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Bellingham Technical College
The Pacific Northwest Center of Excellence for Clean Energy

NSF Grant Research
Industry Focus Group

Focus Group Report

October 28, 2015

Agenda:

1.	Welcome and Introductions	Barbara Hins-Turner & Jill Davishahl
2.	Overview of the Focus Group	DC
3.	Review of the Packet	DC
4.	Workshop I - review of the June 4 Report	DC
5.	Small Group Reports	DC
6.	Workshop II - Review of Labor Market information & discussion on core KSAs	DC
7.	Small Group Reports	DC
8.	Plenary, wrap up	DC
9.	Next Steps & Send Out	Barbara Hins-Turner & Jill Davishahl

Note: All numbering and lettering in this document is for ease of reference only. It does not denote any rating of value or priority.

Participants and the Technical Expertise Available:

1. Sara Bowles, Tacoma Power and Light
2. Dana Brandt, Eco Tech Solar
3. John Bosche, Chinook Wind
4. Mel Cossette, National Resource Center for Material Education, Edmonds Community College
5. Sam Cheung, Electronics faculty, Bellingham Technical College
6. Dana Hickenbottom, Technical Support Engineer and NABCEP Certified Solar PV Technical Sales Professional, Itek Solar
7. Ryan Lambert, Puget Sound Energy
8. Terry Meyer, Convivium Renewable Energy
9. Joshua Miller, Western Solar
10. Jackie Rae, Snohomish PUD
11. Joan Weiss, Washington State Labor Council
12. Jill Davishahl, Faculty - Mechanical Engineering, Bellingham Technical College
13. Terryll Bailey, The Allison Group, Project Evaluator
14. Barbara Hins-Turner, Director, Pacific Northwest Center of Excellence for Clean Energy
15. Lydia Carr, facilitation support
16. Dave Cunningham, Facilitator

Email invitation sent to potential panel members:

(From Barbara Hins-Turner)

Dear Energy Industry Focus Group Participants, On behalf of President Dr. Kimberly Perry, Bellingham Technical College (invitation attached), we would like to invite you to an Energy Forum follow up discussion. Attached are the notes from the June forum for your review. Please join us:

October 28, 1-4pm at Scuttlebutt Brewing
1205 Craftsman Way #101, Everett
Lunch will be served

This meeting will provide an opportunity to revisit this discussion and bring together a broader audience of industry and labor subject matter experts to provide feedback. The outcome of this dialogue will inform the work of the Center of Excellence for Clean Energy, Bellingham Technical College (BTC), and Western Washington University (WWU) on industry trends related to sustainable energy practices, technologies and developments. BTC and WWU will utilize this information to develop an Associate's degree at BTC that will articulate to WWU Institute for Energy Studies.

With your help, this project will strengthen the labor pool in the Pacific Northwest and elsewhere of qualified applicants who seek long term career options in various aspects of sustainable energy systems. Building this project and National Science Foundation grant application on the best available industry expertise and experience will strengthen our case and provide a solid foundation for our work.

Please confirm your attendance and let us know if you have questions or need further information. We look forward to seeing you there, Jill and Barbara

Welcome and Overview

Barbara, Dave, and Jill started the meeting by recapping the work done by the focus group in June. They outlined the purpose of the day, which was to pull together a group of experts to give recommendations for the new AAST degree in sustainable energy. While the degree includes transfer options with established articulations to lead to a Bachelor's, the primary focus of the day was to discuss employment standards for students finishing the 2 year program.

Jill elaborated on the program and plans at BTC. The AAS-T degree at BTC is to get jobs in the sustainable energy arena or transfer to the WWU Institute for Energy Students program. A lot of things must come to the table and align to make it happen, working with faculty to contextualize curriculum and create a series of projects around alternative energy and bring them into existing courses (chemistry, econ, policy, etc.)

BTC also will offer undergraduate research opportunities. The proximity to WWU campus makes this possible. WWU does not have a lab so they will bring their 4-year students who don't have a technical background to the BTC lab. BTC in turn will send students to WWU for research experience.

