Pilot Project Report: OSU Agricultural Assessments

Energy | Efficiency Center

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Pilot Project Report: OSU Agricultural Assessments:

This is a summary of the results of a pilot project to perform agricultural assessments of four (4) Oregon State University (OSU) facilities.

Background: The OSU Energy | Efficiency Center

This Pilot project is part of an effort to leverage the 20+ years of OSU Industrial Assessment Center (IAC) experience. The center is growing into the OSU Energy | Efficiency Center (EEC) with a goal of providing the Northwest a laboratory to develop a knowledge base of new & common efficiency opportunities in a range of sectors, currently including industry, agriculture, and institutional facilities.

The center is built on student management with faculty mentorship. Since 1986 the core EEC project, the IAC has: Served over 500 manufacturers (545 to date), recommended over $86 million in annual savings with an average 1.0 year payback, and helped industry achieve implemented savings of over $9,700,000 in energy, $4,600,000 in Waste Minimization/ Pollution Prevention, and $11,800,000 in Productivity Improvements.

The mission of the EEC is to “help partners and the region, reduce energy consumption and waste generation, conserve natural resources, and improve profitability and sustainability.” The intended impacts include: direct partner results, influencing and providing learning opportunities for our graduates, and developing resources as well as a wide knowledge-base from EEC activity.

Students develop professionally as they collect data on site, learn to rapidly visualize new systems, brainstorm and problem solve, quickly estimate potential with available data, work professionally with clients and colleagues, analyze opportunities and prepare reports, act as subject mentors and leaders. Partners and the region benefit from student time, energy, creativity, technical capability, and willingness to ask the “dumb question” that can surface unexamined assumptions.

Students offer a special advantage for providing farm assessments, as the relatively low cost to support a student assessment team can make it cost effective to visit farms, a sector that is poorly served currently as agricultural operations are often hard pressed to foot the cost of professional consultants.

Farm Assessment Project Phase 1: Assessments of OSU facilities

This summer in a cross campus agreement, four OSU operations were assessed: The OSU Dairy, Hyslop Farm, Greenhouse, and Vegetable Farm. Four reports were prepared. Following is a brief summary of the results. (The four individual project reports are attached as separate files.)

OSU Hyslop Farm

Opportunities Quantified

- Lighting
- Dryer Fan Controls
- Turn of Dryer
- Boiler Tune

Other Measures Considered

- Boiler & Dryer Economizer
- Chemical Hood Filter
- Blower Sizing
- Tractor Operation
- Fuel Tank Cover
- Low Pressure Irrigation
- Swamp Cooler Control

OSU Dairy

Opportunities Quantified

- Milk Tank Insulation
- Parlor Heating Interlock
- Safety Lighting Control
- Barn Lighting Upgrade
- Vacuum Pump VSD
- Roofing
- Electric Waste Water Pump

Other Measures Considered

- Field Moisture Sensors

OSU Vegetable Farm

Opportunities Quantified

- Electric Tractor Conversion
- Electric People Movers
- Composting: Vegetable Plots
- Composting: Hazelnut Plots
- Photovoltaic Array

Other Measures Considered

- Fuel Tank Cover
- Tractor Operation
- Low Pressure Irrigation
- Ecosystem Services
- Double Pane Windows

