WINDUSTRY'S

Community Wind Toolbox

This chapter is part of Windustry's Community Wind Toolbox which is designed to guide you through various aspects of developing a commercial-scale community wind project. Each section gives you background information about particular steps in project development and provides you with resources to help you to do more in-depth research on your own.

2105 First Avenue South
Minneapolis, MN 55404
phone 612.870.3461
toll-free 800.946.3640
email info@windustry.org
www.windustry.org

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Chapter 3:
Community Wind Project Planning and Management

This section focuses on project management and planning, two elements that are essential to a successful 2-50 MW community wind project. Topics covered in this section include putting together a reliable project team and understanding risks and ways to mitigate them. The section also provides resources for creating a realistic project plan and timeline, as well as tips from experienced community wind developers..

This section builds on an excellent previous publication, "Community Wind: An Oregon Guidebook" prepared for the Energy Trust of Oregon by Northwest Sustainable Energy for Economic Development in 2005, available at: www.nwseed.org/publications

Key to Toolbox icons:

Best Practices | Caution | Links to more information | Information that will affect your project's bottom line | Example

Putting Together the Project Team

Community Wind Development Team = Board of Directors + Wind Energy Consultants

The first step in project management and planning is to put together a reliable project team. This team should have entrepreneurial spirit, experienced leadership, and a governance structure, as it will guide the project and provide accountability for decision-making. If this is your first wind project, the people that you and your project manager bring together can make or break your project

Project Governance

As with any multi-million dollar business venture, launching a community wind development effort requires a sound business operations structure. This includes an experienced Chief Executive Officer supported by team members, all of which are described below. If you have never presided over an enterprise of this scale, you may want to partner with a veteran project executive to help you steer though major decisions and management issues. Once your project is built, you will need to ensure ongoing oversight for maintenance monitoring, operations, and reporting on the various financial aspects of the business.

Chief Executive Officer. Developing a community wind energy project is similar to developing an ethanol plant. It takes a dedicated and diverse team to bring it into production, including a strong Chief Executive Officer and Board of Directors who will keep the project on track. The CEO should have experience in business, preferably in the energy sector, and should have a strong understanding of the wind industry and the associated risks and rewards of community wind development. The CEO is instrumental in developing relationships with potential investors and financing institutions. These are relationships that the project will depend on when capital is needed to move forward with development steps. The CEO should be savvy enough to understand when and how to exercise these relationships to ensure you meet the goals for investment share and return that you set out at the beginning of the project.

For a community project, it takes a person or a group that really believes in it to lead and organize and to spur the professionals on. Somebody has to volunteer to be the leader.

Keith Bolin
Hog Farmer and
Community Wind Developer
Bureau Valley, IL

In addition to key team members, community wind projects have connections to many different members of the community as well as local, state, and federal agencies and leaders. This picture shows the ribbon cutting for Minwind I&II, a farmer owned wind project. See Minwind Case Study for more information.

Photos: Windustry staff

Board of Directors. The Board of Directors should be diverse, and comprised of members of the community with experience with energy, rural politics, business management, and legal issues. The Board's job is to guide the project toward desired goals by providing input at various stages of project development and giving advice when important decisions must be made involving business planning, finance, and legal issues. Board members should be selected not only for these qualities but also for their ability to make sound business decisions that are not clouded by emotions or local politics. A strong and diverse board will help the project thwart troubles before they develop into substantial problems by drawing on their past experiences with similar endeavors and making difficult decisions when issues do arise. A strong board can also help attract equity to the project, when needed, because investors will have assurance that their money will be used in a responsible way.

Project Manager. An effective project manger acts as the development team leader. He or she is responsible for making sure that tasks are assigned to the proper team members and completed within the timeframe required to meet project deadlines. The project manager should be experienced in wind energy development and able to properly assess project risks and team member talents. In addition, this person is responsible for making sure team members exchange needed information in a timely manner. A project manager should communicate well, be organized, and be capable of managing all team members to ensure efficient use of resources and time.

The project manager, in many cases, will be the public face of the project, engaging community members and meeting with officials. He or she will be closely involved in the negotiations for turbine purchase, power purchase agreement, and interconnection. An understanding of business metrics, as they pertain to community wind development and local politics, is a must for a well-qualified team leader.

