

Defining the Future for WSU Extension Energy Programming

WSU EXTENSION ENERGY TASKFORCE RECOMMENDATIONS • JUNE 2008

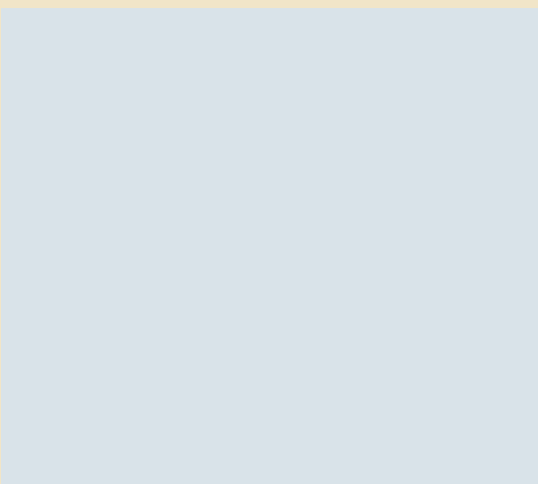
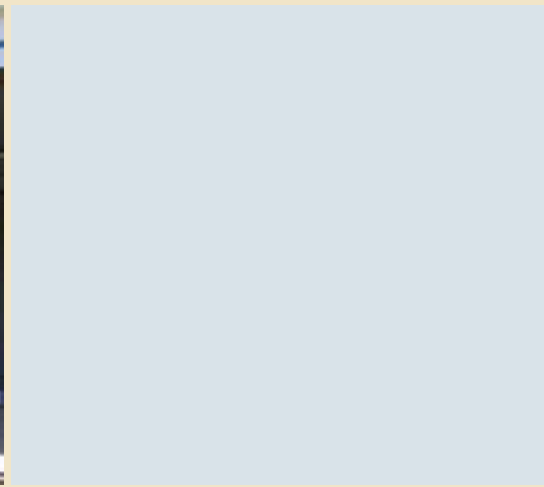


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Defining the Future for WSU Extension Energy Programming

Introduction

Energy usage and climate change are emerging as key issues for many Washington State University Extension personnel as our partners', clients' and constituents' interests in these topics grow. WSU Extension is engaged in the delivery of numerous programs related to energy production and use. The largest body of outreach and applied research is conducted by the WSU Extension Energy Program, but there are many other entities working on energy-related projects including faculty and staff in several counties; within centers such as the Center for Sustaining Agriculture and Natural Resources and the Center for Environmental Research, Education and Outreach; the Center for Bioproducts and Bioenergy (CBB); the Bioproducts, Sciences, and Engineering Laboratory (BSEL); the Wood Materials and Engineering Laboratory (WEML); the Transportation Research Group (TRG); and in several academic departments (Crop and Soil Sciences, Bio-Systems Engineering, Animal Sciences, Natural Resources, the School of Economic Sciences, Civil and Environmental Engineering, the School of Electrical Engineering and Computer Science, the School of Architecture and Construction Management, the School of Mechanical and Materials Engineering, etc.). Each of these have resources and information that can and should be provided through Extension programming.

Associate Vice President and Dean, WSU Extension, Linda Kirk Fox charged an Energy Taskforce to review future opportunities for programming based on societal need and the potential ability of WSU Extension to have meaningful impacts related to energy. Additionally, she requested that the Taskforce evaluate models that will facilitate better coordination among energy programming conducted by WSU Extension personnel statewide.

The Taskforce met at the WSU Extension Energy Program offices in Olympia on November 30, 2007. Most of the effort was focused on understanding the breadth of current programming and on evaluating both opportunities and needs relative to future programming. Special emphasis was placed on identifying programming that would generate measurable and important impacts such as enhanced energy security, improved economic viability, and reduced environmental impact of Washington's industries and residents.

The output of that effort served as the basis for a survey of all Extension personnel seeking their input on the draft. A small writing subcommittee was assembled to incorporate the input from the 70+ responses to the survey and develop this final set of recommendations.

