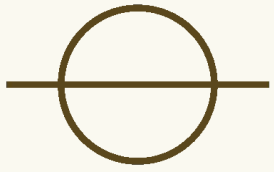




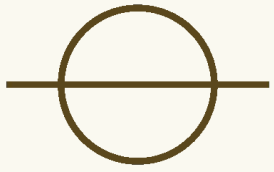
Irrigation Modernization: The water/energy nexus



Irrigation Modernization

Water in the West

- 80% of freshwater in the west is diverted for agriculture
- GWs of energy is used to move that water
- Untapped energy savings and generation across irrigation districts
- Energy lost through heavy pump loads and inefficiency systems
- The districts are in rural areas and away from public purview



Current Issues

- Old Earthen Canals that lose water through seepage
- Patrons must use energy-intensive pumps to irrigate their property
- High evaporation rates due to direct exposure
- Outdated systems – in some cases headgates are manually operated
- Expensive maintenance cost





Farmers Conservation Alliance's Role

- FCA does a comprehensive energy analysis for every district that comes into the modernization program
- Goal is to modernize system through pipe additions – can be up to \$1,000,000 - 7,000,000 per mile
- Over a billion dollars in the Deschutes Basin alone.
- Oregon is ahead of the curve because of partnerships like ETO. There are very few resources for the upfront energy evaluations
- We need significant investment in these systems



Modernization Goals



Save water through piping, putting CFS back in-stream



Generate renewable energy: in-conduit hydro, Micro hydropower, Energy conservation, pump upgrades, solar, or other alternatives



Update technology systems like SCADA



Reduce Algae Growth



Cool water for water returns to streams



Long-term asset for districts



Patrons can save by switching to pressurized systems

Canal/Floating Solar



- FCA has 3 projects in development: Klamath Drainage District, Medford Irrigation District, and the Ute Mountain Ute tribe
- 70% design for the canal solar
- Most districts have reservoirs which are uncovered
- Not all canals can be piped so canal solar makes sense
- Many areas in Oregon are high value solar – so canal/floating solar are good alternatives
- Only 1 canal solar project in the world has been completed (India)
- Cost has been prohibitive until the new tax credits and IRA grants

Battery Storage/ Demand Programs

- Irrigation district haven't been able to participate in demand programs
- When a patron calls for water, the district must deliver that water. Districts don't have the option to curtail usage
- Battery storage could produce multiple benefits
 - Pumps could run on the battery during peak events, allowing the districts to capitalize on demand payments
 - Additionally, during power loss events, pumps could run on the battery to continue water delivery during extreme weather preventing crop loss