

# BUSINESS PLAN

*Wind River Biomass Utility, LLC*

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*Located in Stabler, Washington*

## CHARTER MEMBERS:

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# EXECUTIVE SUMMARY

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The Wind River Biomass Utility LLC (WRBU) seeks to build a business that benefits our forests, our environment, our local economy, and our overall community. Our mission is to buy waste wood, also known as biomass, from local land managers and mills and use that biomass to fuel a utility operation that creates renewable energy while reducing problems like forest fires and pest infestations that plague heavily forested communities. Reducing and removing excess woody debris and harvest slash as well as performing thinning treatments throughout the timberlands has become an expensive obstacle for land managers and we aim to provide the solution by giving that waste wood value.

To support this vision and purpose, with the construction of our Combined Heat and Power (CHP) facility, WRBU will produce and sell electrical power to the utilities that are required to meet renewable-energy purchase rules; heat for commercial operations via hot water; heat-treated firewood for bundled firewood sales; and biochar for fertilizer and filtration applications. These products are in high demand due to the worldwide pursuit of renewable-energy deployment, including the sustainable use of woody biomass, energy efficiency, and organic agriculture.

Since its founding in 2012, WRBU has acquired vital equipment at pennies on the dollar, and secured the perfect location to develop an efficient and sustainable CHP facility that will provide the ideal opportunity for agricultural and economic development in the county for years to come. We believe our model will become the standard for industry best practices and will be ideal for replication in other rural locations with natural-resource-based economies.

The founding members of WRBU bring experience in forestry, engineering, renewable energy, community development, and the forest products industry to this project. We are seeking financial support partners-to

participate in this 'green' endeavor that will have a multifaceted impact on both the community and the natural environment.

## GENERAL COMPANY DESCRIPTION

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The Wind River Biomass Utility (WRBU) is a Limited Liability Corporation (LLC) registered in Washington State and located in Skamania County.

*Physical Address:*

Wind River Business Park  
Trout Creek Field  
Carson, WA  
98610

*Mailing Address:*

250 NE Vista Drive  
PO Box 658  
Stevenson, WA  
98648

### What We Do

In this Business Plan, the term "biomass" refers to the waste wood left over from forest management, lumber production or wood recycling activities that can be used as fuel. The biomass "utility" refers to the facility using biomass to produce energy. As a result of Washington and Oregon State's current focus on clean and sustainable energy, biomass-fueled clean energy facilities have emerged as a proven reliable base load power alternative to fossil fuels in the production of heat and power. WRBU was founded in an effort to specifically address the local need to utilize biomass waste on a sustainable basis and produce energy and other products while supporting both healthy forests and healthy communities.

In 2012, the U.S. Forest Service reported to the South Gifford Pinchot Collaborative Group that the Gifford Pinchot National Forest was full of biomass that was a byproduct of forest management activities. They said that this waste wood was a fire hazard, was piled and burned and the expense of disposal limited the amount of forest management that could take place. The idea for WRBU was born from that meeting as the four Charter Members decided to create a business to increase the utilization of locally available biomass by incorporating the clean energy Combined Heat and Power (CHP)

concept. This technology is designed to maximize the efficient use of woody biomass as fuel to create heat and electric power thereby creating higher value. This higher value allows greater biomass use and less biomass waste left in the forest as a fire hazard or in need of disposal in burn piles. The biomass will instead produce both useful products and jobs and ultimately result in more forest management.

In pursuit of this goal, WRBU seeks to do the following:

1. Utilize waste-wood that is generally considered to be in excess according to the basic requirements of forest ecology.
2. Generate thermal and electrical energy, produce biochar and kiln dry firewood with controlled combustion of woody biomass in a CHP facility.
3. Efficiently process this biomass, thereby utilizing sustainable resources, to achieve a moderate return on investment that will ensure both the financial stability and survivability of the business as well as maximize the number of jobs and businesses that support a median level of income per Washington State standards for the south-central Skamania County area.

Located just 60 miles east of Portland, Oregon, the WRBU CHP operation is being developed on 25 acres at the Wind River Business Park in the Stabler/Carson area that is leased from Skamania County and managed by the Port of Skamania County. The site is ideal for organic agricultural and commercial development.

