Wildcat Wind Power

Advisors

Electrical
Dr. Ruth Miller, Associate Professor, Kansas State University

Mechanical
Dr. Warren White, Associate Professor, Kansas State
Greg Spaulding, P.E., Assistant Professor, Kansas State
Dr. Youqi Wang, Professor, Kansas State University

Business
Kim Fowler, Graduate Student, Kansas State
Jason Schmitt, Founder & COO, Nitride Solutions

Mechanical Team

Joe Kuhn – CEO/President
Aaron Akin
Stuart Disberger
Bret Gross
Aaron Thomsen
Jordan Robl
Cody Yost
Lane Yoder

Electrical Team

Will Duren – CTO/Senior VP
Martin Mixon
Shae Pelkowski

Business Team

Matt Clark – CFO/Senior VP
Tanzila Ahmed
Lawryn Edmonds
Armando Marquez
James Remley
Zachary Wassenberg

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Executive Summary

Wildcat Wind Power seeks to provide affordable, reliable, and efficient wind and solar powered lighting solutions. We believe that providing renewable-energy powered street lights that work independently from the grid can offer more than just energy savings. During power outages, our street lights will continue to glow, promoting safety during a potentially troublesome time. We believe that this feature will allow us to succeed across the globe, as there are many reasons for grid issues, including weather, maintenance, instability, or lack of resource.

Our business hopes to be a leader in renewable energy technology in the near future. The opportunities that exist with harnessing wind and solar energy are both exciting and a growing necessity. There may not be enough sunlight in the day to get things finished with today's fast-paced and globally integrated economy. In order to keep up and continue economic growth, sometimes a few more hours are needed throughout the day. That's where Wildcat Wind Power can help. We can help light the path for that delivery that needs to be made by sunrise. We can help keep families safe when they get an early start on vacation. And we can be there when a disaster hits, and everything else may seem lost.

We believe that there is a market gap in options for reliable public lighting, especially in hurricane prone areas. Current lighting relies on either metal halide or high pressure sodium lights, which do not last as long, and consume more energy, than LED bulbs. By using solar and wind energy to generate power, and batteries to store this energy, our lights can remain disconnected from the grid. Not only can our streetlights reduce electricity costs, they can also cut maintenance costs. Additionally, our design allows for the streetlight to be easily removed (by appropriate persons) by utilizing a detachable base. This allows for quicker disaster relief by making it quick and easy to replace any broken poles and restore streetlights quicker.

We feel there is great opportunity for our design to be used in the coastal areas of the United States. There is a large potential for harnessing the sea breeze, and with some offshore wind farming efforts halting for various reasons, we believe this solution will be well received by the public. We envision success in this market, and will pursue other markets after this, including the interior US, as well as overseas markets. Internationally, we believe we can succeed greatly, as there can be unpredictable, and sometimes manipulated, control of power from the grid.

Wildcat Wind Power is dedicated to providing reliable, efficient, and environmentally friendly streetlights. To do this we will use wind and solar power to create a streetlight that uses no power from the grid and provides an equal amount of light. It will also provide a source of electricity during times of emergency. Wildcat Wind Power is dedicated to stable financial growth, environmental responsibility, and community improvement.

Our team is composed of Mechanical and Electrical Engineering students from Kansas State. These students compose three main teams: Mechanical, Electrical, and Business. Communication between these three teams has been a challenge, but thanks to current technologies, such as group texting services, and shared online storage such as Google Drive, we have maintained this communication between teams. We hold weekly meetings where all team members attend, to update all other teams on progress made in a certain area, as well as smaller team-specific meetings at other, more frequent times. Our business plan is based off of our Mechanical team's design, with slight variations (found in Appendix B). We decided to implement a twisted-H rotor design in our business plan due to its multi-angular response, however due to manufacturing constraints, were not able to prototype this for our design challenge.

Our company logo, designed by Jay Disberger, can be found in Appendix A. This is our logo that is used in all outward communication, as well as on our team polos. We also include a logo for the

Kansas State College of Engineering, as we are still a design team sponsored by them, and appreciate all the help and support we have received from them.

Figure 1 - Company Logo, Designed by Jay Disberger

Business Overview

Power generation is, and will remain, a controversial topic within our economy. With depleting oil reserves, constraints on coal usage, as well as fossil fuel's effect on the planet, there is now a large amount of public pressure for renewable energy sources. Wind and solar farms have had success with alleviating some of this pressure, but cannot currently solve every issue. Wildcat Wind Power (WWP) believes we can help. There is clear and present need for renewable energy sources, as well as high efficiency utilities in our communities. We have designed highly efficient, renewable energy based public lighting solutions to meet these needs.

The basic standards for WWP to be a sound business are the capabilities of designing and selling the best product. The requirements to complete these include a manufacturing plant implementing the latest technology and a management team with the appropriate experience and expertise. Another necessity for the company is a network of agreements with other companies. These business partners will be our suppliers of steel, generators, and solar panels, as well as other suppliers and consultancies. Finally, in order to be successful, a timely market deployment is vital. This includes manufacturing our streetlights, marketing in the correct areas, meeting with potential buyers to inform them of how our product can benefit them, and finally closing the sale.

Our company is offering an elegant, free-standing lighting solution that is separate from the grid. We provide highly efficient, sustainable wind and solar powered outdoor LED lighting solutions. Our product is aesthetically pleasing with a twenty year lifetime guarantee and low maintenance. WWP's target market is coastal cities with a continuous sea breeze. Inspiration for this market came from travelling over multiple bridges in Florida, and noticing the constant high wind speed that these locations were receiving. We also believe that our lights can be used at any beach to avoid wiring required to light popular areas and piers. Any city or area that chooses WWP for their lighting solutions will be seen as a model city of the future, while also being an environmental leader. In order to further our business, we will continue designing and engineering for different locations, such as the interior US, which may see larger wind speeds at a less consistent and predictable behavior. We also plan to pursue markets outside the United States, and will evolve designs to fit these markets.

We hope to become a leader in renewable energy lighting solutions, and in order to get there, we will maintain positive relationship with our customers. WWP will have easily accessible contact for our customers and potential customers, through phone and email. We feel that these are the best and most commonly used modes of communication between customers and a business. Through these means of communication, our customers can find out more information about our products, provide feedback, troubleshoot any issues, or speak with our sales team about ordering. In addition to our direct contact methods, WWP's Facebook page would be a good form of communication between the company and customers, allowing us to disseminate information to our customers. It can also stand as a ground for communication between the customers themselves.

