



Smart Management for  
Small Water Systems

# Managing Energy at Your Small Drinking Water System – A Workshop Series for New Hampshire Utilities

Workshop 1 – 07/19/16

Ashland Fire Station, Ashland, NH

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cooperative agreement with EPA.



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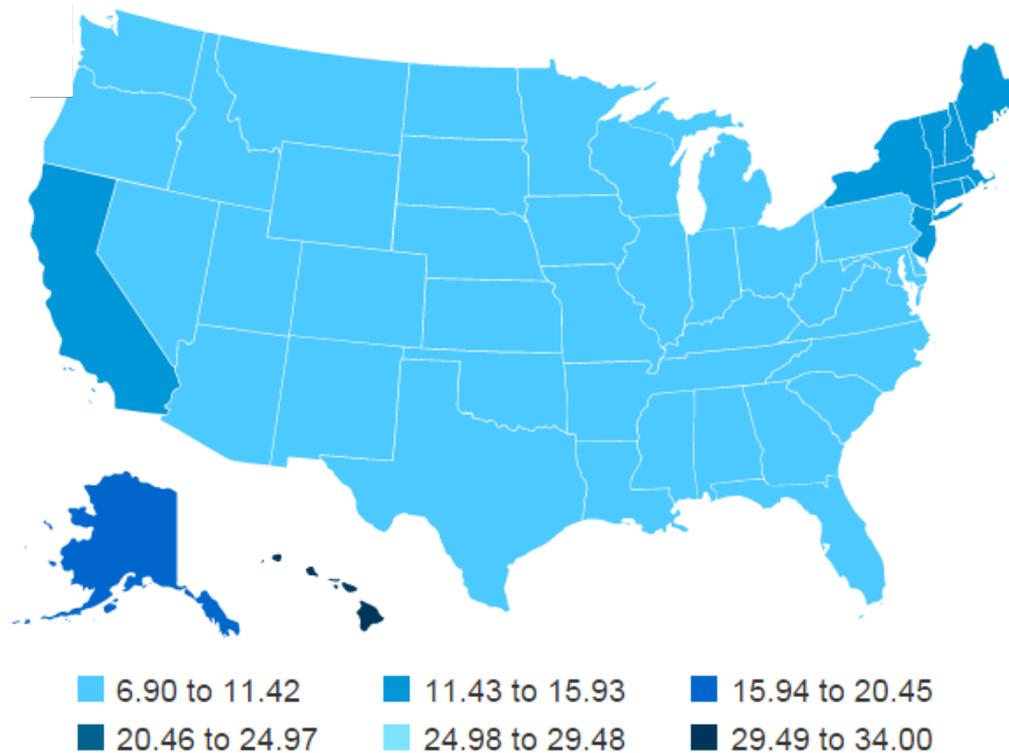


# Understanding Your Electricity Bill





**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><b>CONVENIENT WAYS TO PAY YOUR BILL</b></p> <ul style="list-style-type: none"> <li>■ <b>SmartHub online Bill Pay</b> - make a payment, access your account, or contact via online or mobile device.</li> <li>■ <b>Pay Now</b> - quick online payment with real-time billing information.</li> <li>■ <b>Electronic Funds Transfer</b> - Pre-Authorized transfer of payment from your bank to</li> </ul>					Date: <u>12-17-14</u> Acct: <u>500-462-413-00</u> Authorized By: _____			
					<b>Current Charges Due By 12/29/2014</b>			<b>3015.53</b>
					<b>Previous Balance Was Due 12/01/2014</b>			<b>0.00</b>
					<b>Total Amount Due</b>			<b>3015.53</b>

Retain this copy for your records.



# Typical Electric Bill Components

- Customer charge
- Consumption charge (by kWh)
- Demand charge (by kW)
  - 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	Curtable 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/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
  - OPEB
  - PILOT
  - Insurance
- Uniform rate energy charge
- Fuel charge

## Large Power

- Customer charge
- Demand charge
- Surcharges
  - Line loss
  - Maintenance
  - OPEB
  - PILOT
  - 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)

- 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)

- OPEB – Other Post-Employment Benefits
  - \$0.008668/kWh (Commercial & Large Power)
- PILOT – Payment in Lieu of Taxes to Territorial Government
  - \$0.000686/kWh (Commercial and Large Power)
- INS – Covers the cost for the electrical utility to self-insure
  - \$0.001925/kWh (Commercial and Large Power)



# Surcharge Example: Fuel Charge

- 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.*