



Guides for **Electric Cooperative Development and Rural Electrification**



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NRECA International Ltd.

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Glossary of Abbreviations

A	Ampere
AH	Amp-hour
AC	Alternating current
ACSR	Aluminum conductor, steel reinforced
A&G	Administrative and general
AWG	American wire gauge
CARES	Central American Rural Electrification Support Program
CCT	Correlated color temperature
CDA	Cooperative Development Authority (Philippines)
CEF	Fronteriza Electric Cooperative (Dominican Republic)*
CFC	National Rural Utilities Cooperative Finance Corporation, also known as NRUCFC (U.S.)
CFL	Compact fluorescent light bulb
CLARITY	Cooperative Law and Regulation Initiative
CONELECTRICAS	National Consortium of Electrification Companies of Costa Rica (Costa Rica)*
DC	Direct current
DISCEL	Electric Distributor of the Hydroelectric Executive Commission of Rio Lempa (El Salvador)*
EBIT	Earnings before interest and taxes
EBITDA	Earnings before interest, taxes, depreciation and amortization.
EEGSA	Electric Company of Guatemala, PLC (Guatemala)*
ESMAP	Energy Sector Management Assistance Program (World Bank)
FUNDAP	Foundation for Economic Development
G&T	Generation and transmission cooperative
GIS	Geographic information system
GPS	Global positioning system
HVD	High voltage disconnection
I	Electrical current, measured in amperes
ICE	Costa Rican Institute of Electricity (Costa Rica)*
IEC	International Electro-technical Commission
INDE	National Institute of Electrification (Guatemala)*
INE	National Institute of Statistics (Bolivia)*
IRR	Internal rate of return
ISPRA	National Institute for Protection and Environmental Research (Italy)
K	Kelvin
klmh	Kilo-lumen hour
kV	Kilovolt
kVA	Kilovolt-ampere
kVAR	Reactive kilovolt-ampere
kW	Kilowatt

kWh	Kilowatt hour
LED	Light-emitting diode
LPG	Liquefied petroleum gas
LVD	Low voltage disconnection
LVR	Low voltage reconnection
MRT	Single wire earth return*
MW	Megawatt
MWh	Megawatt hour
NEA	National Electrification Administration (Philippines)
NESC	National Electrical Safety Code
NGO	Non-governmental organization
NOAA	United States National Oceanic and Atmospheric Administration
NPV	Net present value
NRECA	National Rural Electric Cooperative Association International, Limited
OCDC	Overseas Cooperative Development Council
O&M	Operations and maintenance
PDB	Power development board
PUC	Public utility commission
PUE	Productive use of electricity
PV	Photovoltaic
PWM	Pulse width modulation
R	Electrical resistance
R&D	Research and development
RE	Rural electrification
REA	Rural Electrification Administration, an agency of the Department of Agriculture of the United States, now known as RUS
REB	Rural Electrification Board (Bangladesh)
RFP	Request for proposal
RFQ	Request for quote
ROE	Return on equity
RUS	Rural Utilities Services, an agency of the Department of Agriculture of the United States, previously known as REA
SWER	Single wire earth return
TAG	Technical assistance guide
UL	Underwriters Laboratory
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USTDA	United States Trade and Development Agency
V	Volt
W	Watt
WH	Watt-hour
Wp	Watts peak
WtP	Willingness to pay

*English translation of Spanish abbreviation

Guide for the Creation of Electric Cooperatives

MODULE 2 OF NRECA'S TECHNICAL ASSISTANCE GUIDES



EXECUTIVE SUMMARY

This module serves as a reference for developing countries that are embarking on the creation of a new electric cooperative. It presents a step-by-step process to form a cooperative, which is often the most appropriate solution to a lack of electricity in rural areas.

The process described here builds on the experience obtained from organizing numerous cooperatives. Using this module to guide the formation process promotes greater efficiency and promises a higher probability of success. The methodology presented, though consistent in its principles, is sufficiently flexible to adapt to on-the-ground realities faced by project proponents in various countries.

Summarized below are the 18 steps required to organize an electric cooperative, based on NRECA's cumulative experience and the methodology outlined in the USDA report, *How to Organize a Cooperative*.¹

1. Conduct a leadership meeting to discuss the need for a cooperative.
2. Meet with people who have expressed interest in forming an electric cooperative. Vote to determine if process should continue. If affirmative, select a Provisional Committee.
3. Survey potential members to determine interest in the creation of an electric cooperative.
4. Conduct a General Meeting to discuss the results of the survey. Vote to decide whether or not to proceed.
5. If the decision is to proceed, choose a Steering Committee.
6. Contact government and regulatory organizations, e.g. the Ministry of Energy.
7. Conduct a feasibility study.
8. Hold a General Meeting to discuss the results of the feasibility study. Take a secret vote to decide whether to proceed.
9. Develop a business plan and financial analysis.
10. Hold a General Meeting to discuss the results of the financial analysis and the business plan. Vote on whether to proceed.
11. Prepare the necessary legal documentation and initiate the incorporation process.
12. Carry out a member registration campaign.
13. Conduct a Founding Assembly with all the potential charter members to approve the Bylaws and choose a Board of Directors.
14. Conduct Board Meetings to elect officers and assign responsibilities to implement the business plan.
15. Implement the necessary legal steps, e.g. incorporation, service territory concession,

¹Galen Rapp and Gerald Ely, *How to Organize a Cooperative*, USDA Cooperative Information Report 7 (Washington, D.C.: USDA, 1996), available online at <http://www.rurdev.usda.gov/rbs/pub/cir7/cir7rpt.htm#General%20Rules%20for%20Success>.

construction authorizations or transfer of existing electrical infrastructure, and tariff approval.

16. Prepare a capitalization plan and loan applications.
17. Prepare to start operations by hiring a General Manager and acquiring the necessary infrastructure, tools, and equipment.
18. Commence operations

INTRODUCTION

An estimated 1.6 billion people around the world live without access to electricity. Where electricity does exist, poor quality of service is often the norm. In response to this reality, communities face three options:

1. *Business-as-usual*: A community may resign itself to a life of subsistence and underdevelopment due to the lack of modern reliable energy services.
2. *Wait and see*: A community may appeal to the national or private electric utility to help them electrify, and wait to see how the request is prioritized.
3. *Communal organization*: Community members may organize themselves to create and operate their own electric distribution organization, such as an electric cooperative.

A cooperative is often formed when people realize they can do something to help themselves. Creating a cooperative, however, should follow certain steps to ensure that it is the best solution to bring electricity to a community.

This module guides those individuals and communities who have decided to create a cooperative to bring electricity to a community and/or to manage their electrical system.