WWP has taken into account the monetary consequences to run the business. This includes the price of production, materials, salaries, and marketing fees. The revenue streams from which money is earned is through our sales. Further reading on our financial analysis for our company can be seen in our Financial Analysis section.

As our main focus is environmental sustainability with our product, our business will hold true to triple bottom line practices. WWP exhibits high business morals and corporate social responsibility. We do so by ensuring that we follow OSHA guidelines as a minimum, which will protect the health of our manufacturing workers. We will be environmentally conscience in our manufacturing process, making sure to retrieve all scrap for recycling. Ideally, we will source our power from renewable energy sources, which is one benefit of basing our operations in Kansas, due to the increasing amount of wind farms. While not all manufacturing processes cannot be kind to the environment, we believe that our product more than makes up for this. We are proud of our roots and our supporting community, and will make sure our community knows how much they have helped us. The city will be able to enjoy the many economic benefits our business will bring, such as manufacturing jobs and sales taxes. We plan to base our operations away from main residential areas, as to not disrupt those areas with shipping traffic and some of the dangers and non-idealities that manufacturing plants create.

Market Opportunity

Market Gap

After researching current renewable energy light sources (RELS), we found that vast majority of them are mass produced. This causes them to be generic in terms of functionality because of this generic design many of the RELS are inefficient for clients specific location.

Target Client

We plan on selling to coastal cities with large amounts of boardwalks and recreational beach areas. We plan to sell RELS for these areas to eliminate the need for on grid public lighting. Our goal is to reduce the eye-sores associated with on grid lighting such as large overhead power lines. These on grid public lights will be replaced with our aesthetically pleasing RELS.

Potential Solutions

To capitalize upon this market gap our solution is to have a company based on maximizing RELS power for a client's specific location. This would involve doing case studies of each city in our market forecast. With these case studies we could design optimal RELS' to market to our clients. This unique approach to marketing and selling RELS will give us an opportunity to enter a competitive market place. Due to our unique case study approach the RELS designs will be more efficient than our competitors, thus making our product more desirable by reducing capital costs. In Appendix B are provided wind and solar maps, generated by 3TIER, a global renewable energy consultancy. Looking at these figures, it is interesting to see that there is a quasi-inverse relationship between solar irradiance and wind speed for certain geographies. This is why we feel that the solar panel and wind turbine combination can help us expand to a global market.

Design Implementation

To make our solution to the market gap realizable we will have multiple sizes of wind turbines and solar panel blocks for construction, which will work in tandem to charge a battery to power a 60 Watt LED bulb. After a case study is done for a particular client we will select the appropriate size of turbine for the client's location. We will also find the most cost-efficient balance between wind and solar power, using equations found in Appendix B. Depending on the clients location a battery bank will be sized for each RELS. These design ideas will ensure the most cost effective product for each individual client.

Management Team

Management:

Joe Kuhn (Founder, CEO, President)

Joe helped establish Wildcat Wind Power as a collaborative effort between Electrical Engineering and Mechanical Engineering. For the Mechanical Engineers, this was their senior design project for a capstone class in their department. Joe led this group of seven other students in designing and prototyping a vertical axis wind turbine to compete in the NREL sponsored Collegiate Wind Competition. Joe is currently a senior in Mechanical Engineering at Kansas State, and has previous experience working as a Design Intern at Bombardier Learjet. (Résumé attached, Appendix A)

Will Duren (Founder, CTO, Senior VP)

Will was approached by Joe to help with the design of the turbine competing in the CWC in August 2013. Since then, Will has been the Electrical Team Lead, helping design the circuitry necessary to meet competition requirements. He has taken power-oriented classes, including a Renewable Energy Lab. Will is currently a junior in Electrical Engineering at Kansas State, focusing on Power Systems. He has previously worked as an Electrical Engineering Intern at Burns & McDonnell. (Résumé attached)

Matthew Clark (CFO, Senior VP)

During his undergraduate career, Matthew had maintained an interest in business and finance aspects of engineering. While studying in London at the University of Hertfordshire, Matthew took a finance course that gave him an introduction to business finances. Since then, he has completed other business and economics courses and plans on getting an MBA after undergraduate studies. Matthew is currently a senior in Electrical Engineering at Kansas State, focusing on Digital Systems, with a minor in Business. He has previous experience as a Software Engineering Intern at John Deere. (Résumé attached)

Board of Directors:

Will Duren, CTO

Matthew Clark, CFO

Jason Schmitt (Founder, COO, Nitride Solutions)

Mr. Schmitt graduated from Kansas State in 2003, and has also earned a Chemical Engineering and MBA degree from Warsaw University of Technology. In 2007, Mr. Schmitt started up Kansas Semiconductors, focusing on creating aluminum-nitride substrates, and in 2009, founded Nitride Solutions, focusing on compound semiconductor substrates.

Kim Fowler (Graduate Student, Instructor, and Researcher, KSU)

Mr. Fowler is currently a graduate student and Ph.D. candidate in Electrical and Computer Engineering at Kansas State. He was previously the owner of Sharfus Draid, Inc., a consulting agency for systems engineering, system architecture, and program management. He is also currently a Fellow at IEEE for his "contributions to mission-critical and safety-critical systems engineering".

Product Development and Operations

Wildcat Wind Power will not only be a reputable company for our designs, but for our manufacturing as well. To begin, we will source steel poles from a supplier, as we feel this is the most economically responsible thing to do at the time. We will spec the steel to the correct dimensions, and it will be ready for assembly upon arrival. The twisted-H blades and interior Savonius structure will be designed and manufactured on site using 3-D printing technology. WWP believes that this technology is best suited for our needs due to its ease and safety of operation, accuracy, and relative timely production of parts. With 3-D printing, it will also be significantly easier to modify designs for testing of future products. Generators will be sized and sourced, as well as solar panels and battery. The generators will all be of the same design, however, the solar panels and battery sizes and specifications will differ for different markets. These may be specifications that we can narrow down upon deployment of our product and receiving critical feedback. We chose lithium ion batteries as the technology is evolving in a positive direction rapidly, and with designs for large scale lithium cell production facilities being talked about, it will eventually be a considerably cheaper alternative to other energy storage.