From this location, the operational objective of the utility, raw material collection, and associated energy production will optimize the efficiency of the overall fuel-capture and energy production system, as well as the end-use of the energy, by both design and practice. We expect that in a single year the WRBU CHP will utilize 12,000 dry tons of waste wood to generate heat and electricity to support the variety of industries mentioned above. Excess electricity can be sold to the utilities in the regional transmission grid. Each year WRBU will use less than 25% of the excess biomass produced from forest management activities on local federal, state, and private timberlands to generate up to 4 million kWh and 40,000 million BTU of heat per year.

Once fully operational, WRBU LLC will be a model for similar developments in many other rural locations with forest-resource-based economies. WRBU

will provide relevant technical, business, and project-development information for other developers to assist in creating equally economically viable CHP facilities in other areas.

### **What We've Done**

Since its formation in 2012, WRBU has worked hard to establish strong partnerships with local and regional agencies, including the Skamania County PUD, the Bonneville Power Authority (BPA), the U.S. Forest Service, WA Department of Natural Resources, WA Department of Commerce, and the Port of Skamania County. In addition, we have excellent working relationships with suppliers, state legislators, U.S. congressional representatives, Skamania County officials, as well as local citizens. With this social capital, we have done the following:

- Obtained Grant Funding from the Community Economic Revitalization Board (CERB) and Skamania County to fund a feasibility study for the WRBU CHP facility at the Wind River Business Park which showed viability for a small-scale operation (see Wallowa 2014 Feasibility Study, available on our website);
- Purchased a Small Generator Interconnection Study from BPA that defines the equipment and process for electrical power sales from a renewable, baseline generator (see BPA 2014 Small Generator Interconnection Report, available on our website);
- Received a USDA Rural Energy for America Program (REAP) grant to fund a market feasibility study for greenhouse development at the Wind River Business Park (see REAP 2015 Feasibility Study, available on our website);
- Obtained a grant from the US Forest Service for the final engineering design/plan for WRBU CHP facility at the Wind River Business Park (see WRBP CHP plans 2015, available on our website);
- Purchased a gasifier/burner system that uses wood chips to heat 'thermal oil' to drive an electrical generation system and for delivery of heat to greenhouses with funding obtained from the WA State Dept. of Commerce (2014);
- Received a loan from Bonneville Environmental Foundation (BEF) for development money (permits, lawyer fees, etc.) to be repaid in Renewable Energy Credits (REC) when electrical power sales occur (2015);
- Secured a long-term lease at a low rate for 25 acres from the Port of Skamania for a former nursery field with electrical and water connection infrastructure in place and a gravel road suitable for log trucks (2015);

- Purchased two 200 KW propane fueled motor-generator sets for power and hot water back-up, plus a 110-ton hot-water-absorption chiller powered using the heat from the biomass gasifier system (2015).

### **What We Have**

Good equipment and proper planning is essential to any business operation, and WRBU has made significant gains in acquiring the funding for and the acquisition of both the means and the modes of production for a CHP biomass facility. To date, we have:

- A full set of engineering data and drawings incorporating the LLC's equipment on its leased site (cost \$100,000);
- A comprehensive technical report on greenhouse costs and opportunities;
- A Small Generator Interconnection Report (SGIR) from the BPA for power-purchase arrangements;
- A new and unused Chiptec P-20 gasifier/burner system with all the peripheral electrical controls, pumps, fans, valves needed to burn wood chips and to produce and capture heat (original invoice \$1,100,000);
- Two motor-generator sets of 200kW capacity each and a 110 ton hot-water absorption chiller designed and built to work with the two m-g sets.