The cooperative organizational model, where agreements are made between people to solve problems and improve living conditions, has been in existence since the dawn of recorded history. For example, the Egyptians, Sumerians, and the early native peoples of present-day Latin America developed cooperative-style organizational structures. The cooperative approach has demonstrated inherent value to humanity, inspiring solidarity in response to natural disasters and in efforts to solve social problems afflicting humanity.

Formally organized cooperatives emerged following the Industrial Revolution, which had a severe impact on the working and lower-income classes. In 1844, the first recorded modern-day cooperative was formed in Rochdale, England, as a reaction to the social depression of the time.² In this first cooperative, a group of entrepreneurs banded together in an effort to open a storefront of their own. At the time, the advent of the modern machine was quickly forcing skilled laborers into poverty. However, this group was able to pool together skills and capital, to persevere collectively where they had failed individually. Through this process, they established the Rochdale Principles. These principles serve as the basis for the seven cooperative principles embodied in the International Co-operative Alliance's *Statement on the Co-operative Identity*.³

Electric cooperatives have existed in various countries throughout the world for decades. However, the electric cooperative model of the United States has proven to be the most successful model. In 1935, less than 10% of rural Americans in the United States had access to electricity. At the time, private electric companies did not consider the rural areas financially attractive. Several communities therefore began to form electric cooperatives to service their need for

²"Rochdale Principles of Co-operation 1937 - Section 1." International Cooperative Alliance. 21 Jan. 2009 <http://www.ica.coop/coop/1937-01.html>.

³"Statement on the Co-operative Identity." International Cooperative Alliance. 21 Jan. 2009 <http://www.ica.coop/coop/principles.html>.

electricity. Steadily, one cooperative after another was formed. By 1970, 35 years later, an impressive 99% of rural communities in the United States had been electrified using the cooperative model.

The cooperatives formed a service organization in 1942 called the National Rural Electrical Cooperative Association. Its purpose was “to overcome World War II shortages of electric construction materials, to obtain insurance coverage for newly constructed rural electric cooperatives, and to mitigate wholesale power problems.”⁴ Today there are more than 900 electric cooperatives within the United States. NRECA’s work began in 1962. Since the program’s inception, international electrification projects developed by NRECA have benefited more than 100 million people globally.

Electricity is a basic and necessary ingredient for sustainable development. Most modern conveniences require electricity to operate. Often, access to electric service is taken for granted in urban areas, where it is a prerequisite for life’s daily activities. In rural areas, however, especially in communities in developing countries, the arrival of electricity is a major event. The day that “light arrives” to an area is a memorable day that many people later remember with great satisfaction. For many, it is remembered as the moment when the community became part of “civilization” and truly “joined the world.”

When electricity arrives in a community, the social, commercial, and entrepreneurial dynamics transform, providing new opportunities for businesses to grow, for people to begin new enterprises, and for education, health, and cultural life to advance.

This brief summary alone should justify efforts by rural areas to obtain modern energy services. However, history has demonstrated that rural areas are typically not financially attractive to

many commercial electric companies, primarily because the return on investment is likely to be lower than required for profit-oriented entities.

When the need for modern energy services becomes evident, many communities begin to lobby the electric company (state-owned or private) to obtain electrical service in their area. Like most people, they seek quality service at affordable prices. When it becomes apparent that the state or private electric company will not deliver electricity to them, communities turn to alternatives. A community may decide to form their own electric company, following these principles:

- The company is owned by the members it serves.
- Each member is entitled to a vote.
- The surplus revenue (margins) at the end of each year is redistributed to members according to the amount of electricity each consumed during the year.

This is the electric cooperative model.

Definitions

The following definitions will enhance understanding of the subject matter in this module.

- *Cooperative*: “A cooperative is an independent association of people who voluntarily come together in order to face their common social and cultural needs and their economic aspirations by means of a jointly owned and democratically controlled company.”⁵
- *Provisional Committee*: Group of people named from among those who consider it worth finding out whether sufficient interest

Since the program’s inception, international electrification projects developed by NRECA have benefited more than 100 million people globally.

⁴“History of Electric Co-ops.” National Rural Electric Cooperative Association. 21 Jan. 2009 <http://www.nreca.org/>.

⁵“Information on Co-operatives.” International Cooperative Alliance. 21 Jan. 2009 <http://www.ica.coop/coop/index.html>.

Electric cooperatives have proven to be productive and effective models for rural electrification.

exists among potential members to form a cooperative. They verify initial interest and position the project to become an official organization.

- *Steering Committee:* Group of people elected by those interested in forming a cooperative. They are responsible for steering the process to its formal conclusion including celebrating the Founding Assembly.
- *Founding Assembly:* The meeting during which the founding members officially form the cooperative.
- *Board of Directors:* A group of people chosen by the members to govern the cooperative.
- *General Manager:* A person contracted by the Board of Directors to direct the daily operations of the cooperative.
- *Member:* A person who has fulfilled all requirements stipulated in the cooperative's bylaws regarding membership.

Purpose

In the face of the challenges of life in developing countries, there are leaders who step forward with a strong desire to find solutions. In many cases, these individuals have either visited or become aware of places where problems similar to theirs have been solved. With this knowledge, they begin to consider possibilities to achieve similar results within their spheres of influence. This module provides instruction for such forward-looking leaders on the necessary steps to create an electric cooperative, using specific methods of investigation, organization, planning, and execution.

This module can direct the formation of any size of electric cooperative, from one organized by a neighborhood group to bring electricity to their street or locality, to one of much greater scope. The methodology easily adapts to the scale of the cooperative effort.

Global Perspective

The module was designed for use in developing countries throughout the world. Cultural and socioeconomic reality, however, varies greatly from country to country, and from project to project. With this in mind, project proponents must be sensitive to the national, regional, or local context where the cooperative is to be formed and adapt their approach accordingly.

BACKGROUND

The creation of an electric cooperative often occurs in response to a conventional electric company's refusal to extend service to specific areas, typically rural areas. In general, the return on investment in less populated regions outside urban areas is insufficient to attract conventional, for-profit utilities. Electric cooperatives, however, have proven to be productive and effective models for rural electrification. Numerous developing countries⁶ have demonstrated the economic feasibility of the cooperative model for rural electrification. It continues to be an effective model for rural and peri-urban communities to gain access to modern, affordable energy services, provided by an institution responsive to community needs.

General Cooperative Concepts

A number of commonly understood cooperative concepts apply in all cultures and countries. These include values, principles, social purpose, and three distinguishing characteristics of the cooperative model.