In order to deliver our product to our customers, we will source our delivery management to one of many successful transportation companies. One issue with this is an increase in cost, which we hope we can lower by our volume shipped with a specific company, and by building up a trusting partnership. One issue that may happen during shipment is damage to the product, the most vulnerable part of which is the turbine blades and the solar panels. Although it is not as convenient for the customer, we will ship these parts detached from the structure to try to be efficient with shipping, as well as making sure to deliver an undamaged product. Setup from there is as simple as attaching the structures with a few special connections. This is our largest concern for the company – the customers' hesitation to purchase our product knowing they are not already set up. We hope that after providing instructional videos as well as in depth instructions with the product, the customer realizes that this is for the safety of their purchase, and that we are only doing it to ensure their satisfaction.

Another challenge we will face is reluctance to spend more for our product when existing street lamps may be less. We hope to educate our customers about the energy savings received with our lamps. Looking at the formula below, if we use conservative estimates of 100 Watt bulbs on current street lamps, and assume an average of 12 hours per day of use, and \$0.14 per kWh:

$$0.1\ kW \times 12\ hrs\ \times 365\ days \times \frac{\$0.14}{kWh} = \$61.32\ per\ year$$

Annually, the customer is saving around \$60 per lamp by using our street lamps, using conservative values. This figure does not include cost savings of lower maintenance and less expensive replacement parts due to our high-volume 3-D printing. It also does not include the fact that these street lamps are designed to last for many years and through many different stresses.

Please refer to Appendix B for further technical design and analysis.

Financial Analysis

In order to project our needed capital to finance our business, we have performed multiple financial analyses in order to scope the size of our project. Within our analyses, we have made a few assumptions, outlined below, in order to leave room for divergence from our plan. In our plan, we assume the following:

1. Ignore inflation; assume 20% for taxes.
2. Ignore the time value of money (no investments or capital gains).

3. For equipment, use a 10 year straight line depreciation approach with no salvage value.
4. Cost of Goods Sold for all projected sales is included in the needed capital.
5. No internal capital is contributed, nor any outside capital generated (from angel investors, financial institutions, or other private investors).

Taking these assumptions into account, we have calculated that we will require $62.6M worth of outside capital to begin our business. This number is largely inflated due to Assumption 4, which makes our Cost of Goods Sold about 77% of our total necessary capital. If we ignore this assumption, and look at just what is needed for overhead, we come up with a figure of $14.5M necessary for our start up. This $14.5M includes supplies, salaries, and other items, such as legal consultancy, rent, insurance, and other miscellaneous expenses.

We project that our Development Phase will take about 14 months. This phase will begin when we acquire all necessary capital, and will end when we manufacture our first product. From this point, we have projected that it will take 20 months after the Development Phase to reach a breakeven point. This is a time that is about 2 years, 10 months after our start. After the breakeven point, we project that it will take another 13 months (about 4 years from the beginning) to saturate our initial target market. This is why we are emphasizing our research and development, so that we can break into new markets.

Please refer to Appendix C – Financial Analysis Tables and Forecasts, for further analysis. We have provided budget overviews, labor expenses, and financial documents until our projected payback.

Appendix A – Team and Company Information

A.1 Company Logo

WILDCAT
WIND POWER

A.2 Company Photo

Front Row (L to R): Tanzila Ahmed, Aaron Thomsen, Lane Yoder, Aaron Akin, Cody Yost, Armando Marquez, Matthew Clark

Back Row (L to R): James Remley, Stuart Disberger, Will Duren, Joe Kuhn, Bret Gross, Jordan Robl, Martin Mixon, Zach Wassenberg, Shae Pelkowski, Lawryn Edmonds

A.3 Resumes and Experience of Key Management

i. Joeseph Kuhn, Founder, CEO, President

Joseph Kuhn

Current Address	*Permanent Address*	*Contact Info*
901 Laramie St	1309 N Hunter Dr	Phone: (913) 526-5855
Manhattan, KS 66502	Olathe, KS 66061	Email: joetkuhn@gmail.com

Education

***Kansas State University* - Bachelor of Science in Engineering** — **Expected May 2014**

- Major: Mechanical Engineering
- Cumulative G.P.A. - 3.875
- Awarded Putnam Scholarship

Employment

Bombardier Learjet — **May 2013 - August 2013**

Intern - Learjet 85 Design Engineering - Learjet 85 Doors

- Drafted engineering drawings for detail parts, assemblies, and installations in Catia V5
- Modeled and modified parts/assemblies for both flight-test and production aircraft
- Prepared various documents associated with the design/cataloguing process
- Supported the Project Integration Team with various cataloguing documents
- Edited and reviewed drawings produced by myself and others in preparation for release
- Collaborated with the Electrical, Project Integration, and Drafting departments on the design of a particular part in order to revise the part to meet new design needs

Kansas State University Mechanical Engineering Department — **January 2012 - Present**

Undergraduate Instructor - ME 212 - Engineering Graphics

- Teach a class of 45-50 students in the basics of hand drafting and SolidWorks modeling/drafting
- Grade assignments in a timely manner, meeting deadlines and giving constructive feedback
- Collaborate with a team of other instructors to design and/or update daily assignments, exams and a new SolidWorks project each semester according to new and existing needs
- Received positive reviews from the vast majority of students in post-semester evaluations

Target - Olathe, KS — **Seasonally 2008 - January 2013**

Cashier

- Assisted customers with their needs in a fast and efficient manner, building valuable soft skills
- Designed new, more efficient layout for PLU Produce books for all cashiers
- Trained a number of new cashiers on their first full shift

Kansas State University Mathematics Department — **September 2011 - December 2011**

Technical Office Assistant

- Maintained several large databases via updating and data entry in Microsoft Access
- Designed sample curricula schedules for students with dual majors in an assortment of fields

Activities and Awards

American Society of Civil Engineers - Concrete Canoe Team — **2011 - Present**
Mechanical Engineering Senior Design - Project Leader — **2013 - Present**
Mechanical Engineering Freshman Mentor — **2013**

Technical Skills

Engineering Software: SolidWorks (including Finite Element Analysis), MATLAB, Catia (V5), LabVIEW
Programming Languages: Proficient in C, MATLAB, and VBA
Desktop Applications: Microsoft Word, Excel, Access, PowerPoint, Publisher, Visual Studio

References Available Upon Request

ii. William Duren, Founder, CTO, Senior VP

WILLIAM L. DUREN

Permanent Address:
203 Pine Ride Ct.
Rose Hill, KS 67133

E-mail: wld@ksu.edu
Phone: (620) 506-1934

Current Address:
1602 Hillcrest Dr. 302
Manhattan KS, 66502

Education: Kansas State University — Manhattan, KS — Expected Grad. Date: May 2015
Bachelor of Science in Electrical Engineering — GPA: 4.00

Skills: Basic skills in, Revit, Auto-CAD, ArcGIS, experience in C programming and HTML, control systems, and automotive maintenance.

