

Energy Efficiency and Renewable Energy

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Benefits to Agriculture

- Energy efficiency can mean major savings
- Potential producers of renewable energy
- Risk management strategy
- Incentives available
- Marketing
- Other natural resource benefits

Energy Efficiency

- Irrigation efficiency
- Nutrient/pesticide application
- Tillage
- Heating/cooling systems
- Lighting & ventilation
- Recycling

Efficiency resources

- New NRCS efficiency web site!
 - <http://www.ruralenergy.wisc.edu/>
- National Center for Appropriate Technology
 - Great irrigation section
 - http://attra.ncat.org/farm_energy/irrigation.html

Irrigation Efficiency

- Irrigation scheduling

- Efficient irrigation equipment
- Regular maintenance

Pump efficiency

- Properly sized valves/fittings
- Consider premium-efficiency pump
- Match pump size to pressure needs
- VFDs in certain situations

VFD applications for irrigation

1) Milking/cooling systems

- VFDs on vacuum pumps
- Replace reciprocating compressors with scroll compressors
- Refrigeration heat recovery units
- Pre-coolers (in-line coolers)

2) Vacuum pump with VFD

3) Ventilation

- Roof vents
- Regular fan maintenance
- High efficiency fans
- VFDs on ventilation systems

Lighting

- Upgrade T12 to T8
- High efficiency circular fluorescent
- Metal halide to pulse-start metal halide

Nutrient Application

- Nutrients are an energy input

- Maximize value of nutrients/pesticides applied
 - Soil sampling
 - Precision application
 - Slow-release formulations
 - Legumes in rotations/cover crops
 - Manure applications

Tillage

- Consider conservation tillage
- Overlap reduction technology
- Proper equipment maintenance

Renewable Energy – Types

- Solar
- Wind
- Small hydro
- Geothermal
- Biomass
 - Biofuels
 - Bioenergy

Net Metering – Definition

- Grid-tied projects
- Project's power production is subtracted off annual power bill
- Power production above & beyond landowner's use goes into low-income energy fund to help people pay bills OR landowners may be paid for surplus production (depends on utility)

Feed-In Tariff

- Pilot project bill passed in 2009 session
- Oregon Public Utility Commission is developing rules

- Would result in payments to solar project owners for electricity production
- Stay tuned for more information!!

Solar

- Oregon receives enough sun for solar projects
- 1.1 to 1.5 kWh per watt of capacity
- Approx \$6 per watt (before incentives)
- Prices may be lower during next couple of years

Wind

- Works well at sites with average speeds above 10-12 mph
- Several websites can help you find ave. wind speed at your site
- Farm, community, and large-scale

EXAMPLE: 10 kW Turbine – McMinnville

- Discounted cost: \$68,000
- Typical cost: \$90,000
- Business Energy Tax Credit
- Energy Trust
- Eligible for USDA but did not apply

Wind Turbine Considerations

- Farm-size projects - towers typically 120 feet tall
- Can get a tilt-down tower
- Site close to interconnection
- Check with county planning about land use ordinances on EFU

Small hydro

- Need sufficient head and water flow
- Ag applications

- Ponds
- Streams
- Irrigation ditches/pipes

Incentives

- State
- Federal
- Local
- Energy Trust of Oregon

Business Energy Tax Credit (BETC)

- Based on capital costs that will be recovered in a 15-year period
 - Energy efficiency projects (pumps, motors, lighting, etc.) receive 35% credit
 - Renewable energy projects receive 50% credit

Biomass Incentives

- Oregon Producer-Collector Credit
 - Per unit credits for biomass, including oilseeds, converted to bioenergy
- FSA - Biomass Crop Assistance Program

Federal tax incentives

- Federal tax credits for certain renewable energy projects
- Accelerated depreciation for certain renewable energy projects

Incentives – USDA

- Rural Development Programs
 - Value Added Producer Grant Program
 - Rural Energy for America Program
- Environmental Quality Incentives Program
- Conservation Security Program

Energy Trust of Oregon

- Renewable projects
- Efficiency projects
- Feasibility studies
- Grant applications
- Generally, should be within areas served by PGE or PPL
- NW, Cascade, Avista Natural Gas

For More Information

- ODA - Energy and Ag website
- ODOE - renewable energy, efficiency, tax credits
- USDA Rural Development - Oregon
- Energy Trust of Oregon
- National Renewable Energy Lab
- Harvesting Clean Energy Conference