OSU Greenhouse

Opportunities Quantified

- Insulate Steam Pipes
- Drip Irrigation
- Lighting
- Air Compressor

Other Measures Considered

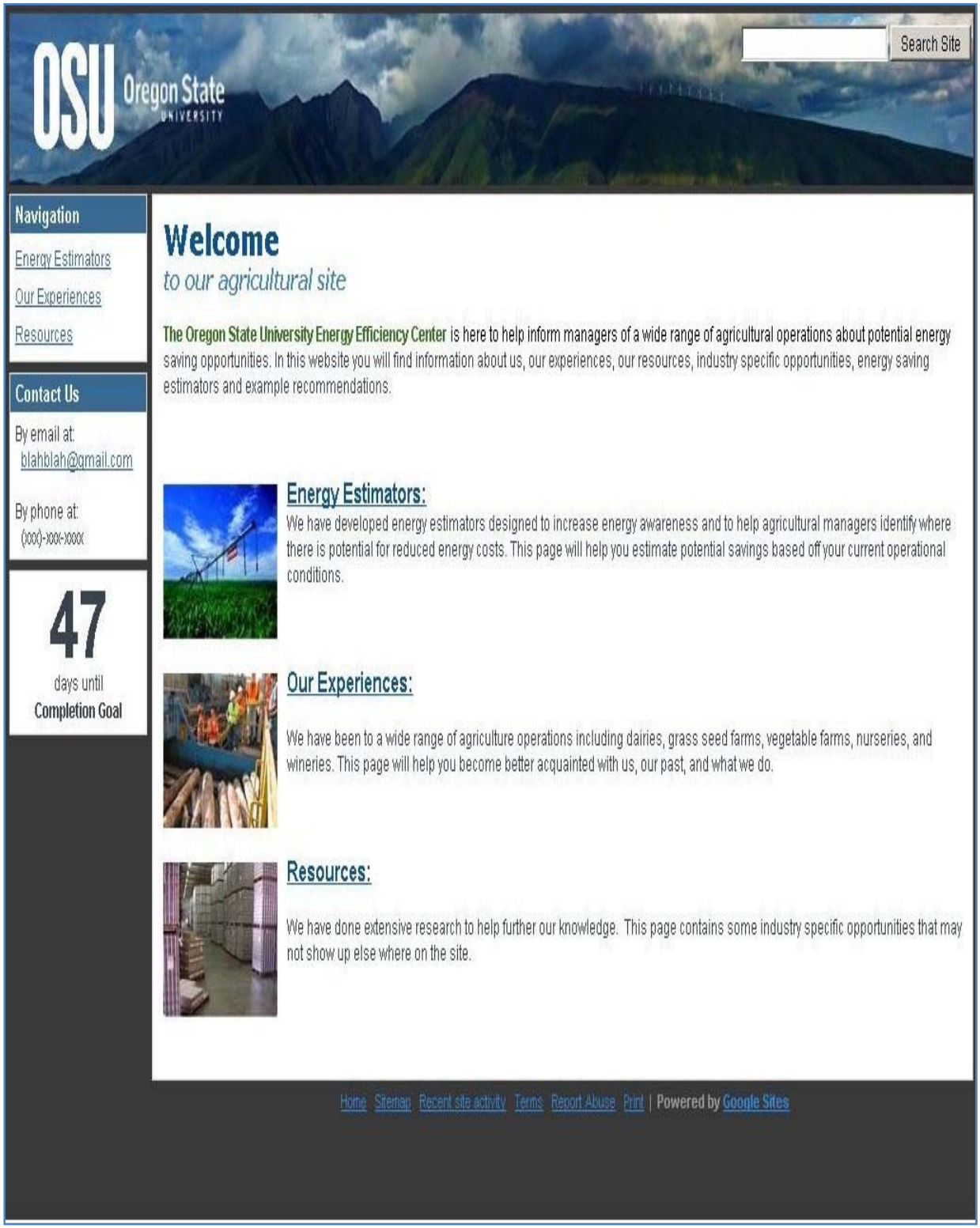
- Angle Fans
- Steam Heating Units

Project Phase 2: Web Resource and Analysis Tool

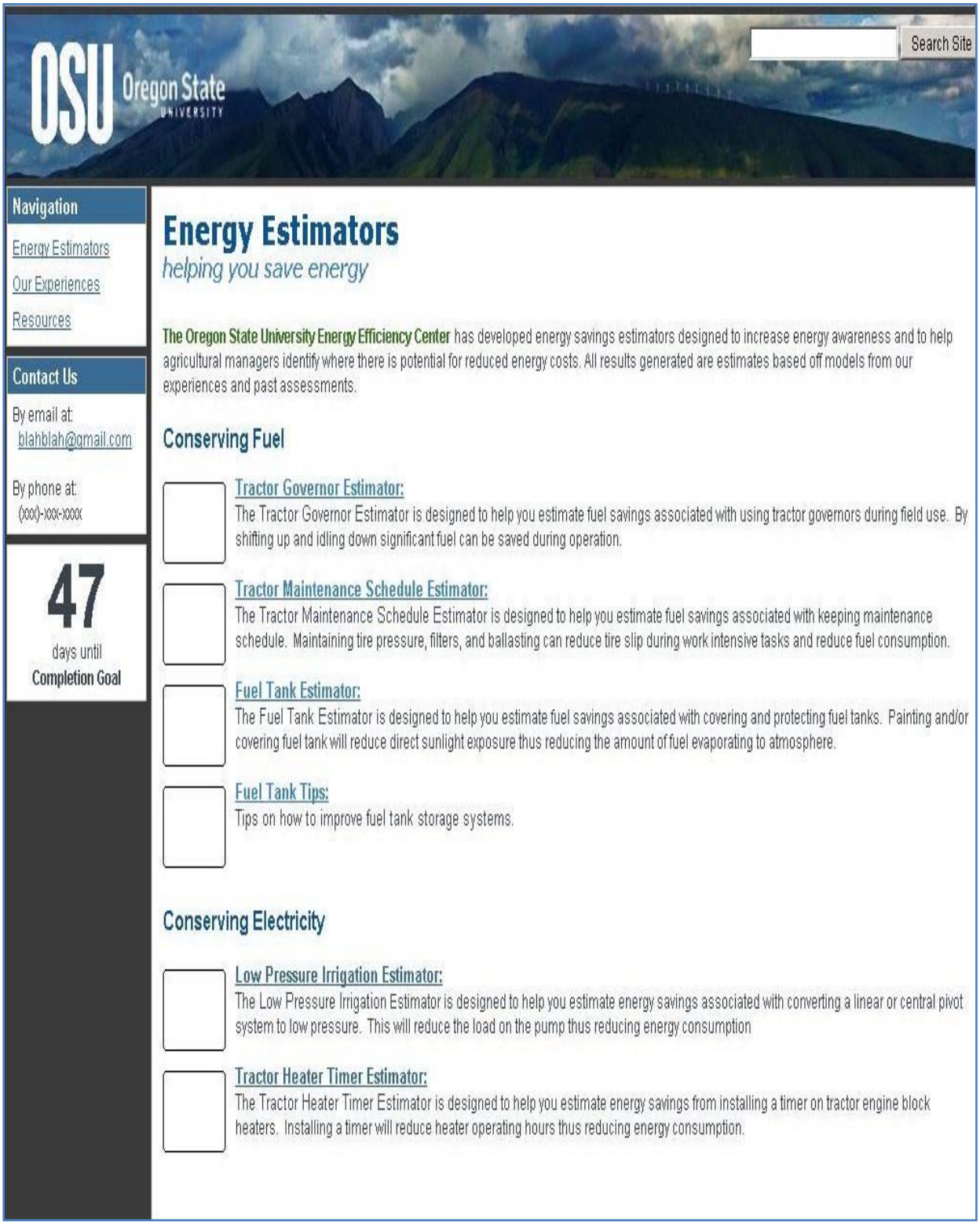
in order to extend the reach of the assessment effort, the center also initiated work on a draft Web Resource and Analysis Tool to begin capturing the information, understandings, and analysis approaches gathered and developed in preparation for and through farm assessment and report preparation. The long term goal is to provide links/resources for a wide range of agricultural related topics. To date one of our talented students has developed the basic layout of the site and is tackling it section by section as time permits. Currently the focus is on an Energy Estimators section which we believe will be most useful for website viewers. It is not yet ready for public viewing but we can grant access to interested parties and collaborators to view and provide input on the current state of the site.

