Water and Energy in Ag

A brief look at the energy demands of irrigated agriculture in Colorado
# Electrical Demand

<table>
<thead>
<tr>
<th>YEAR</th>
<th>HIGHLINE</th>
<th>ELECTRIC</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total KwH</td>
<td>Irrigation</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>380,294,461</td>
<td>219,349,614</td>
<td>57.6</td>
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<tr>
<td>2006</td>
<td>399,343,212</td>
<td>244,361,261</td>
<td>61.2</td>
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<tr>
<td>2007</td>
<td>399,266,313</td>
<td>213,101,543</td>
<td>53.4</td>
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<tr>
<td>2008</td>
<td>429,822,893</td>
<td>208,746,222</td>
<td>48.6</td>
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<tr>
<td>Totals</td>
<td>1,606,686,879</td>
<td>885,558,640</td>
<td>55.2</td>
</tr>
</tbody>
</table>
## Electrical Demand

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<thead>
<tr>
<th>Year</th>
<th>YW Total Kwh</th>
<th>Electric Irrigation</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>316,808,726</td>
<td>175,058,336</td>
<td>55.3</td>
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<tr>
<td>2006</td>
<td>345,837,391</td>
<td>200,533,879</td>
<td>58.0</td>
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<tr>
<td>2007</td>
<td>333,021,043</td>
<td>166,273,105</td>
<td>50.0</td>
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<tr>
<td>2008</td>
<td>333,947,246</td>
<td>160,332,505</td>
<td>48.0</td>
</tr>
<tr>
<td>Totals</td>
<td>1,329,614,406</td>
<td>702,197,825</td>
<td>52.8</td>
</tr>
</tbody>
</table>
Irrigation Information

- About 4,000 irrigation wells in Basin
- Typical well irrigates 120-130 acres
- Crops: Corn, Sugar Beets, Dry Beans, Alfalfa, Wheat and Soybeans
- Yuma County, CO produces 42,000,000 bushels of corn annually
Farmer Brown typically grows irrigated corn on 130 acres. He uses 18 acre inches, and yields 225 bu. Total energy use = 125,000 KwH. Power of Consumption Coefficient = 641 KwH per Acre Foot.
Farmer Brown cont.

- If Farmer Brown reduces his irrigation by 3 inches (16%)
- His total power consumption drops by 20,800 KwH (16%)
Ways to reduce

- **Management**
  - Crop rotation
  - Irrigation Water Management
  - Target yield reduction

- **Technology**
  - Advanced computerized irrigation panels
  - Precision agriculture
  - Energy storage
Why is Irrigation so Important?

- Consistent production for farmer
- More production equals more gross revenue
- More gross revenue equals a healthier local economy
- The producer lives on the net dollar, the community lives on the gross dollar.
All data taken from the 2002 Census of Agriculture.
Net Cash Return From Agricultural Sales ($1000)

Yuma: 58,023
Wash: 2,612

Net Cash Return From Agricultural Sales ($1000)
What do these numbers mean?

- The counties are very equal in numbers of farmers and average size of farms.
- The main difference is an extra 210,000 acres of irrigated ground in Yuma County.
- Without irrigation, Yuma County would not have the cattle numbers that it does.
- An extra $470 million in Ag sales can be directly attributed to the presence of irrigation in Yuma County.
- An extra $420 million in Ag dollars spent is due to irrigation.
- Most of these Ag dollars are spent locally, driving our economy.
- THAT is why keeping irrigated acres in our county is so important.
Yuma Conservation District Programs

- **Cost share for irrigation panels**
  - $2,500 cost share incentive
  - Will track data, pre- and post installation
    - Hope to achieve up to 20% reduction in energy and water usage

- **Energy Storage**
  - Pilot project with iCAST USA
  - Store energy with compressed air
    - Potential to reduce energy bill by 30%
Irrigation Panel examples

Control Panel on Center Pivot

Remote control from PDA

Images from Valley Irrigation promotional material
Programs cont.

- Yuma Conservation District using comprehensive approach integrating water, energy, economic development, etc.
  - Oilseed crushing facility
    - Will promote lower water use crops, create jobs, create renewable fuels
  - Crop Insurance Project
    - Pilot project to introduce crop insurance programs in areas without an established cropping history
    - Utilize research institution data to establish baseline
Vast amounts of land
- Ag lands best option for producing alternative energy (bio, wind, solar)

Carbon offsets
- Huge potential
- Income can offset production losses
USDA Programs

- Rules under 2010 Farm Bill
- Repowering Assistance Payments
  - new systems that encourage renewable biomass energy use and replace fossil fuels
- Bioenergy Program for Advanced Biofuels
  - Need to consider crop insurance/risk mgmt
- Grants for Regional Econ. & Community Dev. “best practice” Great Regions projects (food, renewables, broadband, access to capital, natural resources)
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