National Development Plans.
- 2) Monitoring of development projects in progress.
- 3) Coordination and preparation of development and recurrent budgets revenue estimates and controlling the use of public, funds including and receipts thereof.
- 4) Coordination of rural development.
- 5) Internal Audit of Government financial operations system.

MFDP allocates the national budget to each Ministry, specifying how much is available in each sector area. Each ministry then forwards the memorandum to the MFDP for approval. Concerning the development planning including rural electrification and rural development, MFDP plays a major role. MFDP's role in determining the amount to be allocated to these grants (subventions) is extremely important. MFDP, of course, determines the amount of the capital development budget. While each ministry allocates

the budget to each department and local government, MFDP retains final authority to approve or deny a specific project (through the project memorandum requirement) and controls actual disbursement for each project according to its progress.

(3) Botswana Power Corporation (BPC):

BPC is a parastatal monopolistic utility under MMEWR to generate, to import, to transmit and distribute electricity. BPC operates an integrated grid of 220kV and 132kV transmission lines and 66, 33, 11 and 0.4kV distribution lines. BPC is promoting the Rural Electrification Collective Scheme (RCS), aiming at alleviating the problem of a low percentage of electricity connection caused by the high up-front costs. BPC once planned its own Khakia PV project, but canceled it because the grid reached the village.

(4) The Botswana Technology Center (BoTeC):

BoTeC was established in 1979 as a national center for research and development. BoTeC undertakes research, information dissemination and Dissemination Projects in new and renewable technologies, and have expertise in PV. BoTeC undertook PV mini-grid Pilot Project in Motshegaletau village and has supported NPV-REP on technical aspects.

(5) Rural Industries Promotion Company (RIPCO)/Rural Industries Innovation Center (RIIC):

RIPCO is a parastatal company, the mission of which is to create employment for, and improve the quality of life of Botswana. RIIC is RIPCO's research and development wing. RIIC involved in research, information dissemination and pilot projects with renewable technologies, with a particular focus on rural industries. RIIC undertook operation and management of Manyana Pilot Project in commercial phase and NPV-REP.

(6) The Ministry of Local Government (MLG)-Department of Local Government and Development (DLGD):

MLG is the "parent" ministry of all local governments in Botswana. As Botswana is a unitary state, local government has no constitutional status and is a purely statutory creation. Within these statutes, MLG plays key roles in

virtually every aspect of local government. These include controlling or supervising most key decisions regarding local personnel, budgeting, development planning, self-help projects; ensuring conformity with national policies and priorities; providing training; developing new revenue sources; and developing new managerial systems and procedures. Even when local governments seek greater autonomy, their primary spokesperson and advocate is MLG. Thus, this ministry is critical for all aspects of local governance in Botswana.

DLGD has the responsibility to support and facilitate the sound running of rural and urban development and administration machinery of local government. The department also provides support services as well as financial resources to local authorities. The department aims to achieve the following objectives; Provide effective local government machinery policy directions and strategies; Provide overall rural and urban development integration and provision of backup administration support services, Ensuring sound maintenance and upkeep of basic social services such as primary education, health, sanitation, village infrastructure etc.

MLG has started installing PV lighting systems in rural school reading rooms, clinics, police stations and Kgotla.

(7) The Ministry of Land, Housing and Environment (MLHE)

The Ministry of Lands, Housing and Environment was re-established as a result of split of the Ministry of Local Government Lands and Housing. The other ministry formed out of the split is the Ministry of Local Government

National Conservation Strategy (Coordinating Agency)

The NCS Coordinating Agency is the secretariat under the NCS Advisory Board. The main function of the Board is to coordinate and advise both Government and the private sector on all environmental issues as reflected in the National Conservation Strategy document. The Agency thus services the Board and coordinates the execution of its decisions. It liaises with other organization to ensure that the NCS goals and objectives are achieved. The Agency is also charged with advising and supporting line Ministries/ Departments in discharging their various environmental responsibilities.