Jill asked participants to consider BTC students for internships. She said that as this degree plan takes shape BTC might co-enroll WWU students and possibly team teach with WWU faculty. She indicated a fresh openness and creative thinking was happening both at BTC and at WWU with respect to this energy program so the future looks favorable.

The AAS-T degree structure is fairly new and regards where it fits into existing degree patterns remains to be worked out. Essentially the AAS-T degree has an academic core, a technology core, and specialization coursework, giving students a solid technical foundation in sustainable energy that prepares them for the workplace as well as academic coursework that prepares them transfer to a 4 year institution

Overall Project Objectives

- Create an AAST degree that meets industry needs while preparing students for transfer.
- Increase pathways for employment in the sustainable energy fields
- Establish and disseminate technical knowledge that align with industry standards
- Determine which primary skills, knowledge and attributes are needed in the industry.
- Determine where the industry is going, where the jobs will be and how many.

Participants introduced themselves and described their role within their company or organization and how they fit in the industry.

Tacoma Power

- Main work focus is on Energy Conservation and energy efficiency, both of which will be huge parts of meeting the energy needs of the state in foreseeable future

Eco Tech Solar

- Design and install solar electrical systems (commercial and residential)
- Residential is the bigger part of the business due to the state's incentives program for customers

Consulting

- Answers energy questions
- Consults on small scale community energy projects

Solar Panel Manufacturer

- Provides technical support and management for product development. One trend is the move away from high wage engineering positions. The solar project design for a customer, for example, is often done using an APP. A building can be scanned using a smart phone equipped with the solar app and out comes the design, the estimates and timing information required to submit a project bid.

Western Solar

- Design, sales, installation of solar systems for commercial applications (i.e. school projects, county facilities)
- Offers guidance on the differences between residential and commercial solar applications in industry

BTC Electronics Technology instructor

- Electronics Technologies fundamentals and applications within the energy industry
- Expertise includes energy technologies (i.e. solar, fuel cells, Nano technology)

Snohomish County PUD

- Customer Incentives
- Lobbying the legislature on behalf of commercial energy interests
- Adjusting to market and industry changes

Chinook Wind

- Energy systems Consulting
- Utility scale wind project design
- Consultation with banks, developers and facility and site owners
- Advising on staffing issues with operators of solar energy systems

Washington State Labor Council

- Makes sure labor interests are represented in business and industry contracts

Puget Sound Energy Manager

- Energy management and conservation of energy in new and as-built environments. Much emphasis on doing unique calculations on heating and cooling in a customer's building and since most buildings are unique, a common algorithm does not exist for this work.

Participants spoke about what they are looking for in new employees

Tacoma Power

1. Customer service skills
2. People skills
3. Industrial, commercial and residential knowledge
4. Computer skills
5. Tech savvy (Share Point and similar in house systems for sharing information)
6. Complete base knowledge of energy production, transmission, distribution and conservation

Puget Sound Energy

1. Project management
2. MS Excel
3. Customer Service
4. Communication skills
5. Math and Science
6. General knowledge of energy and conservation

Western Solar

1. Technical skills
2. The solar industry is moving away from needing electrical and structural engineers. "There is an app for that!" Permit ready drawings are readily available. The industry is moving to standardization due to the need to bring installation costs down. All we need are a couple of sales guys, project managers and installers without any extra skills."

Puget Sound Energy

1. The energy conservation side isn't moving to standardization
2. Good understanding of the energy industry

Chinook Wind

1. Reliability, timeliness and ability to pass random drug tests
2. Basic electrical and mechanical safety
3. Technical skills are learned on the job
4. 90% of jobs in Wind are out of state

Labor

1. Legalization of Marijuana has changed the game in random drug testing due to employees being able to smoke during off hours and then testing positive on random tests.

Break Out Session #1.

The following captures the groups recommended edits and additions to the Report from the June 4 Focus Group.

