Solar (& Wind) For the Farm

Potentials and Practical Applications

Organic Connections Conference
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Kelln Solar
The Power of the Future

Outline

- Forms of Use
- Relative Costs
- Practicalities & Applications
- Practical Examples
- Renewable Incentives

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Wind and Solar

Forms of Use

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Wind – Forms of Use

- Mechanical – used to directly drive such things as windmills for grain milling, water pumping, or aeration in water bodies
- Electrical – used to generate electricity

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Solar Energy – Forms of Use

- Thermal – using the sun's infra-red radiation directly, or indirectly, to provide heat
- Electrical – transferring energy from the sun's light spectrum into useable electrical power.

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Solar Thermal Energy

- Passive Use – direct heating by the sun's rays striking an object (i.e. – a rock, dark object, or as in heating a room using a window)
- Active Use - indirect use of the sun's heat through the use of solar collectors and mechanical means of heat distribution.

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Solar Electrical

- The use of solar electrical panels (photovoltaics), which use silicone and the presence of positive and negative particles, to produce electrical energy when struck by the sun's rays.

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Renewables – Hard Facts

- Reduce is the first 'R' - of Reduce, Re-use & Re-cycle
- Reducing our use of energy will enable us to use Renewables effectively
- $1 in Energy **Conservation** = $3-$5 in Energy **Generation**

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Relative Costs

Least Costly to Most Costly:

- Energy Conservation/ Efficiency
- Passive Solar
- Solar Pool Heating
- Solar DHW (domestic hot water)
- Ground Source Heating (geo-thermal)
- Solar Thermal for Space Heating
- Wind Electric Generation- small scale
- Solar Electric Generation

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Wind and Solar

Practicalities & Applications

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Wind - Practicalities

- Good wind exposure – particularly in the southern prairies
- No regulations
- Few noise and liability issues

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Solar - Practicalities

- Great wide open skies – great insolation
- Solar electrical applications for remote locations – pumping, aeration, site lighting
- Solar thermal – for drying grain, heating shops, providing hot water

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Wind Energy Applications

- Sailing
- Pumping water
- Aerating water bodies
- Electrical power generation

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Solar Electric Applications

- To use directly – as in solar direct pumping
- To store in batteries for later use (off-grid system or remote livestock system)
- To transfer to the electrical grid for use by others (grid-tied).

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Solar Thermal Applications

- Solar air – to heat air for such use as drying grain or replacement air in buildings
- Solar hydronic – to heat water or a water/anti-freeze mixture to provide heat for DHW (domestic hot water) or for space heating.

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Renewables

Examples

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Wind Generation – 66Kw

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Remote Watering - Summer

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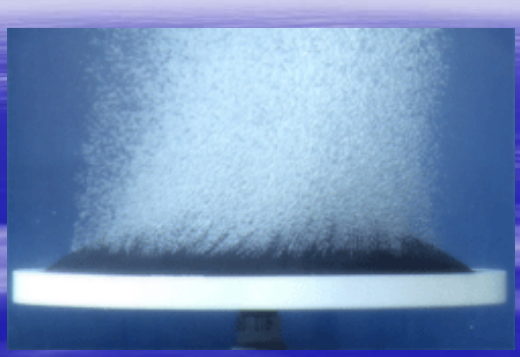
Solar Aeration – All Seasons



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Freeze-Proof Watering

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Watering w/o Heating

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Solar Hot Water

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Energy Conservation - Farm

- Reduce idling, even diesels
- Put timers on various heating equipment – tractor block heaters,
- Use synthetic oil in equipment for easier winter starting

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Energy Conservation - Farm

- Eliminate air leaks in heated buildings
- Retro-fit to improve energy efficiency
- Eliminate un-required yard lights, or convert to motion-controlled units

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New Construction

- Build a highly insulated building with long axis east-west
- Allow window on south wall to admit light (heat)
- Consider radiant floor (insulate floor)

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Wind & Solar Power Incentives

- As of Sep '07, net-metering for small-scale power producers in SK
- Net-metering - production is subtracted from consumption
- No cheques - over-production credited to next billing

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Wind & Solar Incentives

- Wind or Solar Grants (provincial) - to cover 25% of renewable power installed costs - (rumours of another 10%)
- Thermal incentives available for commercial applications (including farms) – up to 50% (eco-ENERGY & SHIFT)

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Review

- Forms of Use
- Relative Costs
- Practicalities & Applications
- Practical Examples
- Renewable Incentives

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For Things Solar (& wind)…..

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