The NCS Agency also consults with and assists local authorities in formulating their Local/District Conservation Strategies; it provides professional advice to Central Government, Local Authorities and the public on natural resources conservation; and assesses, prepares and sets standards for Environmental Impact Assessments; and is charged with preparing annual/biennial State of the Environment Reviews.

(8) District Institutions:

District institutions are composed of District Administration, District Council, Land Board, Tribal Administration, District Development Committee and Village/Ward Development Committees.

Refer to Appendix 2.1.1 (3) on Community Development Structure.

(9) The Ministry of Works, Transport and Communications (MWTC) -
Department of Electrical and Mechanical Services (DEMS):

The Department of Electrical and Mechanical Services (DEMS) is primarily a multi-disciplinary department providing professional and engineering services in electrical and mechanical design, installation, commissioning, operation and maintenance, for Government establishments and institutions. Electricity is provided first to government buildings, and then to businesses or private households only when there is a surplus.

(10) Botswana Telecommunications Corporation

BTC was formed as a parastatal in 1980 under MWTC. It provides national and international telecommunications services. BTC has installed and maintained PV systems for its facilities.

(11) MMEWR-Department of Water Affairs (DWA):

DWA uses PV water pumping technology extensively.

(12) The Ministry of Education (ME)-Department of Vocational Education and Training (DVET)-Brigades

The responsibility for vocational education and training is shared by MOE and the Ministry of Labor and Home Affairs (MLHA), while technician training is provided through several ministries, parastatal organizations and

private sector. DVET is primary responsible for all institutional-based vocational programs provided through 6 government Technical Colleges and about 40 government subsidized community-based school called Brigades.

5.2 Study on the Implementation Body for PV Rural Electrification

5.2.1 Management Lessons Learned from Ongoing PV Projects in Botswana and Other Countries

Lessons learned from PV Projects in Botswana and other countries are useful and suggestive to formulate the plan of institutional framework for PV dissemination in Botswana. The followings are the discussion on application of such lessons for Botswana.

(1) Centralization or Decentralization of PV Projects Management

Botswana Energy Master Plan (1996) proposes that responsibility for PV electrification needs to be centralized if it is to address national needs optimally and be integrated effectively with national electrification program. Ongoing PV projects have been promoted by EAD and its implementations have been undertaken by RIIC and BoTeC and therefore, the management has been centralized. PV projects in most of development countries have been promoted by central governments or national utilities.

On the other hand, it is also pointed out in the evaluation of the ongoing national PV project in Botswana, NPV-REP, that PV systems scattered all over the country make it difficult to respond to system troubles or customer needs adequately and dissemination in collaboration with local communities has not been sufficiently established.

PV electrification, especially of SHSs, is in its nature to be expanded and maintained in a geographically sporadic manner, as opposed to grid extension that forms continuous patterns.

Therefore, it is clear that centralized management of PV systems in such sparsely located villages in Botswana becomes very difficult and uneconomical.

In many PV projects in the world, actual implementing organizations are locally based.

(2) Private Entity or Governmental Organization

World Bank puts stress on supporting the sustainable commercialization of PV based energy services by private companies. Many reports points out that the entire SHS program should be executed with significant private sector participation and as little reliance on government involvement including subsidies as possible.

However, in case of Botswana, as mentioned in Section 2.3.2, pre-conditions for launching PV programs and business on a commercial basis are not satisfied and the private sector has not been well developed.¹⁾ It will be difficult to promote PV rural electrification without government involvement including allocation of appropriate subsidies. However, private sector participation can be made in its equipment supply, installation and maintenance services. Participating such activities, private sector in Botswana will increase their capacities and then, they will be able to undertake such concession approaches as implemented in South Africa, Argentina, etc.

(3) Open-market Approach or ESCO-concession Approach

NPV-REP has adopted the open-market approach, applying preferential loan scheme. However, it is reported by World Bank that to overcome the constraints associated with the low density, low skill levels, and remoteness of the rural communities, an institutional approach appears to be most likely to succeed in providing PV-based electricity on a fee-for-service basis by a utility (ESCO approach), rather than relying on the scaling of hardware to individual consumers.²⁾ The utility should be locally, community-based and be suitable to supply such services.