The project manager is often a seasoned wind developer who the project proponent hires. You may wish to hire a project manager who has developed other types of large energy projects, since the skill sets for developing community wind projects and other generation facilities are similar. The key is to hire someone that you trust, because this person will be primarily responsible for making sure that you and your investors realize your desired return on your investment.

Key Consultants

Putting together the right team to execute community wind energy development is very important; you should consult with others who have completed similar projects to learn about their experiences with specific consultants, manufacturers, and construction companies. You need to make sure that your project's team of consultants consists of experienced and reliable individuals with whom you have good rapport. Your project will require expertise in areas that include but are not limited to:

- Wind resource assessment
- Environmental impact studies
- Interconnection design
- Construction management
- Foundation design
- Legal agreements

How many experts you decide to hire for your project will depend on the Board's experience and level of comfort – and the time the Board is willing to devote – in each of these areas. If you have little expertise in wind energy, you may want to hire experts for each of these project development aspects. Some community wind developers may feel qualified to undertake certain tasks themselves.

Wind Resource Assessment. Evaluating and documenting the wind resource at your site is one of the most important steps in the design of your project. For a commercial-scale project, you will need to conduct extensive on-site data collection and analysis. The wind data requirements to finance a 50 MW project are often substantially more rigorous than what lenders may require for a 2 MW project. Consulting a meteorologist or wind assessment professional for input on where turbines should be sited is required for some federal grants, and is recommended for sites with complex terrain. A meteorologist or site modeling specialist can confirm the best positions for the equipment and for the project's expected output.

Environmental Impact Studies. For many community wind projects, an environmental impact assessment is required. Professional scientists can help negotiate study protocols and conduct a scientifically sound field survey. A defensible set of environmental studies is important for obtaining permits and community support. Many grants come with requirements for who needs to perform the study and what it must cover. Consulting with local, state, and federal wildlife and environmental agencies will help you to understand what expertise will be required to complete environmental impact studies.

Interconnection Design. The utility your project interconnects to will design the interconnection system for your wind project, but it may be a good idea to contract with an engineer who is independent of the utility to help design the interconnection system, ensure that the utility's plans are within reason, and confirm that associated costs are realistic. Construction managers are often able to recommend an engineer with interconnection experience.

Construction Management. The construction manager is a critical team member, responsible for overseeing construction of the project and operating within budget and schedule constraints that may be imposed by power purchase agreements

or the expiration of incentives. Ideally, you will be able to hire a local general contractor with previous experience managing wind turbine installations. If not, your turbine manufacturer should be able to recommend one or more high quality construction managers.

Steel tube which makes up a portion of the foundation of Carlton College's 1.65 MW wind turbine.

Photo: Carlton College, Northfield, MN

Foundation Design. The turbine foundation is a site-specific structure, and it must be properly designed to bear the substantial loads placed on it by the wind turbine. A civil engineer will be consulted to conduct soil tests and recommend a foundation design, or to create a new design as the case warrants. Your turbine manufacturer may be able to provide a list of engineers who have previously designed foundations for their turbines.

Legal Assistance. You will most likely have to hire multiple attorneys with different areas of expertise to see the project through to fruition. Power purchase agreements, turbine procurement, project financing, land control, and various associated contracts are specialized to the independent power industry. Some attorneys also specialize in permitting and environmental compliance. These parts of a community wind development process must meet industry standards. A community wind project is a multi-million dollar investment and it is worthwhile to consult attorneys experienced in corporate and tax law to make sure that your assets are protected should the project not perform as expected.

Risk Management

Wind projects often have a protracted period of at-risk investment.

Until all permits, financing, and equipment are obtained, risk remains that the project will not be completed. It is therefore essential to be prepared to face and manage risks.

The right project team, including a project manager who is familiar with the associated risks, should be able to incorporate risk mitigation into a successful management plan.