Experience:

Developing Scholars Program — Kansas State University — August 2013 - Present
- Undergraduate Research Program.
- Worked with Dr. Steward, Civil Engineering Professor.
- Researched water resources in Midwest America.
- Learned about research methods.

Burns and McDonnell Internship — Kansas City, MO — May 2013 – August 2013
- Global Facilities Division & Terminals and Pipelines Group.
- Worked with P&IDs, cable tray layout, and one line diagrams.
- Communicated with vendors and clients to get specs and quotes.

Scholars Assisting Scholars Tutor — Kansas State University — January 2012 – May 2013
- Chemistry I for two semester
- Engineering Physics II for one semester.
- Developed my ability to talk to groups of people.
- Learned to be able to communicate with many different learning styles.

Burns and McDonnell Internship — Kansas City, MO — May 2013 – August 2013
- Marketing intern.
- Data Basing, writing proposals, and creating project sheets.
- Developed team work skills, and communication skills.
- Networked with professional engineers.

Honors and Awards:

Eta Kappa Nu	2012
IEEE Power and Energy Scholar	2012
National Action Council for Minority Engineers Scholar	2012
Cargill Scholar Impact Scholar	2011
Multicultural Academic Program Success (MAPS)	2011
Foundation Scholar	2011

Extra-Curricular Activities:

Kansas State University Wind Competition Design Team — August 2013 – Present
- Start to finish design of a marketable product.
- Market analysis and business plan.
- Develop team skills and leadership.

Multicultural Engineering Program (MEP) — August 2011 – Present
ECE 015 Seminar Mentor — August 2013 – Present
Kansas State Intramurals — August 2011 – Present
- Played on the defense for a soccer team which developed teamwork.

iii. Matthew Clark, CFO, Senior VP

Matthew T. Clark

Current Address (until May 2014):
1848 Todd Rd.
Manhattan, KS 66502

mtclark@ksu.edu
785-477-1358

Permanent Address:
1815 Virginia Drive
Manhattan, KS 66502

EDUCATION

Kansas State University B.S. Electrical Engineering — December 2014

- Concentration in Digital Systems
- Business Minor
- 100% Funded by Student
- Fluent in Spanish
- Experience with C/C++, C#, Java, MATLAB, Verilog, CANlog

University of Hertfordshire — Spring 2012

- Semester of Study Abroad
- London, England, U.K.

EXPERIENCE

KSU Electrical and Computer Engineering — Aug 2011 - Present

Undergraduate Teaching Assistant

- Conduct lab sections for our Introduction to Computer Engineering course
- Teach basics of digital logic and circuits

Student Web Developer

- Design, code, and troubleshoot webpages for a National Science Foundation funded project

John Deere — Summer 2013

Software Product Engineering Intern

- Collaborated with Automation Team of Electrohydraulic Systems, dealing with integration of automated implements
- Created a Windows based simulator to test against

KSU Office of Mediated Education — Dec 2010 – Dec 2011

Quality Assurance/Software Tester

- Assisted with end-user issues dealing with KSU's proprietary course management system
- Tested future product for use by entire campus

KSU Biological and Agricultural Engineering — Summer 2008

Student Research Assistant

- Collected and entered field based data for a graduate research project

HONORS

KSU - Putnam Scholarship Recipient	Aug 2010 – Present
KSU Engineering - Knights of St. Patrick Nominee	Spring 2014
Boy Scouts of America – Eagle Scout	April 2008

ACTIVITIES

KSU ECE Equipment Fee Committee – Student Rep.	Jan 2014 – Present
KSU Wind Turbine Design Team – Business Team Lead	Aug 2013 – Present
KSU Study Abroad Mentors	Aug 2013 – Present
KSU Formula SAE – Electronics Team	Aug 2010 – Dec 2012
Society of Automotive Engineers	Aug 2010 - May 2012

Appendix B – Renderings and Design Specifications

B.1 Sizing equations for Wind and Solar components

Assuming lights are on for 10 hours, solar and wind sources charge for 10 hours:

$$P_{Wind} = \frac{1}{2} \times Air\ Density \times Area \times velocity^3 \times efficiency\ = \frac{1}{2}\left(\frac{1.2\ kg}{m^3}\right)(Area)\left(5\frac{m}{s}\right)^3\left(\frac{1}{3}\right)$$

$$Area(height\ x\ diameter) = \frac{6 \times 60\ Watts\ (largest\ case)}{1.2\ \times 125} = 2.4\ m^2\ = 1.5\ m\ tall, 1.5\ m\ diameter$$