(4) SHS or PV mini-Grid

Many lessons learned by on-going PV rural electrification suggest that centralized PV stations have an inherent disadvantage in requiring high capital investment and high maintenance costs due to the sophisticated system compared with SHS and will not be disseminated in rural areas.³⁾

¹⁾ Source: Attachment, Reference List No.6

²⁾ Source: Attachment, Reference List No.102

³⁾ Source: Attachment, Reference List No.88

It will be also true in case of Botswana PV rural electrification. If so, requirement for technical level of technicians for maintenance will not be so severe.

(5) Electricity Utility or Other Organization

It will be better to contract with a utility which has planning, technical, infrastructural and financial capabilities to undertake PV rural electrification. However, PV electrification, especially SHS does not require high level of professional technologies and technicians for this can be trained on short-term training basis.

Besides technology, the organization should have financial and operational management capabilities.

Looking at cases in other countries, many PV rural electrification projects are implemented by local cooperatives, local governments other than utilities.

Electricity utility has service stations and depots in rural areas. It is necessary for the Implementation Body to be able to facilitate such facilities. As mentioned in detail in Chapter 5 and Chapter 7, profitability of PV rural electrification is very poor, due to a low level of revenues because many rural households cannot afford to pay electricity charges. Therefore, such facilities and cost of operations should be cost-minimized. Existing facilities and organization should be fully utilized.

The Implementation Body should be the one that meets such requirement.

(6) Integration of PV Electrification with Local Development

Not only supplying light to the community, but also integrating it with the rural development plan will be important. In South Africa, Northern Province, the project "Poverty relief, Infrastructure Investment and Job Creation" including PV electrification is proceeded by a community and NGO. The project includes SHS, water pumping, farming, food processing utilizing solar heat, etc. and it is expected to create jobs in the village area.

Such integrated approach will be necessary in rural areas of Botswana. The Implementation Body is preferably suitable to incorporate such comprehensive activities.

5.2.2 Selection of the PV-based Rural Electrification Project Implementation Body

(1) Evaluation of the candidate organizations

Based on the above criteria, the study team evaluated the candidate organizations. The results are shown in Appendix Tables 5.2-1 and 5.2-2.

(2) Recommendation

The study team recommended at the stage of the Progress Report RIIC as the most suitable Implementation Body for the PV-based rural electrification project for the following reasons.

- 1) As pointed out in the Energy Master Plan of Botswana, BPC, as the power utility in the country, has technical expertise and planning and management capabilities required to implement the rural electrification project. Yet BPC should be disqualified for the following reasons.
 - a. BPC is the power utility exclusively managing power generation (including imports), transmission and distribution in the country. If it is to implement the PV-based rural electrification project, the electricity sector is highly centralized – the situation that opposes to the world trend toward decentralization on the basis of open competition.
 - b. As BPC is currently focusing on expansion of its grid, accompanied by increased connectivity to customers, the PV-base rural electrification project clearly conflicts with its objective. It is difficult to expect BPC to be actively involved in the project.
 - c. The potential customer base of the PV-based rural electrification project has been rapidly reducing due to the rapid expansion of the grid in recent years and is too small for BPC. If BPC is appointed as the execution agency, the project will receive only a low priority.
- 2) MLG/district councils are a primary candidate because the project would benefit their own communities and they are expected to actively promote it, albeit low levels of feasibility. Nevertheless, they should be disqualified for the following reasons.