Wind project development risk factors, or sources of risk, fall into three main categories:

1. **Energy Production Factors**
   - Wind resource
   - Equipment
   - Operations and maintenance
   - Force majeure
2. **Other Revenue Factors**
   - Value of energy produced
   - Tax benefit allocation
   - On-again/off-again tax subsidies
   - Transmission

COMMUNITY WIND DEVELOPER TIP

Get the Numbers Right

Good projects sell themselves and economics are the main selling point so it is very important to get your numbers right.

Involve the Community

Getting public feedback with regards to project siting is absolutely essential in gaining public support for a project, especially in relatively densely populated areas.

Loren Pruskowski
Sustainable Energy Developments, Inc.
Ontario, NY

3. **Other Project "Make or Break" Factors**
   - Permits
   - Environmental impacts
   - Public acceptance/politics
   - Site control
   - Construction

The typical sources of risk within each of these categories are described in the following table, along with key tools to help manage that risk. Though all of these risks can prevent a project from coming to fruition, you may have more control over and can more easily mitigate some than others. Ratings of risk levels shown in the table illustrate how much of a factor each risk plays in the overall project plan. A one-star rating is typically easy to deal with, if you have planned appropriately. Five stars means that you have no control over this risk or that it should be evaluated early in the development process because it represents a potentially "fatal flaw" – one that can terminate a project.

The following is adapted from similar tables found in "Community Wind: An Oregon Guidebook" prepared by Northwest SEED and "Community Wind Financing" published by the Environmental Law & Policy Center.

RISK FACTORS

Energy Production Factors	Issues	Mitigation
Wind Resource LEVEL OF RISK ●●●●●	Cash-flow projections based on wind resource assessment are only as accurate as the assessment. Long term cash-flows determined from a year when wind speeds are 10-12% higher than the long-term average of your site will cause your project to fall short of meeting return requirements set by investors.	*Higher-quality and longer term resource assessment mitigates the risk of inadequate long-term production. However, more robust resource studies and record extensions require more upfront capital that may not see return. To balance this risk, consider getting expert opinions and using public reference stations for data. When making assumptions for the project's pro forma, you should take the wind data's uncertainty into account by using conservative assumptions for long-term production projections.*
Equipment LEVEL OF RISK ●●	As with any equipment, wind turbines require regular maintenance and occasionally break down. Turbines not properly maintained will break down more frequently with more costly repairs. An offline turbine also means lost production and lost revenue. Typical equipment warranties are two years, and extended contracts may be purchased for up to five years. After this period, if the turbine faults it is your responsibility to get it running, which can mean costly repairs.	*Siting your project close to existing projects with the same manufacturer can provide easier access to maintenance personnel and spare parts. After the manufacturer's maintenance contract expires, you will need to negotiate a contract for future maintenance or find another firm to maintain the turbines for you. Extending the turbine warranty will cost extra in the short run but can provide piece of mind and make financing easier to acquire. Begin setting funds aside in year one to safeguard against equipment failures after the warranty has expired.*
Operation and Maintenance LEVEL OF RISK ●●●●	As described above, the turbines will need to be maintained through their 20-year lifetime to keep producing well and prevent failures.	*Mitigate operation risks by hiring an experienced site manager and entering into a solid maintenance contract. Your manufacturer will provide the maintenance schedule and requirements for the turbine warranty to remain valid, and may be willing to train you or a member of your team to perform maintenance on the turbines after the warranty expires. This will involve regularly climbing the towers as well as an understanding of electrical equipment.*
Force Majeure *(Acts of Nature)* LEVEL OF RISK ●	Ice storms in the winter, lightning strikes in the summer, and other extreme weather events can damage wind turbines and other system components, reducing production of the turbines and potentially requiring extensive repairs.	*Fully insuring the project mitigates your financial loss due to force majeure (acts of nature). This will add to project costs but will provide much needed peace of mind against the loss of your investment. Financing institutions will probably not lend capital to a project without proper insurance.*