### **Where We Are Heading**

Our goals have evolved significantly since 2012. We have identified a variety of energy products that will allow us to utilize as much of the biomass energy as possible. In order for us to do this, our highest priority is getting the WRBU facility up and running. We are working with Skamania County, who owns the land we lease, to construct the facility that will house the CHP system. To help fund all of the steps that are necessary to make the WRBU facility operational and bring in local support and investment we are launching a WeFunder campaign in September 2017. In addition to the crowdfunding, WRBU is already in the start-up phase of Firewood production. Four state campgrounds have contracted with us to provide approximately 4,000 bundles of firewood. The revenue created by these sales as well as residential firewood sales is allowing us to cover our current operating expenses. Furthermore, WRBU is in the process of gathering bids for the acquisition, installation, and commissioning of a gasifier burner hot

oil heat exchanger with all necessary equipment to drive an Organic Rankine Cycle (ORC) electrical generator system.

## **BIOMASS SUPPLY & PRODUCTS**

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The Wind River Business Park that is home to WRBU is located in Skamania County, a heavily forested region of Washington State. Ninety-eight percent (98%) of the County is forest land, with 80% of the County being part of the Gifford Pinchot National Forest. According to the study conducted by Wallowa Resources Community Solutions for the Port of Skamania County (2014), “Between private, State, and Federal forest land in immediate proximity to the project site, it is generally understood that there will be biomass available from these sources in perpetuity.” This means that waste wood from logging, thinning slash, and lumber production is consistently available. Forest managers must spend a significant amount of resources to treat the waste wood in accordance with forest management practices and they will welcome the opportunity to more conveniently dispose of the biomass waste.

The local economy was sustained by the timber industry for nearly 130 years and, as a result, there are several sawmills in the region. It is estimated that there are 36,600 dry tons of residuals produced in the two nearest sawmills every year. The residual biomass waste from sawmill, plywood mill, and whole-log chipping operations must be disposed of through various disposal methods. Eliminating this waste wood is costly, whether it be the space the waste occupies or paying for its treatment. There are also the unaccounted environmental costs of burning all of this waste. This creates a demand for a sustainable alternative. WRBU can make waste wood utilization a viable alternative to expensive treatment options and create the following energy products:

### ***Thermal Energy***

The WRBU facility will provide heat from renewable resources. To build our business and meet our goals of sustainability, we are focusing on the

recruitment of heat customers. WRBU will be able to offer customers a less expensive thermal energy alternative to propane.

### ***Electrical Power***

The electrical power output will be sold as 'base load' power, as opposed to the variable power that often comes from sources like wind turbines and photovoltaics. Our energy consultants have indicated this is a strong positive for deployment in the renewable-energy market. Electrical sales will also have a Renewable Energy Credit (REC) value due to the rising need from utility companies for renewable power to meet their state renewable-energy standards (in WA and OR).

### ***Biochar***

The WRBU owns a Chiptec P-20 gasifier that is capable of producing Biochar. Biochar is essentially charcoal derived from biomass and is used as a soil additive in agriculture. By producing Biochar, WRBU will be able to offer a product that is experiencing rapid market growth. Following a year's worth of research, we now estimate that biochar can account for approximately 30% of revenue.

### ***Firewood***

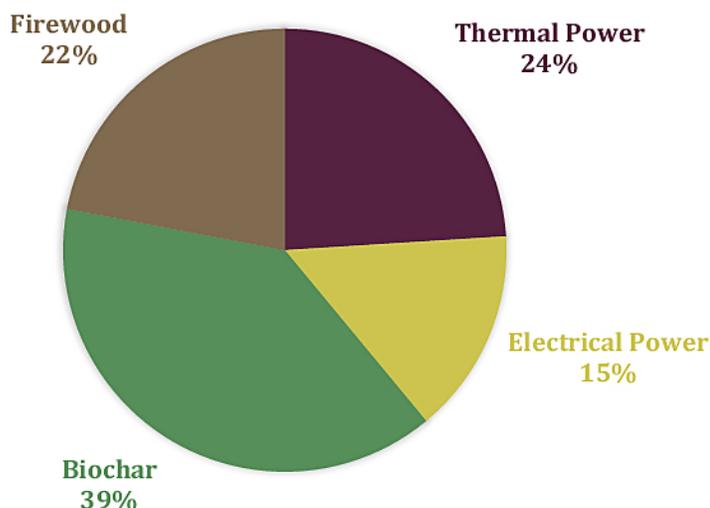
WRBU is producing 'seasoned' firewood for local cordwood and bundled-firewood sales. When the WRBU CHP facility becomes operational, this product can be kiln-dried to kill pests and timber-related diseases for both local and interstate bundled-firewood sales via wholesale distributors.