Values

Cooperatives are based on the values of mutual aid, responsibility, democracy, equality, fairness, and solidarity. Members believe in the ethical values

⁶Douglas F. Barnes, *The Challenge of Rural Electrification: Strategies for Developing Countries*. (Washington, DC: Resources For The Future Press, 2007).

of honesty, transparency, social responsibility, and care for others.

Principles

Cooperative principles are guidelines for implementation of the values. These principles were approved by the International Cooperative Alliance as part of the Statement on Cooperative Identity,⁷ and are in still in effect today. The seven principles are as follows:

1. Voluntary and open membership
2. Democratic member control
3. Member economic participation
4. Autonomy and independence
5. Education, training and information
6. Cooperation among cooperatives
7. Concern for community

Cooperatives' Social Purpose

The social purpose of a cooperative is to improve the quality of life of its members, to integrate them into the economic development processes of the country, and to advance the electric services provided in an area towards best-practices standards.

Distinguishing Characteristics of the Cooperative Model

Three fundamental characteristics distinguish the cooperative model from a commercial or for-profit corporate model.

1. *Financial Participation.* Typically, investors in a commercial company contribute capital in order to make a profit on their investment

⁷Ibid.

through dividends and share price appreciation. If the company prospers, the investor gains through dividend increases and higher share prices. In a cooperative, the “dividend” is a member’s proportional share of the surplus revenue (margins) remaining at year end (based on each member’s energy consumption).

2. *Individual Contribution - Required Investment.* In a commercial company, investors buy shares according to their financial capacity and discretion. In a cooperative, each member is typically required to contribute some capital initially (e.g. a registration fee), and additional capital is provided in the cost paid per kilowatt-hour consumed. Cooperative financial policies and conditions dictate the capital investment required by members to maintain economic viability.
3. *Management Decisions.* In a commercial entity, only majority shareholders may play a role in the administration of the company. In a cooperative, all members have some part in determining policies and in directing the general course of business. In some cases, delegates elected by the membership provide guidance to the cooperative, and in other cases, membership meetings provide opportunities for members to directly influence cooperative management.

In an electric cooperative, all users are co-owners of the company, except for users who choose not to become members and simply remain as consumers.

Electric Cooperatives Compared to Investor-owned and Publicly Owned Utilities in the United States

In the U.S., the cooperative institutional model has proven to be an effective and successful approach to delivering electric utility services. When administered professionally, cooperatives can offer similar services and tariffs to those of private investor-owned and/or government-

Cooperative financial policies and conditions dictate the capital investment required by members to maintain economic viability.

operated electric utilities. However, electric cooperatives typically comprise significantly lower numbers of users and much less income per mile of electric line. In fact, income per mile of private and/or government-operated electric line can be more than seven times larger than that of cooperatives, as shown in Table 1.⁸

NRECA's Experience in the Creation of Cooperatives

NRECA was created to apply the expertise of America's rural electric cooperative community to developing practical and lasting solutions for

⁸Adapted from NRECA webpage, <http://www.nreca.org/AboutUs/Co-op101/CooperativeFacts.htm>

rural electrification throughout the world. The mission of this program is to provide global leadership for rural electrification efforts in developing countries in helping to bring electricity and economic and social development to rural areas around the world through adaptation of the highly successful U.S. rural electric cooperative system.

Through the years, NRECA personnel have provided support in the creation of numerous electric cooperatives. NRECA has helped form electric cooperatives in numerous countries, including Nicaragua, Costa Rica, El Salvador, the Philippines, Bolivia, Bangladesh, and the Dominican Republic.

Table 1. Comparisons between electric cooperatives, investor-owned utilities, and public utilities in the US

	Investor-Owned	Publicly Owned	Cooperatives	Total
Number of Organizations	220	2,000	930	3,150
Number of Total Customers	102 m	20 m	17 m	140 m
Size (median number of customers)	400,000	2,000	12,500	
Customers, % of total	73%	15%	12%	
Revenues, % of total	76%	14%	10%	
kWh sales, % of total	74%	16%	10%	

Sales (billions kilowatt hours)	Investor-Owned	Publicly Owned	Cooperatives	Total
Residential	937	202	213	1,360
Commercial	1,017	207	75	1,285
Industrial	725	153	83	954
Other	4	3	0	7
Total	2,683	564	372	3,619

	Investor-Owned	Publicly Owned	Cooperatives	Total
Miles of Distribution Line	50%	7%	43%	
Customers per mile of line (density)	35	47	7	34
Revenue per mile of line	\$62,665	\$86,302	\$10,565	\$60,827
Distribution plant per Customer	\$2,229	\$2,309	\$2,845	\$2,362
Assets (billions)	\$700	\$200	\$100	\$1,000
Equity (billions)	\$220	\$55	\$31	\$306

Note: "Investor-Owned" includes data for investor-owned affiliates engaged in competitive retail markets where appropriate.

Source: 2005 EIA, RUS Data, CFC

National Rural Electric Cooperative Association Strategic Analysis • Last Updated: February 2008

Through many years of experience assisting with numerous projects in many countries, NRECA learned that the needs and motivation of people everywhere are similar, when it comes to electricity service and improving lives. In particular, people everywhere are willing to act in their own self-interest as communities to obtain electricity. NRECA's success comes from tapping this motivation; from its basic belief that electrification makes a unique and comprehensive contribution to development; and from the attitude of practicality, flexibility, and innovativeness in its approach to designing and implementing projects.

One of NRECA's most successful electric cooperative programs is in Bangladesh.

Bangladesh Project

As a result of an agreement signed in October 1976 with the Power Development Board (PDB) of Bangladesh, NRECA conducted a comprehensive feasibility and organizational study for the implementation of a nationwide rural electrification program. The study resulted in the establishment of the Rural Electrification Board (REB) that has developed from a small government body to coordinate early electrification efforts to one of the most successful electrification programs in all of Asia.

With NRECA's continued assistance over the past 30 years, REB has designed and organized 70 rural electric cooperatives serving 7.3 million connections, or 45 million people, and covering almost the entire country. Over 373 substations and 206,000 km of lines have been energized. NRECA provided assistance to REB in design, construction, and utility operations. NRECA recently provided additional technical assistance to develop small, 10 MW power plants as well as an institutional renewable energy strategy to complement the conventional electrification program.

METHODOLOGY FOR CREATING A COOPERATIVE

The methodology to create an electric cooperative developed through experience gained from organizing numerous cooperatives. The 18 steps described here enable the process to flow more efficiently and achieve a higher probability of success. This approach is based on a combination of NRECA's international experience, and information presented in *How to Organize to Cooperative*.⁹ The methodology is flexible enough to adapt to various situations in different countries.