RISK FACTORS

Other Revenue Factors	Issues	Mitigation
Value of Energy Produced LEVEL OF RISK ● ●	In order to secure financing of the project, required revenue streams are needed to appease lending and/or other financing institutions as well as investors. The largest component of project cash flow is from the sale of electricity. If the power purchase rate is not high enough, it will be very difficult or impossible to acquire financing.	*Consider what type of utility provides service in the area where the project is located, that utility's attitude towards community wind projects, and its need for power. If the prospective power purchaser is obligated by a renewable energy standard or is actively looking for wind energy for its generation portfolio, this will affect Power Purchase Agreement (PPA) negotiations. Also, consider Renewable Energy Credits as an additional commodity worth negotiating. Wheeling might also be an option to increase overall revenue, but will add cost and complexity.*
Tax Benefit Allocation LEVEL OF RISK ● ●	When developing a project, the projected cash flow is only as accurate as the assumptions made. Tax treatment of wind energy projects can be complicated, especially when taking advantage of tax-based incentives such as the PTC, accelerated deprecation, or state tax based incentives. Falsely representing your project to the IRS, even if you are unaware you are doing it, could send your project into financial ruin and cause penalties or even criminal prosecution.	*Consult with a tax professional to make sure that the proposed tax benefit allocations are acceptable. IRS Private Letter rulings may be necessary to address specific technical tax issues. A professional may also suggest more efficient ways of structuring your project to decrease your project's tax burden, as well as how to better take advantage of tax based incentives.*
On-again/ Off-again Tax Subsidies LEVEL OF RISK ● ● ● ●	The uncertainty of incentives such as the federal PTC can wreak havoc on projects dependent on the revenue from these incentives, creating development deadlines and market uncertainty with large fluctuations in turbine availability, price, and other project variables.	*Be aware of any assumptions made in the financial plan, and have contingency financing plans whenever possible.*
Transmission LEVEL OF RISK ● ● ● ●	Without transmission, your project does not have a route to get the energy it produces to consumers. If the electric grid faces transmission constraints, you may have to downsize or relocate your project to avoid expensive upgrades that can severely impact the cost structure of the project and its viability.	*This risk can be mitigated with careful siting within the utility system, relocation, or resizing of the project. Be flexible with these variables so that when interconnection study results come back, your project plan is not so rigid as to kill your project.*
"Make or Break" Factors	**Issues**	**Mitigation**
Permits LEVEL OF RISK ● ● ● ● ●	Commercial-scale wind electricity generating facilities need many different permits before construction can commence, including: building permits, Federal Aviation Administration permits, and permits for access roads. State agencies may also require that you provide proof that your project will not interfere with communications, television reception, or other forms of electromagnetic communication that require studies.	*Contact the appropriate agencies early in the planning process so you understand what is involved in obtaining the required permits. Doing so will allow you to plan other aspects of the development process around these requirements and timelines. FAA permits are "fatal flaw" tests for a project. The application fee for an FAA permit is inexpensive, so apply for it early to determine if your project can stay where it is being planned, or if it needs to be moved because of its proximity to an airport or military radar installation.*
Environmental Impacts LEVEL OF RISK ● ● ● ●	In deciding whether to issue a permit, local planning departments may require a number of environmental studies on sound, wildlife presence, rare plants, land-use impacts, and aesthetics.	*Researching existing information will help determine whether the project might raise critical environmental concerns. Early involvement of environmental and wildlife experts (such as the state Department of Natural Resources) and potential critics (such as local wildlife organizations), as well as thorough responses to concerns, careful project layout, and a detailed construction plan can mitigate these risks and make the permitting process go much more smoothly.*

RISK FACTORS		
"Make or Break" Factors	**Issues**	**Mitigation**
Public Acceptance/Politics LEVEL OF RISK ●●●●	Objections from the public can range widely and are hard to predict. Some neighbors may be concerned about noise from the turbines, while others may not want to have turbines visible on the landscape or see them as encroachment of civilization in a rural area.	*It is important to understand local concerns and plan appropriately. Siting the project to minimize sound, visual, and wildlife impacts decreases the likelihood of public opposition. Plan to consult with community members and other stakeholders early in the project development. At the least, you will learn what opposition you may face early, and at best, the open communication will alleviate public resistance to the project.*
Site Control LEVEL OF RISK ●●	You will need to obtain control of the proposed project site to obtain permits, financing, and some grants and incentives for the project. Securing control of the site requires an investment of time and more importantly, money. In "locking up" land too soon, there is risk of investing in a site that turns out to be unsuitable. Waiting too long increases the risk of investing in the site only to lose building rights.	*To protect project development investments, it is prudent to execute a pre-development option agreement upon completion of the fatal flaws review. Work with property owners, a title company, and county planning office staff to ensure that no surprises related to land ownership or use restrictions arise later in the development process.*
Construction LEVEL OF RISK ●●	Timeframes for project completion can be tight due to PPA stipulations, requirements from granting or lending institutions, as well as incentives that your project may depend on for a good return. Construction delays also mean lost revenue from no production.	*To mitigate the risks associated with construction delays, develop a contract that includes completion dates and penalties if the construction firm, turbine delivery/supplier company, and/or material suppliers do not meet these deadlines.*