- a. While MLG and district councils maintain close communication, it is not warranted that district councils can establish effective communication with EAD that is responsible for planning and promotion of energy-related projects. Also, district councils and tribe authorities are highly bureaucratic organizations and spend fairly long time for decision-making.
 - b. District councils are said to be reluctant to collection of electricity charges from local residents, accompanied by law enforcement including punishment. They cannot be expected to manage the project in a fair and objective manner.
 - c. The rapid expansion of the grid in recent years has reduced the number of rural households that need to be served by the PV-based rural electrification project. In fact, the number of unserved households in each district is no longer large enough to require local management. Instead, the project can now be implemented by a central Implementation Body in cooperation of local communities.
- 3) Finally, RIIC has long experience in PV-based rural electrification and is implementing NPV-REP, which will complete its fourth year in April 2001. As the project is scheduled for an official review to determine its continuity, RIIC intends to integrate it with the new PV Master Plan for continuation. It is important to use RIIC's experience and organization in implementation of the PV master plan. In particular, RIIC has successfully improved the performance of NPV-REP, which faced operational and management problems in the initial stage. NPV-REP has been implemented under a cost-plus-constant fee contract with the government. RIIC is ready to manage it as its own project and seems to be capable of doing so. The new project seems to be suitable for RIIC's organization and size. Furthermore, RIIC's activities in the field of rural small industries innovation together with PV electrification will increase inhabitants' affordability and contribute to success of the PV projects.

Appendix Table 5.2-1 Comparison of Candidates for Selection of the Implementation Body

Selection Criteria		BPC	RIIC	BoTeC	DEMS	MLG/District Councils
a)	Non-central Government Institution or Parastatal	Proper	Proper	Proper	Questionable	MLG: Questionable, D/C: Proper
	Point	3	3	3	2	2
b)	Close Relationship between the Central and Rural	Exelent	Exelent	Good	Exelent	Exellent
	Point	3	3	2	3	3
c)	Managerial Capability (Firm Organizational Structure and Human Resources)	Exelent	Good	Fair	Good	Good
	Point	3	2	1	2	2
d)	Technological Ability (Experiences in Rural Electrification and/or PV Electrification)	Exelent	Exelent	Exelent	Exelent	Good
	Point	3	3	3	3	2
e)	Magnitude and Time Requirement for What is to be Done, When It is to be Selected as Execution Body	Little	No small	Much	No small	No small
	Point	3	2	1	2	2
f)	Ability of Collaboration with Private Sector	Exellent	Exellent	Exellent	Exellent	Exellent
	Point	3	3	3	3	3
g)	Integrity with Rural Development	Good	Exelent	Fair	Fair	Exelent
	Point	2	3	1	1	3
Total Point		20	19	14	16	17
h)	Willingness to Undertake PV Projects	Reluctant	Aggressive			Aggressive
	Point	0	3			3
i)	Overall					
	Point	20	22			20

Appendix Table 5.2-2 Comparison of Candidates for Selection of the Implementation Body

