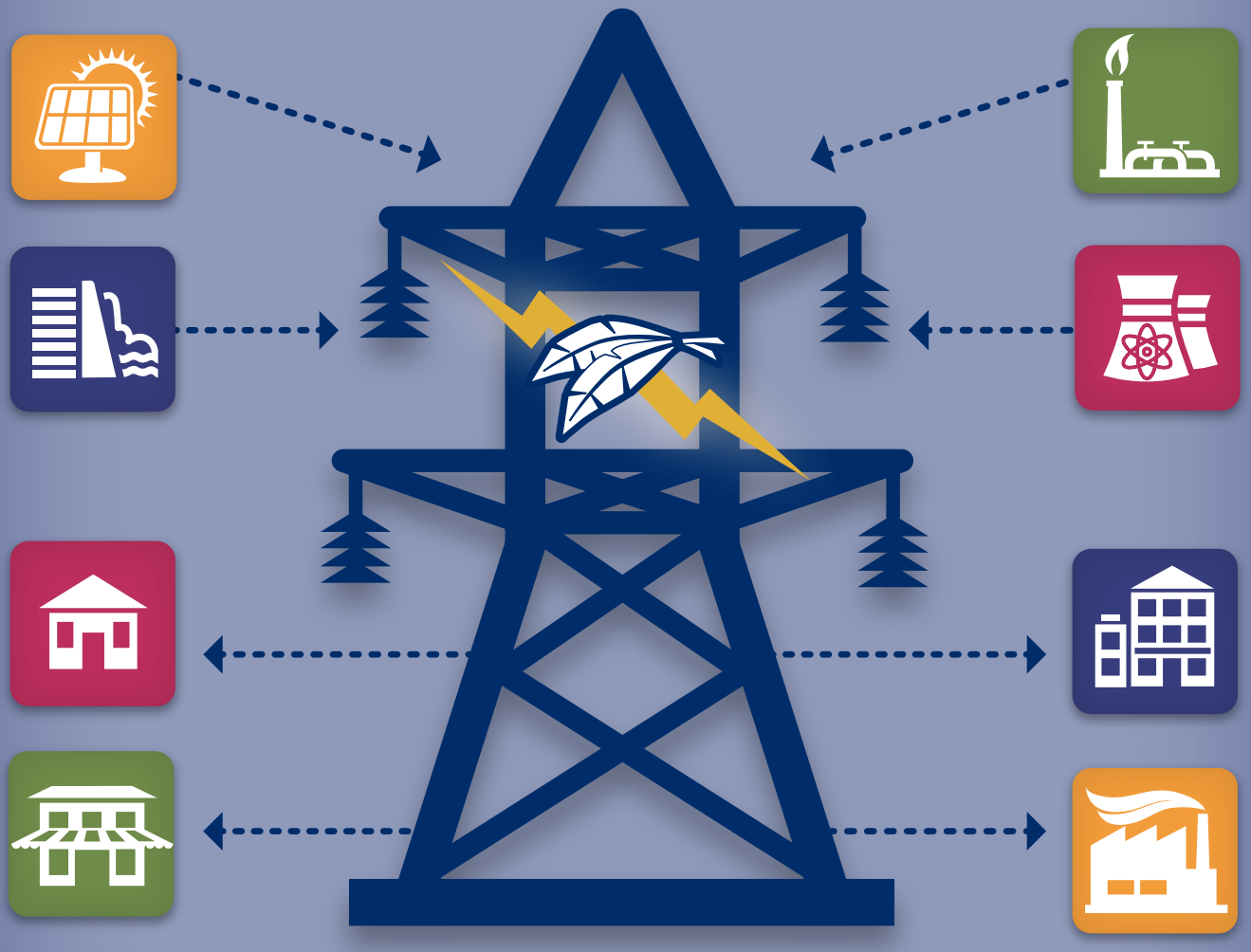
ESTABLISHING A

Tribal Utility Authority

HANDBOOK

2012 Edition



By

Leonard S. Gold

President, Utility Strategies Consulting Group, LLC

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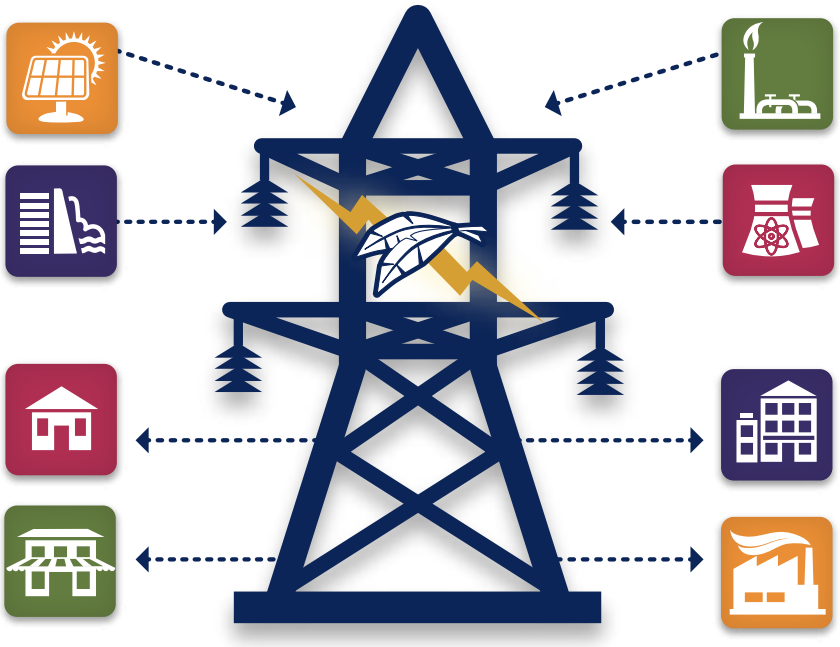

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Disclaimer: This Handbook does not represent the views of the U.S. Department of the Interior or any other federal agency. This Handbook is intended to provide an introduction to electric utility operation and to provide general guidance for the steps required to form a Tribal Utility Authority.

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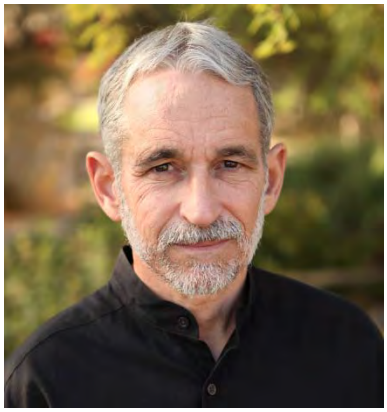
The Author



Leonard S. Gold is the owner of Utility Strategies Consulting Group LLC. He has more than thirty-nine years of utility and consulting experience. Mr. Gold has worked with numerous tribes in the Southwest relating to issues of tribal utility formation and energy issues. Mr. Gold assisted the Ak-Chin Indian Community with the formation of its tribal utility authority, Ak-Chin Energy Services (ACES), and currently manages ACES. Mr. Gold also assisted the Gila River Indian Community with the formation of its tribal utility authority, the Gila River Indian Community Utility Authority. Mr. Gold is also the President of the Arizona Tribal Energy Association.

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Introduction

There have been significant advances in technology in the past 15 – 20 years. The Internet, cellular telephone service and high-definition television have changed the way we do business and interact with each other on a daily basis. We have become more dependent on these technologies, tending to take for granted that they will always work. However, we also know that this is not always the case – one of several critical drivers for keeping these technologies working is electricity.

Homes, casinos, police departments, fire departments, tribal office buildings, non-tribal commercial business on reservations all require electricity for safety, health and function.

Electricity provides the power to run much household and business equipment. Below is a list of some of the equipment requiring electricity on which our daily activities rely.

- Lights
- Well and irrigation pumps
- Cooking
- Heating and/or cooling
- Refrigerators
- Computers
- Battery charges (for cell phones, flash lights, cameras, etc.)
- Stereos
- Televisions

Absent some advance contingency any interruption to the electrical power supply will likely render much of the above equipment not useable.

Before describing an electric utility and the system of facilities it operates, there are a few terms that need to be defined as they will be used throughout this document. The definitions come from the Department of Energy, U. S. Energy Information Administration Glossary found at http://205.254.135.7/tools/glossary/index.cfm on the internet. The following list is not all inclusive and additional definitions can be found on the website link previously provided.

- Watt – The unit of electrical power equal to one ampere under a pressure of one volt. (a watt is equal to 1/746 horse power)
- Kilowatt (kW) – One thousand watts of electricity
- Megawatt (MW) – One million watts of electricity

- Watthour (Wh) – The electrical energy unit of measure equal to one watt of power supplied to, or taken from, an electric circuit steadily for one hour
- Kilowatthour (kWh) - One thousand watthours of electrical energy
- Megawatthour (MWh) – One million watthours of electrical energy
- Electric Energy – The ability of an electric current to produce work, heat, light, or other forms of energy. It is measured in watthours and often expressed in kilowatthours (kWh) or megawatthours (MWh)
- Power – The rate of producing, transferring, or using energy, most commonly associated with electricity. Power is measured in watts and often expressed in kilowatts (kW) or megawatts (MW)
- Volt – The volt is the International System of Units(SI) measure of electric potential or electromotive force
- Kilovolt (kV) – One thousand volts
- Megavolt (MV) – One million volts
- Voltage - The difference in electrical potential between any two conductors or between a conductor and ground
- Volt-Ampere (Va) –A unit of apparent power, the mathematical product of the volts and amperes in an electrical circuit
- Kilovolt-Amperes (kVA) - One thousand volt-ampere
- Megavolt-Amperes (MVA) - One million volt-ampere

An electric utility is a business that provides eclectic power to its customers. The top priority for an electric utility is safety. Working on or around electric facilities is dangerous. Whether it is a utility person or a customer, caution should always be used when around electric equipment. Safety is ingrained in the electric utility staff daily and information is provided to the electric utilities customers to remind them about the danger of electric facilities.