The 18 steps for organizing a cooperative are as follows:

1. Conduct a leadership meeting to discuss the need for a cooperative.
2. Meet with people who have expressed interest in forming an electric cooperative. Vote to determine if process should continue. If affirmative, select a Provisional Committee.
3. Survey potential members to determine interest in the creation of an electric cooperative.
4. Conduct a General Meeting to discuss the results of the survey. Vote to decide whether or not to proceed.
5. If the decision is to proceed, choose a Steering Committee.
6. Contact government and regulatory organizations, e.g. the Ministry of Energy.
7. Conduct a feasibility study.
8. Hold a General Meeting to discuss the results of the feasibility study. Take a secret vote to decide whether to proceed.

⁹Opt.

With NRECA's continued assistance over the past 30 years, REB has designed and organized 70 rural electric cooperatives serving 7.3 million connections, or 45 million people.

The process of starting an electric cooperative begins when individuals decide to address the issue of electric service in their area.

9. Develop a business plan and financial analysis.
10. Hold a General Meeting to discuss the results of the financial analysis and the business plan. Vote on whether to proceed.
11. Prepare the necessary legal documentation and initiate the incorporation process.
12. Carry out a member registration campaign.
13. Conduct a Founding Assembly with all the potential charter members to approve the Bylaws and choose a Board of Directors.
14. Conduct Board Meetings to elect officers and assign responsibilities to implement the business plan.
15. Implement the necessary legal steps, e.g. incorporation, service territory concession, construction authorizations or transfer of existing electrical infrastructure, and tariff approval.
16. Prepare a capitalization plan and loan applications.
17. Prepare to start operations by hiring a General Manager and acquiring the necessary infrastructure, tools, and equipment.
18. Commence operations.

The following sections of this module elaborate on these steps, providing details, suggestions, and recommendations to assist in implementation.

STEP 1: Leadership Meeting

The process of starting an electric cooperative begins when individuals decide to address the issue of electric service in their area. It may be that there is no electricity service at all. Possibly the electric service is of poor quality. Or perhaps the community wants a change, regardless of how reliable the service is. For example, they may want to obtain a more competitive tariff

or a more community-oriented service. In any instance, the first step is to convene a meeting of interested parties.

During this meeting, the project leaders or proponents discuss whether the formation of an electric cooperative is an appropriate solution to their problem. If they agree that this approach has a high probability of success, or at least that the concept is worth further exploration, the next step is to determine who else is interested.

STEP 2: Project Scoping

During the next step, interested parties may meet several times. If interest is sufficient, the community may nominate a Provisional Committee to determine the scope of the initial project, or they may immediately appoint or elect a Steering Committee with responsibilities for a specific series of functions.

If a Provisional Committee is formed, its main task is to seek out interested parties and collect basic market data and information. Such data will be needed to present a convincing project to the corresponding regulatory agencies in the electric sector and the cooperative sector, as the case may require in the legal context of each country. The data might include:

- Area population and main cities
- Territory to be covered
- What productive uses of energy are present in the area?
- What are the community's first impressions of the project? How do people respond when they first hear about the project?
- What energy source will be used? Will it be connected to the grid or be an isolated system?
- How will financing be acquired for construction of the electric system?

- Is there an existing system available for acquisition? What deficiencies exist, and how will system rehabilitation be financed?

The following factors should also be considered to promote the probability of success in forming a new cooperative:

- *Lines of communication:* Establish reliable lines of communication to permit project proponents access to one another at all times of the day, and throughout the year.
- *Population stability:* Ascertain whether seasonal laborers or nomadic peoples represent a significant percentage of the proposed project population.
- *Company-owned housing:* Investigate the existence of company-owned housing or lodging in agricultural or industrial centers, where inhabitants have access to housing only through labor contracts (and do not have title to property). If a significant portion of the project area population lives under these conditions, it could affect the feasibility of the proposed electric cooperative.
- *Divisions among population groups:* Explore divisions that exist within the community that could be detrimental to cooperation. Become aware of racial, religious, political, and social class discrimination and biases, and how they affect life in the community.

Project proponents should consider these and other social concerns that could affect the feasibility of an electric cooperative in a target region. In addition, cooperative developers should ascertain whether they will be able to fully satisfy both the short-term and the long-term demand for electricity in the communities.

STEP 3: Survey Potential Members

Next, ascertain that interest among potential members of the affected community is sufficient

to proceed with the project. To gauge interest, use a survey. Survey responses provide proponents with quantitative information regarding the level of interest in the community and indicate whether there is sufficient support to set the project in motion. The survey should also reveal the community's willingness to make capital contributions and pay the tariffs necessary to maintain the cooperative's financial viability.

In some countries, government organizations may require proof of interest in the project within the affected community. There may be a legal stipulation dictating a minimum number of members required to form an electrical cooperative. In the Dominican Republic, for example, the law requires a minimum of 200 members to form any public service cooperative. A survey can be an appropriate preliminary tool to address such requirements.

The survey form should be unbiased and worded to elicit honest answers. Pollsters should be thoroughly educated about the project, so they can respond to questions and address reactions within the community.¹⁰

STEP 4: General Meeting: Survey Results

Hold a meeting with the interested parties to discuss the survey results. Following discussion, attendees should vote to decide whether or not they should proceed with the project or not. If the group agrees to move ahead, they should select a Steering Committee.

STEP 5: Steering Committee

Whereas the Provisional Committee has the limited responsibility of verifying initial interest and positioning the project to become an official organization, the Steering Committee has a greater scope of functions. It assumes management of

Project proponents should consider these and other social concerns that could affect the feasibility of an electric cooperative in a target region.

¹⁰For more information on how to conduct surveys, refer to NRECA's Module 6: *Consumer Willingness to Pay and Economic Benefit Analysis of Rural Electrification Projects*.

the entire project until the Founding Assembly takes place. Therefore, the Steering Committee should include representatives from all the major population centers and key groups in the target area. This facilitates information flow in two directions: from the committee to the responsible government organizations and from the committee to potential members and other interested parties. Broad representation on the Steering Committee will greatly bolster the success of the process, assist in properly informing prospective members prior to the Founding Assembly, and assure that all legal requirements are duly met.

The Steering Committee is responsible for a number of functions that may be outside of the technical ability of its individual members. For this reason, the committee will often seek technical assistance to complete the necessary tasks, such as preparing a willingness-to-pay study.

Technical assistance might come from a variety of sources and will depend upon the availability of experts in the country. The committee sometimes can rely on qualified personnel in a reputable government agency. Other sources for technical assistance are international donor organizations and non-governmental aid organizations.