$$P_{solar} = 1000\frac{W}{m^2} \times 15\%\ \times A$$

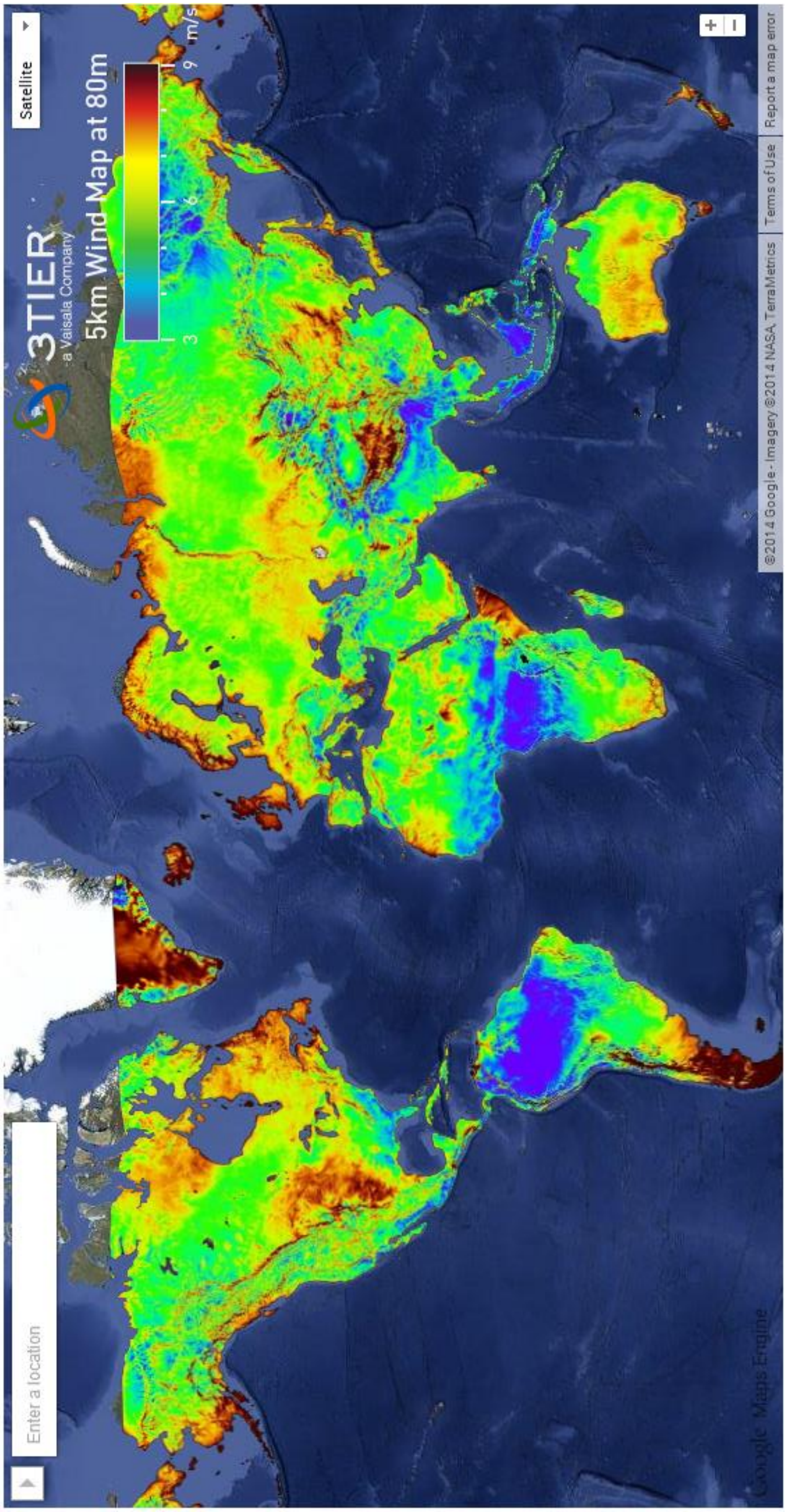
$$Area\ (length\ x\ width) = \frac{60\ Watts}{.15\ \times 1000\frac{W}{m^2}} =\ .4m^2\ =\ 0.6m\ x\ 0.6m$$