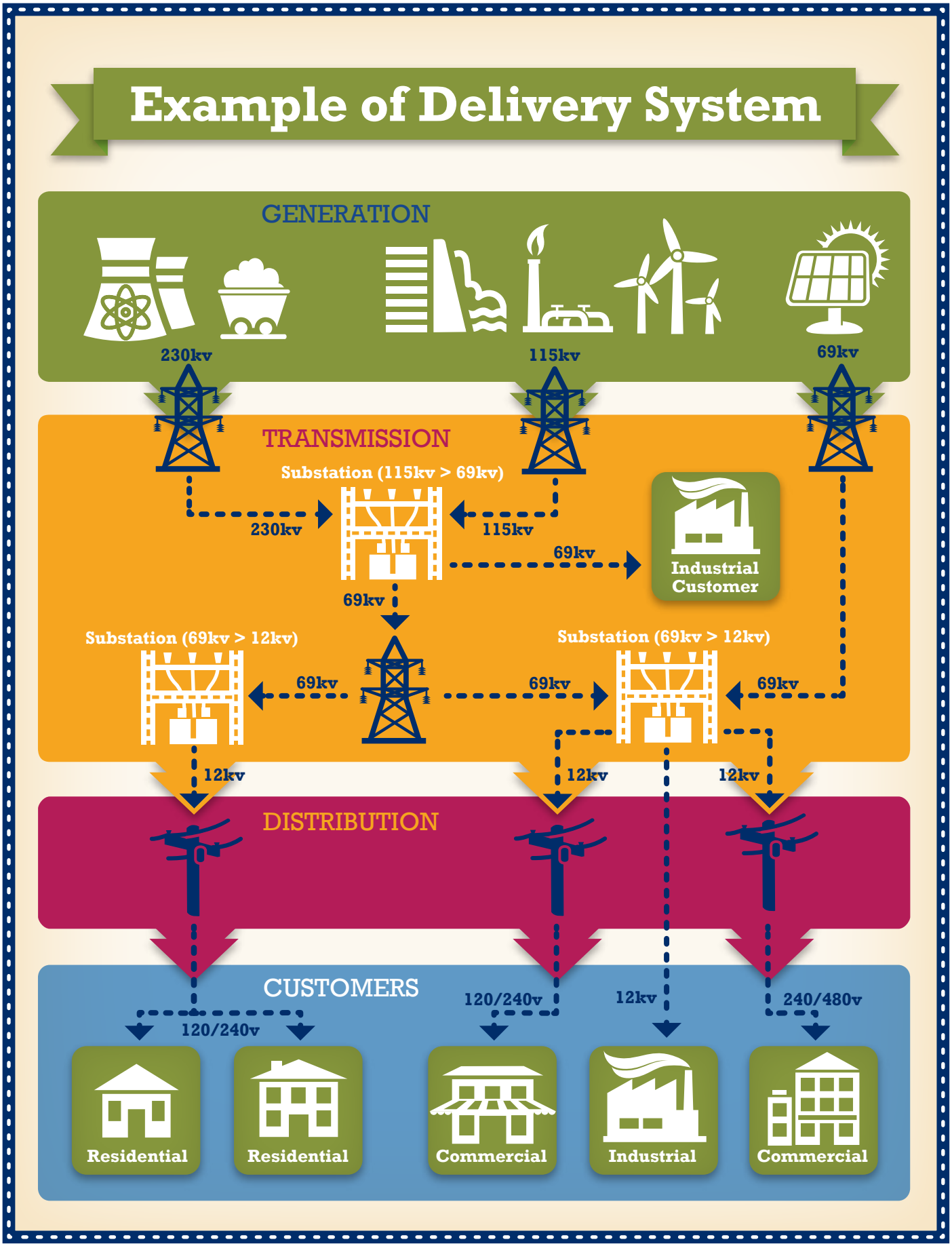
One other important fact about an electric utility is that there could be a significant cost to get into the business. The start-up cost will ultimately be recovered from customers over a period of around 20 years or so. However, initially this will have to come either through a loan or from tribal funds, but can be repaid through long-term utility payments. The cost to build and operate the electric facilities would be included in the rates charged for the energy sold to customers.

Finally, like any type of complex industry, tribal leaders and staff will need to become familiar with the electric utility industry's distinct terminology. It will take some time to get up to speed, but it is just a part of the TUA formation process. Further, A TUA may be subject, directly or indirectly, to the regional utility practices, rules and contracts. This will need to be considered during the evaluation process for deciding if forming a TUA is the correct choice.

1. Electric System Description

In order to be able to provide electric power to its customers the TUA needs to operate and maintain s system of facilities that not only produces the electric power, but can also deliver it to the customer's location. Electric utilities operate a system of facilities to generate, transmit, and deliver electrical power to the end user, you. The cost of these facilities can be in the millions of dollars. Figure 1 on the next page is a diagram depicting the different components of an electric system; generation, transmission, distribution and end-user. Also, the reader can go to pages 5-7, which provides additional discussion about the electric utility system.

Figure 1


Example of Delivery System
GENERATION
230kv
115kv
69kv
TRANSMISSION
Substation (115kv > 69kv)
230kv
115kv
69kv
Industrial Customer
69kv
Substation (69kv > 12kv)
69kv
69kv
Substation (69kv > 12kv)
69kv
12kv
12kv
12kv
DISTRIBUTION
CUSTOMERS
120/240v
120/240v
12kv
240/480v
Residential
Residential
Commercial
Industrial
Commercial

It can be helpful to think about transmission, distribution and customer service as you would think of a pipeline for transmitting water. Larger pipes are used to bring the water from the source to the location where people live and work. Smaller pipes are used to bring the water down the streets to homes and business. Even smaller pipes are then used to bring the water into the home or business. The basic components of the electric system include, but are not limited to the following:

- Generation (Nuclear, coal, natural gas, hydro, solar, wind, biogas, steam from the earth). Generating plants are rated in kilowatts (kW) or megawatts (MW).
- Transmission Facilities (poles and wires that transmit electrical power over long distances at different voltages) Voltage levels include but are not limited to 500 kilovolt (kV), 345 kilovolt (kV), 230 kilovolt (kV), 115 kilovolt (kV) and 69 kilovolt (kV).
- Substations (transformers that either step up or step down the voltage). Substation transformers are rated in kilovolt-amperes (kVA) or megavolt-amperes (MVA),
- Distribution Facilities (poles and wires that deliver the power at voltage levels such as 69 kilovolt(kV), 34 kilovolt(kV), 24 kilovolt(kV)or 12 kilovolt(kV) to distribution transformers)
- Customer Service Facilities (poles and wires that deliver power to the customers meter at voltage levels such as 120 volts, 240 volts, 277 volts, 480 volts and meters that measure the power flow.)

Generating, transmitting and delivering electrical power requires skilled individuals experienced in different utility functions. As will be discussed in more detail in subsequent sections, there can be many different levels of involvement in each of the electric system components. Below is a brief overview of levels of involvement in each component of the electric utility system.

- **Generation**

  In most cases, generators are very large in order to achieve ''economies of scale'' or enough return on the capital investment and operating expenses. Generating plants require a substantial investment of capital. The operation requires a large and skilled staff. Most small utilities, including tribal utility authorities (TUA), tend to either obtain a percent ownership in a generating plant or to purchase power from a third party. Percent ownership or power purchase allows the TUA to avoid having to hire a large skilled staff to operate and maintain the generator and can also allow for a reserve of some amount of capital for other TUA needs.

- **Transmission Facilities**

  With the increased interest in renewable energy, smaller local generators such as solar and small wind turbines can be installed to provide power or an individual or small group of individuals. These types of technologies also require skilled staff to operate and maintain. The cost of installation is typically above that of the cost of generation from a large conventional type generator.

  Transmission is built to bring power from generating stations over long distances to local areas where the power is to be consumed. Transmission lines typically connect generators to substations. The development and construction of a transmission line requires a large and skilled staff. In addition, there is additional skilled staff required to operate and maintain the transmission facilities. Most small utilities, including TUA' s, tend to either obtain a percent ownership in a transmission line or to purchase transmission capacity from a third party or build their own. Percent ownership or power purchase allows the TUA to avoid having to hire and maintain a large skilled staff as well as to keep precious capital for other TUA needs. TUA's can develop the staff and technical skills to build transmission lines as needed. The Federal Energy Regulatory Commission (FERC) has jurisdiction over the buying and selling of electrical power for resale by a third party. FERC also regulates the transmission system used to transport power. FERC has established rules that allow for open access to the transmission system. All users of the transmission system are required to follow the published process for the particular utility system and to obtain standard studies and meet published standards when requesting available transmission capacity.

- **Substations**

  Substations are built to change voltage levels so the electrical power can either be transmitted further or can be used on the distribution system to deliver the electrical power to the end user. Substations that function at very high voltage levels require large and skilled staff for design, construction, operation and maintenance. Most small utilities, including TUA's, tend to obtain a percent ownership in a substation or purchase substation capacity from a third party. For substations that function at lower voltage levels, ownership is not only an option - but may be mandatory. There nevertheless may still be times when percent ownership is

appropriate. At the lower voltage levels, small utilities, including TUA's, will most likely own a distribution type substation.

- **Distribution Facilities**

  Distribution lines are built to deliver voltage from substations to individual distribution transformers that serve businesses and homes. Most small utilities, including TUA's, will own distribution facilities and have a skilled staff for design, construction, operation and maintenance purposes.

- **Customer Service Facilities**

  Customer lines are built to deliver voltage from the distribution lines through distribution transformers to the customer's meter. Most small utilities, including TUA's, will own customer service facilities and have a skilled staff for design, construction, operation and maintenance of the customer facilities. In addition, there will be trained staff to handle billing, customer calls, applications for service, etc.

The rest of this document will provide information to assist tribal leaders in deciding whether forming a TUA is the correct decision. Forming a TUA will require some amount of initial financial investment and specialized staff including - engineers, lawyers, accountants, and consultants for project particulars; there must also be an understanding that this is a long-term investment without the expectation for any significant immediate gains. Further, with today's strong reliance on electrical power and/or desire to bring more electrical power on to a reservation, tribal leaders and tribal members interested in forming a TUA need to take the time to fully evaluate this decision.

2. Is A Tribal Utility Authority The Right Choice?

The first step is to pose some basic questions and provide some possible answers. The answers are intended to stimulate discussion among tribal leaders and tribal members regarding forming a TUA. Section 3 of this handbook provides a more detailed discussion of reasons for forming a TUA.

2.1. Why do you want to from an electric Tribal Utility Authority (TUA)?

Tribes look to form a TUA for many different reasons. It is important to ensure that the reason for forming the TUA is clearly defined and has the support of the tribal leaders and tribal members. A TUA can be formed to regulate energy activities or it can be formed to assume responsibility for and control of delivering power to the customer's meter. Some reasons for forming a TUA are:

- There are frequent and long power outages under current service arrangements that independent tribal management could likely resolve
- Lack of or poor working relationship with the serving electric utility, resulting in new service connection and/or other delays
- Little or no support for renewable energy projects or other tribal energy priorities
- No involvement in the planning process for new facilities and establishing service in new areas of the reservation
- Lack of institutional knowledge about energy issues
- Bring service to remote portions of reservation
- Limited or poor interaction with state and/or federal entities to address reservation energy issues
- Little or no incentive for existing utility to invest in improvement or expansion of service on reservation
- Little or no control over the rates charged and resulting inequities
- Desire for self-governance
- Economic opportunities expansion: utility market sector participant
- Expansion of service on reservation of health and well being of tribal members
- Create job opportunities for tribal members
- Cost savings
- Participation in energy and utility policy and industry circles

2.2 . What are the tribe's expectations?