The Steering Committee is responsible for the following:

- Obtain a template to formulate the cooperative's bylaws from the appropriate government agency, or alternative source.
- Discuss the scope of the cooperative's bylaws.
- Manage and coordinate a course on cooperatives for the founding members.
- Carry out a survey to determine the level of interest for an electric cooperative within the community.
- Determine approximate project costs, employing technical assistance as needed.
- Establish a quota for initial capital requirements needed to form the cooperative.
- Establish the quota for the number of applications (i.e. enlisted members) required to form the cooperative.
- Formulate documentation to recruit members and raise capital.
- Raise capital contributions.
- Educate the public about the project. The global project may include both the formation of an electric cooperative and an electrification project, in which case the education campaign should cover both.
- Hold periodic information and coordination meetings.
- Prepare a report for the Founding Assembly.
- If the project includes acquiring an existing system, obtain necessary legal documents that indicate that the sale of the existing electric system can take place.
- Create debate rules for the Assembly.
- Carry out the logistics, preparations, and arrangements to hold the Founding Assembly meeting.
- Convene and run the Founding Assembly.

STEP 6: Initiate Contact with Government and Regulatory Agencies

The Steering Committee should initiate contact with appropriate government organizations and regulatory bodies to obtain a clear understanding of the legal and regulatory aspects related to creating and operating an electric cooperative. The committee must identify requirements, timelines, and actions necessary to comply with existing laws and regulations, and determine

whether new legislation may be required for the establishment of the cooperative.

National Legislation

In some countries, the creation of an electric cooperative may require new national legislation. If electricity in the country is provided solely by a national utility, legislation is required to authorize privatization of parts of the national utility by electric cooperatives. Note also that while most democratic countries have created laws facilitating the organization of cooperatives, not all authorize the organization of electric cooperatives.

Consideration of national legislation, therefore, requires a review of existing laws to determine whether privatization (including electric cooperatives) is possible, and whether the existing cooperative laws need revision to clearly identify electric cooperatives as a type of cooperative. Discussions and negotiations must be conducted at the national level to assure that proper laws are in place for the proposed electric cooperative to be formed. For more information on this process, review Module 1 *Legal and Institutional Enabling Systems for Sustainable Electric Cooperative Development*, and the publications, “CLARITY - Enabling Cooperative Development – Principles for Legal Reform” and “Creating CLARITY: Assessment, Analysis and Outreach for Cooperative Legal Reform - CLARITY II” publications, available through the Cooperative Development Program’s Cooperative Law and Regulation Initiative,¹¹ funded by USAID.

Regulatory Agencies

National governments normally rely on agencies to regulate energy activities. In some countries, regulatory agencies exist for both the electric sector and the cooperative sector. In some cases,

the Steering Committee must submit the proposed project to the agency that oversees the cooperative sector and have an official promoter assigned to the project. The promoter is responsible for helping the founders comply with all the legal requirements to form a cooperative. Even in that instance, a cooperative promoter may never have overseen the creation of an electric cooperative. Therefore, electric cooperative organizers must also approach the pertinent electric sector entities to learn about standards, regulations, and legal requirements that apply to electric cooperatives.

Relevant standards and regulations may include the following:

- Requirements for “Articles of Incorporation” or “Articles of Association”
- How to legally define a service territory
- How to obtain a concession to distribute electricity (or a concession for generation and authorizations for transmission, if the project includes those components)
- How to value existing electric assets within the proposed territory
- How to legally transfer existing assets to the electric cooperative
- Operating license (or charter) requirements to authorize an electric cooperative
- Employment laws for cooperatives
- Construction standards
- Public safety
- Environmental protection
- Power line right-of-way and clearances laws and standards (e.g. removal of trees and buildings) for the construction and operation of the electric grid

Discussions and negotiations must be conducted at the national level to assure that proper laws are in place for the proposed electric cooperative to be formed.

¹¹Please visit www.ocdc.coop/clarity/default.html for more information

Research and quantitative analysis will help convince prospective electric cooperative members, government officials, and funding sources that the electric cooperative should be created.

- Rules on respecting and protecting indigenous peoples
- Regulations concerning private property easements
- Regulations concerning national parks and preserves (if applicable to the proposed project)
- Tariff regulations
- Reporting requirements
- Others

Some type of government oversight is necessary to provide consistent financial, regulatory, and management controls for electric cooperatives. Major lenders, such as the World Bank, require oversight by an authorized government agency. The agency should have direct ties to the government, while at the same time retain limited autonomy so as not to be politically influenced. An oversight agency specifically for electric cooperatives is the best solution. National laws should be examined to determine whether such an agency exists or can be created. The creation of such an institution is beyond the scope of this module, and its existence is not a prerequisite to the formation of an electric cooperative.

Other Discussion Items

Other important areas for discussion with government and regulatory entities include:

- Source of wholesale power (either self-generation or power purchased from the grid)
- Employment laws for cooperatives
- Tax laws for cooperatives
- Fees and dues applicable to cooperatives
- Laws concerning employment unions and the effect on cooperatives

- Identification and evaluation of environmental laws
- Monitoring and evaluation needs

STEP 7: Conduct a Feasibility Study

A feasibility study (formal project assessment) then helps to determine whether the project should be implemented. Research and quantitative analysis will help convince prospective electric cooperative members, government officials, and funding sources that the electric cooperative should be created.

A feasibility study should include:

- Market research
- Willingness-to-pay analysis
- Project characteristics
- Proposed system map
- Projected load flow studies
- Project cost estimates
- Initial financial projections

Market research is a key aspect of feasibility analysis. To determine whether the market is large enough to justify the project costs, the Steering Committee and the project advisors should assemble pertinent information relating to the target region, including total population, target area economics, and the area residents' ability and willingness to pay for the proposed electric service. Information sources may include government organizations (e.g. department of statistics, department of commerce, agricultural extension, etc.), universities, electric utilities, community organizations, development agencies, commercial organizations, and consulting companies. When vital information cannot be obtained from other sources or does not exist, the

Steering Committee must contract with experts to perform surveys and studies.

The Steering Committee should consult with experts to develop preliminary project design characteristics, including a proposed system map and projected load flow studies. Engineering advisors should prepare estimates of project construction costs. If the proposed cooperative is acquiring an existing system, the costs should include the acquisition price as well as the cost of any improvements or rehabilitation required to provide satisfactory service. Financial advisors should prepare initial financial projections for the project, including expenditures related to establishing offices and acquiring the equipment and materials needed to operate the cooperative.

