1. Overview

Provide a one paragraph description of the proposed program. Be specific about what degree, major, minor, or option is sought

.

The Sustainable Energy Technician Certificate of Applied Science program prepares students for operation and maintenance jobs in the rapidly expanding sustainable energy industry. Program graduates have general skills in industrial safety, electrical troubleshooting, hydraulic and pneumatic system operation, and mechanical system repair. These skills are built on a strong educational foundation in math, writing, communications, and computing.

2. Need

a. To what specific need is the institution responding in developing the proposed program?

Predicting or projecting workforce needs to meet the expected growth in the state of Montana is always a challenge for any educational program (new or existing), but the evidence for energy growth is all around us. The *Wind Montana* grant statement of need summed it up by stating, "Renewable energy will continue to be a priority for national and state energy policies. Montana ranks fifth in potential wind power capacity. The Idaho National Laboratory estimates Montana's wind potential at 116,438 megawatts (MW) – a potential for more than a thousand new wind technician jobs in the state alone. Serendipitously, many rural Montana communities with the greatest potential for wind energy development are experiencing population and economic decreases. Wind energy may very well be a catalyst for their revitalization."

According to the American Wind Energy Association (AWEA):
http://www.awea.org/faq/wwt_economy.html

"The U. S. wind industry currently directly employs more than 2,000 people. The wind industry contributes directly to the economies of 45 states, with power plants and manufacturing facilities that produce wind turbines, blades, electronic components, gearboxes, generators, and a wide range of other equipment. The Renewable Energy Policy Project (REPP) estimates that every megawatt of installed wind capacity creates about 4.8 job years of employment, both direct (manufacturing, construction, operations) and indirect (advertising, office support, etc.). This means that a 50-MW wind farm creates 240 job-years of employment. According to a REPP study released in October 2004, boosting U. S. installations to approximately eight times today's levels could create 150,000 manufacturing jobs nationwide, with most jobs being added in the 20 states that have lost the most in recent years."

A REPP study released in October 2004 reported that boosting U. S. Wind energy installations to approximately eight times today's levels could create 150,000 manufacturing jobs nationwide, with most jobs being added in the 20 states that have lost the most in recent years. According to REPP some 90 companies in 25 states currently manufacture wind turbine components and over 15,000 companies in all 50 states have the technical potential to enter the wind turbine market. The full report is available on the REPP Web site at: http://www.repp.org/articles/static/1/binaries/WindLocator.pdf.

Finally, the State of Montana says:
http://commerce.mt.gov/energy/energy.asp

"Wind and solar energy are likely to be among the largest sources of new manufacturing jobs worldwide during the 21st Century. Montana has more potential for energy development from existing and untapped diversified sources than any state in the nation.

- Number 1 in U. S. coal deposits
- Number 1 in wind potential class 3 and above
- Over 50 wind farms in various levels of production
- More than 15 locations for potential geothermal energy
- 40% increase in oil production between 2005 and 2008

The world relies heavily on fossil fuels for energy. Renewable energy eliminates carbon dioxide and other pollutants that fossil fuels emit."

b. How will students and any other affected constituencies be served by the proposed program?

As the number one state in the nation in wind potential – class 3 and above, the Montana University System must be on the forefront, providing training to meet the workforce needs of the sustainable energy industries that are and will be flocking to the Treasure State. As reported during the ground-breaking ceremony on November 30, 2009 in Great Falls, all the capacity of the Montana-Alberta Tie Line (the MATL) is sold – and the line is not yet completed. The partner campuses will implement training programs in four locations throughout the MUS. And, it is our dream that the system will build on this programming to become leaders in training workers at all levels for these industries.

Although our first educational focus of the Wind Montana Project is on meeting the workforce needs of the energy industries in Montana, as an educational system, the MUS has been exporting talented graduates out-of-state for many years. We see the sustainable energy training program as serving local and regional workfare needs, and ultimately providing opportunities nationally and internationally for our graduates once our programs are well established. The companies currently in Montana's energy marketplace and those entering, are national and international companies in many cases.

c. *What is the anticipated demand for the program? How was this determined?*

Section 2- a above cites several pieces of pertinent data supporting demand for these programs in our state. No one knows for certain what the timing and number of jobs will be. But, given that schools all over the nation are rushing to develop renewable energy programs, we have to maximize Montana's and the MUS's advantage of being in the heart of the emerging energy economy. If we do not, other schools elsewhere will be exporting their sustainable energy technicians to Montana to meet the various industry needs. We already see this happening and heard from our industry advisory board that they would hire as many graduates as we could produce.