As tribal leaders discuss forming a TUA it is important to fully discuss expectations, both positive and negative. Operating, maintaining and constructing electric facilities require a significant amount of capital investment and responsibility. Some expectations and/or assumptions might be:

- Positive
  - ✓ Lower rates
  - ✓ More responsive customer service
  - ✓ Improved quality and reliability of service
  - ✓ Local presence provides more customer convenience
  - ✓ Employment of tribal members
  - ✓ Tribal input into planning and development of electric facilities on reservation
  - ✓ Knowledge and involvement in energy issues that affect tribe
  - ✓ Ability to join energy organizations and participate in power and transmission project development

- Negative
  - ✓ Higher rates
  - ✓ Less responsive customer service
  - ✓ No improvement in quality and reliability of service
  - ✓ Increased complaints from disconnected customers
  - ✓ Concern for safety of tribal customers and tribal elders when power goes out
  - ✓ Obligations to set and enforce utility policies

2.3. How long does it take to form a TUA?

The basic steps to form a TUA are:

- Tribal leaders decide they are interested in forming a TUA.
- Tribal leaders become educated regarding what is involved in forming a TUA, including but not limited to understanding how a TUA operates, the financial requirements, the staffing requirements and the policy issues.
- Once tribal leaders have an understanding of a TUA they could pass a resolution forming TUA, if still interested. The type of tribal entity would need to be determined by tribe such that the organization is tribe.
- Conduct a valuation and assessment of facilities.
  - Prepare a five to ten year *pro forma* analysis to determine preliminary cost/benefit.
  - Tribal leaders review results and make decision to proceed with or cancel the TUA formation.

- If a go, proceed to next steps.
    - Negotiate with incumbent utility for the purchase of the electric facilities and related land rights, or acquire new land rights and construct replacement facilities.
    - Negotiate purchase power agreement and transmission service.
    - Negotiate equipment and material arrangements.
    - Tribal leaders review results and make decision to proceed with or stop the TUA formation
- If a go, proceed with the next steps
    - Prepare detailed business plan, outlining organization, services, equipment and operational procedures.
    - Develop rates, policies and procedures.
    - Hire staff, open office and begin operation.
    - Begin providing service and delivering power to customers.

The biggest unknown factor in the preceding steps is the time it takes to negotiate for the purchase of the electric facilities from the existing provider including the acquisition of land rights and/or new construction of facilities. If the incumbent provider is a willing seller, the agreement could be completed within whatever regulatory timeframe is required for a sale of assets. If the incumbent provider is not a willing seller, then the process will be lengthy and involve legal delays. Many of the steps can be done concurrently. A reasonable overall time estimate is between 3 -5 years from the formation decision.

3. Reasons for TUA Formation

3.1. Tribal Goals

The common primary goal for establishing a TUA on a reservation is to provide reliable electric service at competitive prices to residents and commercial enterprises. Additional goals could include, but are not limited to, those discussed below.

3.2. Energy Self-Sufficiency

- Energy Knowledge Base –

Ultimately, staff will become knowledgeable regarding energy issues and can provide advice to tribal leaders.

- Opportunities For Ownership Of Generation –

  Eventually, staff will evaluate the cost/benefits of participation in generating station ownership as well as opportunities to develop renewable energy projects on reservation.

- Cost of Energy –

  Keep rates as low as possible while observing sound business practices.

3.3. Customer Service

3.3.1 Establishment of a Local Presence and Jobs

The TUA office could be local and staffed by local people, providing local employment opportunities in both the administrative and technical fields such as, including but not limited to, those listed below:

- Administrative –

  Customer Service, Billing, Accounting and Human Resources

- Technical –

  Engineering, Designing, Metering and Lineman

- Provide Convenience and Flexibility –

  The TUA's plan could provide increased flexibility over time for customers to be able to access information and utility services on-line. In addition, a local TUA could work with its customers to establish the best billing approach for their customers, such as levelized billing (average annual payments over twelve months), pay-as-you-go, or billing day scheduling flexibility.

- Improved Customer Service –

  By being local, the TUA could personally know their customers and their needs, and over time, provide more efficient service, such as same day turn-on service.

- Provide New Services –

  Ensure that tribal members historically lacking service are able to receive service by gradually extending service to underserved areas of the reservation.

3.4. Service Reliability

- Staff Commitment –

  Staff is on-call 24/7 to respond to outages and service problems.

- Improved Response Time –

  As service is established, response time for restoring power to those facilities controlled by the TUA after interruptions could be reduced.

- Improved On-Reservation Service Reliability –

  Over time staff will undertake upgrades of existing electric facilities, expanding the electric system and reinvesting the returns back into reservation electric facilities.

4. Types of Formation and Formation Documents

4.1. Types of Formation

In 2008 a handbook titled *Tribal Business Structure Handbook*, was prepared by Karen J. Atkinson and Kathleen M. Niles as a tribal self-governance project of the Tulalip Tribes as funded by an economic development grant awarded by the U.S. Department of the Interior's Office of Indian Energy and Economic Development (IEED) to the Tulalip Tribes of Washington. The Tribal Business Structure Handbook discusses at length the different types of business formations. As part of a tribe's effort to establish a TUA, the tribe should consult not only its legal counsel but also review the above mentioned handbook. Each tribe will choose a particular type of TUA business structure. The TUA must function as a business, be allowed to run without tribal government interference, and have a board of directors with knowledge and experience in at least some aspects of the electric utility field.

In addition, a tribe interested in forming a TUA should contact existing TUA's regarding their individual experiences. Information from these entities can be helpful in avoiding difficulties common to tribes and on-reservation enterprises, and can also create a better understanding of the practical considerations of the formation process. See Appendix A for a list of some of the tribal utility authorities.

4.2. Formation Documents

The formation documents need to clearly define the goals of the organization, the governing structure, board duties, and board responsibilities. Formation documents need to allow for the TUA to enter into agreements such as for transmission and purchase power requirements. As stated previously, it is recommended that tribes contact existing TUA's for input regarding formation documents. The formation documents should include, but may not be limited to the following:

- Establish clear rules for organization
- Clearly delineate tribal government and TUA Board
- Define the duties and responsibilities of the TUA Board
- Duties and responsibilities of the TUA
- Grant authority to TUA to enter into agreements with non-tribal entities
- Model TUA after utility business

5. TUA Business & Operating Organization

5.1. Overview

Within the TUA organization there are two distinct functions. The operations side, is generally responsible for the engineering, design, warehouse, inventory, construction, trouble calls, outage response, maintenance, system operations, and safety. The business side is generally responsible for rate setting, regulatory compliance, accounting, customer billing, new connections, customer questions, human resources, power purchases, obtaining insurance, administrative functions, and legal tasks. The size and type of both the business and operating sides of the organization is dependent upon the service area, the number of customers and whether the services for each are performed internally or by an external third party.

The remainder of this section provides a discussion for establishing the needed staff, equipment, materials, and technology to begin operating a TUA that would meet the objectives of providing reliable service at reasonable prices.

5.2. Staffing Requirements

The location and number of TUA offices would be determined based upon the service area, number of customers, and economic considerations of the venture. In most cases, there would be only one centrally located office at the beginning of operations with additional offices established later as economically-feasible and necessary.

The location of the main office would be determined by analyzing population density and travel times. This first local office would conduct the day-to-day business and operation needs of the TUA. The office would need to be large enough to house the business and operation functions of the TUA. Typically, there would be office space, a warehouse building, a material yard, and vehicle parking area. It is possible to hire third-party firms to do some or all of the activities of the utility, such as construction, maintenance, outage response, billing, and to take customer calls. The actual size of the office facility will be determined based upon the results of the *pro forma* and cost/benefit analysis. For example, if an outside contractor is used for all construction and maintenance, then there might not be a need for a warehouse and material yard.

The staffing requirements could be as small as one person, relying on outsourcing contracts in place. If a third-party contract is not an option, then the size of the staff would be dependent upon the number of customers. For a utility with less than 3,000 customers and without any outside contracts, a staff of between 15 - 20 people would probably be sufficient. The staff will need to be technically competent with the use of computers, internet, word processing, spreadsheets and other software tools. In general, the TUA would require the following types of staffing, whether provided by direct hire or through an outside contractor:

- General Manager – responsible for entire organization
- Finance Director – manages customer side of business
- Customer Service Representative – handles customer calls
- Customer Billing Person – performs customer billing functions
- Accounting – performs accounting functions, including accounts payable and receivables
- Operations Supervisor – manages operations side of business
- Engineering – performs system design, handles all technical issues and sets standards and power quality parameters

- Designers – work with new customers and system projects
- Line Crew – handle all construction, maintenance, and trouble calls
- Warehouse Person – manage purchase of system materials, such as poles, transformers, and wire; as well as ensure rubber goods are tested
- Administrative Assistant – provide administrative functions
- Safety Staff Person or Outside Consultant – provide safety training as well as safety reminders to line crew and staff
- Legal and compliance staff or consultants
- Energy efficiency or conservation staff

It is important that the TUA hire a General Manager that is trained in the electric utility industry and has broad experience running an organization similar to a TUA. The General Manager will be interacting with other electric utilities, addressing customer issues, overseeing the establishment of utility focused accounting practices, negotiating for transmission services, purchasing power, and interfacing with the tribal leaders. It is important that the General Manager understands the electric utility business, but the General Manager must also be able to understand the tribal culture and tribal goals for the TUA.

Typically, the TUA follows the tribal employment policy to ensure that qualified tribal members are given preference in TUA hiring. Staff would be added as required to balance customer needs and operating costs, but tribal capacity building would likely necessitate the expense of specific training to ensure personnel possess the skill levels needed.

There would be a need to furnish the office prior to startup. There would be a one-time cost for such equipment as vehicles, a telephone system, desktop personal computers and printers, copiers and fax machines, computer software, and office furniture.

There are additional functions that could be done in-house, but initially would most likely be provided via a third-party agreement. These services include, but are not limited to, legal, consulting, advertising, billing and accounting services.

Customer inquiries during normal business hours would be handled by the local office. Outage response services would be provided through either the TUA staff or an outside contractor.