STEP 8: General Meeting to Discuss Feasibility Study Results

After completing the feasibility study, project organizers should present the results to the potential members for consideration. Following discussion, conduct a secret vote to determine whether the majority supports continuing the process to organize the cooperative. Those who are in favor of proceeding should then register as members. By signing an application form, the candidate for membership makes a commitment to pay the registration fees, contribute capital to the cooperative, and to fulfill member duties and requirements specified in the cooperative bylaws.

At the General Meeting, be sure to inform potential members about the way registration fees and capital contributions will be handled and how payments will be refunded in case the process fails, or if a member withdraws.

STEP 9: Business Plan and Financial Analysis

A business plan is a critical element in the cooperative development process, serving two

functions. First, it helps ensure that all aspects of the project have been considered. Second, it serves as a vehicle to inform prospective members and lending agencies about the project. A clearly written business plan forces project supporters to examine all facets of the business, to obtain the best information and reduce the potential for misunderstandings. Lenders always require a written business plan and financial analysis. It demonstrates that the project sponsors have adequately evaluated the revenues, costs, and risks of the project.

The business plan expands on information obtained for the feasibility study and includes the following components:

- Project history and overview
- Market analysis: Estimated electricity sales by customer class (numbers of consumers and kWh sale projections); willingness-to-pay study results
- Power supply: Power source and transmission supply; plan for initial and future power requirements; pricing and reliability of supplier(s)
- System design: Diagrams of electrical system; system design and costs; energy loss projections; schedules for major additions and associated costs
- Management plan: Description of project ownership and organization; governance and legal representations; list of staff positions with wages/salaries
- Operational plan: The guiding operational philosophies, including how the electric lines will be maintained, bills prepared and collected, engineering and planning, etc.
- Marketing plan: How the entity will engage with consumers, government, and local community; retail pricing targets; growth targets

The Steering Committee presents the results of the financial analysis, attendees deliberate the business plan, and the community members vote on whether or not to proceed with the project.

- Regulatory approval requirements: Identification of governmental authorities that exert regulatory oversight; approval process steps
- Financial and economic analysis: Financial modeling for at least ten years; documentation of major assumptions; sensitivity analysis to demonstrate risks and returns
- Project implementation schedules

Financial analysis is an essential feature in the business plan. It establishes the financial viability of the project. Lenders require this analysis as part of the financial due diligence process to evaluate the cooperative's ability to repay debt.

Though ultimate responsibility for the business plan belongs to the Steering Committee, it is advisable to hire a reputable expert to prepare the business plan and financial analysis. The Steering Committee must be integrally involved in validating assumptions used and providing feedback as the plans take shape. Complete technical guides on these subjects are available from NRECA.¹²

STEP 10: General Meeting to Discuss Results of the Business Plan and Financial Analysis

The meeting to review the business plan and financial analysis is one of the most important meetings in the process of creating a cooperative. The Steering Committee presents the results of the financial analysis, attendees deliberate the business plan, and the community members vote on whether or not to proceed with the project. Often this decision will affect the life of thousands of people and will involve an investment equivalent to millions of dollars. Given the implications of this decision, it is worth reiterating the importance of having a solid business plan and financial analysis. The results are only as good as the data

and assumptions used. Deciding to proceed only to discover later that the decision was based on erroneously optimistic projections can be very costly.

STEP 11: Prepare Legal Documentation

The Steering Committee must complete the paperwork for legal requirements with respect to incorporation and operation. In the first category are all the documents needed to found an electric cooperative and obtain its legal identity. Depending on local laws, documents required to incorporate a cooperative can include:

- Articles of Incorporation
- Bylaws
- The membership roster
- An official record of the Founding Assembly meeting

Articles of Incorporation (also known as Articles of Association) are primary rules governing management of the cooperative. They identify the name, address, nature, and term (duration) of the business, as well as its purposes and powers. Articles of Incorporation are typically only a few pages long.

Bylaws contain directives governing the internal management of the cooperative. They specify how the cooperative will conduct business, the membership requirements, the rights and responsibilities of members, how to call and conduct membership meetings, how directors and officers are elected or removed, how net margins will be distributed, the process for redeeming equity, etc. This document is often more lengthy than the Articles of Incorporation. The cooperative's owner-members have authority to approve the bylaws. (Some countries require extensive Articles of Incorporation, which may include much of what would normally be in bylaws.)

¹²See Module 4: *Business Plan for Electric Cooperatives*, and Module 8: *Financial Analysis of Rural Electrification Projects*.

The Steering Committee must determine what the national requirements are and prepare the Articles of Incorporation, bylaws, and other documents accordingly. The required documentation must then be submitted to the corresponding government agency. Upon approval, the cooperative receives the pertinent decree or certificate of legal identity.

The cooperative must obtain not only the legal right to exist but also the legal right to operate, which indicates the second category of legal requirements associated with a new electric cooperative. Without the right to operate, the cooperative may exist legally, but it will not be able to distribute any electricity. The preference is to obtain its own exclusive concession – a defined service area within which it has the sole right to distribute electricity.

Important legal documents associated with the relationship between the cooperative and its members include the membership application form, which serves as the legal basis for a person to become a member of the cooperative, and capital contribution certificates.

Other legal documentation governs the relationship of the cooperative with other institutions. One of the most vital of those legal documents is a purchase contract for energy, commonly called a power purchase agreement, signed with one or more entities from whom the cooperative buys electricity.

STEP 12: Member Registration Campaign

A cooperative must register sufficient members to fulfill legal requirements, obtain a critical social mass, and obtain a sustainable level of capital contribution inflows.

With that said, keep in mind the difference between what is legally required and what is feasible. For example, in the Dominican Republic the law requires a minimum of 200 members to

form a public service cooperative. It is highly unlikely, however, that 200 relatively poor rural families would be enough to form a financially sustainable electric cooperative.

To illustrate the importance of achieving a critical social mass, consider creating an electric cooperative in a region where 10,000 families live without electricity. Ideally, all 10,000 families would become registered members of the cooperative. However, rarely is it possible to get 100% of the population to sign up. When project proponents find some who do not want to become members, it should not be cause for alarm. Yet if a majority does not sign up, project feasibility must be seriously reconsidered. If granted a concession, by law the cooperative will have to provide service to both members and non-members and project proponents must ask themselves what would happen when faced with significant challenges if the cooperative lacks majority consumer support. What would happen, for example, during a hostile takeover attempt or unfavorable legislation that threatens to eliminate electric cooperatives?

A critical social mass is also necessary to provide sufficient capital inflows. Continuing with the above illustration of a region with 10,000 families, if the project costs an estimated US\$10 million and all 10,000 families join the cooperative, a US\$1,000 contribution per family could finance the whole project. However, if only 1,000 families register, with a commitment to pay US\$1,000 each, the cooperative would have only one-tenth of the financing required. In this case, the cooperative would have to collect more money from each member, look for other sources of financing, register more members, or decide not to go ahead with the project.