It is worth noting that the firewood operation is additionally beneficial for WRBU as well in that it brings operational flexibility. With reasonable capacity planning, the firewood operation can be built around the capacity to 'take up the slack', when heat demand is relatively low from greenhouses.

**Table 1: WRBU Annual Production with 12,000 dry tons of waste wood**

| Product:                | CHP Produces:                                       |
|-------------------------|---|
| <b>Thermal Power</b>    | 40,000 Million BTU                                  |
| <b>Electrical Power</b> | 3,720,000 kWh                                       |
| <b>Biochar</b>          | 1,200 tons  |
| <b>Firewood</b>         | 250 cords residential use; 128,000 campfire bundles |

**TABLE 2: WRBU REVENUE SUMMARY**



## MARKETING PLAN

WRBU is a solution to the biomass problem that is accumulating in our county, not to mention a relief to the air quality problems our region has experienced from the wildfires this summer. To help alleviate these issues, we are informing our community and affected agencies of our solution to take the “waste” out of “waste wood” and with it, the opportunity to reduce the risk for massive fires with a better managed forest. We have contracted with a project specialist to help launch our WeFunder crowdfunding efforts to bring in investors, with a release planned for September 2017. We will be launching our website and branding simultaneously.

Marketing our four products – thermal energy, electrical power, Biochar, and firewood - requires a targeted customer approach. The following are planned or in process:

*For Thermal Energy Customers*

As shown in the Wallowa Feasibility Study (2014), the site and the WRBU CHP will make a variety of businesses viable at the Wind River Business Park. This same study made the point that it can be especially beneficial to produce wood products and biomass energy when businesses “are linked through value and supply chains, labor, inputs, technology, and complementary outputs” and that grouping businesses like this together can “improve production and efficiency in numerous ways”.

In addition to purchasing a thermal customer (greenhouse) study from Fresh Earth Gardens LLC in 2015, we have also contacted local small farmers, Underwood Conservation District, and veteran’s group “Archi’s Acres” to identify potential greenhouse operators for our site. In support of this type of development, it should also be noted that water is available in all seasons from a newly-drilled well on the Trout Creek Field. Also, the site is only 60 miles from a large metropolitan area with high demand for organic produce.

*For Electrical Power Sales*

The added efficiency derived from the CHP process that WRBU will employ allows us to offer competitive pricing to our electrical service customers.

The power can be used by the large utilities in Oregon and Washington to meet their renewable-energy-use benchmarks as regulated by state laws. Our energy consultant predicts that the 2020 benchmarks in both states will cause the regulated utilities to bid up the price of renewable energy, including the RECs associated with the power sale which go to the producer.

Related to this is the fact that a biomass boiler can produce steady-state (base load) power. This is needed to help to balance the power supply from the major renewable-energy sources (wind and solar), which is variable due to changes in wind and sunshine levels. A particular feature for the WRBU

operation is that it can switch power transmission from the grid to internal operations (e.g., chipping, firewood preparation, heat storage), when the variable suppliers are working at full output (e.g., a sunny, windy day).

In addition to working with our energy consultant we have also had discussions with Energy Northwest and CREA (Community Renewable Energy Association) for potential electrical power sales to, for instance, Portland General Electric (PGE). WRBU is a member of CREA.

#### *For Biochar Sales*

We have contracted with a biochar consultant and have begun discussions with a char producer who sells raw biochar in our region. An agreement is being contemplated that will allow us to offer Biochar on the wholesale market. WRBU is a member of the International Biochar Initiative (IBI) which will keep us informed of the best practices in Biochar production and sales.