5.3. Warehouse Requirements

Operating an electric utility requires an inventory of materials and equipment. Whether the TUA is formed with or without a third-party agreement, the materials required would be the same, but the location of where the materials are housed could be different. If the TUA is formed without any outsourcing agreements, then it would need to create the initial inventory as well as maintain the inventory on an on-going basis. If the TUA hired an outside contractor, then the contractor would be responsible for the initial inventory and maintaining the on-going inventory. For third-party materials management, a small on-site storage area might be required for small parts, supplies, and routine maintenance items. The types of materials that would be required include, but are not limited to:

- Poles, cross arms and insulators
- Overhead and underground transformers
- Sectionalization equipment
- Conductor and related connectors
- Cable and related termination equipment
- Conduit and ducts
- Lightning arrestors and protective equipment
- Meters and service assemblies
- Nuts, bolts, washers
- Safety equipment
- Tape, rubber gloves, etc.
- Fork lift and boom truck to move stock.

A third-party agreement could help to minimize the cost of purchasing the initial inventory as well as the complexity of establishing a warehouse and material management system. However, keeping this function in-house is certainly doable and may be preferred. The determination of whether to establish the warehouse or contract it to an outside source will be determined based upon the results of the *pro forma* and cost/benefit analysis. Regardless of whether the warehouse is done in-house or through a third-party, it is critical that enough materials are on hand to support restoration of service in case of equipment failure.

As part of the establishment of the warehouse function, the TUA will need to seek out and establish business relationships with suppliers. These relationships would provide the TUA the following benefits:

- Access to a complete inventory of electric system equipment at competitive pricing
- Access to local inventory
- Material management efficiencies
- Work scheduling efficiencies

5.4. Customer Service

One of the important functions of the business side is having customer service staff available to speak with and address customer issues. The customer service staff would be housed at the local office. During normal business hours, the local customer service staff would handle customer calls and respond to billing inquiries, power problems, and other customer questions. After business hours, an answering service would take calls; the calls would be passed on to the on-call person; and finally the line crew would be dispatched, as needed.

The customer service staff would have a need for day-to-day information technology to support a customer call center, customer information, billing, and accounting. Additionally, as the business grows and dependent upon cost, implementation of an outage management system and a geographic information system (GIS) that could be interconnected with the other systems would be beneficial. The TUA could enter into an agreement with a third party or parties, or assume direct responsibility to provide the services listed above. The actual size of the customer service staff and the information technology needed will be determined based upon the results of the *pro forma* and cost/benefit analysis.

The customer service staff would be responsible for applying the TUA's payment and disconnect policies; including disconnecting service to customers whose bills exceed the past due payment policy. The customer service staff will accept payments and also work with customers to make arrangements to get bills paid. It is important that tribal leaders acknowledge that the TUA is a business, cannot operate if its customers do not pay their bills and support the TUA's payment and disconnect policies. The tribal leaders should not become involved in TUA billing issues, as this is the responsibility of the TUA staff and its Board of Directors.

5.5. Operations, Maintenance & Construction (OM&C)

With respect to the need to provide construction, engineering, operation, and maintenance functions, the TUA could contract for these services or perform them in-house. Whether performed by an outside contractor or in-house, the services to be performed are the same. The actual determination will be based upon the results of the *pro forma* and cost/benefit analysis.

The services required on a day-to-day basis would include transmission and distribution system management, operations, maintenance, engineering, and construction services necessary for the TUA to provide adequate and reliable retail service. The TUA would be responsible for all electric facilities including, but not limited to, transmission, overhead and underground distribution, street lighting systems, solar and wind electric systems, metering, and service lines. The following provides a list of responsibilities indicative of the types of services that would be provided by the TUA:

- System planning and engineering
- Operations management
- Line and service extensions
- Meter installation and reading
- Scheduled and unscheduled maintenance
- Dispatch and outage restoration
- Construction and construction management
- Management of material and equipment

Coordination with the TUA staff working out of the local offices would include:

- Planning to define facility requirements to serve customers
- Scheduling of construction and maintenance work
- Preparing work orders for field installations and documenting actual installation and equipment/material costs
- Performing line and service extensions
- Providing construction management of work performed by contractors
- Performing routine system maintenance
- Managing and responding to outages
- Managing equipment/material

- Performing meter reading
- Reviewing contractor invoices for labor, parts, and materials

The OM&C staff would include, but is not limited to, engineers, designers, CAD operators, warehouse personnel, linemen and meter personnel. The TUA would evaluate the level of staff and/or third-party contracts required to meet the needs of the TUA's customers. In addition to the staffing resources required for the OM&C function, the TUA will need to obtain equipment and establish polices, standards, and restoration procedures, as described in the following sections.

5.5.1. OM&C Equipment Requirements

To operate the TUA, a vehicle fleet will be required. Either the TUA buys or leases the equipment or the equipment is provided as part of the third-party agreement. The types of vehicles required include, but is not limited to, the following:

- bucket trucks
- digger derricks
- tilt bed
- wire reel
- pole trailers
- pickup trucks
- associated support equipment (air compressors, light plant, etc.)

5.5.2. Distribution and Maintenance Policies

The TUA will need to develop a comprehensive set of operational and maintenance policies as part of the formation of the TUA. These policies would be based on accepted industry practices and include operational and maintenance standards, safety procedures, reporting protocols, mapping standards, communication procedures, etc. The policies would ensure effective and safe coordination of the TUA operations with any interconnecting utility. These policies would be reviewed with comments solicited from any interconnecting utilities to ensure compatibility with policies and system operations.

5.5.3. Planning, Engineering and Construction Standards

A set of planning, engineering, and construction standards would be developed by the TUA as part of its formation. These standards would be based on accepted utility industry practices, and with a clear understanding of the needs of the interconnecting utilities to ensure compatibility of design and construction standards. These standards would be reviewed with all interconnecting utilities and comments would be solicited to insure compatibility with policies and systems operation.

5.5.4. Training

A training program for all linemen, as well as for the engineering and design staff, will need to be developed. The training should include safety, technical and equipment use. The TUA should look to join regional or national utility organizations that can provide assistance in developing training programs, as well as conducting the actual training.

5.5.5. Dispatch and Service Restoration

A dispatch capability would be developed to insure timely response to all service calls. Detail dispatch procedures would be developed as part of the formation of the TUA. A few general guidelines and approaches should be considered when developing the detailed procedure:

- All calls would be routed to the on-call person, dispatcher or designated crewman.
- Availability of customer information and accurate maps will help to identify critical customer information and expedite response and restoration time.
- An effective communication system would be established.
- Develop relationships with adjacent utilities to insure coordination of outages and operational actions.

5.6. Power Purchases

The TUA would need to develop a power supply strategy that would provide reliable and cost competitive electricity to its customers. It should be noted that between 60 – 70 % of the TUA's budget could be needed for the purchase of power. As part of the *pro forma* and cost/benefit analysis, load forecasts would be developed to determine the level of power purchases required, the transmission

arrangements needed, the potential supply sources and the estimated costs. Initially, the General Manager might need assistance from an outside consultant with identifying the most appropriate generated resources to serve the retail electric load. By managing its power supply, the TUA could have opportunities, if cost-effective, to more fully incorporate renewable resources such as wind, solar, or biomass for meeting the reservation's future needs.

A well-defined power supply arrangement would need to be in place to provide competitively priced power to the retail customers. Additionally, long term planning would need to be undertaken to ensure cost-effective power supply arrangements are in place as contracts expire.

5.7. Scheduling of Power

Once the TUA is operating and has made purchases of power, the TUA will be required to schedule its power resources with an external utility that operates the transmission system. The scheduling of power requires forecasting the hourly load for the upcoming month and matching the power resources that the TUA has under contract to meet that hourly load. After the fact, the TUA will engage in a "true-up" or adjustment to what is actually used with the transmission operating utility as required.

5.8. Scheduling of Transmission

Once the TUA is operating and has made purchases of transmission, the TUA will be required to schedule its transmission resources to allow for delivery of its power purchases with the operators of the transmission system. Transmission scheduling in many service areas can be contracted for through other providers.

5.9. Legal

The TUA would need legal advice from time to time. It would be important for the TUA to retain the services of an attorney or firm that has expertise in electric utility issues as well as tribal issues. The TUA's attorney will need to be available to review agreements and assist with negotiations as required.

5.10. Accounting

The TUA would need outside accounting advice from time to time. It would be important for the TUA to retain the services of an accounting firm that has expertise in electric utility issues as well as tribal issues. The TUA's accountant

will need to be available to conduct annual audits as well as answer questions as required.

5.11. Other as Needed

The TUA may need other outside services from time to time. These services could include, but are not limited to, rate studies, engineering studies, external financial audits and human resources specialist assistance.

6. TUA Service

When forming a TUA, there is a need to identify the services to be offered; some services would be essential but others could be offered depending on the need and cost. For example, some services are required system wide, while others may be location specific. The TUA will need to establish a policy regarding the cost sharing for customer specific infrastructure. For example, many utilities require commercial and residential subdivisions to pay for all infrastructure required to serve the load. The TUA may or may not decide to provide an allowance for infrastructure required to serve an individual home. Below is a list of possible services. The *pro forma* and cost/benefit analysis should only include the base services as part of the TUA formation process.

Base services may include but are not limited to:

- Distribution system services such as
  - Receive calls from customers regarding service issues
  - Respond to outages and restore service
  - Design new facilities
  - Respond to customer voltage and other power issues
  - Conduct voltage and power flow studies
  - Do relay and fuse coordination studies
  - Develop mapping
  - Develop O&M plan
  - Develop load forecast
  - Procure power and transmission resources
  - Develop distribution system expansion plan
  - Work with developers and provide interconnection specifications
  - Perform system protection

  - Build new facilities
  - Maintain existing facilities
  - Work with developers to install facilities
  - Acquire proper equipment

- Meters
  - Read meters to obtain usage
  - Install new meters
  - Change out faulty meters

- Billing
  - Issue monthly bills for service
  - Explain billing to customers
  - Issue past-due notices
  - Issue turn-off notices
  - Develop payment plans

- Customer Service
  - Receive customer calls
  - Explain reason for past due or turn-off notices
  - Work with customer to resolve outstanding balance to avoid disconnection
  - Accept complaints

- Accounting
  - Pay vendors
  - Receive payments
  - Prepare financial statements

Services that could be offered to customers with payment requirements and responsibility determined prior to the service being implemented, include but are not limited to the following:

- Street lighting
- Security lighting
- New service to commercial or residential subdivision
- Dual-feed service for enhanced reliability

- Operations and Maintenance services for customer-owned facilities or distributed- generation interconnection
- Emergency power backup service
- Energy efficiency educational materials and workshops
- Renewable energy programs
- Pay-as-you-go metering
- Working with the tribal government for the establishment of programs for low income and elderly energy assistance

One of the purposes of forming the TUA would be to work to increase operating efficiencies and provide improved customer service. The TUA could take advantage of automation when cost justified.