B.2 SolidWorks rendering WWP market turbine

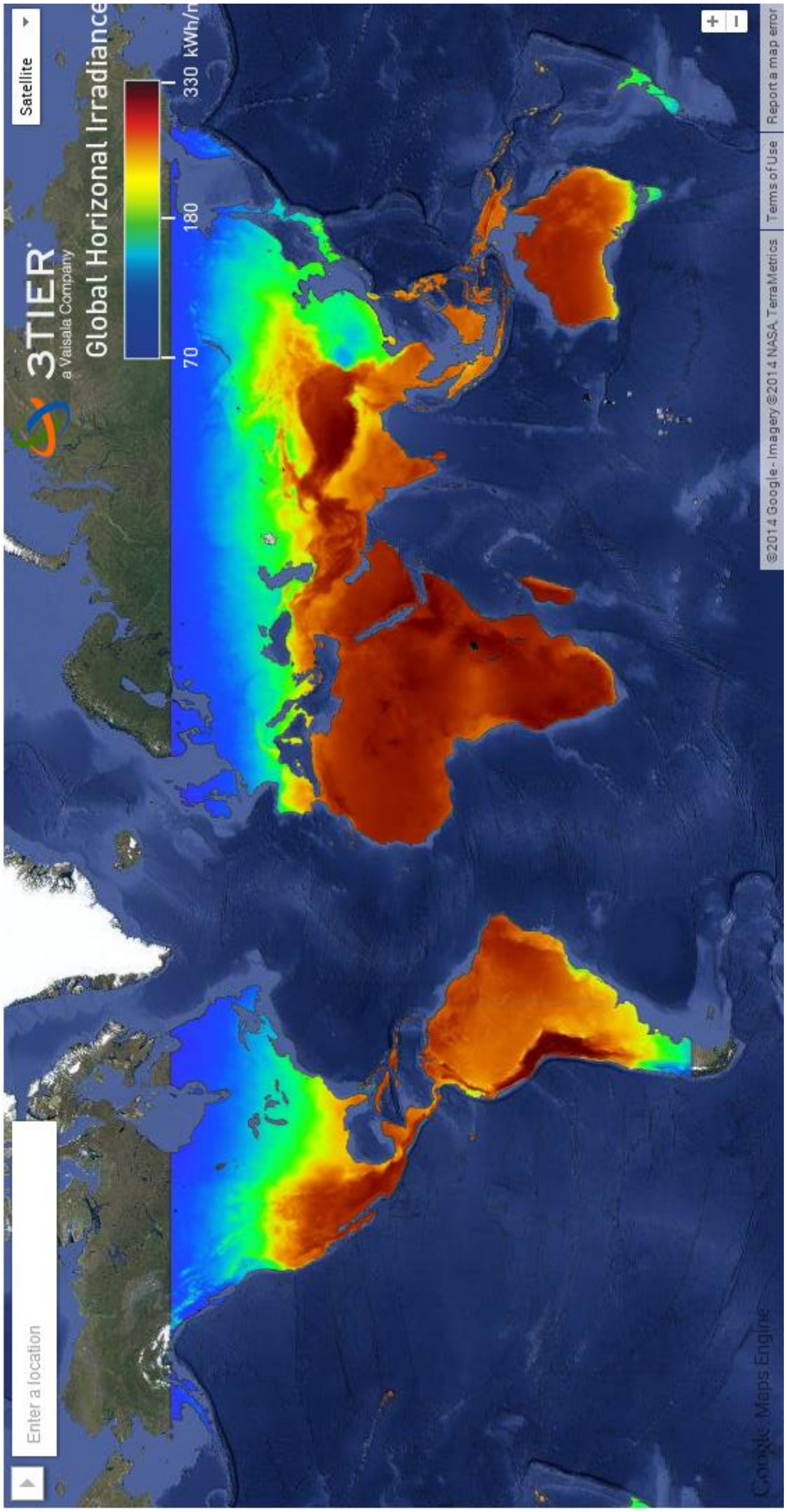
B.3 Conceptual uses for WWP's Design

B.4 Wind and Solar Maps

Average annual wind speed at 80m above ground. Taken from 3TIER, a Vaisala Company.



Average annual global horizontal irradiance. Taken from 3TIER, a Vaisala Company.



Appendix C – Financial Analysis Tables and Forecasts

C.1 Startup Budget Overview

Startup Budget

April 16, 2014

	Cash Needed to Start	% of Total
4 Year Planned Costs		
Salary of owner-manager	$300,000	0.5%
All other salaries and wages	$7,577,358	12.1%
Rent	336,000	0.5%
Advertising	96,000	0.2%
Furniture	48,000	0.1%
Supplies	48,000	0.1%
Telephone	48,000	0.1%
Other utilities	168,000	0.3%
Insurance	48,000	0.1%
Maintenance	24,000	0.0%
Legal and other professional fees	144,000	0.2%
Miscellaneous	24,000	0.0%
Subtotal	**$8,861,358**	**14.2%**
One-Time Costs		
Fixtures and Equipment	$ 5,525,000	8.8%
Total Product Materials	48,125,000	76.9%
Deposits with public utilities	1,000	0.0%
Licenses and permits	1,000	0.0%
Advertising and promotion for opening	500	0.0%
Cash	36,000	0.1%
Other	9,600	0.0%
Subtotal	**$53,698,100**	**85.8%**
Totals	**$62,559,458**	**100%**

C.2 Startup Labor Expenses

Profession	Qty. of People	Hours of Effort for Development Phase 1 Concept	Phase 2 Planning	Phase 3 Design	Phase 4 Testing	Phase 5 Release	Subtotal of Hours	Hourly Wage	Subtotal of Labor Costs	Costs per Month
Administrative Support	2	2000	4000	4000	1000	2000	13000	$20	$260,000	$5,451
System Architect	1	2000	4000	4000	1000	500	11500	$75	$862,500	$18,082
Electrical Engineers	2	1000	2000	4000	4000	500	11500	$75	$862,500	$18,082
Software Engineers	1	1000	2000	4000	4000	500	11500	$75	$862,500	$18,082
Mechanical Engineers	3	1000	2000	4000	4000	500	11500	$75	$862,500	$18,082
Civil Engineers	1	1000	2000	4000	2000	2000	11000	$75	$825,000	$17,296
Materials Engineer	1	500	2000	2000	2000	2000	8500	$75	$637,500	$13,365
Manufacturing Engineer	1	500	2000	2000	1000	4000	9500	$75	$712,500	$14,937
Marketing Personal	5	500	1000	500	500	3000	5500	$40	$220,000	$4,612.16
Sales and Tech Support	5	500	500	500	500	4000	6000	$35	$210,000	$4,402.52
Drafters	2	1000	1000	2000	4000	2000	10000	$60	$600,000	$12,579
Environmental Specilist	1	500	1000	3000	500	3000	8000	$60	$480,000	$10,063
General Manufacturing	15	0	0	0	500	4000	4500	$30	$135,000	$2,830
Totals	**40**	**11500**	**23500**	**34000**	**25000**	**28000**	**122000**	**n/a**	**$7,530,000**	**$157,862**

Estimated Calender Time Developement (yrs.):	1.175	Estimated Calender Time (yrs.):	3.98
Estimated Calender Time Release (yrs.):	2.8	Estimated Calender Time (months):	47.70