A New Vision for WSU Extension Energy Programming

Many specific recommendations from the survey have been incorporated or used to develop or enhance the goals, objectives and strategies identified below. In addition, several broad themes emerged from both the survey results and the initial taskforce work. These include:

- The importance of stating and maintaining focus on the primary goal of achieving high levels of energy efficiency and developing renewable energy sources to ultimately improve our state's, and the nation's energy security by reducing climate change impacts and dependence on foreign and domestic hydrocarbon-based fuels.
- The importance of leveraging and building from the strengths of WSU Extension in outreach and education, applied research and field testing, local knowledge and presence. Further, we have a wide range of community impact programs, each of which can be and should be increasingly sensitive to energy issues.
- The importance of leveraging and building from our subject-matter expertise. The Taskforce determined that WSU, WSU Extension, and WSU Extension Energy Program's strengths lie in the areas of 1) conservation of energy through increasing efficiency of buildings and their systems, transportation, manufacturing and other industrial processes, and agricultural processes; and 2) increasing production and use of renewable energy resources.
- The importance of connecting with other WSU Extension and University initiatives to ensure that energy initiatives, both at the Extension Energy Program and throughout Extension, are connected to and where appropriate, coordinated with, community development and economic development initiatives.
- The importance of developing energy solutions that include smaller industries, businesses and farms (as well as individual citizens) as well as the largest ones in the state.
- The importance of working with other partners outside of WSU if the benchmarks are to be achieved. Very few of the goals and objectives are within the complete control of Extension personnel and programs.

Where appropriate, these themes are reflected in the specific strategies identified. However, together they represent a set of guiding principles for the implementation of the specific recommendations set forth below.

Goal 1: Position Extension for a Lead Role in Energy Programming

Objective 1.1: Ensure that the proper resources are in place.

- Strategy 1.1.1:** Realign, and reallocate existing personnel and funding, and/or develop new funding to focus on the strategies identified in this report.
- Strategy 1.1.2:** Develop academic ties on energy issues with the research and teaching faculty, the students and other programs through internships, mutual grant efforts and classroom material development.
- Benchmarks:** Increase undergraduate and graduate student participation in extension energy projects by 200 % by 2015.
Increase PBL funding dedicated to energy extension issues and programming by 100% by 2015.
- Who:** WSU Extension, Agricultural Research Center, other research and teaching entities.
- Partners:** WA Legislature, county government, grant agencies, business extramural funding, etc.

Objective 1.2: Lead by Example: Reduce energy use by Extension

- Strategy 1.2.1:** Estimate total energy used by WSU Extension for travel and identify ways to cut use.
- Strategy 1.2.2:** Implement the best of the identified energy saving strategies within WSU Extension.
- Benchmarks:** Reduce miles traveled and flown by Extension personnel by 15% by 2015.
Increase the use of distance communication technologies within Extension by 100% by 2015.
- Who:** All WSU personnel.
- Partners:** Agricultural Research Center, Research and Extension Centers, county governments, regional campuses, community colleges with Learning Centers, other constituents.

Goal 2: Improve the Energy Efficiency of Buildings and Their Systems, Transportation, Manufacturing and Other Industrial Processes, and Agriculture

Objective 2.1: Increase the energy efficiency of new and existing buildings (public, commercial, and residential).

- Strategy 2.1.1:** Provide technical support to policymakers related to energy code and energy using equipment standards enhancements at both national and state levels.
- Strategy 2.1.2:** Provide training to local building officials about improved energy code rules and regulations.
- Strategy 2.1.3:** Support 'beyond code' programs to increase adoption of energy efficient construction techniques, building systems and building materials.
- Strategy 2.1.4:** Provide information and referral to consumers regarding energy efficiency measures for new and existing buildings and maintain climate change and energy information and technical support website for consumers.
- Strategy 2.1.5:** Provide technical assistance for selected entities such as local governments, campuses, hospitals, federal facilities, data centers and other energy intensive businesses.
- Benchmarks:** Energy efficiency of new buildings in WA has increased by 50% by 2015.
Energy efficiency of remodeled buildings has increased by 10% by 2015.
- Who:** WSU Extension Energy Program, Wood Materials and Engineering Laboratory
- Partners:** College of Engineering and Architecture, Agricultural Research Center, State Building Code Council, electric and gas utilities, NW Energy Efficiency Council, NW Energy Efficiency Alliance, etc.

Objective 2.2: Increase the efficiency of transportation of people and products.