The TUA would be responsible for providing retail electric service for the distribution of electricity from a point of interconnection on a transmission or distribution system to a point of connection (at secondary and primary voltage, with either single-phase or three-phase service) with a retail customer. The services provided by the TUA to deliver the power to the customer include such functions as, but are not limited to, the following:

- Regulation and control of electricity in the distribution system
- Planning, design, operation and maintenance of the distribution system facilities
- System voltage and power continuity
- Response to system outages
- Line safety, including tree trimming
- Placement of street lights and power required to run them

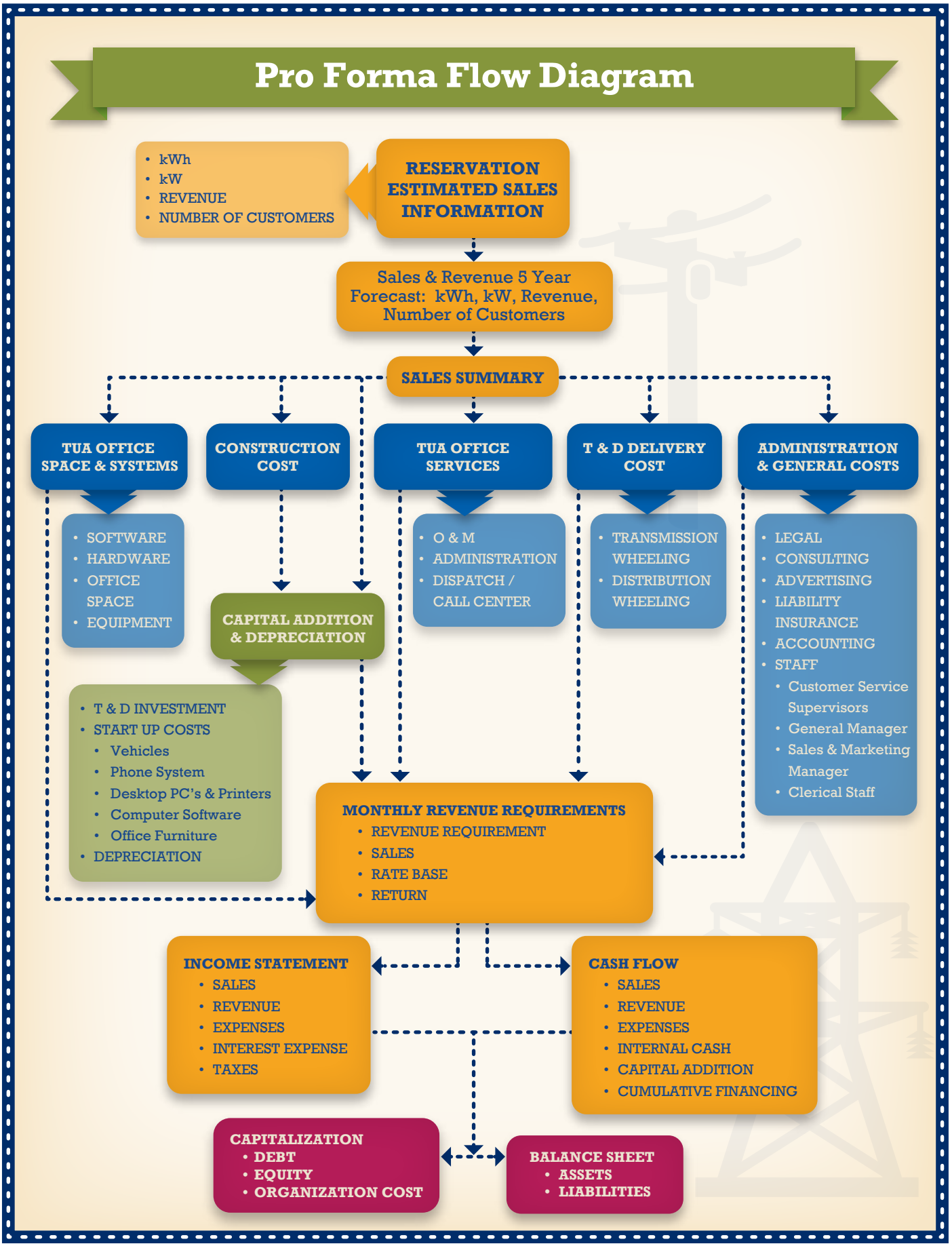
7. Evaluating the Feasibility of Forming a TUA - Study Steps

7.1. Overview

After tribal leaders have made a determination that there is interest in forming a TUA, along with an understanding of the topics in Section 4 and 5, a feasibility assessment should be undertaken to determine the cost-effectiveness of proceeding. A five to ten year *pro forma* should be prepared considering all of the cost components. During the process of evaluating whether it is cost-effective to form a TUA, multiple *pro forma* analyses would be prepared. Each *pro forma*

would increase in examination of different options and refinement of estimates. Figure 2 on the next page is a flow chart showing the typical components included in the *pro forma* and their relationships to each other. The initial *pro forma* would be done at a high level, as a screening tool and would use conservative estimates to provide an indication of the cost effectiveness of forming a TUA. The initial *pro forma* and subsequent *pro forma* would provide tribal leaders with decision points as to whether to proceed with the formation of a TUA or to discontinue the process. It is important that the tribal leaders understand the information being presented at these decision points, in order to clearly identify the relevant financial and policy requirements before making any decision.

Figure 2


Pro Forma Flow Diagram
• kWh
• kW
• REVENUE
• NUMBER OF CUSTOMERS
RESERVATION ESTIMATED SALES INFORMATION
Sales & Revenue 5 Year Forecast: kWh, kW, Revenue, Number of Customers
SALES SUMMARY
TUA OFFICE SPACE & SYSTEMS
CONSTRUCTION COST
TUA OFFICE SERVICES
T & D DELIVERY COST
ADMINISTRATION & GENERAL COSTS
• SOFTWARE
• HARDWARE
• OFFICE SPACE
• EQUIPMENT
• O & M
• ADMINISTRATION
• DISPATCH / CALL CENTER
• TRANSMISSION WHEELING
• DISTRIBUTION WHEELING
• LEGAL
• CONSULTING
• ADVERTISING
• LIABILITY INSURANCE
• ACCOUNTING
• STAFF
• Customer Service Supervisors
• General Manager
• Sales & Marketing Manager
• Clerical Staff
CAPITAL ADDITION & DEPRECIATION
• T & D INVESTMENT
• START UP COSTS
• Vehicles
• Phone System
• Desktop PC's & Printers
• Computer Software
• Office Furniture
• DEPRECIATION
MONTHLY REVENUE REQUIREMENTS
• REVENUE REQUIREMENT
• SALES
• RATE BASE
• RETURN
INCOME STATEMENT
• SALES
• REVENUE
• EXPENSES
• INTEREST EXPENSE
• TAXES
CASH FLOW
• SALES
• REVENUE
• EXPENSES
• INTERNAL CASH
• CAPITAL ADDITION
• CUMULATIVE FINANCING
CAPITALIZATION
• DEBT
• EQUITY
• ORGANIZATION COST
BALANCE SHEET
• ASSETS
• LIABILITIES

The initial step is to undertake a system valuation and condition assessment. The System Valuation and Condition Assessment Study (SVACS) would provide the tribe with a better understanding of what it might cost to purchase the system from the existing utility, indicate how well the system has been maintained, the level of maintenance that would be required if the system were acquired from the existing utility, and would enable the tribe to meaningfully negotiate the price of purchase. Upon completion of the SVACS, the tribe would next begin the development of the *pro forma* in order to determine the cost-effectiveness of forming the TUA. It should be understood that a tribe may form a TUA based upon other policy considerations, even though the economics do not support the TUA formation. The next two sections describe in greater depth the SVACS and *pro forma* development.

7.1.1. Valuation of Electric Facilities

One of the key cost components included in the evaluation of whether to form a TUA is the need to construct and/or purchase existing electric facilities, referred to as the distribution and transmission systems. The distribution system may consist of medium voltage electrical lines (such as 12 kV), substations, and related lower-level voltage equipment (such as distribution transformers). The transmission system may consist of facilities at voltages of 69kV or less. An assessment needs to be made of the distribution system, and maybe portions of the transmission system, that serves the reservation. The difficulty associated with conducting the assessment is dependent upon the existing owners support for the tribe to form a TUA and its willingness to provide needed data.

The SVACS should be undertaken, typically early in the process, to evaluate the cost-effectiveness of establishing a TUA. The SVACS provides an estimate, or range of estimates, for the dollar value of the distribution and transmission systems being considered and the value of these systems provides an indication of the amount of investment to be made to purchase the needed electric facilities from the current owner. The actual purchase price most likely would be the result of negotiations between the current owner and the tribe.

The SVACS would also provide an indication of the condition of the distribution system. An estimate of the cost to rehabilitate the system and maintain it up to industry standards would be determined, considering the system condition at the time. The steps associated with the conduct of the SVACS are briefly described in the following sections.

7.1.1.1. Conduct field inventory of facilities on reservation

The inventory would include the electrical lines, substations, and related lower-level voltage equipment used to provide electrical power to the customers on the reservation. Typical steps include but may vary depending upon the situation:

- Observe all facilities on reservation
- Inventory the facilities on reservation
- Test or review test results of equipment, as possible

7.1.1.2. Determine value of inventoried facilities

Several different approaches can be used to value electric systems. The approaches include being based on physical assets, potential lost revenue or the market value of those assets. However, the results are subjective and depend upon assumptions and the experience of those performing the analysis. It is not uncommon to utilize multiple approaches to provide a range of values. The final sale/purchase price will ultimately result from negotiations between the parties.

In addition, the valuation will generate an estimate of depreciation. There may also be other costs that the serving utility might request be included in the sale price.

Below is a list of some common approaches that can be used to determine estimates of the system value. The estimates provide the basis for economic analysis and negotiations. It is possible that some other approach would need to be used because of regulatory requirements that the serving utility must meet.

- Replacement Cost New (RCN)
    - Replacement Cost New (RCN) represents the estimated value of installing facilities in the present that replicate the system inventory. The field inventory provides the data that is used to estimate the cost, including such items as materials, labor and engineering, of reconstructing the facilities.
- Original Cost (OC)
    - Original Cost (OC) is the value of the facility when first placed in-service or its original cost. OC can be obtained

either from the serving utility or derived based upon the system inventory, RCN and the industry standard Handy Whitman Utility Cost Index.

