



Smart Management for
Small Water Systems

Managing Energy at Your Small Drinking Water System – A Workshop Series for North Carolina Utilities

Workshop 1 – Tuesday, 11/29/16

Land-of-Sky Regional Council,
Asheville, NC

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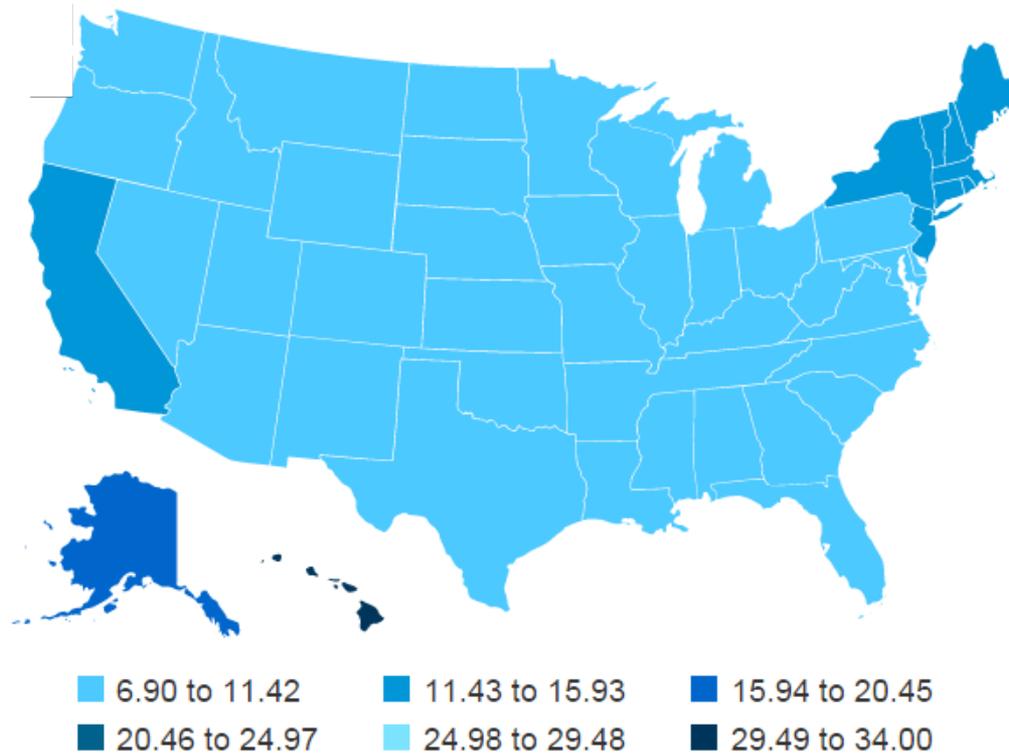


Understanding Your Electricity Bill





U.S. average retail price per kilowatthour is 10 cents



Source: U.S. Energy Information Administration as of Feb. 2016

Sample Electricity Bill for a Small Water System

Account No.	Service Location			Cycle	Service From	To	Days	Rate / Reference / Bill Type
92747600	WTPA OXBOW 460			2	11/01/2014	12/01/2014	30	45 / MUNICIPAL WAT / REGULAR
Meter Nbr	Pres Rdg	Prev Rdg	Mult	kWh Used	<p style="text-align: center;"><u>ACTIVITY PRIOR TO BILLING</u></p> PREVIOUS BALANCE 4790.71 PAYMENTS -4790.71 BALANCE FORWARD 0.00 <p style="text-align: center;"><u>CURRENT BILL INFORMATION</u></p> ENERGY 1997.75 DEMAND CHARGE 260.00 KVA 871.00 GRID ACCESS 58.95 FRANCHISE FEE 87.83			
50078	4867	4742	200.0000	25000				
<p>CONVENIENT WAYS TO PAY YOUR BILL</p> <ul style="list-style-type: none"> ■ SmartHub online Bill Pay - make a payment, access your account, or contact via online or mobile device. ■ Pay Now - quick online payment with real-time billing information. ■ Electronic Funds Transfer - Pre-Authorized transfer of payment from your bank to 					Date: <u>12-17-14</u> Acct: <u>500-462-413-00</u> Authorized By: _____			
					Current Charges Due By 12/29/2014			3015.53
					Previous Balance Was Due 12/01/2014			0.00
					Total Amount Due			3015.53

Retain this copy for your records.



