

OPPORTUNITIES IN RENEWABLE ENERGY

Oregon farms both consume energy and create feedstocks to generate energy and fuels. The concept of renewable fuels made from biomass and farm or forest-based feedstocks is not necessarily new, but technologies are improving and new opportunities are developing.

A 2003 report by the Council of State Governments indicates that: “Concerns about the environment, public health, energy security and price volatility continue to be motivating factors for the growth of renewable energy... renewable energy has the potential to benefit the entire country in these areas... In addition, locally produced renewable energy has the potential to spur development of supporting industries in construction, operation, maintenance, and other associated technological industries. ...It has been estimated that tripling the country’s use of biomass energy from farm residues and energy crops could produce approximately \$20 billion in new income for farmers and rural communities. Wind energy has similar potential for rural communities, according to the US Department of Energy, which estimates that more than \$1.2 billion in new income for farmers and 80,000 new jobs could be created by producing 5 percent of the country’s electricity from wind energy by 2020. Additional

tax revenue can be another boon of renewable energy development, due to the taxes from local energy production companies and from an increased worker base.”

The 2002 Farm Bill, for the first time in history, contained an energy component that provided new grant assistance to agriculture for developing renewable energy systems. Much of the initial assistance has been directed to the Midwest where farmer-owned biofuel cooperatives are well underway in the development of ethanol and biodiesel facilities.

Oregon has the potential for a diverse approach to renewable energy given the diversity of agriculture. Indeed, nearly all concepts associated with renewable energy have a link to agriculture.



Wind farms

Wind farms are largely located in rural wheat fields and rangelands of Eastern Oregon. Farmers who lease land to power companies for placement of wind towers are benefiting economically. Some growers are trying to establish ownership of a few wind towers rather than merely leasing land to power companies, but the challenges and up-front costs are difficult.

Micro-hydro

Micro-hydro has many potential applications in existing irrigation networks, from piped systems which could accommodate a micro-power turbine, to off-stream irrigation canals that are non-fish bearing and could utilize a “run-of-the-river” water wheel technology for power generation. Much needs to be explored about the potential

and uses for this technology.

Legislative concepts will consider streamlining the permitting of these facilities.

Anaerobic digesters

Anaerobic digesters produce methane gas from livestock manure for use in power generation, heating, or fuel production, and are increasingly being evaluated and used by dairies. In Oregon, three are in operation and several more are under design and construction. Digesters are costly and require additional management, but they have many benefits, including odor reduction, pathogen reduction, nutrient management, and by-product generation for potential off-farm sales or on-farm use (compost, heat, electricity). An estimated 100 dairies in Oregon have more than 1,000 animals and are at the threshold of potential cost-effectiveness for development of an anaerobic digester.

Biofuels

The US produces about 40 percent of its present petroleum usage. Contrary to popular perception, most imports come from Canada, Mexico, Latin America, and Africa, which, combined, supply more fuel than the Middle East.

However, the tripling of petroleum prices in the past three years has created interest in alternatives. Market pressures, spurred by growth in China and India competing for oil, as well as natural disaster interruptions in production, are pushing record output of both biodiesel (made from oilseed crops) and ethanol

US crude oil imports (thousand barrels/day)

	YTD 04	Percent share
Canada	1,568	17.3%
Mexico	1,553	17.1%
Saudi Arabia	1,404	15.5%
Venezuela	1,312	14.5%
Iraq	614	6.8%
Angola	295	3.3%
United Kingdom	237	2.6%
Algeria	157	1.7%
Norway	178	2.0%
Kuwait	179	2.0%
Gabon	122	1.3%
Colombia	149	1.6%
Ecuador	163	1.8%
Equatorial Guinea	69	0.8%
Total imports	9,068	100.0%
Domestic production	6,045	
Total consumption	15,113	

(made from plant starches and cellulose). Oilseeds, which provide an option for growers looking for rotational crops, and traditional agricultural biomass from currently grown crops, can serve as feedstock for biofuel production.

The diversity of agriculture in the Willamette Valley has presented conflicting interests between growers of specialty vegetable seeds and those who want to grow canola. These vegetable seed crops are in the same biological family (brassica). Canola, rapeseed, and mustard are some of the highest yielding oilseed crops and are of interest as to grass seed growers as potential rotational crops. Vegetable seed growers are worried that large canola oilseed production could present pest and disease pressures and affect export markets for vegetable seed.

The Oregon Department of Agriculture established a two-year rule to address these concerns by creating open/general production areas and protected areas. The open/general production areas have minimal requirements for oilseed production, requiring certified/treated seed and limitation of brassica production to two of five years on the same ground.

The protected districts limit brassicas for oilseed production but do allow growing canola/rapeseed for forage as long as it isn't allowed to flower. Production for certified seed is also allowed. In protected districts, certified/treated seed is required, as well as a limit of one in four years of production on the same property. An isolation distance of two to three miles is

required. Fields must be identified or "pinned" at county extension offices. Secure transportation of seed is required so that seed is not spilled along roadways. Volunteer control is essential.

Oregon State University is conducting research to evaluate the risk of canola to other brassica crops, the yield potential of canola, the economics of production, and other potential oilseed crops that can be produced in the Willamette Valley. ODA will base future decisions regarding canola production on the outcome of this research (anticipated from 2006-2008).

Presently, there is little infrastructure available in Oregon to process oilseed into biodiesel, or biomass into ethanol. Pendleton Grain Growers, a grower-owned cooperative, has installed crushing capacity, as has another grower in Eastern Oregon and growers in Klamath Falls. Sequential Biofuels, a distributor of biodiesel, opened a waste-cooking oil-to-biodiesel processing facility in 2005—the only operating processor in the state, and is now using some Oregon grown canola oil.

Several other proposals are pending in various stages of planning, siting, and permitting, but none are in operation as of this publication. This limits the ability of growers to commit land to oilseed or biomass crops without a "home" or facility for processing. The escalating price of petroleum and related products is generating more interest in alternatives and making the economics look better as time goes on. Additional



incentives from state or federal legislation can assist in furthering project development.

As cellulosic conversion processes are fine-tuned and become economical in the next two to four years, Oregon's production of hybrid poplars may be another potential feedstock for ethanol production. There are presently more than 20,000 acres of hybrid poplars growing in Oregon. These are being grown for pulp or dimensional lumber, and milled for moldings and various other wood products. An estimated one million tons of ryegrass straw and a larger amount of wheat straw would also be available for cellulosic conversion to ethanol.

Many studies demonstrate the economic benefits to local economies of renewable energy development—including crop production receipts, jobs associated with facility construction and operation, local and regional sales of output products, an enhanced tax base, and displacement of imported products.