3. Institutional and System Fit

a. What is the connection between the proposed program and existing programs at the institution?

Each of the partner campuses has trades programming foundational to the implementation of both the CAS and an AAS on that campus. And, each of the partner campuses has specialty areas that will eventually allow them to fortify and expand. That will actually be an iterative journey as our programs and the industry unfolds. We see this collaboration as foundational to expansion.

b. Will approval of the proposed program require changes to any existing programs at the institution? If so, please describe.

No programs at any of the partner campuses will require changes.

c. Describe what differentiates this program from other, closely related programs at the institution (if appropriate).

The CAS is essentially the first year to the Sustainable Energy Technician Associate of Applied Science in that the AAS program includes additional program outcomes that build on the foundational skills developed in the CAS program. That said, it does stand alone and provide an entry point for employment. The program is identical at all four partner campuses.

d. How does the proposed program serve to advance the strategic goals of the institution?

In alignment with the strategic plan of the Montana Board of Regents, the partner campuses are committed to increasing participation of students in post-secondary education, specifically two-year programming, as well as increasing the number of students earning a credential. This program will lead to more graduates in a high employment potential field.

e. Describe the relationship between the proposed program and any similar programs within the MUS. In cases of substantial duplication, explain the need for the proposed program at an additional institution. Describe any efforts that were made to collaborate with these similar programs; and if no efforts were made, explain

why. If articulation or transfer agreements have been developed for the substantially duplicated programs, please include the agreement as part of the documentation.

Currently, there are no Sustainable Energy Technician programs in the MUS.

4. Program Details

a. Provide a detailed description of the proposed curriculum. Where possible, present the information in the form intended to appear in the catalog of other publications.

The programs' curricula are included in Appendices A and B. Please note that there are substantial changes to the program. Those changes resulted in large part because of input from the Industry Advisory Board. Both the programs' former and proposed final curricula are presented for review.

b. *Describe the planned implementation of the proposed program, including estimates of numbers of students at each stage*

Interest in the program has been extremely strong. Two of the partner campuses (MSU-Northern and Montana Tech COT) implemented courses fall 2009 and have students working toward the common CAS brought before the Board on August 3, 2009. There are currently 15 of them working toward that credential. Many of those 15 indicated they have a strong interest in moving on to the AAS.

Students currently enrolled in the CAS in Havre and Butte are expected to continue on into the second year. At Great Falls and Billings, students will start the program during the 2010/2011 academic year. Already, in Great Falls, several students are working on related instruction courses with the program implementation date of fall 2010 circled on their calendars. That will allow them to focus on the program-specific courses as outlined above.

At this writing, the AIT (Academic Implementation Team – consisting of representatives from all four partner campuses) is working on the recommendation for the ultimate number of students who will be admitted into the program on each campus. The determining factor will be the finalization of the equipment lists, as it is those lists that will determine the number of work stations for the labs. The best estimate at this time is from 20-24 students per program.

5. Resources

a. Will additional faculty resources be required to implement this program? If yes, please describe the need and indicate the plan for meeting this need.

Funding for one faculty position for each of the four partner campuses will be provided by the Wind Montana Project through February 2012. After February 2012, the faculty position will need to be funded out of each college's budget.

It is possible that an additional faculty position will need to be budgeted at each campus. In order to offer the Associated of Applied Science degree that builds on the CAS, a second faculty position is needed. Campuses that only have one faculty position have the following two options:

- Offer only the Certificate of Applied Science program
- Only intake students every other year

b. Are other, additional resources required to ensure the success of the proposed program? If yes, please describe the need and indicate the plan for meeting his need.

There is a variety of equipment in place at each of the units. However, there are some campuses that will need more start-up equipment than others. More specifically, electrical, mechanical, and hydraulic/pneumatic training systems will need to be used by the program. The Wind Montana grant provides funds to purchase equipment and workstations as necessary or to supplement equipment at campuses where there is a need to do so.

The AIT, at this writing, is in the process of determining the exact needs of each campus and finalizing avenues to share and expand on what the system already owns. For example, in one scenario, MSU-Northern indicated that

perhaps they could refurbish a trailer that could house common equipment used by the program. Then, if each of the partner campuses staggered courses in a certain way, perhaps the consortium could have a mobile equipment unit that could support the curriculum. The partner campuses are committed to maximizing current resources and sharing the equipment needed to get the programs up and running.