Following are a few screen shots from the site.

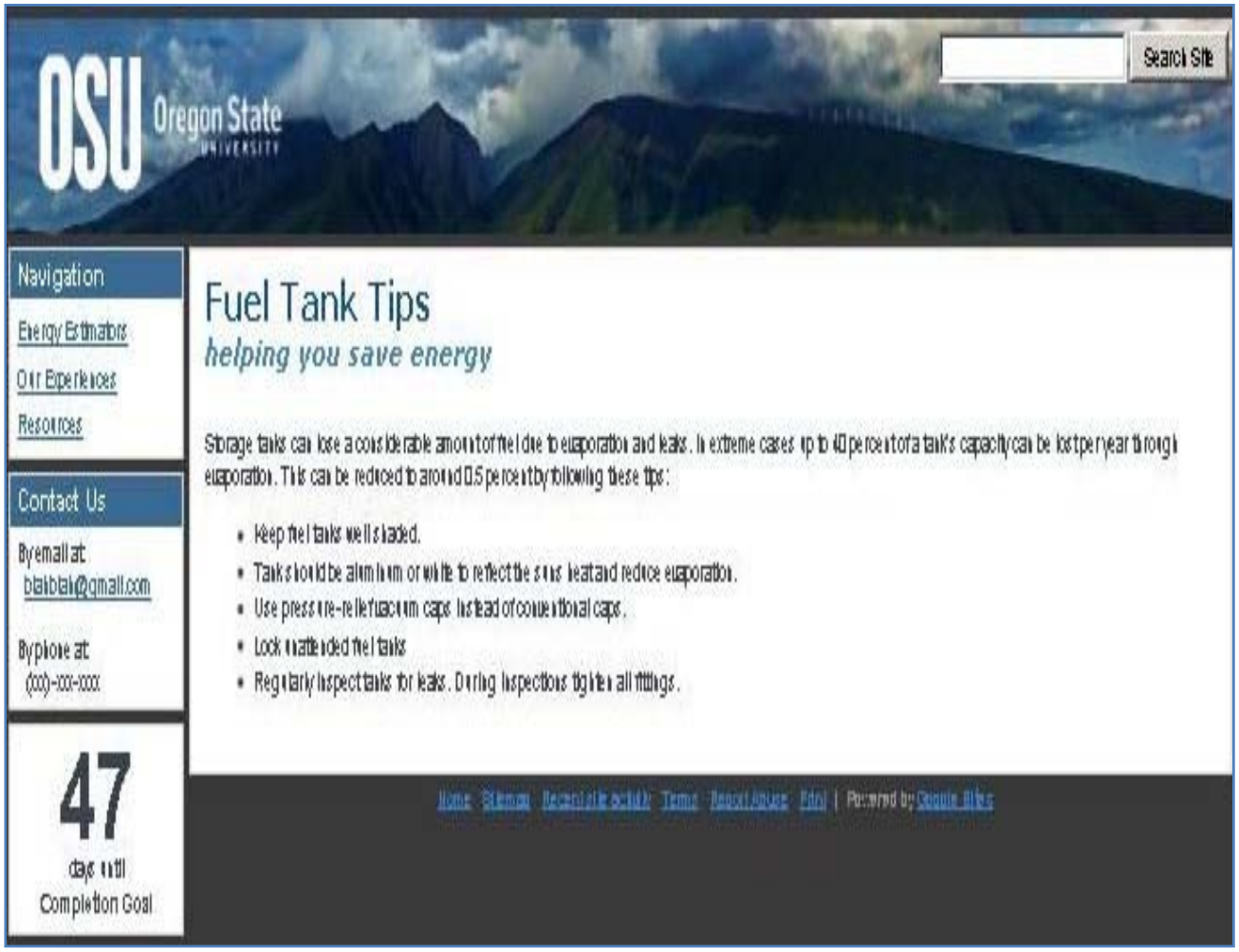
Home Page


OSU
Oregon State
UNIVERSITY
Search Site
Navigation
Energy Estimators
Our Experiences
Resources
Contact Us
By email at:
blahblah@gmail.com
By phone at:
(xxx)-xxx-xxxx
47
days until
Completion Goal
Welcome
to our agricultural site
The Oregon State University Energy Efficiency Center is here to help inform managers of a wide range of agricultural operations about potential energy saving opportunities. In this website you will find information about us, our experiences, our resources, industry specific opportunities, energy saving estimators and example recommendations.
Energy Estimators:
We have developed energy estimators designed to increase energy awareness and to help agricultural managers identify where there is potential for reduced energy costs. This page will help you estimate potential savings based off your current operational conditions.
Our Experiences:
We have been to a wide range of agriculture operations including dairies, grass seed farms, vegetable farms, nurseries, and wineries. This page will help you become better acquainted with us, our past, and what we do.
