

Micro-hydro uses energy in falling water to spin a turbine to produce electricity

The Delta Conservation District is uniquely situated with regard to micro-hydro opportunities. With high mountain elevations collecting water in more than 1,600 ditches and canals distributing water to the valley floors below, there is abundant potential to harness clean energy. However, not every site is optimal for micro-hydro application. This brochure is designed to assist landowners within the District in determining if their site-specific circumstances are amenable to the application of micro-hydro.

Watt=unit of power (one joule of energy per second)

Kilowatt or kW=1,000 watts

Kilowatt hours=kW x hours

On average, 1CFS x 100 Feet = 8.5kW

5kW will power an average home

Related Information Sources

Delta Montrose Electric Association
www.dmea.com
Colorado Division of Water Resources
www.water.state.co.us
Governor's Energy Office—Colorado
www.colorado.gov/energy/
www.canyonhydro.com

Possible Funding Sources

Painted Sky RC&D 970.874.5735 ext.133
www.paintedskyrca.org
USDA Rural Development 970.874.5735 ext. 4
www.rurdev.usda.gov/co/delta.htm
USDA Natural Resource Conservation Service
www.co.nrcs.usda.gov

This brochure was a joint effort between DMEA and the Delta Conservation District.



The Delta Conservation District thanks you for conserving our natural resources

DELTA CONSERVATION DISTRICT

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Delta Conservation District

Conserving Colorado's Natural Resources

GUIDE TO MICRO-HYDRO FOR LANDOWNERS IN WESTERN COLORADO



Harness the Energy of Flowing Water

Micro-hydro

Net Metering and Power Purchase Agreement (PPA) policy varies by utility company. The main utility company in the Delta Conservation District is **Delta-Montrose Electric Association**. DMEA's *Net Metering Policy* allows a user to offset some or all of his or her electricity consumption. Individuals can feed excess electricity through the meter onto the grid. The excess electricity is credited to the user. Up to 25 kW systems can be Net Metered; however ideally, a micro-hydro system should be sized no larger than what is required to offset annual electricity consumption. The computation at right may be used to determine an appropriate size system.

Individuals with a large generating capacity who wish to sell electricity to DMEA will need to negotiate a PPA. PPA's are much more complex than Net Metering. Interconnection standards from your hydro-electric generator to DMEA's grid must be followed. Typically, a feasibility study will be required, and the cost of constructing the infrastructure to tie to the grid can be relatively high (generally, 3-Phase transmission lines will be required).

Is micro-hydro applicable to your site? Examine your monthly power bills. What is your *average* kWh consumption per month? _____ **Average Monthly kWh use**

Do you have the ability to generate **more** or **less** kWh than what you consume on an average monthly basis? (Note: *the calculation below for your potential electric generation is rudimentary and does not account for variation of flow and generator efficiency.*)

Input your measurements here:

H _____ ft (Where H=Head or total vertical drop between stream water collection point and turbine measured in feet using a level, transit, topo map or GPS)

X

F _____ cfs (Where F=Flow or volume of water. This can be obtained by looking at the measuring flume. Also, more information can be found on websites such as www.canyonhydro.com)

X

0.085 *

* Constant used when H is measured in ft and F is measured in feet /sec

_____ **kW** (power or kilowatts)

X
720

To get kW hours, multiply by 24 hrs/day & 30 days/month **or** 720

_____ **kWh production estimate**

Is your production estimate less than or close to your average monthly consumption **or** substantially greater than your consumption?

Your Production Estimate

If your production estimate is **substantially** greater than your consumption and you have approval to use the water from the appropriate authority, contact your utility company to discuss a **Power Purchase Agreement**.

If your production estimate is **close to but not substantially** greater than your consumption and you have approval to use the water from the appropriate authority, consult your utility company to discuss **Net-metering**.

Obtaining Approval of Water Use

If the water you will use for micro-hydro is in a natural stream or river you must file for a non-consumptive use with the State of Colorado. **If** the water is in a ditch or canal, you must obtain the approval of the appropriate ditch company.