Space requirements are being addressed in different ways on the different campuses. MSU-Northern has existing labs and classrooms ready and have been offering preliminary courses toward the common CAS since fall 2009. Montana Tech COT is doing the same. MSU-Great Falls COT has an empty bay in their Trades building where the program will initially be housed. Additional dedicated classroom space might be needed for an electronics lab there; however because equipment lists are still be finalized by the AIT, that is yet to be determined. There are classrooms available on the Great Falls campus where the labs can be housed. The MSU-Billings COT campus has existing labs and classrooms that will be used for the program.

Professional development resource requirements are significant. The sustainable energy faculty members will need additional training in electronics, climb safety, mechanical systems, and wind turbine technology. These professional development activities are being funded by the Wind Montana grant project and by Perkins grant funds. It is possible that some campus professional development funds will also need to be used. At this writing, training needs are being finalized and schedules for summer start for faculty who will be teaching the discrete courses will be implemented.

6. Assessment

How will the success of the program be measured?

Initially, general interest in the program was evident by the partner institutions' receipt of numerous phone calls from students and employers about this program once the grant award to the campuses became public. A clear need was also established through feedback and data offered by the Wind Montana Project Industry Advisory Board.

Each of the partner campuses will use a variety of core indicators to measure the success of the program, including:

1. Persistence (Retention)
2. Graduation Rates
3. Placement in the Field
4. Employer Satisfaction with Graduates

7. Process Leading to Submission

Describe the process of developing and approving the proposed program. Indicate, where appropriate, involvement by faculty, students, community members, potential employers, accrediting agencies, etc.

This program was developed as a workforce development project funded by the Department of Labor's Community-Based Jobs Training Grant program. Project partners include the Wind Montana project industrial advisory board and four units of the Montana University System: Montana Tech College of Technology, Montana State University-Northern, Montana State University-Billings College of Technology, and Montana State University-Great Falls College of Technology. The program will be available on all four campuses.

An Academic Implementation Team (AIT), consisting of representatives from all four partner campuses has been meeting since July 2009 to coordinate program development. The AIT presented the program to an industry advisory board in November 2009 and modified the program based on advisory board input. The same program will be implemented at all four partner campuses.

In addition to several course and competency changes, the industry advisory board suggested a program name change to "Sustainable Energy Technician" for both the CAS and AAS. There are two reasons for the change:

- Program outcomes are broad based and apply to employment in numerous areas ranging from traditional energy (transmission, power-plants, etc.) to renewable fields such as wind, solar, and geothermal. Graduates may also find employment in many industrial settings because of the broad-base of trades skills they will learn.

- The word “technician” in the program title identifies program graduates as field technicians. The board felt it was important to differentiate it from “energy technology” which is typically used for engineering programs.

Proposed Common Curriculum for Energy Technology CAS
August 2009

	MT Tech COT Equivalencies for AY 2009 ONLY			MSU-Northern Equivalencies for AY 2009 ONLY			MSU-Billings COT Target for Fall 2010		
	Course Number	*Course Name*	*Credits*	*Course Number*	*Course Name*	*Credits*	*Course Number*	*Course Name*	*Credits*
Related Instruction	PSYX 100	Intro Psychology	3	M 121	College Algebra	3	M 121	College Algebra	3
	WRIT 101	College Writing I	3	SPCH 142	Interpersonal Communication	3	COMT 109	Human Relations	3
	M 121	College Algebra	3	WRIT 108	Elem Technical Writing	3	WRIT 104	Workplace Communications	3
Electricity	SET 110	Introduction to Electricity	3	EET 110	Electronics Survey	3	EET XXX	Introduction to Electricity	3
	SET 130	Advanced Electrical Applications	4	EET 103	Electronics Fund I	3	EET XXX	Advanced Electricity	3
	EET XXX	Electric Meters and Motors	3	ELEC 131	Meters & Motors	3	EET XXX	Electric Meters and Motors	3
Mechanical	SET 140	Motors, Generators & Transmissions	3	AUTO 117	Manual Transmission	4	MECH XXX	Power and Transmission I	3
	MECH XXX	Power and Transmission II	3	SET XXX	Power & Transmission	2	MECH XXX	Power and Transmission II	3
Safety	IT XXX	Industrial Site Safety	3	IT 111	Industrial Safety/Waste Mgmt	2	IT XXX	Industrial Site Safety	3
				IT 135	Basic Rigging	1			
Sustainable Energy	SET XXX	Introduction to Sustainable Energy	3	SET XXX	Intro to Sustainable Energy	3	SET XXX	Introduction to Sustainable Energy	3
Computers	CAPP 131	Basic MS Office	3	CAPP 120	Introduction to Computers	3	CAPP 120	Introduction to Computers	3
		Total Credits	***34***		***Total Credits***	***33***		***Total Credits***	***33***