Resources:
We have done extensive research to help further our knowledge. This page contains some industry specific opportunities that may not show up else where on the site.
Home Sitemap Recent site activity Terms Report Abuse Print | Powered by Google Sites

Energy Estimator List Page



Tips Page


OSU
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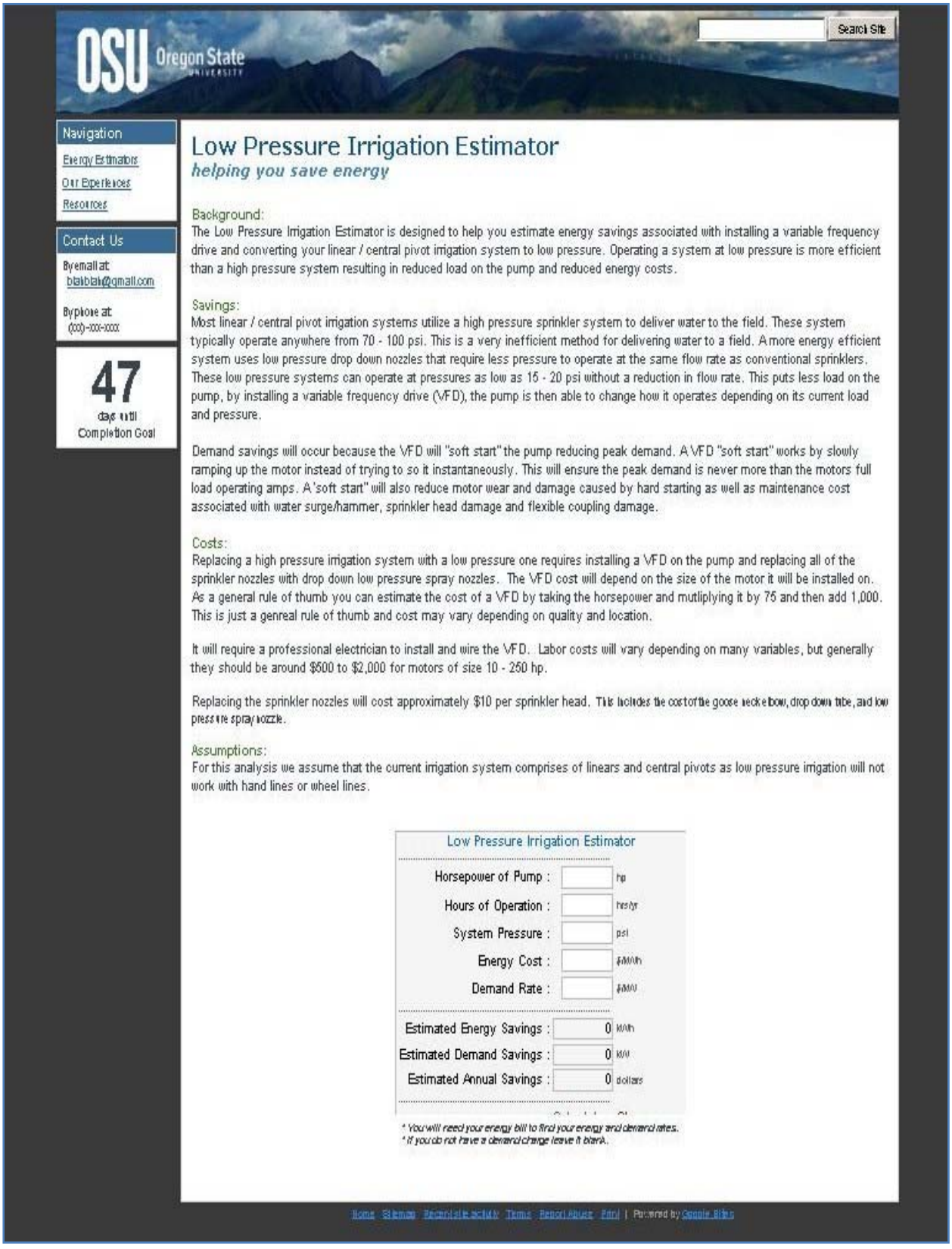
Search Site
Navigation
Energy Estimators
Our Experiences
Resources
Contact Us
By email at:
blahblah@gmail.com
By phone at:
(xxx)-xxx-xxxx
47
days until
Completion Goal
Fuel Tank Tips
helping you save energy
Storage tanks can lose a considerable amount of fuel due to evaporation and leaks. In extreme cases up to 40 percent of a tank's capacity can be lost per year through evaporation. This can be reduced to around 0.5 percent by following these tips:
Keep fuel tanks well stocked.
Tanks should be aluminum or white to reflect the sun's heat and reduce evaporation.
Use pressure-relief vacuum caps instead of conventional caps.
Locate unattended fuel tanks
Regularly inspect tanks for leaks. During inspections tighten all fittings.