Feasibility Study

To determine whether significant resources should be spent to move a project forward, it is wise to hire an outside firm to perform a feasibility study. This study will help you to better understand the market that the project is entering into, aid in developing a comprehensive business plan, and consider many of the "fatal flaw" tests up front. There are many consulting firms with experience in wind energy project development that can help to draft a portion or all of the feasibility study.

Items typically included in a feasibility study are[1]:

- Description of the Project
- General Setting and Need for the Project
- Market Potential (both Current and in the Future)
- Supply of Raw Materials and Equipment Procurement Plan
- Supply of Labor and other Key Inputs
- Technical Characteristics and Specifications
- Development Schedule and Production Plan
- Capitol Requirements and Investment Schedule
- Sales Plan and Revenue Schedule
- Projected Operating Costs and Net Revenue
- Schedule of New Benefits – Partial Budget
- Economic Feasibility of Project
- Financial Plan for Project
- Appendices and Notes
- Management Requirements for the Project

A project that fails a "fatal flaw" test most likely should be abandoned. Sticking with a fatally flawed project will cost a great deal of time, money and legal headaches, so it is important to know when to terminate the project development.

[1] *James Matson and Joe Folsom, U.S.D.A.*

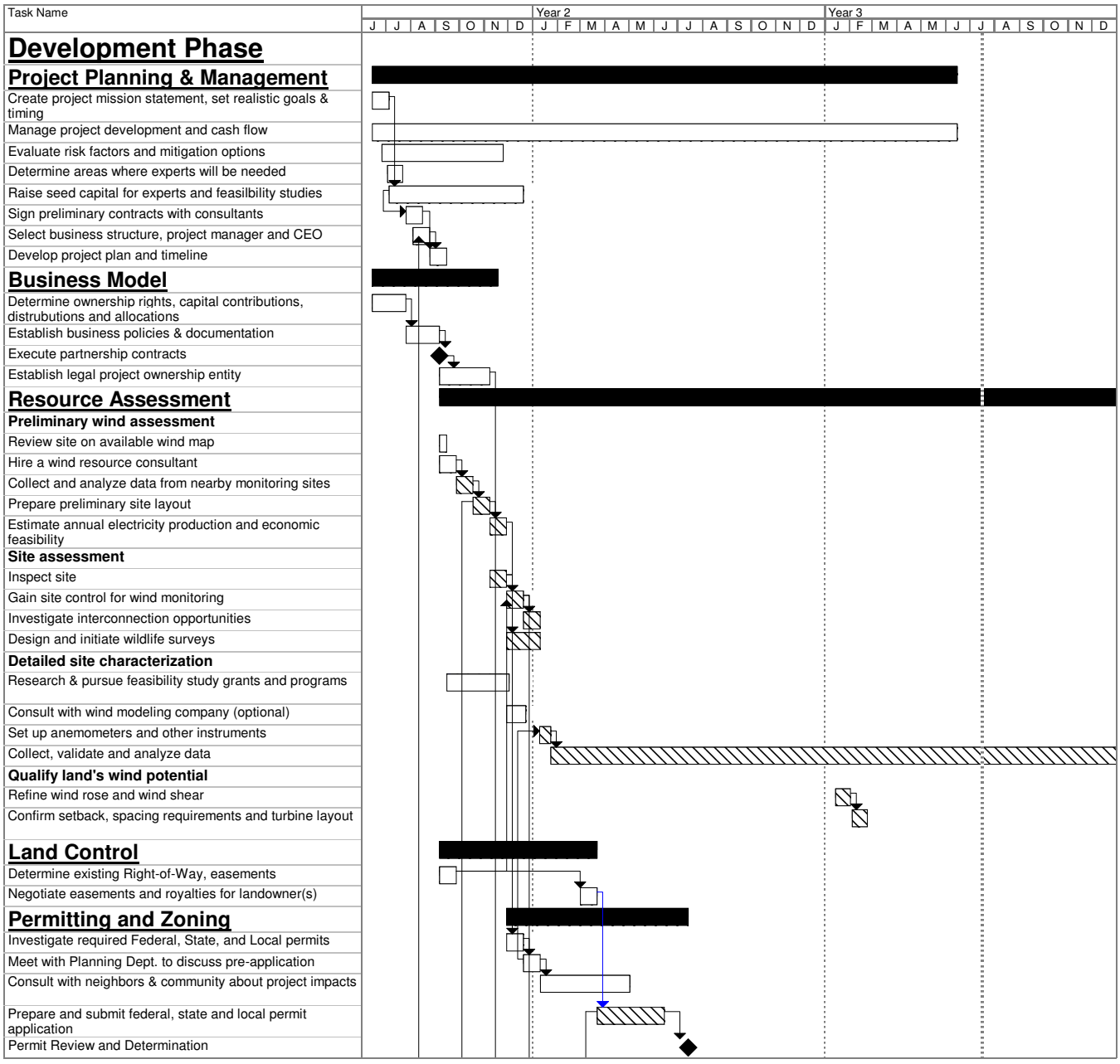
Tips for Managing Community Wind Development