MSU-Great Falls COT Target for Fall 2010			*COMMON AT ALL PARTNER SCHOOLS BY FALL 2010 Energy Technology CAS*		
Course Number	*Course Name*	*Credits*	*Course Number*	*Course Name*	*Credits*
M 121	College Algebra	3	M 121	College Algebra	3
COMM 120	Interpersonal Skills in the Workplace	2	COMM 120	Interpersonal Skills in the Workplace	2
WRIT 104	Workplace Communications	3	WRIT 104	Workplace Communications	3
EET XXX	Introduction to Electricity	3	EET XXX	Introduction to Electricity	3
EET XXX	Advanced Electricity	3	EET XXX	Advanced Electricity	3
EET XXX	Electric Meters and Motors	3	EET XXX	Electric Meters and Motors	3
MECH XXX	Power and Transmission I	3	MECH XXX	Power and Transmission I	3
MECH XXX	Power and Transmission II	3	MECH XXX	Power and Transmission II	3
IT XXX	Industrial Site Safety	3	IT XXX	Industrial Site Safety	3
SET XXX	Introduction to Sustainable Energy	3	SET XXX	Introduction to Sustainable Energy	3
CAPP 120	Introduction to Computers	3	CAPP 120	Introduction to Computers	3
	Total Credits	***32***		***Total Credits***	***32***

Sustainable Energy Technician
Certificate of Applied Science Program
Courses and Competencies

Program Description:
The Sustainable Energy Technician Certificate of Applied Science program prepares students for operation and maintenance jobs in the rapidly expanding sustainable energy industry. Program graduates have general skills in industrial safety, electrical troubleshooting, hydraulic and pneumatic system operation, and mechanical system repair. These skills are built on a strong educational foundation in math, writing, communications, and computing.

Student Outcomes:
Upon completion students will:

- Identify and practice safe workplace habits.
- Demonstrate familiarity with basic electrical tools and the ability to troubleshoot a basic electrical system.
- Demonstrate familiarity with basic mechanical tools and the ability to repair a basic mechanical system.
- Demonstrate a basic understanding of hydraulic and pneumatic systems.
- Demonstrate the ability to use personal computers and common operating systems and applications software.
- Develop and practice professional standards of workplace communication and interpersonal skills.

Partnerships:
This program was developed as a workforce development project funded by the Department of Labor's Community-Based Jobs Training Grant program. Project partners include the Wind Montana project industrial advisory board and four units of the Montana University System: Montana Tech College of Technology, Montana State University-Northern, Montana State University-Billings College of Technology, and Montana State University-Great Falls College of Technology. The program is available on all four campuses.

Program Curriculum Sequence:

Fall Semester 1

Course Number	Title	Credits
SETXXX	Introduction to Sustainable Energy	3
EETXXX	AC/DC Electronics I	3
M111	Technical Mathematics	3
SETXXX	Industrial Safety and Rigging	3
WRIT104	Workplace Communication	2
SETXXX	Fundamentals of Mechanical Systems	3
	Total	17

Spring Semester 1

Course Number	Title	Credits
CAPP120	Introduction to Computers	3
EETXXX	AC/DC Electronics II	3
ELECXXX	Electric Motors and Generators	3
SETXXX	Fundamentals of Hydraulic/Pneumatic Systems	3
COMM135	Interpersonal Communication	3
	Total	15

TOTAL PROGRAM CREDITS	32

CORE COURSE DESCRIPTIONS

Course Number: CAPP120
Course Title: Introduction to Computers
Credits: 3
Description: This course introduces the technology and terminology of computer systems and demonstrates how computers have impacted individuals and society. The course also provides instruction in the basics of operating systems and word processing, spreadsheet, and database software.
Competencies:

- Understand basic computer terminology and concepts.
- Familiarize students with the major components of computer hardware.
- Introduce students to operating system and application software.
- Demonstrate basic file management skills.
- Introduce social, ethical, legal, and cultural issues involving technology.