- Original Cost Less Depreciation (OCLD)
  - Original Cost Less Depreciation (OCLD) represents the remaining value of the system facilities. OCLD is computed by subtracting the estimated depreciation of the facilities from the OC.
- Replacement Cost New Less Depreciation (RCND)
  - Replacement Cost New Less Depreciation (RCNLD) represents the estimated RCN less an applicable deduction for depreciation.

7.1.1.3. System Condition

The field inventory includes estimates of the age of the facilities, as well as consideration of the relative condition of the facilities, and whether or not they are legally compliant. Based upon such criteria, estimates would be developed of the overall system condition and costs of needed upgrades, as well as the cost to performance maintenance.

The value and condition of the system is used to develop estimates for the preparation of the *pro forma*, as well as the basis for entering into negotiations with the serving utility. However, the serving utility may not choose to sell the system to the tribe: if such a situation were to occur, the tribe would need to consult its attorney to evaluate other means to acquire the systems, including, but not limited to, condemnation.

7.1.2. *Pro forma* Development

The next step after completing the SVACS is to prepare the financial model or *pro forma*. A *pro forma* needs to encompass, at minimum, the initial five years of operation of the proposed TUA. This approach allows the tribe to determine the economic feasibility of forming a TUA to operate the electric systems.

The *pro forma* statement is a forecast or estimate of the revenues and costs associated with the utility operations. The *pro forma* is intended to demonstrate whether the proposed project, to form a TUA, is economically feasible and would support the goals established by tribal leaders. The *pro forma* statement is intended to show that the TUA, as proposed, would provide

for the necessary financial, professional, technical and managerial resources in order to provide safe and reliable service at a competitive cost. The chart previously discussed in Section 5.1, displays a flow diagram of the components included in the *pro forma* and the general relationships of the components. The *pro forma* contains the following items:

- Revenue and Customer Load Forecast
- Purchased Power Costs
- Transmission and Distribution Delivery Costs
- Operation, Maintenance & Construction Costs
- Administrative & General Costs
- Revenue Requirements
- Cash Flow Analysis
- Capitalization Requirements

The *pro forma* analysis supporting the formation of a TUA to serve the customers on the reservation should reflect conservative assumptions; yet provide a realistic indication that the TUA would be able to provide reliable services at prices, terms and conditions attractive to existing and new customers. The results contained in the *pro forma* may include, but are not limited to, assumptions such as building new distribution facilities, installing new meters for its customers, and using third-party transmission, substation and distribution lines to provide for delivery of power to the TUA's customers.

7.1.2.1. Customer Load and Revenue Forecast

A customer load and revenue forecast will need to be prepared. This is the starting point or foundation for the development of the overall *pro forma*. The load forecast is used to determine the level of power that will need to be purchased, as well as the substation and transmission capacity required. The revenue forecast will be used to determine the adequacy of the proposed rates to recover the costs associated with providing service and indicate if an adjustment to the rates would be required. Below is a brief discussion of the type of data and assumptions that would be used in the development of the load and revenue forecasts.

Load and revenue data will either be obtained from the existing serving utility or it will have to be estimated. If the existing serving utility agrees to provide data, it should include the number of customers,

monthly energy sales and revenues by rate type, and monthly peak demands for the total load on the reservation. If this data is not provided, then the load and revenue data would need to be estimated based upon the rates of the incumbent utility, the number of homes and businesses from the tribe's database; copies of individual bills, if available; and assumptions as to the utilization of energy by each rate type.

If no load data is available from the existing serving utility, a load forecast of both energy and demand usage at the customer meter will need to be prepared. The load forecast would be developed based upon type of customer or rate classification. The estimation or development of this data would typically require, but is not limited to, the following:

- Obtain a count of all residences, businesses, irrigation services, wells and other electrical loads on the reservation
- Obtain a sampling of existing utility bills from on reservation customers
- Estimate energy usage at the customer meter
- Use results from the SVACS to estimate demands at the customer meter
- Estimate relationship between the peak demand and energy usage at the customer meter, which is known as the customer load factor
- Estimate losses from customer meter to the purchased power delivery point
- Estimate energy and demand requirements at the purchased power delivery point

If no revenue data is available from the existing serving utility, a revenue forecast will need to be prepared. The revenue forecast projects expected income based upon energy sales to the TUA's customers. Data from the load forecast will be combined with the electric rates of the existing serving utility. The estimation or development of the revenue data would typically require, but is not limited to, the following:

- number of customers
- monthly energy use
- rate type
- rate schedules

The base test year energy and revenue forecast would be escalated based upon assumptions of future growth to develop a five year forecast of load and revenue. The initial base case would be established on the assumption that the rates would not change over the study period, such that the average cost per kWh remained constant throughout the study period or at the same level as was being charged in the initial year of the study.

7.1.2.2. Purchased Power Costs

The power resources and costs available to each area are unique. A general discussion of the development of power resources follows below.

A determination will need to be made of the following items:

- Substations where the tribe's load is connected to the electric grid, the capacity available, and the associated costs
- Transmission lines that are connected to the substations; the amount of possible capacity, and the associated costs
- Resources available to meet the forecasted load in the region that could be delivered to the substation and the associated costs

The use and cost associated with transmission is governed by rules established by the Federal Regulatory Commission (FERC). FERC also established an application process for requesting transmission service.

The use and cost associated with a substation may be included as part of the transmission process or may need to be negotiated as a separate agreement. As with the transmission, if additional substation capacity is required, it is typically paid for by the entity requesting the increase.

Power resources can either be purchased from a third party or generation can be constructed to serve the load. In most cases, building generation will not be cost effective at start-up. Portions of a TUA's power needs could be met by the development of renewable resources such as solar, wind, biomass, or geothermal, though the cost may be prohibitive. The cost of the energy delivered for each power purchase would need to be evaluated to determine the most reliable and cost-effective choice. Power resources can be purchased hourly, daily, weekly, monthly,

annually, and for terms of years. The power purchase may be priced with a capacity and energy charge or as an energy charge only. The power purchase typically will be take and/or pay, which means that if the TUA could not take delivery of all that was purchased, the TUA would still pay for the full originally agreed upon amount. All of these factors would be addressed in the *pro forma* analysis. More often than not, a proxy price would be developed for the *pro forma* since actual prices are usually not available, unless a contract has been executed to lock in a price.

In some instances, there may be areas on the reservation that are isolated and not connected to any transmission or distribution grid. To meet the power needs of these areas, estimates would be prepared for developing diesel or gas generators, solar/battery hybrids, or by building an interconnection to the area.

7.1.2.3. Transmission and Distribution Delivery Cost

As mentioned above, some areas will be connected and served from the transmission grid, while other areas may be completely off-grid. For areas connected to the transmission grid, an analysis will be done to identify the different connection points that would provide a path from the point where the purchased power is put into the grid to the point where the purchased power is delivered to the reservation. At each delivery point, metering will need to be installed to measure the power coming into the system. For the transmission system, there might be several different voltage levels that will need to be crossed in order to get to the delivery point. Adjustments will be made each time the voltage changes to correct for losses.

In addition, for transmission service, the purchaser must obtain what is referred to as "ancillary services". Below is a list of the services to be purchased and the typical units for the charges. Each area and transmission system would be priced separately, but the services offered would be the same. For purposes of the *pro forma*, it would be assumed that the TUA would purchase the necessary ancillary services. Below is a table listing the ancillary services, as well as some examples of pricing for illustrative purposes only. Actual prices will be dependent upon the rates filed by the transmission owner in the area where the TUA is located.

Ancillary Services		
Description	Charge	
Scheduling, System Control & Dispatch Service	0.08	per kW-month * TUA peak coincident with Transmission System peak
Reactive Supply & Voltage Control from Generation Sources Service	0.10	per kW-month * TUA peak coincident with Transmission System peak
Regulation & Frequency Response Service	0.00355	per kWh * 3.99%
Energy Imbalance Service		
Operating Reserve/Spinning Reserve Service	0.00783	per kWh * 3.5%
Operating Reserve/Supplemental Reserve Service	0.01133	per kWh * 3.5%

7.1.2.4. Substations

In addition to indentifying the transmission needed, the location of the substations that serve the reservation will need to be determined. Arrangements will need to be made with the substation owners for use by the TUA of the substations or delivery points. The costs associated with the use of a delivery point or points will need to be negotiated with the owner.

Typically, the TUA would obtain a certain level of capacity in the substation based upon the TUA load forecast, to be used to deliver purchased power to the TUA customers. If upgrades are required, the TUA would be obligated to fund them. The TUA might also have the ability to become a joint owner in a substation so as to purchase the capacity needed by the TUA. The cost effectiveness of such an option would need to be evaluated at the time the option becomes available.

7.1.2.5. Distribution Operations, Maintenance and Construction (OM&C)

The ability to provide O&M for the distribution system requires staffing that is available 24 hours per day, 7 days per week, and 365 days per year. This includes the staff to cover the normal business hours and after-hours issues, such as power outages. How this need is met is dependent upon the size of the electric system infrastructure, proximity of third-party O&M providers, revenue levels and, as revenue projections allow, the preferences of those forming or overseeing the TUA.

7.1.2.6. Distribution OM&C Staffing

An analysis needs to be undertaken to determine the minimum staffing levels that would be required to provide the appropriate level of OM&C for the specific system. The evaluation would include consideration of total distribution line distance, total transmission line distance, the number of distribution substations, and the number of customers. In addition, the condition of the system will provide an indication of the need for O&M, as well as capital improvements in the early operational period to bring the system up to code. The base case would reflect the cost of hiring the necessary staff. This cost would be developed based upon local utility labor costs and size and condition of the system.

A sensitivity analysis of the base case would be to determine the cost-effectiveness of hiring a third-party to perform some or all of the O&M activities. Normally, a third-party would provide services on a fee basis. The fees could include an hourly labor rate plus load, a material cost plus load, a vehicle charge, a monthly fixed fee for being ready and available as well as for having the systems in place. If a third-party is available, the sensitivity *pro forma* would include estimates for what these services might cost. When preparing the analysis, estimates may be made available by the third-party.

If a third-party is not available, then the *pro forma* would just reflect the in-house staffing and costs. A decision would have to be made to proceed with the formation of the TUA knowing that it might need to be subsidized until the customer and load base grows enough to cover the O&M staffing costs. Once the staffing levels have been identified, staffing costs could be estimated. These costs would include not only the hourly rate, but also overhead costs such as benefits, overtime, on-call pay, etc.