Project Plan and Timeline

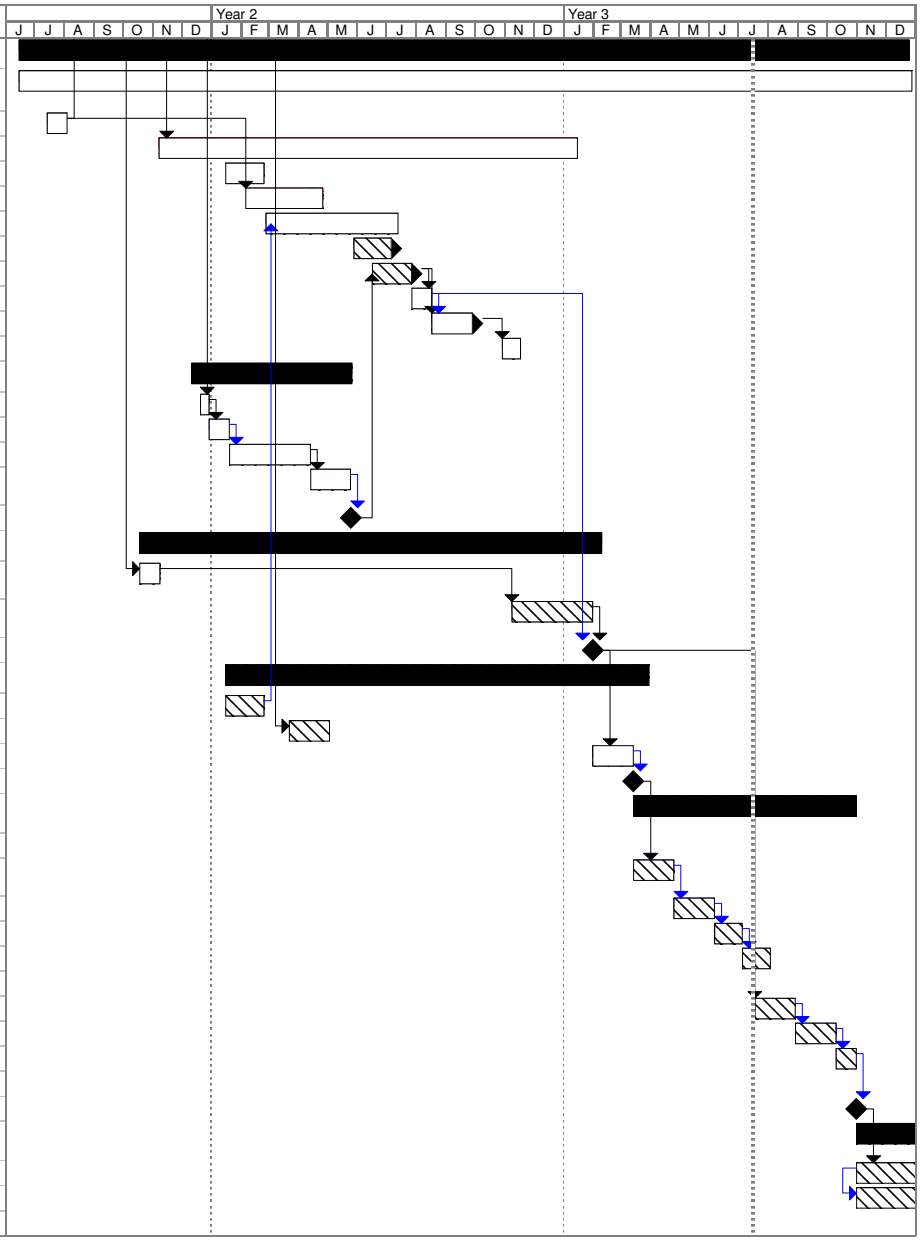
Planning a community wind project requires juggling many processes at once and dealing with a lot of different people, agencies, and businesses. It is important to be organized during the development of your project so that critical steps are not missed. One way to make sure that you stay on top of all the necessary steps and required paperwork is to develop a detailed project plan and timeline before advancing too far along in development.