An innovative member registration campaign helps attract new members. The campaign can use a variety of methods, such as a series of simple face-to-face conversations, house-to-house visits, small group meetings in homes, or large community gatherings.

A cooperative must register sufficient members to fulfill legal requirements, obtain a critical social mass, and obtain a sustainable level of capital contribution inflows.

The idea is to convince people to become part of the project. This requires educating them about what a cooperative is, as well as informing them about the benefits and responsibilities of membership.

The creative abilities of organizers and promoters are an essential ingredient in selecting an approach (or a combination of approaches) to recruit new members. The final goal must be to recruit as many members as possible. Promotional material for distribution may include pamphlets, brochures, comic strips, and other types of printed material, as well as TV, radio, and loudspeakers. The idea is to convince people to become part of the project. This requires educating them about what a cooperative is, as well as informing them about the benefits and responsibilities of membership.

Sufficient membership application forms should be available at all times for interested parties who would like to sign up on the spot. Promoters should also be ready to receive registration payments from individuals during meetings or at gatherings. One of the most sensitive points in this process is how money will be handled. For the success of the project, it is vital that project money be managed with total transparency. Ideally, each member would go directly to the bank to deposit their registration fee, but this is not always a practical solution due to time, distance, and bank location. In such cases, it is important to establish mechanisms for trustworthy individuals to receive registration fees and other funds, and issue receipts. The Steering Committee should maintain and update project records, archives, and other pertinent databases so that exact and reliable information is readily available.

STEP 13: Founding Assembly Meeting

The Founding Assembly meeting requires significant preparation by the Steering Committee. The Committee must arrange all logistics for the event, based on the number of people expected.

National laws often have requirements for notifications and invitations to the Founding Assembly. The Steering Committee must comply with these requirements to assure that all prospective members receive advance notice of the meeting and that they have all the necessary information to participate.

The Assembly is conducted according to a pre-established agenda. Deliberations are governed by the debate rules prepared by the Steering Committee for the meeting.

The most important actions taken at a Founding Assembly Meeting are approving the bylaws, and electing the Board of Directors.

STEP 14: Board Meetings

Those elected to the Board of Directors should meet immediately after the adjournment of the Founding Meeting or as soon thereafter as conveniently possible. In most cases, those elected to Board of Directors should then conduct internal elections for positions indicated in the bylaws, e.g. the president, vice-president, secretary, and treasurer. Results of elections are recorded in the official minutes of the cooperative.

Following the internal elections, the president of the Board of Directors should be authorized to immediately register the cooperative with the appropriate government agency to obtain full legal recognition.

Thereafter, the Board of Directors should conduct regular and special meetings as established in the bylaws, starting as soon after the Founding Assembly as possible. The Board should use the first regular meetings, and whatever special meetings as may be necessary for the President to call, to formulate an administrative and organizational plan for the cooperative. One of the first tasks is to develop an implementation plan.

Implementation Plan

The Board of Directors should develop a written plan to organize the management and operational aspects of the cooperative to achieve the cooperative's goals. The implementation plan not only serves as an internal guide for the organization but also as a tool to inform the membership about expected progress. It identifies

the organizational structure, administrative functions, requirements for staffing, equipment, and other needed resources, as well as a schedule to accomplish action items.

Preparing an implementation plan may require technical assistance from external advisors or consultants. Implementation plan action items include:

- Obtain legal status for the cooperative.
- Acquire office and operations center locations.
- Hire a manager and assign him or her functions and responsibilities. (Expert advice should be sought for this key task.)
- Comply with financial accounting standards.
- Transfer saved funds to checking accounts.
- Register authorized signatures to draw funds.
- Obtain outside advice and assist the General Manager during power purchase negotiations.
- Obtain advisors to assist the General Manager, e.g. in proceedings related to concession licensing and tariffs, setting up electric service requirements, defining project costs; etc.
- Acquire electrical systems within the area.
- Assist the General Manager in specific proceedings, e.g. financial, acquiring government endorsements, etc.

The implementation plan is the cooperative's road map to a successful launch. The Board of Directors must make it a priority and take all steps necessary to fulfill this responsibility.

STEP 15: Legal Steps

Important legal steps vary from country to country and may include the following.

Obtain Legal Status

The process and time required to obtain legal status for a business varies widely from country to country. The work of Hernando De Soto illustrates this point. In his book *El Otro Sendero* (The Other Path), De Soto describes documenting the time required to legally incorporate a microenterprise for sewing garments in Peru. The time required: 289 days. De Soto sent researchers to Tampa, Florida to carry out the same exercise. The time required: 3.5 hours.¹³ In most developing countries, electric cooperative organizers should be prepared to spend more than 3.5 hours to obtain legal status.

Obtain the Service Territory Concession

Project proponents must approach the appropriate government agencies or regulators to obtain a concession or permission authorizing the cooperative to operate as an electric utility.

Construction Authorization or Contracts to Transfer Existing Electrical Infrastructure Ownership

If the cooperative is being formed in a region that does not have existing electric service, authorization must be obtained in order to build an electric system. In areas where the electric infrastructure already exists, the transfer of assets and infrastructure to the cooperative must be delineated in a formal binding document.

Obtain Tariff Authorization

Proposed tariffs should be approved by the regulatory agency prior to commencing operations.

STEP 16: Capitalization Plan

Capitalization refers to the amount and source of the money required to create and operate the

If the cooperative is being formed in a region that does not have existing electric service, authorization must be obtained in order to build an electric system.

¹³*El Otro Sendero*, Hernando De Soto, ISBN 968-13-1769-6, Copyright 1987, por Editorial Diana, S.A. de C.V.

business. A cooperative capitalization plan usually includes funding from both members and outside sources such as donors or lending institutions. Electric cooperatives are generally capitalized with the following major sources:

- Registration fees
- Revenue in excess of expenses (margins)
- Contributions in aid of construction
- Loans and grants

Member Contributions

Members provide revenue in two ways. First, they pay a small registration fee when the individual joins the cooperative (usually around US \$5). Second, they pay for the electricity they consume.

Capital received from members is called equity. Member's equity consists of their registration fee and their share of the margins (revenue in excess of expenses) remaining each year after all cooperative expenses have been paid. Margins are allocated to each member's equity account annually, usually in direct proportion to their purchases of electricity.

Members may also provide contributions to the cooperative in the form of "construction aid" for line extensions, new services, upgrades, etc. These funds are generally credited against the cost of the project (to reduce debt) and are not included in the member's equity.