	Selection Criteria	BPC	RIIC	BoTeC
a)	Non-central Government Institution or Parastatal	BPC is a parastatal monopolistic electricity utility and there might be concerns about too much concentration of electricity business to BPC.	RIIC is a parastatal company, RIPCO's research and development wing. RIIC has been undertaking national projects, training, installation, maintenance, supporting and marketing.	BoTeC is a national center for research and development. BoTeC undertakes research, information dissemination and pilot projects in new and renewable technologies, and have expertise in PV.
b)	Close Relationship between the Central and the Rural (Channel of Report)	BPC is operating its business under EAD supervision and has basing points such as service stations and depots all over the country.	RIIC involved in research, information dissemination, pilot and commercial projects with renewable technologies, with a particular focus on rural industries. RIIC has undertaken EAD's PV projects. RIIC has several basing points in rural areas and has cooperated with village authorities such as Village Development Committees.	BoTeC has cooperated with EAD in various projects, especially in PV Projects on technical aspects.
c)	Managerial Capability (Firm Organizational Structure and Human Resources)	BPC has its organization and human resources required for technical and managerial activities.	RIIC has 280 employees and several local offices such as in Maun and Palapye. Operation of NPV-REP undertaken by RIIC had a lot of troubles in technical services and administrative management, but the situations were much improved recently. Different from cost plus fee basis undertaking, it is expected that RIIC will utilize its entire organization and manpower for its own business.	BoTeC as a national technology center, has a limited capacity for project implementation.
d)	Technological Ability (Experiences in Rural Electrification and/or PV Electrification)	BPC has not enough experiences in PV electrification, but BPC has basic technologies and technical experts.	RIIC is a pioneer in PV projects in Botswana and has engaged in Manyana PV pilot project and NPV-REP.	BoTeC was established as a national center for research and development. BoTeC undertakes research, information dissemination and pilot projects in new and renewable technologies, and have expertise in PV. BoTeC undertook PV mini-grid pilot project in Motshagaletau village and has supported NPV-REP on technical aspects.
e)	Magnitude and Time Requirement for What is to be Done, When It is to be Selected as Implementation Body	BPC will be able to utilize existing manpower and local basing points for the PV projects with minor modification and short-term training.	RIIC has been engaging NPV-REP since 1997 and has established local offices in Kanye and Palapye and managing tools. Collaboration with postal offices has been established for payment collection. Such facilities and tools and managing know-how will be utilized for the PV projects.	In order to implement PV business as the Implementation Body, restructuring will be necessary in organization and human resources.
f)	Ability of Collaboration with Private Sector	BPC has utilized private sector in its activities.	In NPV-REP, private sector has participated in the field of equipment purchasing, installation and maintenance.	BoTeC has been engaged in hardware management such as formulation of hardware standards and register system for manufacturers, retailers, installers. In this regards, BoTeC has close connection with private sector and will be able to expand collaboration for PV projects.
g)	Integrity with Rural Development	BPC's grid extension will accelerate rural development. BPC actively supports and encourages more households to be connected on the basis of supply-side.	RIIC's mission is to innovate and develop rural industries. It is expected that RIIC cooperates closely with rural villages and district councils for the purpose of mutual development.	BoTeC's research and development works cover innovation of rural areas including the studies on socio-economic survey of rural areas, but the cohesion to rural areas is relatively weak.
h)	Willingness to Undertake PV Projects	BPC has been supportive in PV business, in addition to extending grids and increasing household-connections.	RIIC expresses strong willingness to undertake the PV projects including PV Dissemination Projects in 3villages as the Implementation Body.	

	Selection Criteria	DEMS	MLGLH/District Councils
a)	Non-central Government Institution or Parastatal	DEMS of MWT&C is primarily a multi-disciplinary department providing professional and engineering services in electrical and mechanical design, installation, commissioning, operation and maintenance, for government offices and organizations.	MLG will not be Implementation Body because of decentralized policy, but will play the role to supply District Council with human resources and other supports. District Council can be the Implementation Body in line with the policy.
b)	Close Relationship between the Central and the Rural (Channel of Report)	DEMS is a central governmental organization and collaborated with EAD in rural mini-grid diesel based electrification. DEMS has footholds in rural areas.	In case District Councils are the Implementation Body, involvement of MLG is indispensable. All planning of District Councils (Project Memorandum) shall be directed to planning office of MLG. MLG under EAD's project formation and budget allocation will apportion the budget to each District Council. Physical planning, management and implementation are done by District Councils. District Council will report to EAD through MLG.
c)	Managerial Capability (Firm Organizational Structure and Human Resources)	DEMS's work scope is limited to hardware purchasing, installation, operation and maintenance and managerial works such as tariff collection are excluded or entrusted to other institutions.	District Council has organizations for planning, construction, maintenance and administrative activities. Important human resources are allocated by MLG. There will be a concern that District Council cannot severely collect fees for example of the cases of fee collection failures in sanitation and water rates.
d)	Technological Ability (Experiences in Rural Electrification and/or PV Electrification)	DEMS has been engaged in supplying with electricity mainly generated by diesel generators to government buildings in rural areas, and then to businesses or private households only if there is extra. DEMS has large scale maintenance shops and engineers/technicians.	District Councils engage in local physical planning, prepare development plans, and manage the implementation of a large number of capital projects on an annual basis. District Council have records of delivering such key services as water, education, and health. One of such services includes PV electrification of schools, clinics, village offices, etc. PV electrification for village households has been out of scope of its services.
e)	Magnitude and Time Requirement for What is to be Done, When It is to be Selected as Implementation Body	On the technical aspects minor expansion will be sufficient for PV implementation, but on managerial aspects much improvement will be necessary.	Existing facilities, organizations and human resources will be able to be utilized for PV electrification. It will be necessary to increase engineers/technicians in District Councils and also to increase capability of doing business and fee collection system.
f)	Ability of Collaboration with Private Sector	DEMS has been using 13 to 16 sub-contractors for its implementation. The relations can be easily expanded for PV projects.	Most of works in District Councils have been implemented by tender calling from private sector. For the installation and maintenance of PV systems in their public facilities, District Councils have dealt with private sector and will expand the dealings in order to cover their capabilities.
g)	Integrity with Rural Development	DEMS's activities cover rural areas, but mainly government facilities. Therefore, its cohesion to rural lives and development is relatively weak.	District Council will be able to give priority for PV electrification, considering harmony with the rural development.
h)	Willingness to Undertake PV Projects		District Councils and Village Authorities are willing to participate or undertake PV electrification as the Implementation Body.