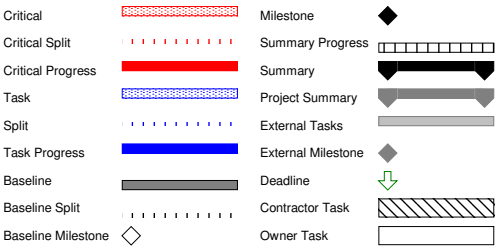
Your project plan should identify the project's team members, define the tasks that need to be completed, assign tasks to team members, determine task dependencies, and lay out the project's timeline. A good way to organize your project plan is to break it up into the typical phases of project development. The chart below shows an example project timeline that can serve as a good guide for your project plan.

The following is adapted from similar chart developed by Northwest SEED for "Community Wind: An Oregon Guidebook."



Task Name
Financing
Generate balance sheet, cash flow & income statements
Research eligibility requirements for incentives
Conduct equity drive
Define insurance requirements and solicit estimates
Complete applications for loans and grants
Determine expected costs and revenue
Negotiate & execute contract to sell RECs
Negotiate & execute Power Purchase Agreement
Negotiate & execute agreements with equity investors
Execute insurance and other vender agreements
Prepare tax incentive applications and documentation
Utility Interconnection
Complete interconnection application
Meet with utility and agree on interconnection studies
Perform interconnection studies and review
Execute interconnection and (if needed) transmission agreements
Place transformer order with deposit
Turbine Selection and Purchase
Review turbine options and determine best turbine for project
Negotiate and execute turbine purchase agreement, warranty and O&M contract
Place turbine order with deposit
Construction Preparation
Investigate potential contractors and solicit estimates
Soil borings and foundation design
Determine construction timeline
Execute construction contract
Construction Phase
Site preparation
Grading, road improvements/construction, fencing & erosion control
Substation construction/ improvements and testing
Trenching, cable-laying and transformer installation
Foundation and crane pad construction
Turbine installation
Turbine and tower transportation
Turbine and tower assembly
Complete Interconnection
Testing and commissioning
Inspections Completed and Operations Startup
O&M Phase
Ongoing project management & financial oversight
Perform routine maintenance checks and repairs
Decommissioning and site restoration (end of project)





Conducting a successful equity drive

One of the key pieces to moving the project forward is to attract equity for constructing the project. The more equity you are able to raise, the less money the project will have to borrow or seek from an outside equity firm.