Equity, representing ownership by members, is retained by the cooperative for specific periods of time to provide financial reserves and meet lender requirements. If the cooperative is financially successful, the Board of Directors may elect to return portions of equity to the members at some future date. In the United States, common practice is to return equity to members 10 – 20 years after it was allocated (assuming the

cooperative will remain financially solvent thereafter).

Loans

Loans are the other major source of capital for a cooperative. Building an electric distribution infrastructure is a capital-intensive effort, and it is impossible to generate sufficient member funds to cover the costs of constructing a distribution system. Cooperatives typically seek loans for construction of long-lived assets and amortize the cost of building the electric system over the life of those assets. This is an appropriate method to finance system construction, expansion, and upgrades. Power lines and substations built well today will remain in service for more than 30 years. By spreading the loan repayment schedule over 30 years, both current and future consumers who are benefiting from the system are helping to pay for it.

Loans for major construction projects may be available from government financing entities or international institutions. The Board of Directors should explore all available long-term loan sources, including savings and loan associations, commercial banks, and insurance agencies.

Preparing a loan application to fund a new cooperative is a significant task. The Board should assemble a technical team for the purpose, including financial experts (e.g. the advisor(s) who developed the financial plan), an attorney, a licensed public accountant, and others as needed. The application package should clearly describe how the loan funds would be used. Financial information demonstrating how the loan will be repaid is an integral part of the loan application. Much of the required financial information for the loan application will be in the cooperative's business plan.

Once established, cooperatives often fund short-term borrowing needs (up to 1 year) through local banks. A line of credit is often

used to acquire a portion of the money needed for operating capital and interim funding for construction projects prior to receiving a long-term loan. Typically, the total amount of borrowing is limited, and these loans must be renewed annually. They do not take the place of a long-term loan.

Grants

Grants may be available from donor agencies, government entities, and other organizations. Certain grants may be designated to support the start-up phase of a cooperative prior to generating funds from members or lenders.

STEP 17: Prepare to Commence Operations

A variety of tasks must be accomplished prior to beginning operations at a new cooperative, starting with hiring a General Manager.

Hiring a General Manager

An effective General Manager is essential to the success of a cooperative. Minimum requirements for this position should be established prior to hiring the manager. Be sure to create a policy defining the relationship between the General Manager and the Board of Directors. The Board normally contracts the General Manager, and in turn, the General Manager hires the rest of the personnel and directs the day-to-day operations of the cooperative.

A General Manager should possess three key attributes: academic preparation, electric sector experience, and the ability to work with other people. While the position description may include numerous other requirements, these three are the most critical.

Other factors to be considered in assessing manager candidates include:

- References

- Base wages
- Health certificate
- Background check or police certificate
- Valid driver's license
- Experience in financial management, engineering, procurement, etc.
- Languages

Note that while some of the above criteria may not be acceptable job screening criteria in the U.S., they are not only accepted but even expected in some developing countries.

The Board of Directors determines which criteria are required and which preferred. A position description outlining these items should be prepared. The position should be publicized as broadly as possible, including a timetable for applications. After the close of the application period, the Board evaluates resumes, conducts interviews and background checks, and makes a selection.

Preparing a Strategic Plan

A strategic plan must also be prepared to provide direction to management and establish a guide for the cooperative. The plan includes the cooperative's social and economic purposes as well as a broad outline of operations.

A strategic plan typically includes the following elements:

- Mission
- Vision
- Values and principles
- Strategic targets
- Key factors for success

The Board normally contracts the General Manager, and in turn, the General Manager hires the rest of the personnel and directs the day-to-day operations of the cooperative.

The cooperative must sign contracts with all its members and clients prior to commencing sales of electricity.

- Key business strategies
- Plans and programs
- Goals
- Execution timelines

Policies

Policies must be developed to provide more detailed information regarding cooperative operations.

Organizational Chart and Job Descriptions

An organizational chart and job descriptions must be prepared. The General Manager typically participates in the development of these documents.

Contracts with Users

The cooperative must sign contracts with all its members and clients prior to commencing sales of electricity. Initiate this process as soon as the service area concession is obtained.

Operational Infrastructure: Office, Warehouse, Etc.

Before operations can start, the cooperative has to construct or rent office space, warehouses, workshops, and any other infrastructure required. These facilities must be adequately equipped with computer systems, furniture, telephones, etc.

Install Computer System: Consumer and Business Information

A computerized system is the best way to maintain consumer and business records. At a minimum, it must be capable of preparing invoices and automating reports. Useful software programs include those for consumer database management, billing, financial and plant accounting, engineering, operations, and human resources recordkeeping.

Purchasing a suite of software programs from a single company is often the best approach, rather than selecting programs from different vendors or creating custom software. However, carefully consider each option before making a final decision.

A contract for on-going support and maintenance is critical, particularly in rural areas where other support resources are nonexistent. Nevertheless, before selecting a software package, carefully review the cost of the ongoing support and maintenance packages and compare that to the cooperative's needs and ability to pay. Begin by surveying the local and international markets for software packages and prices, and enlist the advice of experts before deciding on a final software package or creating a custom software package. Computer hardware and software solutions are available for all sizes of businesses from a variety of companies, including some that specialize in electric cooperatives.

Engineering and Technical Services

The necessary infrastructure for the distribution of electricity must be in place prior to the cooperative becoming operational. If an existing electric system is to be acquired, all necessary improvements must be completed prior to the start of operations. The cooperative has to either contract or hire an engineering staff as well as linemen and equipment maintenance professionals. The size of this staff depends on the cooperative system's size and complexities.

Care should be given when the cooperative is to acquire the engineering and technical staff of an existing utility. Often public utilities overstaff these departments.

In addition, the cooperative needs to acquire the necessary field equipment, computers and software for the tasks at hand. Typically, software used to model load flows and a geographic information system (GIS) software package are recommended. Hand tools and mechanized tools must also be

procured. The cooperative should seek experts in distribution system operation and maintenance to develop a complete list of necessary tools, equipment, and software.

Training

Training is important at all levels of the cooperative, including for the Board of Directors, management, and staff. Training manuals or modules must be acquired or developed and tailored to the unique culture of the country. Sometimes training information must be translated

into the local language. Whenever possible, professional trainers should be contracted to provide a “training-of-trainers” instruction course on specific cooperative topics.

STEP 18: Commence Operations

The commencement of operations is the culminating step. After all else has been successfully completed, the day finally arrives when the electric cooperative begins to operate.¹⁴

¹⁴For further recommendations on electric cooperative formation, see *How to Organize a Cooperative*, op.cit.