The staffing requirements for either in-house staff or through a third-party could include all or some of the following jobs:

- Line foreman
- Lineman
- Warehouse person
- Operations supervisor
- Designer
- Staker

- Distributing Engineer

7.1.2.7. Distribution OM&C Material and Stores

The TUA will need to establish a plan to address the supply, inventory, and warehousing of materials and equipment. The plan would include the need to create relationships with vendors. The plan could either be for the TUA to establish a physical warehouse or for the TUA to contract with a third-party to provide the warehouse services and functions. This decision will depend upon the availability of third-parties within close proximity of the TUA that provide such services and the cost-effectiveness of each option.

The equipment and material supply plan will need to reflect such items as those listed below:

- Accessibility to a complete inventory of electric system equipment at competitive pricing
- Accessibility to local inventory that will be invoiced at time of use
- Management processes and procedures to track outgoing materials and order or reorder needed materials
- Tie in to the work scheduling process for the job materials staging and the recording of materials placed in service

The types of electric system components that would need to be maintained in a warehouse include, but are not limited to:

- Poles and pole top assemblies
- Overhead and underground transformers
- Sectionalization equipment
- Conductor and related connectors
- Cable and related termination equipment
- Conduit and duct
- Arrestors and protective equipment
- Meters and service assemblies

The development of the equipment and material supply plan is necessary in order to ensure that needed materials and equipment are

available when needed, but also to assist with the controlling of material and equipment costs. This may also include emergency response arrangements with other surrounding utilities.

7.1.3. Administrative & General (A&G) Costs

The A&G costs to provide oversight and administration of the utility functions will need to be determined. Again, a determination will need to be made as to the staffing size, and if for certain functions a third-party might be retained. The primary activities performed include, but are not limited to:

- Meter reading
- Billing
- Contract Administration
- Power scheduling
- Customer service
- Accounting
- Human Resources

The key driver for the meter reading, billing, and customer service is the number of customers that would be served. Labor-related costs would be estimated and compared to estimates for third-party providers of the services.

In addition, material and software system costs would need to be estimated. Software costs include such items as the billing program and material management program. A third-party may include the software costs in its fees.

7.1.4. Revenue Requirement Analysis

The revenue requirement analysis is used to determine the expected revenue required to meet the TUA's costs. The *pro forma* is used to develop the monthly and annual revenue requirement. The revenue requirement reflects the sums of the forecasted costs such as those listed below:

- Operations and Maintenance (O&M) expense
- Warehouse expense
- Depreciation and amortization expense
- Customer sales and service expense

- Administrative and general (A&G) expense
- Return on rate base

The rate base is defined as the amount of investment made in the installed electric facilities. This initially would include the cost of purchasing the electric facilities, materials and equipment, software and vehicles. Eventually, the rate base will grow and will include additional investment made by the TUA for new items. Return on rate base is a measure of the profitability of the TUA. The level of return is also used to determine the need for adjustments to rates. TUA's are formed to provide reliable and low cost power. The measure of the performance of the TUA is whether the TUA generates revenue sufficient for expenses and any loan requirements.

7.1.5. Cash Flow Analysis

Also part of the *pro forma* is the cash flow analysis. This is used to determine the need for additional capital. Cash flow is provided either by revenue generated from customers or from equity investment. The forecasted revenue requirement or monthly revenue to provide safe and reliable service to the forecasted customers is reduced by cash disbursements. Since depreciation and amortization are not cash expenses, these expenses are excluded from cash disbursements and can provide internal cash for construction or other costs.

7.1.6. Capitalization Requirements

The TUA knows that it will obtain the existing customers on the reservation at the time the transfer takes place. Since the TUA is committed to being in business over time, it will need to make sure that there are sufficient funds available at the start-up to provide for the purchase of materials and equipment, hiring of staff, purchasing of software systems, leasing of an office and yard, furniture and computers, and the payment of power and transmission services over the first six to twelve months of operation. The TUA will need to determine if there will be a need to obtain any debt financing. The TUA may be formed with a mix of equity and debt financing or only equity.

The initial investment will be needed by the TUA to cover its organization costs and investment in electric plant during the first several months of operations as well as to provide additional funds for contingencies. Materials and supplies may need to be purchased and paid for prior to the TUA realizing any revenue. The TUA's business plan and *pro forma* should provide

estimates indicating the level of capital that would be required during the first five years. These will also project the growth in investment needs to meet future customer growth and replacement of existing plant that could be provided by revenues. New customers require increased investment, but they also contribute revenues to offset these costs. The TUA's business plan and *pro forma* will provide a good picture of the TUA's ability to have the financial resources to provide customers with safe, reliable and cost-effective service.

7.1.6.1. Capital Equipment

The TUA will need to obtain operational equipment. This can be accomplished through purchase, lease, lease-to-own or some other arrangement. If the TUA selects to use a third-party to provide some or all of the O&M and materials management services, the need for certain equipment would not be required as the third-party would provide it. Below is a list of equipment to provide an indication of the types of equipment that would either be provided directly by the TUA or indirectly under a third-party contract.

- Bucket truck, pole trailer, digger truck, pick-up truck
- Electric system operational equipment and truck stock
- Test equipment
- Computer systems supporting operations, customer information system (CIS), geographic information system (GIS) (hardware/software), material management, facilities plant accounting and financial systems
- Field communications equipment

7.1.7. Distribution & Maintenance Polices

7.1.7.1. Develop Policies

The TUA will need to establish a comprehensive set of operational and maintenance policies prior to beginning to provide service. These policies should be based on accepted industry practices and include operational and maintenance standards, safety procedures, reporting protocols, mapping standards, communication procedures, etc. The policies will ensure effective and safe coordination of the TUA's operations with the interconnecting utility. These policies should be reviewed with the

interconnecting utility and comments solicited to insure compatibility with policies and system operations.

7.1.8. Dispatch & Service Restoration

7.1.8.1. Develop Procedures

A dispatch capability will need to be developed to insure timely response to all service calls. Detail dispatch procedures will be developed prior to beginning to provide service. Below are a few general guidelines and approaches that have been identified and can serve as the starting point for the detail procedures.

- All calls would be routed to a dispatcher or designated serviceman
- An integrated CIS (customer information system) and GIS (graphic information system) should be developed and used by all personnel receiving calls to identify critical customer information and expedite response
- An effective communication system should be established with adjacent utilities to insure proper coordination of outage and operational actions

7.1.9. Planning, Engineering & Construction Standards

7.1.9.1. Develop Construction Standards

An integrated set of planning, engineering and construction standards should be developed prior to service assumption. These standards would be based on accepted utility industry practices and be compatible with those of any interconnecting utility. These standards should be reviewed with any interconnecting utility to insure compatibility with policies and systems operation.

8. Pro forma Example

Once all the data is either obtained or estimated, it is entered into the *pro forma* model. The results of the *pro forma* will provide an indication of the projected annual revenue and the costs associated with operating a TUA. If the revenue, based upon existing utility rates, exceeds the costs, the TUA will not require external support from the tribe. Should that not be the case, the tribe will need to determine if it desires to subsidize the TUA, allow the TUA to raise rates to the level required to meet costs, or choose not to proceed with the formation of the TUA. The results of the *pro forma* provide the financial portion of the discussion regarding forming a TUA. The other piece is the tribal and policy needs. The *pro forma* gives the tribal leaders information needed when discussing whether or not to form a TUA.

Figure 3 on the next page is an example of the results of a *pro forma* for a TUA. As shown, it provides all of the cost components that need to be considered when forming a TUA.