Course Number: COMM135
Course Title: Interpersonal Communication
Credits: 3
Description: This course is designed to show some of the difficulties that language and understanding present us. It is concerned with better understanding of ourselves and our semantic and interpersonal environments. It attempts to develop meaningful, effective, and sensitive means of relating to others. Varied group experiences and oral presentations provide students the opportunity to explore current topics.
Competencies:

- Demonstrate the techniques that lead to improved interpersonal communication.
- Explain the influence and impact of self-concept, perception, language, emotions, listening, and communication climate on interpersonal communication.
- Employ specific strategies to help avoid communication problems, improve communication climates, and resolve interpersonal conflicts.

Course Number: M111
Course Title: Technical Mathematics
Credits: 3
Description: This course presents basic mathematical topics as they are applied in a trades program. Topics covered include: use of measuring tools, measurement systems, dimensional arithmetic, percent, proportion, applied geometry, and basic trigonometry.
Competencies:

- Use fractions in applied problems.

- Use decimal notation.
- Understand and use rounding rules.
- Perform dimensional arithmetic, both in English and metric units.
- Find perimeters, areas, and volumes of standard and composite figures.
- Use ration, proportion, and percent in applied problems.
- Work with angles, and use basic right triangle trigonometry.

Course Number: SETXXX
Course Title: Introduction to Sustainable Energy
Credits: 3
Description: This course provides an overview of sustainable energies including solar, wind, hydro, biomass, and geothermal. Students will learn the basic principles of each technology. Students will also investigate renewable resources and their associated technologies.
Competencies:

- List and explain the main sources of energy and their primary applications.
- Describe the challenges and problems associated with the use of various conventional energy sources, including fossil fuels and nuclear and the challenges and problems associated with alternative renewable energy sources.
- List and describe the primary renewable energy resources and technologies. Compare and contrast each system.
- Describe and illustrate basic electrical concepts and system components.
- Convert units of energy to quantify energy demand and make comparisons among energy uses, resources, and technologies.
- Understand comparative differences in energy needs between large industrial applications and small business or residential applications.
- Understand the concept of net energy production and the concept of integration of renewable energy into existing generation and distribution systems.
- Understand the concepts of energy conservation and wise-use (i.e. allocation and efficiency) as keys to sustainable energy.

Course Number: WRIT104
Course Title: Workplace Communication
Credits: 2
Description: This course introduces students to written and oral communication required in the workplace. Emphasis is placed on basic written formats commonly used in workplace environments such as workplace incident summaries, letters, memos, and brief reports. Students also gain experience in writing application letters, resumes, follow-up letters, as well as interviews.
Competencies:

- Write effective business correspondence.
- Use the processes of drafting and revision in written work.
- Complete workplace forms accurately and neatly.
- Prepare summaries of messages and events.
- Edit written material for clarity, coherence, consistency, accuracy, and the conventions of standard English.
- Identify and employ effective strategies involved in the job search process.
- Prepare a resume.
- Identify effective job interviewing techniques.

ELECTRICAL SYSTEMS COURSE DESCRIPTIONS

Course Number: EETXXX
Course Title: AC/DC Electronics I
Credits: 3
Description: This course introduces safety rules, concepts, and operating characteristics of direct current (DC) and alternating current (AC) electrical circuits. Selection, inspection, use, and maintenance for common electrical test equipment is also covered.
Competencies:

- Demonstrate safe practices when handling electrical circuits and equipment.
- Understand definitions and measurement of resistance, voltage, and current.
- Use Ohms Law and Watts Law to analyze electrical circuits.
- Understand DC circuits. Conduct analysis on series and parallel circuits.
- Use common meters and General Purpose Electronic Test Equipment (GPETE).
- Use an oscilloscope to analyze various electrical circuits and components.
- Understand basic AC theory.

Course Number: EETXXX
Course Title: AC/DC Electronics II
Credits: 3
Prerequisites: EETXXX (AC/DC Electronics I)
Description: This course is a continuation of the AC/DC Electronics I course. Safety rules, concepts, and operating characteristics of electrical circuits will continue to be emphasized. Capacitors, inductors, low voltage power supplies, diodes, transistors, and triodes will be introduced and analyzed.
Competencies:

- Demonstrate safe practices when handling electrical circuits and equipment.
- Understand safe operating procedures for high voltage operations.
- Understand the function of capacitors and inductors and measurement of reactance.
- Understand characteristics of Low Voltage (LV) power supplies, transformers, and rectifiers.
- Understand characteristics of commonly used diodes.
- Understand the function of transistors and Triodes for Alternating Current (TRIACs)

Course Number: ELECXXX
Course Title: Electric Motors and Generators
Credits: 3
Prerequisites: EETXXX (AC/DC Electronics I)
Description: This course covers an introduction to the terminology and basic principles of DC and AC motors and generators. Students will study single phase and three phase motors and generators and

operational controls. Common AC and DC power generation equipment and testing techniques will also be covered.