Program Emphasis:

1. Circuit theory in core electronics
2. Regulatory issues and public policy.
    a. State and federal energy codes, incentives and laws
    b. Basics of policy development for energy-related legislation
3. Science and Math
    a. Applications in sales, design and installation
    b. Basic math skills, core foundational knowledge base is essential
4. Problem Solving - preferably across disciplines
5. The need for versatility within renewable energy
6. A Survey class of the general industry to include:
    a. Context of the field
    b. Typical technologies
    c. The different roles required by the industry
    d. Who the main players are regards lead companies
    e. Jobs in solar, wind, sales, installation etc. in the State of Washington
7. Project Management
8. Economics
    a. The focus should be on how to save money in the long run
    b. The guiding question in every project: "Why does this make sense economically?"
    c. Time management related to economics
9. Basics of Measurement Science
10. Practical hands-on learning and micro mechanics
11. First Responder customer care, good customer service protocols, safety, materials
12. Energy efficiency
13. The physics component should focus on heat flow and energy transfer.
14. A good overview of the industry, how it is structured, major players and guiding regulations

Some general comments on program emphasis were:

1. " The focus should be on project management and construction. Integrate the installation and electrician roles and add renewable energy to the mix of skills."
2. "There are not enough jobs for technicians alone. Electrical engineering jobs are going away. Low cost construction related jobs are more in demand."
3. "Find resources and apply them instead of focusing on specific technologies."
4. "Send students to certification classes on technologies, safety standards and other recognized professional development training."
5. "Introduce them to the National Association of Tower Erectors (NATE) "

6. "Discuss the reality of working conditions in the field early on so no surprises occur mid-training. For example, perform a reality check on what they will actually be doing on the job, such as climbing ladders and crawling under houses."
7. "Overall, keep things broad and focus on developing problem solving skills."

Trends:

1. The trend list from the June Focus Group is too narrow. Trends change too quickly for education to respond effectively. Instead of trying to keep up with the current trends provide a broad based education that meets the needs of the students to continually upgrade and develop themselves professionally. This will help ensure that they will be able to manage the inevitable changes and trends in this quick moving industry.
2. Spend a few hours of instruction on trends to give students the expertise to recognize which trends to focus on and watch as they develop themselves professionally.
3. Add Customer service and client interaction to the trends list. Social media and other phenomena are having a big impact on both in the industry. Students should monitor trends in communication technologies as they affect customer service and client interaction.

Roles:

ADD:

1. Conservation manager
2. Program manager for sustainable connections
3. Communication and Customer interaction
4. Customer Service Manager

CLARIFY

1. Under technical support define the difference between engineers and technicians. Clearly define the role of technicians because there is much change in this area.

Breakout #2

The following captures the group's recommended edits and additions to colleges' view on the labor market opportunities for graduates and the participant's views on the core KSAs that are generally looked for by the industry.

Job Titles

Solar:

1. "Combine Solar PV Technical Sales" with "Solar PV Designer"
2. Change "Module Manufacturing Engineer to "Electronics Technician" with a focus on automation
3. "Wire Technology Engineer" is a questionable career option
4. Add " Solar Installer" who is not an electrician to capture jobs that exist on the way to electrician
5. Engineering Technician encompass a wide variety of jobs in the clean energy sector

Wind:

1. Add "Manufacturing/ Fabrication and assembly"
2. Make sure students are aware that 90% of wind jobs are outside of WA state.

General:

1. Combine “Renewable Energy Technician”, “Field Service Energy Technician” and, “Instrument/Field Technician”
2. Add “Project Manager”, “Energy Efficacy Manager”, “Energy Auditor”, and “Resource Conservation Manager, ” "Building Envelope Professional," "Weatherization Technician,"
3. **Many of the jobs are in public services roles & utility. Look beyond the technical (the jobs on the list are limited). Outreach, legislative aids, more institutional roles (program implementation).**

Core Knowledge

1. Electronics and circuits
    a. Difference between electronic and electrical circuits
    b. Know how circuits work at the building level
2. Economics - business fundamentals
3. Math
4. Understanding of renewable energy and sustainability in the industry
5. Energy physics , heat flow and energy transfer