Figure 3

	Annual Summary				
	Year 1	Year 2	Year 3	Year 4	Year 5
Energy Sales At Meter					
Area 1 Energy Sales At Meter (kWh)	9,647,981	9,810,098	9,980,530	10,153,835	10,330,063
Area 2 Energy Sales At Meter (kWh)	7,943,572	8,102,443	8,264,492	8,429,782	8,598,377
Total Energy Sales - kWh	17,591,553	17,912,541	18,245,022	18,583,617	18,928,440
Revenue From Sales					
Total Area 1 Revenue From Energy Sales - $	$ 1,064,417	$ 1,083,790	$ 1,104,198	$ 1,133,984	$ 1,173,663
Total Area 2 Revenue From Energy Sales - $	$ 911,433	$ 973,905	$ 1,038,695	$ 1,098,348	$ 1,137,191
Total Revenue - $	**$ 1,975,850**	**$ 2,057,695**	**$ 2,142,893**	**$ 2,232,333**	**$ 2,310,854**
Average $/kWh	$ 0.11232	$ 0.11487	$ 0.11745	$ 0.12012	$ 0.12208
Disbursements					
Purchased Power Costs					
Purchase Power Costs					
Primary Power Cost	$ 227,388	$ 231,935	$ 236,574	$ 241,306	$ 246,132
Renewable Power Cost	$ -	$ -	$ -	$ -	$ -
Supplemental Power Cost	$ 1,028,228	$ 1,080,479	$ 1,135,625	$ 1,193,411	$ 1,253,962
Total Area 1 Purchase Power Costs	**$ 1,255,615**	**$ 1,312,414**	**$ 1,372,199**	**$ 1,434,716**	**$ 1,500,093**
Average $/kWh	$ 0.07138	$ 0.07327	$ 0.07521	$ 0.07720	$ 0.07925
Power Delivery Costs					
Power Delivery Costs					
Transmission Delivery Cost	$ 85,732	$ 87,149	$ 88,645	$ 90,165	$ 91,712
12 kV Distribution Delivery Cost	$ 106,266	$ 108,547	$ 110,956	$ 113,426	$ 115,958
Total Area 1 Power Delivery Costs	**$ 191,998**	**$ 195,696**	**$ 199,601**	**$ 203,591**	**$ 207,670**
Total Power Delivery Cost - $	**$ 191,998**	**$ 195,696**	**$ 199,601**	**$ 203,591**	**$ 207,670**
Total Purchase Power & Power Delivery Costs	**$ 1,447,613**	**$ 1,508,110**	**$ 1,571,799**	**$ 1,638,307**	**$ 1,707,763**
Net Profit / (Loss)	**$ 528,237**	**$ 549,585**	**$ 571,094**	**$ 594,025**	**$ 603,091**
Distribution System O,M&C					
Distribution System O,M&C					
O&M Contract Service	$ 24,444	$ 25,334	$ 26,268	$ 27,238	$ 28,243
2-Person Line Crew	$ 165,000	$ 165,000	$ 165,000	$ 165,000	$ 165,000
Equipment	$ 5,000	$ 5,150	$ 5,305	$ 5,464	$ 5,628
Engineering Services	$ 25,000	$ 25,750	$ 26,523	$ 27,318	$ 28,138
Materials	$ 46,600	$ 46,816	$ 47,034	$ 47,255	$ 47,477
Customer Service / Call Center	$ 20,000	$ 20,400	$ 20,808	$ 21,224	$ 21,649
Meter Reading:	$ 11,510	$ 11,531	$ 11,556	$ 11,582	$ 11,607
Billing	$ 5,000	$ 5,150	$ 5,305	$ 5,464	$ 5,628
OM&C Cost subtotal	**$ 302,554**	**$ 305,131**	**$ 307,798**	**$ 310,544**	**$ 313,369**
Total Distribution System O,M&C	**$ 302,554**	**$ 305,131**	**$ 307,798**	**$ 310,544**	**$ 313,369**
Net Profit / (Loss)	**$ 225,682**	**$ 244,454**	**$ 263,295**	**$ 283,481**	**$ 289,722**
Administrative & General:					
Rent	$ 2,000	$ 2,060	$ 2,122	$ 2,185	$ 2,251
Utilities (Water & Electric)	$ 200	$ 206	$ 212	$ 219	$ 225
Telephone	$ 1,200	$ 1,224	$ 1,248	$ 1,273	$ 1,299
Office Maintenance (Repairs, Exterminators, Janitor & Security)	$ 100	$ 103	$ 106	$ 109	$ 113
Salaries & Benefits	$ 60,000	$ 61,200	$ 62,424	$ 63,672	$ 64,946
Board Costs	$ 18,000	$ 18,000	$ 18,000	$ 18,000	$ 18,000
Travel	$ 2,000	$ 2,060	$ 2,122	$ 2,185	$ 2,251
Training	$ 2,000	$ 2,060	$ 2,122	$ 2,185	$ 2,251
Office Materials & Supplies	$ 6,200	$ 6,324	$ 6,450	$ 6,579	$ 6,711
Auto (Insurance, Fuel & Maintenance)	$ 20,000	$ 20,400	$ 20,808	$ 21,224	$ 21,649
Industry Experts	$ 30,000	$ 30,600	$ 31,212	$ 31,836	$ 32,473
Accounting	$ 5,000	$ 5,100	$ 5,202	$ 5,306	$ 5,412
Legal	$ 5,000	$ 5,100	$ 5,202	$ 5,306	$ 5,412
Misc(Payroll Service, Advertising, Bank Charges, donations, dues)	$ 500	$ 515	$ 530	$ 546	$ 563
Total A&G Cost subtotal	**$ 152,200**	**$ 154,952**	**$ 157,761**	**$ 160,628**	**$ 163,555**
Net Profit / (Loss)	**$ 73,482**	**$ 89,502**	**$ 105,534**	**$ 122,853**	**$ 126,167**
Debt Service					
Debt Service Total (P&I)	**$ 65,864**	**$ 83,358**	**$ 100,851**	**$ 118,345**	**$ 135,839**
Net Profit / (Loss)	**$ 7,619**	**$ 6,144**	**$ 4,683**	**$ 4,508**	**$ (9,672)**
Reserves/Contingencies					
Reserves/Contingencies subtotal	**$ 5,000**	**$ 5,100**	**$ 5,202**	**$ 5,306**	**$ 5,412**
Net Profit / (Loss)	**$ 2,619**	**$ 1,044**	**$ (519)**	**$ (798)**	**$ (15,084)**

9. Mitigation Risk

9.1. Develop List of Potential Risks

The TUA needs to be aware that there are certain risks associated with electric utility operation. Efforts should be made to address risks as part of the formation of the TUA. Unfortunately, the future cannot be predicted accurately, such that the TUA will need to be prepared to undertake other measures as situations occur to ensure the safe, reliable and financial viability of the TUA. Below are some examples of the types of risks that could adversely impact the success of any TUA's efforts with possible mitigation strategies. These examples are not intended to be all inclusive. The actual list of risks and mitigation options are unique for each tribe and project.

Risk	Mitigation
Forecast of operating expenses is too low	Maintain flexibility, conduct ongoing assessment of market conditions and have a plan in place to allow for quickly making changes
Rapid customer growth and expansion of electric facilities could place a severe burden on the TUA's financial, operating and management systems	Maintain flexibility to adjust to changes including, but not limited to, being able to contract for construction, maintenance and operations services. Have a plan in place to allow for quickly making changes
Customers do not pay their bills	Establish a clear policy for how unpaid bills will be handled. It is important that the TUA have the support of the tribal leaders, such that customers cannot use political leverage to avoid paying their bills.
The TUA's rates may be higher than the prior utility	The TUA's *pro forma* should provide a rate comparison. If it appears that the initial and early year's rates will exceed those of the existing utility, the TUA in conjunction with the tribal leaders will need to develop a financial plan to correct this situation over a specified time period by adjusting the TUA organization, such that the TUA's rates become competitive

The TUA should seek to develop a conservative business plan and business operating process that provides great flexibility to respond to changes that may occur in market conditions.

10. Summary

Forming a TUA will take commitment by tribal leaders; perseverance and effort by tribal staff, consultants and attorneys with the allocation of adequate resources, to see the job through to the end. There will be challenges and road blocks that will need to be overcome such as those listed below:

- Load and revenue data limitations.
- Serving utility does not want to cooperate with the tribe in forming a TUA.
- Serving utility wants to much for the purchase of the system on-reservation
- Transmission/substation interconnections require upgrades to be paid by the tribe.
- Distribution system is in need of a lot of O&M to bring it up to acceptable utility condition or into code.
- Rates may need to increase in the near term.

Resolution or non-resolution of the challenges becomes part of the decision making process, along with the financial and policy considerations. The financial *pro forma* will provide tribal leaders with the cost-benefit issues that will need to be considered. Policy considerations will be addressed as the policies and procedures of the TUA are developed. Decisions will need to be made during the evaluation process as to whether to proceed or stop. The tribal leaders will have numerous opportunities to question the basis for proceeding with the formation of the TUA and to decide not to proceed.

In general, forming a TUA will result in the following steps and decisions being addressed.

- ❖ First go – no-go decision
  - Does the tribe want to form a tribal utility authority (TUA)?
    - ✓ If go, proceed with following steps:
      - Undertake a System Valuation and Condition Assessment Study (SVACS)

- Prepare Base Case *Pro forma* that reflects preliminary estimates of
  - Loads and Revenues
  - Purchase of on-reservation facilities price
  - Purchase Power costs
  - Interconnection costs
  - O&M costs
  - Labor costs
  - Materials and equipment costs
  - Capital investments

❖ Second go – no-go decision

- Do the *pro forma* results indicate forming a TUA would be cost-effective for the tribe and/or address non-economic issues?
  - ✓ If go, proceed with following steps:
    - Begin negotiations with serving utility for purchase of facilities
    - Update Base Case P*ro forma* to reflect negotiated purchase price and any other refinements to other estimates.

❖ Third go – no-go decision

- Do the revised *pro forma* results still indicate that forming a TUA would be cost-effective for the tribe and/or still addresses non-economic issues?
  - ✓ If go, proceed with following steps:
    - Begin negotiations for interconnection service.
    - Undertake sensitivity analyses of the Base Case *Pro forma* to evaluate such factors as:
      - Third-party contracts for OM&C services that would include, but not be limited to, providing line crews, dispatching, equipment and materials,
      - Purchase power options
    - Update Base Case *Pro forma* to reflect any refinements to other estimates and prepare Sensitivity *Pro forma*'s to reflect estimates of other options.

- ❖ Fourth go – no-go decision
  - Do the revised Base Case *Pro forma* results still indicate that forming a TUA would be cost-effective for the tribe and/or still addresses non-economic issues?
  - Does the Sensitivity *Pro forma*(s) results indicate that forming a TUA based upon different assumptions would be cost-effective compared to the Base Case *Pro forma* for the tribe and/or still addresses non-economic issues
    - ✓ If go, proceed with following steps:
      - Finalize various negotiations
      - Update Base Case *Pro forma* and Sensitivity *Pro forma*s as appropriate and prepare recommendation on which *pro forma* to implement
      - Develop policies and procedures, as well as any other necessary documents needed for the running of the TUA.
- ❖ Final go – no-go decision
  - Does the recommended *pro forma* still indicate that forming a TUA would be cost-effective for the tribe and/or still addresses non-economic issues?
    - ✓ If go, proceed with the formation of the TUA by:
      - Appointing a Board of Directors
      - Board of Directors sets up the TUA organization and operation by
        - Hiring Staff
        - Establishing an office
        - Completing all agreements
        - Setting up all systems
        - Beginning to serve power to customers

There is a lot of analysis and discussion essential, not only for the formation of a TUA, but also for its continued success and operation. In making the commitment to form a TUA, tribal leaders need to clearly embrace the understanding that once the formation is completed, and the TUA is operating, there is no turning back. Assume the TUA will operate for many years. There may be times when the TUA's rates may exceed those of the Off-Reservation utilities, and that is when tribal leaders need to remember the reasons for forming the TUA and the long term goals that were set. In addition, the tribal leaders will rely heavily on the TUA board members to undertake the analysis, development and formation of the TUA. It will take time for the TUA to become

established, but with the same commitment and perseverance exerted during its formation, the TUA will become the organization envisioned by the tribal leaders.

APPENDIX A

TRIBAL UTILITY AUTHORITIES

Name:	Ak-Chin Energy Services (ACES)
Address:	42507 W Peters & Nall Rd
	Maricopa, AZ 85138
Contact:	Leonard S. Gold, Power Consultant
Telephone:	480-731-9506
Email:	lgold@utility-strategies.com

Name:	Aha Macav Power Services (AMPS)
Address:	P.O. Box 6870
	Mohave Valley, AZ 86446
Contact:	William Cyr, General Manager
Telephone:	928-768-2200
Email:	bcyr@ahamacav.com

Name:	Gila River Indian Community Utility Authority (GRICUA)
Address:	6640 W. Sundust Rd. Ste 5091
	Chandler, AZ 85226-4211
Contact:	Leonard S. Gold, General Manager
Telephone:	520-796-0600
Email:	manager@gricua.net

Name:	Navajo Tribal Utility Authority (NTUA)
Address:	P.O. Box 170
	Fort Defiance, AZ 86504-0170
Contact:	Walter Haase, General Manager
Telephone:	(928) 729-5721
Email:	walterh@ntua.com

Name:	Tohono O'odham Utility Authority (TOUA)
Address:	P.O. Box 816
	Sells, AZ 85634
Contact:	Mike Bethurem, General Manager
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