Typical Electric Bill Components

- Customer charge
- Consumption charge (by kWh)
- Demand charge (by kW or kVa)
 - May not apply in some rate structures, e.g. residential electric rate structures
- Other charges
- You may be able to switch rate structures



Base charges / Customer charges / Service availability charges

- Typically charged on a per meter basis regardless of consumption
- Typically covers administrative costs of providing service to the customer / access to the grid
- May have single phase vs. triple phase



Customer Charge Example

- Funds administrative costs of providing service to the customer – charged on a per meter basis

Commercial	Large Power	Curtailable Large Power
Single Phase: \$6.33 Triple Phase: \$12.65	\$48.67	\$131.70
*Per utility's website, effective 1/1/14		



Consumption Charges (by kWh)

- Charged on monthly, per kWh basis
- Typically covers the cost of fuel
- Can vary based on season
- Can vary based on time of day



Consumption Charge Example

- Energy charge— funds the cost for producing and delivering electricity plus investment in the power plants and facilities
 - Commercial: Uniform Rate at \$0.103832 per kWh
 - Large Power: Decreasing Block Rate



Large Power Decreasing Block Rate

ENERGY CHARGE

The Virgin Islands Water and Power Authority uses a declining block pricing system for energy consumption. Blocks rates are determined based on progressive per kWh consumption.



In addition to the per kWh rates, Large Power customers are assessed a flat rate customer charge.

Large Power Customer Charge
\$ 48.67



Electricity Rate Class Examples

Commercial

- Customer charge
- Surcharges
 - Line loss
 - Maintenance
 - Insurance
- Uniform rate energy charge
- Fuel charge

Large Power

- Customer charge
- Demand charge
- Surcharges
 - Line loss
 - Maintenance
 - Insurance
- Decreasing block rate energy charge
- Fuel charge



Types of Electric Rate Structures

- Your electric rate structure may go by any of many different names
- A small water system likely may have a Small General Service or Medium General Service electric rate structure
- Consumption charge (per kWh) portion:
 - Uniform rate
 - Increasing / inclining block rate
 - Decreasing / declining block rate



Demand Charges

- Charged on a per kW basis (or kVa)
 - Real power versus apparent power
- May be charged against the customer's peak demand or the utility's peak demand (coincident peak)
 - E.g. the top one hour per month, or top 15 min., etc.
- Typically covers capital costs, particularly for peaking capacity
- Does it carry over? (Ratchet Charge)



Demand Charge Example (per kW)

- Usually measured in kilowatts (kW), a measurement of power demanded at a given instant in time.
- There are no “demand ratchets” in this example rate structure, where you can get “stuck” with paying for a peak of demand for a long while, such as an entire year.

Commercial	Large Power	Curtable Large Power
NA	\$1.95/kW	-reduced rate (practically covers entire rate)

*Per utility’s website, effective 1/1/14



kWh — like **odometer** (a measure of total energy you use over a specific period of time, NOT at a given moment)

kW — like **speedometer** (a measure of energy use at a given moment, NOT over time)





Other Charges

- Fuel surcharges
- Line loss charges
- Maintenance charges
- Renewable energy and energy efficiency portfolio standard cost compliance charges
- Taxes



Surcharge Examples (per kWh)

- Line loss – funds projects geared towards reducing line loss in the electric system
 - \$0.002196/kWh (Commercial & Large Power)
- Maintenance - Funds earmarked for ongoing repairs, maintenance, and upgrades to the electric utility system
 - \$0.024863/kWh (Commercial & Large Power)



Surcharge Examples (per kWh)

- Fuel charge – cost of fuel consumption collected from customers and paid directly to fuel supplier
 - \$0.279991/kWh (Commercial and Large Power)
 - Surcharge rates such as fuel charges may vary by month, by quarter, etc.



Rate options that can reduce your electricity bills

- Time-of-use rates
- Interruptible rates
- Net metering
- On-bill financing
- Switching your electric rate structure

Note: May require operational changes to take full advantage of rate.



What elements do your water system's electric bills include?

- Share with the group, as time allows.
- We will come back to this at the last session of the day, with the demo of the energy baseline tool.