Core Skills

1. Project management
2. Time management
3. Communication
4. Problem Solving
5. Interpersonal communication
6. Analytical reasoning
7. Measurement Science basics
8. Use of tools
9. Safety
10. Hands-on field experience

Attributes

1. A strong work ethic
2. Customer service bias
3. Teachable
4. Adaptable
5. Dependable
6. Resourceful
7. Team player
8. Personable

Plenary and Wrap Up : Some closing remarks were as follows

1. Technical training limits people but needs to be supported with thinking skills and problem solving skills. Policy development skills are the foundation.
2. The fundamentals are agreed upon by this diverse group as far as the knowledge, skills and attributes needed on the job.
3. The emphasis on economics as opposed to environmentalism was a surprising insight for the Subject Matter Experts.

4. There was a reality check moment for the SME's around the fact that wind technicians will likely be moving out of state to work. The wind farms in the State do not require a big workforce to maintain or manage them.
5. Knowledge of materials is the key for fabrication and the wide range of materials used in the energy industry is such that the topic is large, complex and always changing.
6. The construction side of this industry has a new emphasis

Participants' Recommendations to the Project Design team

General Theme	Recommendations
General Program Design	1. Develop an introductory, overview course prior to students committing to the whole program by way of illustrating what the program will entail. 2. Keep the program course-work broad in scope but do include the opportunity of a specialized capstone project or integrated project based work within courses. 3. Conduct a survey of comparable programs to see how to distinguish this program from others that are online and focused on clean and renewable energy systems. 4. Define and focus the program on the basic and core skills that will serve the needs of most employers. 5. Keep the program evolving and be clear between the work of engineers and that of technicians. 6. Address the fundamental skills that should include: Project Management, Communications, Customer Service, Problem Solving and Technical Writing. 7. Cover the basic fundamentals of all renewable energy technologies and conservation strategies 8. Teach policy design as it pertains to sustainable energy systems and the effects of energy policy on the industry. 9. The curriculum should be dynamic in its forms and modalities to enable adaptations as the industry and its technologies change as they surely will.
Economics of Energy Engineering	1. Teach the Cost/Benefit ratio of different policies for energy conservation and generation. 2. Introduce research skills. 3. Cover the topic of energy conservation that includes the history of the policy and some successful examples from overseas.
Industry Partnerships	1. Develop partnerships with local companies for student projects, material donations and joint collaborative ventures 2. Consider creating an online forum for today's participants to

continue providing ideas and suggestions going forward.

Career Pathways after Graduation

1. For Wind technologies the best pathway may be to go to or partner with a school with a wind energy program. Examples include Texas Tech and the University of Massachusetts at Amherst.
2. Provide students with accurate and realistic employment prospects up front. This should include estimates on salaries and wages.
3. Investigate Solar Energy International's (SEI) Solar Program as a resource. (All employees of Western Solar Inc went through this training.)
4. Prepare students with a broad base of relevant KSAs so they have multiple job prospects when they graduate.

Accurate Employment Prospects in Washington

1. Solar Washington can provide actual jobs data for solar-related work in Washington State.

Energy Efficiency

1. Include a course on this topic with a focus on large end-user demands like lighting, HVAC and other typical load demands.
2. Teach how to calculate high level savings in large buildings that have large demand loads.

References:

1. *Skill Profiles for Energy Management Occupations*, National Science Foundation, June 2014
2. *Workforce Challenges of Electrical power Employers in the Pacific Northwest*, Drs Alan Hardcastle and Pamela Jull and Sally Zeiger Hanson, M.Ed.
3. *Green Jobs in Washington State, Progress, Opportunities & Challenges*, Dr Alan Hardcastle, Senior Research Associate, Washington State University, January 2010
4. *Draft Seventh Northwest Power Plan,* Northwest Power and Conservation Council
5. *Focus Group Report for the NSF Research Grant on Sustainable Energy*, Bellingham Technical College and the Northwest Center of Excellence for Clean Energy, June 4, 2015
6. Project Summary (available from Jill Davishahl)