#### *For Firewood Sales*

We have already begun offering this product since it does not require the same amount of funding or planning as the CHP facility but does allow us to use the waste wood we have at our disposal. The WRBU has agreements with four state parks to provide approximately 4,000 bundles of campfire wood for the current season at an agreed upon rate. WRBU is seeking similar agreements with other campgrounds, and will become even more competitive once our kiln is up and running and we can produce heat treated firewood and premium cord wood. Firewood has become the foundation for developing the rest of our business as it provides both revenue and a means for letting people know about WRBU LLC. For local sales of firewood, the consumer receives a flier telling them about WRBU which includes a link to our website and WeFunder campaign.

# OPERATIONAL PLAN

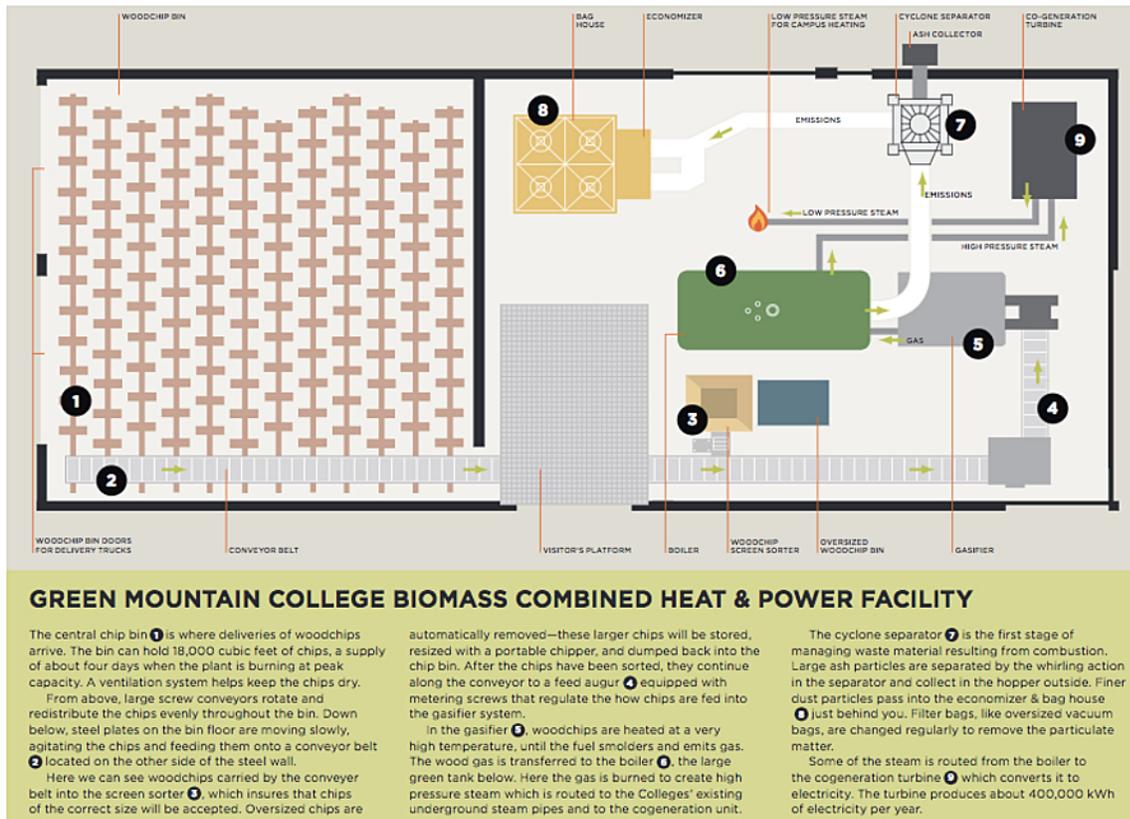
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## **Phase 1: Site Development**

On the 25 acres we have leased from the Port, there is a log deck, equipment for the current firewood operation, and several pieces of the CHP equipment ready and waiting for installation. The next steps are to build the business management systems, develop the raw material supply system, construct the building to house the CHP, connect the necessary utilities to the site, and install the hot-water lines to service our customers.