Competencies:

- Understand common methods of power generation.
- Understand the function of a Permanent Magnet (PM) motor and how it generates power.
- Demonstrate the ability to perform Lockout/Tagout (LOTO) procedures and understand the importance of LOTO.
- Understand the function of synchronous motors.
- Understand the function of induction motors.
- Understand the function of universal motors.
- Recognize and use common AC and DC power generation equipment.

MECHANICAL SYSTEMS COURSE DESCRIPTIONS

Course Number: SETXXX
Course Title: Fundamentals of Mechanical Systems
Credits: 3
Description: This course covers energy industry mechanical systems at the component level. Topics covered include repairing a basic mechanical system, familiarity with basic tooling, and understanding gears and rotational relationships.
Competencies:

- Understand principles of strength of materials.
- Recognize levers, gears, pulleys, and winches and how they are used in mechanical systems.
- Recognize common mechanical system tools and demonstrate how to use them.
- Understand basic drive trains, shafts, bearings, and seals and how they are used in mechanical systems.
- Recognize braking and torque systems and how they are used in mechanical systems.
- Recognize common fasteners and couplings and how they are used in mechanical systems.

Course Number: SETXXX
Course Title: Fundamentals of Hydraulic/Pneumatic Systems
Credits: 3
Description: This course introduces basic hydraulic concepts, formulas, and applications of hydraulic components used for directional, flow and pressure control of circuits. Students will identify and explain safety rules, precautions, test procedures, common components, and operating principles for hydraulic and pneumatic systems commonly found in the energy industry.
Competencies:

- Recognize common schematic symbols and evaluate schematic diagrams.
- Understand basic principles of hydraulics including flow, pressure, and force.
- Recognize common hydraulic system components including valves, tubing, pipe, and hose and understand how they work.
- Demonstrate how to take pressure measurements.

SAFETY COURSE DESCRIPTIONS

Course Number: SETXXX
Course Title: Industrial Safety and Rigging
Credits: 3
Description: This course provides an overview of safe industrial practices and basic rigging techniques.
Competencies:

- Complete the requirements for an OSHA 10 certification.
- Demonstrate the ability to perform CPR.
- Demonstrate the ability to properly construct and use a scaffold system.
- Identify the equipment needed and properly perform the task of shifting heavy loads using winches, cranes, and other similar equipment.
- Demonstrate the ability to safely secure loads for transport.
- Demonstrate the ability to properly climb using fall restraint and arrest gear.
- Complete the requirements to earn an industry recognized fall restraint certification.
- Demonstrate the ability to recognize and avoid hazards.
- Recognize hazardous materials and Material Safety Data Sheets (MSDS).

Building Montana's
WIND ENERGY
workforce statewide:

- MSU–Great Falls COT
- MSU Billings COT
- MSU–Northern
- Montana Tech COT

WIND MONTANA PROJECT'S "WORKING DEFINITION"

OF

SUSTAINABLE ENERGY

It is simple, do the math:

➔ **conventional energy** (coal, oil, natural gas, nuclear)

+ **renewable energy** (**hydro**, **wind**, **solar**, **geothermal**, **tidal**)

+ **wise-use/conservation** (energy and environmentally efficient practices)

= **"sustainable energy"**

(more energy, longer, for more people, w/ least environmental & economic impact)

Building Montana's
WIND ENERGY
workforce statewide:

- MSU–Great Falls COT
- MSU Billings COT
- MSU–Northern
- Montana Tech COT

WIND MONTANA

WIND MONTANA PROJECT INDUSTRY ADVISORY BOARD

INVITED MEMBERS

(As of 01/05/2010)

Currently, we have extended membership to the following companies (20):

IngeteamUSA

Montana Dakota Utilities

Endurance Wind Power

General Electric

NaturEnerUSA & Canada

Tonbridge Power Montana/Alberta Tie Ltd

Pascoe Energy

Exergy Development Group, LLC

John Deere Wind Energy

Chapin LLC

Gaelectric North America

NorthWestern Energy

Invenergy

PPL Montana

Fuhrlaender North America

Grasslands Renewable Energy, LLC

Oversight Resources, LLC

TransCanada Corporation

Sansur Renewable Energy, Inc.

Wind Turbine Tools Inc. & Ltd.

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