- Strategy 2.2.1** Evaluate and communicate the comparative costs and energy savings of trucking, rail, and barge transport by commodities, flows and end use. Work for policies, regulatory and guidance that cause products to flow by the most energy efficient mode (e.g., state purchase of short line railroads, reconstruction of railroad lines in public/private partnerships and similar policy decisions may be goals of the educational effort).
- Strategy 2.2.2:** Work with farmers, carriers and agency personnel to incorporate new technologies and infrastructure leading to more energy efficient transport of agricultural produce, materials, and equipment. Provide information to shippers and policy makers of the existing energy disparities among transportation modes.
- Strategy 2.2.3:** Evaluate current capabilities, operating characteristics and costs of alternative freight modes for agricultural and raw wood products such as on-site processing to increase load densities and to decrease the amount of waste and weight being transported.
- Strategy 2.2.4:** Work with energy intensive natural resource industries and regulatory agencies to identify the energy consumed in alternative techniques and technologies and to infuse those energy usages into public and private decision making.
- Strategy 2.2.5:** Identify rural and small city transit system models that are cost and energy effective and identify relevant public/private partnerships to develop, modify or retrofit such systems.
- Strategy 2.2.6:** Work with policymakers to ensure that most appropriate transit models and growth plans are employed and that appropriate stakeholders are engaged in policy and program development and funding.
- Strategy 2.2.7:** Work with local entrepreneurs, existing/potential businesses and other entities to create viable models, such as telecommuting and digital access, allowing individuals options to work from a distance instead of regularly commuting to urban areas.
- Benchmarks:** Increase average energy efficiency of rural and small city transportation by 10% by 2015.
- Who:** WSU Extension Energy Program and new or reassigned WSU Extension position in transportation economics and energy; WSU Extension Community Development Program (telecommuting).
- Partners:** Agricultural Research Center, WSU School of Economic Sciences, WSDOT and state, small city and rural planning organizations.

Objective 2.3: Increase efficiency of manufacturing and other industrial processes in Washington State.

- Strategy 2.3.1:** Engage with Washington-based industries to demonstrate and encourage implementation of process improvements and on-site power generation leading to energy and cost savings.
- Strategy 2.3.2:** Provide energy use audits and assessments and facilitate financial incentives to industry to catalyze energy efficiency improvement.
- Benchmarks:** Efficiency of WA-based manufacturing processes will increase by 20% by 2015.
- Who:** WSU Extension Energy Program, county-based WSU Extension personnel.
- Partners:** WSU College of Engineering and Architecture, NW Energy Efficiency Alliance, NW Food Processors Association, WA Manufacturing Service, UW Industrial Assessment Center, utilities, etc.

Objective 2.4: Increase on-farm energy efficiency of food and fiber production.

- Strategy 2.4.1:** Provide expertise and program to support for conducting energy audits of current and potential alternative production systems; for example dryland, irrigated, dairy and meat, fruit and vegetable, wood, etc.
- Strategy 2.4.2:** Create agriculture-specific information and deliver technical assistance and training to farmers leading to improved energy efficiency on Washington farms related to conservation tillage, irrigation, grazing, and nitrogen use efficiency.
- Benchmarks:** Efficiency of farm-based electric motors, driers, and electric motor-driven equipment will increase by 20% by 2015.
- Average number of tillage passes per crop will decline by 20% by 2015.
- Acres under improved nitrogen management will increase by 20% 2015.
- Energy used per unit of production (crop, livestock, or timber) will decrease by 10% by 2015.
- Who:** WSU Extension Energy Program, agricultural extension educators/specialists, Small Farms Program, the Center for Sustaining Agriculture and Natural Resources, Natural Resource Extension Educators.
- Partners:** WSU Agricultural Research Center, Natural Resources Conservation Service, Pacific Northwest Direct Seed Association, Utilities, WA Dept. of Agriculture, WA Dept. of Natural Resources, University of Washington.

Goal 3: Increase Production and Use of Renewable Energy

Objective 3.1: Remove existing barriers to economic viability and application of photovoltaic and other solar technologies.

- Strategy 3.1.1:** Identify regulatory and financial barriers to photovoltaic application.
- Strategy 3.1.2:** Engage policymakers to resolve barriers leading to increase application of solar technologies.
- Strategy 3.1.3:** Support adoption and use of photovoltaic and other solar energy systems by providing information and referral to consumers.
- Strategy 3.1.4** Provide technical assistance to manufacturers of photovoltaic and other solar energy systems leading to improved products that are lower in cost and easier to install.
- Strategy 3.1.5** Support implementation of state tax credits leading to increased application of solar energy systems.
- Benchmarks:** Photovoltaic systems will be cost-effective for residential installation by 2015 without subsidies.
- Who:** WSU Extension Energy Program, WSU Extension district and county personnel.
- Partners:** WSU College of Engineering and Architecture, electric utilities, WA Dept of Revenue, solar equipment manufacturers, Washington State solar industry.