## **Phase 2: Construction, Installation, & System Coordination**

We have a complete set of engineering drawings, mass/energy balance estimates, site plans, equipment specifications, equipment quotations, flow diagrams, and control diagrams for the physical plant based on the gasifier system already situated at the WRBU leased site. Not yet acquired or set up is the air-quality control equipment, heat (hot water) distribution infrastructure, wood-chipping/handling equipment, or the Organic Rankine Cycle (ORC) electrical generator. Once the site has been developed and the rest of the necessary equipment has been purchased and delivered, the system integration process can begin. By this point in the operation, we will hire at least three (3) full time workers to manage the set up and implementation.



*This CHP Facility layout, provided by [Green Mountain College Biomass Utility](#), is the model upon which we are building our operation.*

## Legal Environment

There are many state and federal requirements that govern the development and operation of a biomass utility facility. WRBU will obtain the proper permits as we move through the final engineering design process, including Storm Water and Air Quality-in compliance with the Washington State Environmental Protection Act (SEPA). WRBU has obtained WA Labor & Industries Insurance to comply with requirements for workers' insurance and health and safety standards. Skamania County will issue a building permit to verify that the construction of the CHP facility meets the standard structural-criteria. An archaeological review of the site will also be required from SEPA.

# FINANCIAL STRATEGY

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To complete the CHP facility with equipment installation to generate revenue, the WRBU LLC charter (Operating Agreement, Appendix D) has been revised to allow the sale of 24% of equity. The price is \$20,000 per 1 percent of equity in order to raise \$480,000. The share price has been set at \$20 per share with a minimum purchase of 5 shares required. The decision was made to move forward with these changes because of positive feedback from the community and a desire to encourage further community buy-in. An additional benefit will be our ability to demonstrate a higher level of private capitalization to funding agencies.

The opportunity for investment will be managed through WeFunder and advertised in various media. The plan for the remainder of the needed capital is to apply for funding from the WA State Housing Finance Commission (WSHFC), the U.S. Department of Agriculture's REAP staff, and the Energy Fund 2 office of the WA Department of Commerce.

\$3.1 million will allow WRBU to be fully operational. This investment level will purchase the building, the wood chip preparation and delivery system; a firewood processor and kilns; an air-pollution-control system; heat exchangers; biochar collection and storage; a forklift/front-loader combination, a hot-water delivery system for heat customers; plus two Pratt & Whitney Pure-Cycle 280 ORC units.

Extensive resources have already been dedicated towards the development of WRBU and have been detailed throughout this Business Plan. Not already mentioned are:

- Approximately \$30,000 has been directly invested by the four charter members and they are directly responsible for an additional \$20,000.
- LLC members have invested thousands of hours into this project over the past 5 years

- This LLC is currently worth approximately \$500,000 in direct costs. This is based on the \$220,000 cost of the gasifier/burner equipment, \$100,000 for the final engineering study/report, \$10,000 for the greenhouse market viability study, development money from the Bonneville Environmental Foundation (BEF), and cash investment.

## MANAGEMENT & ORGANIZATION

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### Wind River Biomass Utility, LLC Management

#### *Tom Linde*



Retired from the U.S. Forest Service as a Federal Forest Enforcement Officer and with experience as a District Recreational Program Manager and Gifford Pinchot National Forest reforestation stand management, Tom brings a career's worth of knowledge and relationships in logging operations, forest ecology, and timber issues.

#### *Norm Ward*



Having served as Assistant Forest Land Surveyor for the Zoned Forest Boundary Management Program in National Forests and Scenic Areas all over the state of Washington, Norm has extensive experience with surveying and supervising field crews, in the Pacific Northwest.

### ***Bob Sourek***



After beginning his career with the U.S. Forest Service, Bob went on to found one of the first, and now the largest, wood pellet manufacturing companies in the United States. Bob has 30 years of experience in the wood-fuel industry in every aspect from supply to sales to policy advice for state and federal legislatures.

### ***Paul Spencer***



Currently serving as WRBU's Managing Member, Paul is a retired engineer with substantial experience in mechanical systems installations and project management following a successful career in steel foundries and high-purity silica glass fabrication.