David Kolsrud, a farmer who has successfully developed both farmer-owned wind and ethanol facilities, suggests these 13 steps for a successful equity drive:

1. Select an equity fund manager (if necessary)
2. Prepare an offering circular
3. Write a budget
4. Identify potential investors
5. Identify size and scope of area to hold meetings
6. Organize and set equity meeting schedule
7. Develop your presentation
8. Visit and educate area lenders on the project
9. Advertise, advertise, advertise
10. Set up a schedule for which board members will attend and conduct the meetings
11. Set up escrow account and agent
12. Conduct meetings
13. Conclude drive and continue communication with new membership

The key is persistence and having clear objectives when conducting an equity drive. Depending on the number of investors you are seeking, the number of shares you are offering and at what price, you may have to set up many meetings with potential investors. When raising funds for past projects, Mr. Kolsrud has set up three meetings a day, five days week, for several months at a time. Before setting up these meetings you should establish clearly defined goals and have performed economic feasibility analysis to justify to yourself and would-be investors that the wind project, if built, will succeed.

It is also very important to make it clear to investors, especially early investors, that there is the potential that the project might not be constructed. They should be aware of the risk involved due to the volatile nature of the wind industry and electricity markets. Addressing these risks in your business plan and offering a prospectus is a must. Researching the wind industry and market for wind energy and being realistic to investors up front will help you to manage risk much better as the project moves forward. It will also convey to your investors that you fully understand earnings potential AND loss potential and that you are developing strategies for dealing with each of them. Open and honest communication from the outset is key to developing a successful project.

Some of the steps in performing an equity drive require legal assistance, such as when you are preparing the offering, setting up the LLC, and organizing financial arrangements. You need to be clear from the outset as to what the funds will be used for as well as to whom you are marketing your wind business. Visit Windustry's case study on the Minwind projects for an example of how projects can be structured for smaller investors.

COMMUNITY WIND DEVELOPER TIP

Realism

Be realistic about the outcomes of your project. Being overly optimistic in assumptions about your project financials can jeopardize the entire venture.

Make Friends

Networking is key to success. Learn from others who have traveled the path before you. This can add valuable insight to your project. Aiding other developers today by lending expertise or contributing capital can reap rewards tomorrow when you in turn need assistance in developing your own project.

Reason not Emotions

Do not let emotions cloud your decision-making ability. Decisions about project governance, who will host turbines and investors should be made on a purely economic basis. For instance, wind towers should be placed on the land with the best wind resource and ease of access to transmission, regardless of who owns it.

David Kolsrud
DAK Renewable Energy
Brandon, SD

Conclusion

Developing a farmer-owned community wind project has many analogies to constructing an ethanol cooperative. Farmers own corn and other feed stocks that can be utilized to create bio-fuels. Communities that possess a robust wind resource have the opportunity to develop wind projects themselves or market their natural resource and be a partner in its development. Participating in an ethanol cooperative provides larger rewards than simply selling corn to a company that will in turn process the corn into ethanol and sell it at a much higher margin than the farmer is receiving for producing the raw commodity. Owning the wind turbines and directly benefiting from the sale of electricity and incentives yields a much higher return than just simply leasing land to a developer for periodic payments.

Community wind projects can be complex and may involve many different experts and stakeholders. You may have the initiative and vision to recognize an opportunity, but may not have all the skills needed to transform that vision into a reality. A reliable and experienced project team and a well defined project plan will be instrumental to the success of your wind project.

Seek Legal Advice Before Advertising Your Project

You must be aware of legal constraints and Securities and Exchange Commission (SEC) rules and regulations so that you remain within the law. SEC rules and regulations will dictate when, where, and how you can advertise or talk about investment opportunities in your project.

It is advisable to hire skilled legal expertise for guidance.

Additional Resources for Project Planning and Management

"Taking Ownership of Grain Belt Agriculture," published by the National Corn Growers Association:
http://www.mncorn.org/servlet/mcga/resource/taking_ownership.iml?area_id=14&thispage=resource/taking_ownership.iml

"Community Wind: An Oregon Guidebook" prepared for the Energy Trust of Oregon by Northwest Sustainable Energy for Economic Development:
http://www.energytrust.org/RR/wind/community/guidebook/2.pdf