C.3 Startup Equipment Expenses

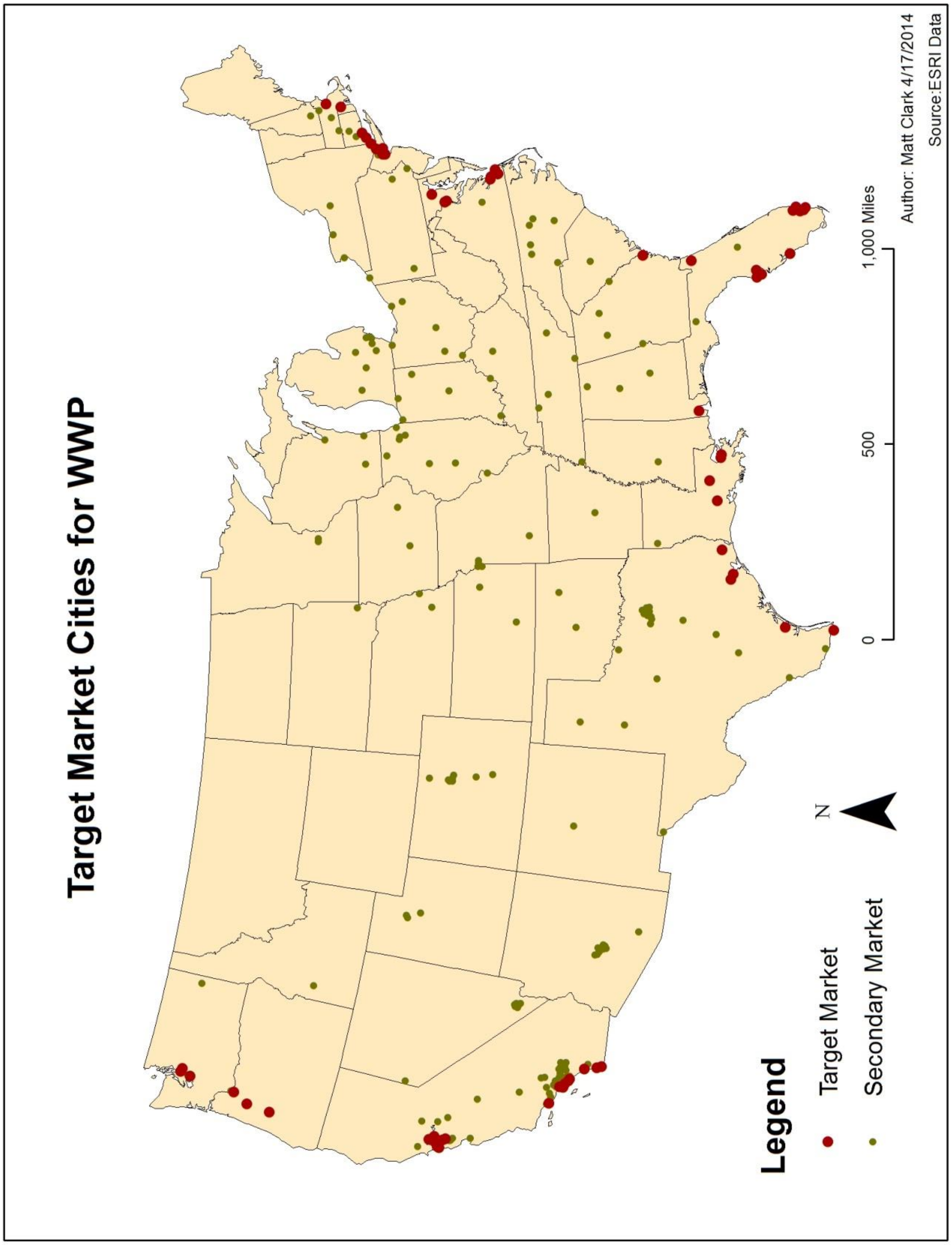
Equipment	Cost
3-D Printer	$ 200,000
Production Machines	$ 2,000,000
Software	$ 1,000,000
Tools	$ 25,000
Wind Tunnel	$ 300,000
Structural Test Machines	$ 1,000,000
Computer Peripherals	$ 1,000,000
Totals	**$ 5,525,000**

C.4 Startup Materials Expenses (per unit)

Materials	Cost per Unit
Turbine Genertor	$ 200
Solar Panels	$ 200
Batteries for Backups	$ 100
Lamp Parts	$ 750
Totals	**$ 1,250**

C.5 Background assumptions for Payback Estimation

C.5.i Map of Projected Target Market Cities



C.5.i Payback Estimation Data

Number of Cities with population over 100,000
77
Number of units selling to each city
500
Selling price per unit
2500
100% of Target market
$ 96,250,000.00

Needed money for investors assume 6% ROI
$66,313,026.00

Profit for Company
$ 29,936,974.00

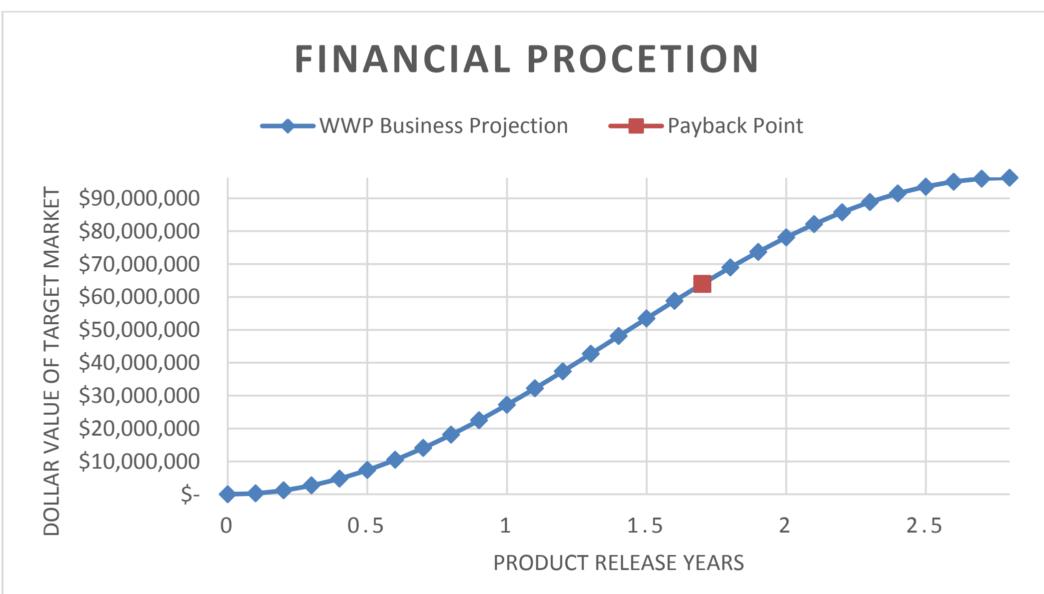
Average Yearly growth rate
13.55%

Payback Point

t	$
1.7	63975748

t array	y array	Money Array
0	0	$ -
0.1	0.003141	$ 302,293
0.2	0.012523	$ 1,205,376
0.3	0.02803	$ 2,697,903
0.4	0.049466	$ 4,761,124
0.5	0.076562	$ 7,369,118
0.6	0.108978	$ 10,489,122
0.7	0.146306	$ 14,081,940
0.8	0.188077	$ 18,102,435
0.9	0.233767	$ 22,500,099
1	0.282802	$ 27,219,686
1.1	0.334565	$ 32,201,902
1.2	0.388407	$ 37,384,158
1.3	0.44365	$ 42,701,349
1.4	0.499602	$ 48,086,677
1.5	0.555558	$ 53,472,486
1.6	0.610817	$ 58,791,116
1.7	0.664683	$ 63,975,748
1.8	0.716481	$ 68,961,251
1.9	0.765558	$ 73,684,991
2	0.8113	$ 78,087,624
2.1	0.853131	$ 82,113,842
2.2	0.890525	$ 85,713,063
2.3	0.923014	$ 88,840,071
2.4	0.950188	$ 91,455,582
2.5	0.971706	$ 93,526,737
2.6	0.987299	$ 95,027,517
2.7	0.99677	$ 95,939,069
2.8	0.999999	$ 96,249,939