### **Organization**

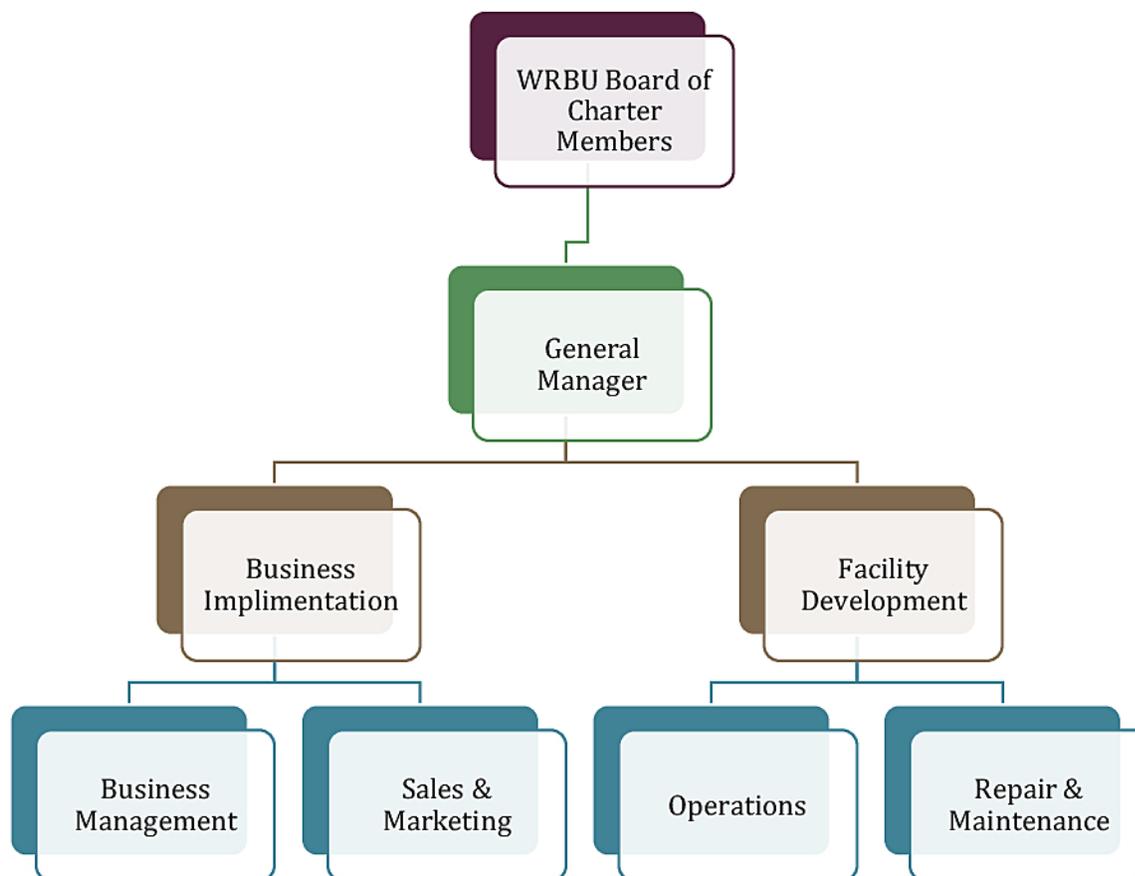
For the start-up period, the charter members meet at least once per month to discuss the current status and plan for 'next steps'. The Managing Member is the main point of contact for potential funders, suppliers, agencies, customers, etc.; but all developments are forwarded to all of the LLC members for review, discussion, and decisions.

During construction and installation work, the Managing Member will supervise and monitor all contracts with engineering and contractors.

As the CHP facility is being constructed, WRBU will hire an on-site manager for Operations in addition to two experienced millwrights to learn about the equipment and system as it is commissioned and integrated. Once fully

operational, the CHP facility should maintain ten (10) Full Time Equivalent (FTE) jobs spread out over four (4) main departments.

**Table 3: WRBU Organization Chart**



To view the appendices, please visit online at: <https://portofskamania.org/wrbiomass/more-information/>. The appendix includes the following items:

- A. **Site plan and site map**
- B. **Pictures of gasifier system**
- C. **Financial pro forma**
- D. **LLC Operating Agreement**
- E. **Admissions Agreement**