(3) Re-evaluation of Institutional Framework for PV Rural Electrification

1) Introduction

The JICA Study Team recommended RIIC as the body to undertake PV dissemination, with basic agreement of EAD. The Team, however, had to reconsider the above institutional framework because of the change in the situation related particularly to the following:

- a) Increase in the number of targets due to inclusion of localities.
- b) Change in the EAD's evaluation on BPC and RIIC.

The need for the re-evaluation was also agreed by the Steering Committee, which was held on 15 June 2001.

The results of re-evaluation made by the Study Team are summarized as follows:

2) Results of Re-evaluation

It was concluded that the original recommendation to use RIIC, needed to be re-considered. The following key points are particularly noteworthy.

a) RIIC

- i. RIIC has a degree of capability of collecting repayment of finance that had been provided to the end-users in NPV-REP.
- ii. It was found that when localities are included RIIC does not have the manpower and managerial capabilities to sustain enlarged PV electrification projects.
- iii. RIIC/RIPCO reports to a Ministry (MCST) other than MMEWR (EAD), and is undergoing restructuring. This situation makes control and delegation of power by EAD difficult. If problems occur it will be difficult to take remedial action quickly and efficiently.
- iv. RIIC is involved in implementation of NPV-REP, which has had problems in the initial phase. Audit results indicate that the existing managerial system is not suitable for large-scale PV projects (i.e., one that includes localities).
- v. RIIC showed willingness to participate in the rural electrification program.

b) BPC

- i. Originally BPC's mandate was only related to the grid.
- ii. BPC is under direct control of MMEWR (EAD) and EAD has a mandate to carry out PV rural electrification, and EAD thus makes it possible for BPC to promote PV rural electrification.
- iii. BPC has enough capacity to undertake PV rural electrification due to its infrastructure in the rural areas.
- iv. BPC is rigid in its approach to rural electrification. They have a top-down approach, which can and probably will cause problems at the rural villages and localities. BPC should be informed that a bottom-up approach of using existing rural organizations or ways of doing things is to be used. Rural people carry out activities on a consultation and consensus basis. They usually decide collectively what they want and negotiations must take place to find the best solution. BPC in principle has agreed to this type of approach.
- v. BPC is extremely willing to do PV rural electrification, due to the fact that some of the remaining un-electrified villages and the localities will not be connected to the grid in future, making the planned effort economically viable.

Detailed comparison results are shown in Appendix Table 5.2-3.

3) Conclusion

According to the re-evaluation, it was concluded that BPC should do the implementation, since it had been found that RIIC lacked certain attributes of BPC.

It is important that BPC should use the approach as presented in the Progress Report.