Objective 3.2: Displace petroleum-based fuels and petrochemical based products with environmentally appropriate biofuels and products, particularly those produced in Washington.

- Strategy 3.2.1:** Create decision models and other analytical tools to effectively support decision-making by agricultural producers about production of feedstocks and/or bio-energy in the form of bio-gas, bio-diesel, ethanol, electricity etc.
- Strategy 3.2.2:** Determine assembly costs of alternative feedstocks and distribution costs of resulting bio-products leading to creation of an economically viable and sustainable bio-energy industry.
- Strategy 3.2.3:** Support science-based policy development, emphasizing economic feasibility, leading to a sustainable and economically viable biofuels industry in WA.

- Strategy 3.2.4:** Create educational strategies and deliver technical assistance and training to potential biofuel producers.
- Strategy 3.2.5:** Provide direct bioenergy project support by troubleshooting problems and providing direct technical assistance.
- Strategy 3.2.6:** Support the development of bioenergy crops/feedstocks for Washington climate and rainfall zones.
- Benchmarks:** 15% of petroleum-based fuels consumed in WA will be replaced with biofuels produced in WA by 2015.
Biofuels will be distributed statewide and readily accessible by consumers by 2012.
- Who:** WSU Extension Energy Program, WSU Extension, WSU Center for Bioproducts and Bioenergy, WSU's Northwest Bioproducts Research Institute.
- Partners:** WSU Agricultural Research Center, WA Dept. of Agriculture, WA Dept. of Ecology, WSU/PNNL BSEL, U.S. Department of Agriculture, the other northwest states and Hawaii (members of the WSU-led regional biomass partnership), Imperium Renewables and other biofuels developers, Battelle Northwest.

Objective 3.3: Increase production of energy from combined heat and power systems (CHP) where the primary energy sources are biopower, anaerobic digestion, waste heat and other opportunity fuels by 2015.

- Strategy 3.3.1:** Work with stakeholders and policy makers to develop and implement policies and financing frameworks that support the development of CHP .
- Strategy 3.3.2:** Provide direct CHP project development support by troubleshooting problems, providing technical assistance, and ensuring quality facility/ farm level assessments.
- Strategy 3.3.3:** Complete the development and full commercialization of a variety of anaerobic digestion systems and sizes with by-products that have economic value.
- Strategy 3.3.4:** Facilitate and support broad adoption of CHP in the forest products and food processing industries and broad adoption at wastewater treatment facilities.
- Benchmark:** Generate 800 megawatts of new power from CHP/biopower, waste heat, or other opportunity fuels in WA by 2015.

Who: WSU Extension Energy Program, WSU Extension, Center for Sustaining Agriculture and Natural Resources, WSU's Northwest Bioproducts Research Institute.

Partners: Paul G. Allen Family Foundation/Vulcan, Inc.; WSU Agricultural Research Center; Washington Department of Ecology; U.S. Department of Agriculture; electric utilities; King County; major industries the other northwest states through the CHP Application Center.

Objective 3.4: Increase sustainable production of energy from wind, tidal action, wave movement and geothermal sources.

Strategy 3.4.1: Track evolution and costs of alternative wind, tidal, wave and geothermal energy technologies, programs and strategies and bring insights to policy and program development efforts.

Benchmark: None

Who: WSU Extension Energy Program and other WSU Extension (county-based and departmental) personnel.

Partners: Utilities, resource developers.

Members of the WSU Extension Energy Taskforce:

Ken Casavant, Transportation Research Group, School of Economic Sciences

Todd Currier, Program Division Manager—WSU Extension Energy Program

Jake Fey, WSU Energy Program

Jim Freed, SW District, Olympia

Brad Gaolach, NW District, King County

David Granatstein, NE District and Center for Sustaining Agriculture and Natural Resources

Hans Kok, Extension Specialist—Crop and Soil Sciences

Chad Kruger, Center for Sustaining Agriculture and Natural Resources

Craig MacConnell, NW District, Whatcom County

Andy McGuire, Extension Educator—Grant County

Jon Newkirk, Puyallup Research and Extension Center, Center Director

Bob Simmons, SW District, Mason County

Claudio Stockle, Biological and Systems Engineering

Vikram Yadama, Wood Materials and Engineering Lab

The final report was produced by Ken Casavant, Todd Currier, Hans Kok and Andy McGuire



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