C.5.ii Payback Estimation Chart



C.6 Financial Documents Previewing the Payback Period

C.6.i Balance Sheet, December 31, 2015

Wildcat Wind Power Balance Sheet December 31, 2015		
Assets		
Cash		55,203,118.50
Accounts Receivable	-	
Inventory		-
Prepaids		192,000.00
Total Current Assets		55,395,118.50
Propert, Plant, & Equipment	5,525,000.00	
Less: Accumulated Depreciation	(552,500.00)	4,972,500.00
Total Assets		60,367,618.50
Liabilities & Stockholders' Equity		
Accounts Payable		-
Unearned Revenue		-
Accrued Liablities		-
Taxes Payable		-
Total Liablities		-
Owners' Equity		62,559,458.00
Profit & Loss		(2,575,839.50)
Total Liabilities and Stockholders' Equity		60,367,618.50

C.6.ii Income Statement, For the Year Ended December 31, 2015

Wildcat Wind Power Income Statement For the Year Ended December 31, 2015		
Net Sales		-
Cost of Goods Sold		-
Gross Margin		-
Salary Expense	1,969,339.50	
Utilities Expense	54,000.00	
Depreciation Expense	552,500.00	
Total Selling & Admin. Expenses		2,575,839.50
Income from Operations		(2,575,839.50)
Income from Continuing Operations (before taxes)		(2,575,839.50)
Income Taxes (20%)		-
Income from Continuing Operations		(2,575,839.50)
Net Income (Loss)		(2,575,839.50)

C.6.iii. Statement of Cash Flows, For the Year Ended December 31, 2015

Wildcat Wind Power Statement of Cash Flows For the Year Ended December 31, 2015		
Operating Activities:		
Net Income	(2,575,839.50)	
Adjustments to Net Income:		
Depreciation Expense	552,500.00	
Acounts Recievable	-	
Inventory	-	
Prepaids	192,000.00	
Unearned Liabilities	-	
Net Cash Flows from Operating Activities		(1,831,339.50)
Investing Activities:		
Equipment Purchased with Cash	(5,525,000.00)	
Net Cash Flows from Investing Activities		(5,525,000.00)
Net Cash Inflows		(7,356,339.50)
Beginning Cash Balance		62,559,458.00
Ending Cash Balance		55,203,118.50

C.6.iv Balance Sheet, December 31, 2016

Wildcat Wind Power Balance Sheet December 31, 2016		
Assets		
Cash		61,127,921
Accounts Receivable	-	
Inventory		-
Prepaids		192,000
Total Current Assets		61,319,921
Propert, Plant, & Equipment	4,972,500	
Less: Accumulated Depreciation	(552,500)	4,420,000
Total Assets		65,739,921
Liabilities & Stockholders' Equity		
Accounts Payable		-
Unearned Revenue		-
Accrued Liablities		-
Taxes Payable		1,295,076
Total Liablities		1,295,076
Owners' Equity		62,559,458
Profit & Loss		2,604,463
Total Liabilities and Stockholders' Equity		65,739,921

C.6.v Income Statement, For the Year Ended December 31, 2016

Wildcat Wind Power Income Statement For the Year Ended December 31, 2016		
Net Sales		18,102,435
Cost of Goods Sold		9,051,218
Gross Margin		9,051,218
Salary Expense	1,969,339.50	
Utilities Expense	54,000	
Depreciation Expense	552,500	
Total Selling & Admin. Expenses		2,575,840
Income from Operations		6,475,378
Income from Continuing Operations (before taxes)		6,475,378
Income Taxes (20%)		1,295,076
Income from Continuing Operations		5,180,302
Net Income		5,180,302

C.6.vi Statement of Cash Flows, For the Year Ended December 31, 2016

Wildcat Wind Power Statement of Cash Flows For the Year Ended December 31, 2016		
Operating Activities:		
Net Income	5,180,302	
Adjustments to Net Income:		
Depreciation Expense	552,500	
Acounts Recievable	-	
Inventory	-	
Prepaids	192,000	
Unearned Liabilities	-	
Net Cash Flows from Operating Activities		5,924,802
Investing Activities:		
Equipment Purchased with Cash	-	
Net Cash Flows from Investing Activities		-
Net Cash Inflows		5,924,802
Beginning Cash Balance		55,203,119
Ending Cash Balance		61,127,921

C.6.vii Balance Sheet, December 31, 2017

Wildcat Wind Power Balance Sheet December 31, 2017		
Assets		
Cash		80,155,276
Accounts Receivable	-	
Inventory		-
Prepaids		192,000
Total Current Assets		80,347,276
Propert, Plant, & Equipment	4,420,000	
Less: Accumulated Depreciation	(552,500)	3,867,500
Total Assets		84,214,776
Liabilities & Stockholders' Equity		
Accounts Payable		-
Unearned Revenue		-
Accrued Liablities		-
Taxes Payable		4,570,714
Total Liablities		4,570,714
Owners' Equity		62,559,458
Profit & Loss		20,887,318
Total Liabilities and Stockholders' Equity		84,214,776

C.6.viii Income Statement, For the Year Ended December 31, 2017

Wildcat Wind Power Income Statement For the Year Ended December 31, 2017		
Net Sales		50,858,816
Cost of Goods Sold		25,429,408
Gross Margin		25,429,408
Salary Expense	1,969,339.50	
Utilities Expense	54,000	
Depreciation Expense	552,500	
Total Selling & Admin. Expenses		2,575,840
Income from Operations		22,853,568
Income from Continuing Operations (before taxes)		22,853,568
Income Taxes (20%)		4,570,714
Income from Continuing Operations		18,282,855
Net Income		18,282,855

C.6.ix Statement of Cash Flows, For the Year Ended December 31, 2017

Wildcat Wind Power Statement of Cash Flows For the Year Ended December 31, 2017		
Operating Activities:		
Net Income	18,282,855	
Adjustments to Net Income:		
Depreciation Expense	552,500	
Acounts Recievable	-	
Inventory	-	
Prepaids	192,000	
Unearned Liabilities	-	
Net Cash Flows from Operating Activities		19,027,355
Investing Activities:		
Equipment Purchased with Cash	-	
Net Cash Flows from Investing Activities		-
Net Cash Inflows		19,027,355
Beginning Cash Balance		61,127,921
Ending Cash Balance		80,155,276