Energy Estimator Page



Project Follow-on: Commercial Farms and Row crop agriculture Assessment Proposal

As follow-on to this project the OSU EEC will visit at least two commercial facilities, perhaps a dairy, grass seed operation (growing and/or cleaning), and/or a nursery operation with greenhouses on site. The OSU EEC has also made a proposal to the Oregon Processed Vegetable Commission through the Agricultural Research Foundation. It is proposed to assess four processed vegetable growers, analyze their energy and resource use patterns and identify opportunities to reduce electrical, fertilizer, & fuel energy use and improve resource use and production efficiency. The goal will be to offer immediate value to assessed facilities, to hone a long term strategy to serve the agricultural sector and to develop experience based tools to identify and evaluate energy and efficiency opportunities in agricultural operations.

Assessment elements might typically include evaluation of irrigation, fuel use and fertilizer application as well as an open ended review of other opportunities to reduce energy, consumption and waste generation, conserve natural resources and improve profitability and sustainability. Assessment teams will typically include one graduate student, several undergraduate students and an optional faculty member.

The assessment process will follow the OSU Agricultural Assessment approach. They will start with pre-assessment data collection of annual month by month energy use and cost, significant energy users, equipment specifications and site visit preparation details. A site visit will follow and include a tour, brainstorm session, preliminary opportunity prioritization, data collection and a wrap up meeting. Follow-on report preparation work will include an email to the grower with a list of initial calculation results, request for additional data that would be helpful, and additional communication as needed. A report will be prepared with a summary of brainstorm ideas and recommendations, detailed presentations of calculation methodologies, and an energy use breakdown. Dissemination of the project results will include electronic and hard copies of the report to the facility, availability of results to OSU faculty and other interested parties, and continuing to share the report, findings, and methodologies via a web interface.