Appendix Table 5.2-3 Comparison of BPC and RIIC for Selection as the Implementation Body under New Conditions

Evaluation Criteria	BPC		RIIC	
	Previous evaluation under the pre-condition of progress report	Revised evaluation taking the new conditions into consideration	Previous evaluation under the pre-condition of progress report	Revised evaluation taking the new conditions into consideration
1	Ability to follow the central policy and supervision on rural electrification led by MMEWA (EAD)			
a)	Government Involvement in its Operation Merit BPC is a parastatal monopolistic electricity utility. There are concerns about too much concentration of electricity business at BPC and future privatization and restructuring will discourage BPC from being active in PV dissemination.	Merit BPC's privatization will be delayed. In this case, present relations will be kept and EAD can motivate BPC to promote PV electrification.	RIIC is a parastatal company, RIPC's research and development wing. RIIC has been undertaking national projects, training, installation, maintenance, support services and marketing.	RIPC/RIIC are in the process of integration and privatization under the Science and Technology Policy. Once privatized or restructured, company policy for PV electrification might be changed.
b)	Report Channeling and Reliability with MMEWA-EAD Merit BPC is operating its business under EAD supervision	Merit Status quo	RIIC is involved in research, information dissemination, and pilot and commercial projects with renewable technology, with a particular focus on rural industries. RIIC has undertaken EAD's PV projects, Manyana and the on-going NPV-REP.	Status quo RIIC/RIIC are under control of a different ministry (MCI). Once any troubles occur, it will be difficult to take immediate necessary measures under the present government system. This is evident in efforts to solve NPV-REP problems.
2	Institutional Capability			
a)	Organizational Structure and Human Resources Merit BPC has the organization and human resources needed for technical and managerial activities.	Merit BPC can mobilize required personnel from existing manpower and has a system to recruit and train personnel.	RIIC has 280 employees and 2 local offices in Maun and Palapye. RIIC's capability is judged appropriate to undertake PV electrification for the estimated PV target households.	Enlargement of the target households to be PV-electrified will make it difficult for RIIC to recruit and mobilize personnel. It is necessary to restructure RIIC's organization to match the new situation.
b)	Technological Ability (Experiences in Rural Electrification and/or PV Electrification) Merit BPC has basic technology and technical experts for electricity and can quickly catch up regarding PV technology.	Merit BPC has GIS technology and can collect and work with exact information on rural areas including localities and utilize it for planning, implementation and management.	RIIC is a pioneer in PV projects in Botswana and has been engaged in the Manyana PV pilot project and NPV-REP.	RIIC lacks systematic software for planning implementation and therefore would be required to acquire it.
	Demerit BPC does not have enough experience in PV electrification.	Demerit BPC does not have enough engineers and technicians.	RIIC does not have enough engineers and technicians.	

Evaluation Criteria	BPC		RIIC	
	Previous evaluation under the pre-condition of progress report	Revised evaluation taking the new conditions into consideration	Previous evaluation under the pre-condition of progress report	Revised evaluation taking the new conditions into consideration
c)	Managing Technologies such as Fee Collection, etc.	Merit BPC has software for all activities required of an electricity supply company.	Status quo	
		Demerit		RIIC has acquired improved managerial software since the start of NPV-REP, but the level is still in the infant stage. In order to implement large scale business it must acquire software and a functioning implementing system.
d)	Existing Technological Infrastructure to be Utilized.	Merit BPC will be able to utilize existing man power and local basing points for the PV projects with minor modification and short-term training.	Status quo	
		Demerit		In case the target households are increased, the existing RIIC technological infrastructure must be expanded.
e)	Financial Capability		BPC has financial capability through its electricity business	RIIC's financial capability is far less than that of BPC.
	Involvement in Rural Development	Merit BPC's grid extension will accelerate rural development. BPC actively supports and encourages more households to be connected on the basis of its supply-side orientation.	If PV implementation is done, cooperation will be given.	Status quo
3		Demerit Lack of cooperation or consultancy has been reported in evaluation of RCS.		
4	Willingness to Participate in PV Projects	BPC has been supportive in the PV business; in addition to extending the grid and increasing household-connections.	BPC showed strong willingness to undertake PV projects as the implementing body, because PV is one of the more economical measures to substitute for grid extension for isolated areas.	Status quo
			RIIC expresses strong willingness to undertake the PV projects including PV Dissemination Projects in three villages as the implementing Body.	Status quo