

# Demand Response/ Load Control

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# DEMAND RESPONSE FOR LOAD MANAGEMENT

We use energy control for:

- 1. MISO Capacity needs** – may be generation shortage or transmission issues
- 2. OTP system maintenance needs** – may be storm related or equipment failure
- 3. Economic control** – to avoid purchasing high priced energy.
  - All energy cost savings flow directly to customers.
  - Economic control helps us keep prices low.

**1/3** of Otter Tail Power customers participate  
in some form of direct load control.

# HOW OTTER TAIL DETERMINES ECONOMIC CONTROL

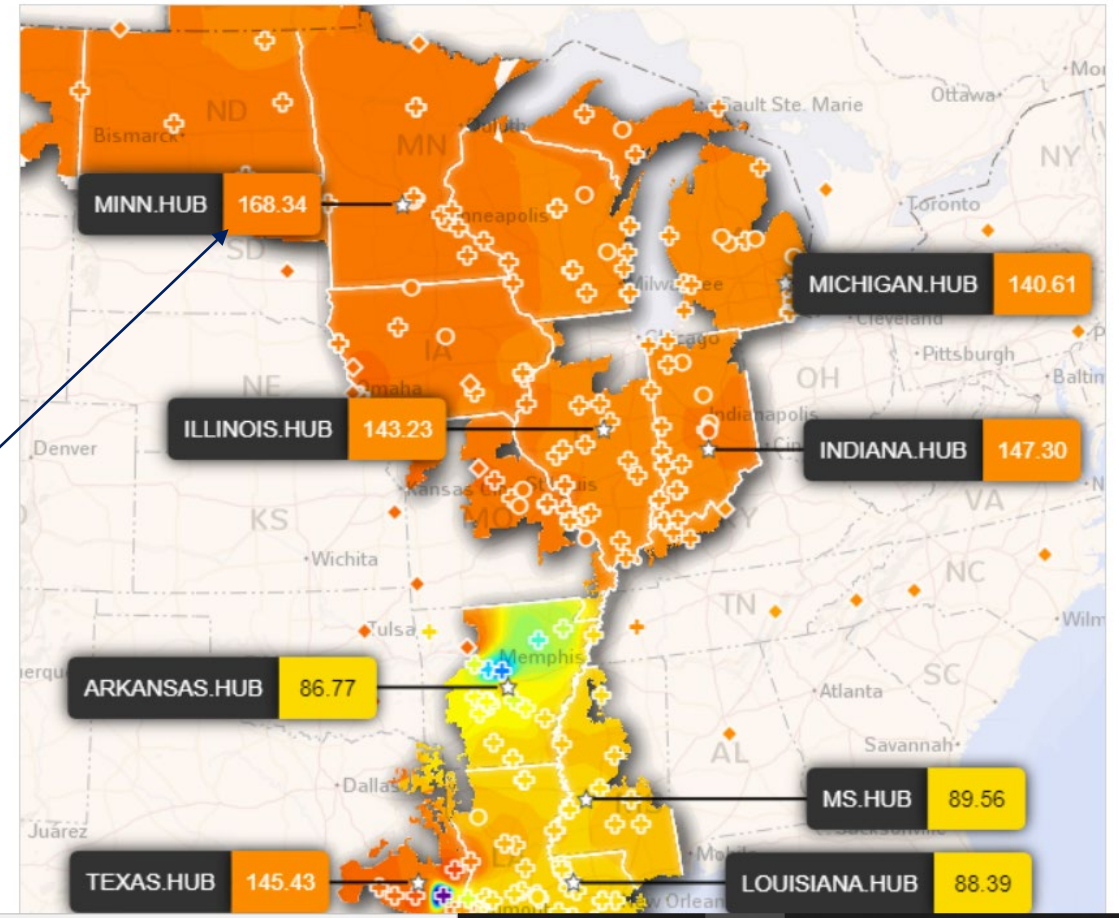
Economic control is determined by:

- Our load forecast.
- Available generation.
- MISO Market prices (which change every 5 minutes).
- Estimates of available controllable load.

*The map shows 5-minute prices per megawatt-hour across the MISO footprint. MINN.HUB price is equal to 16.834 ¢/kWh for energy.*

LMP Contour Map

15-Jan-2024 - 9:10 EST



# DUAL FUEL RATES

All-in prices based on average October 2023 billing.

(Prices vary by state and usage. See page 7 of the 2024 Program and Services Guide.)

Small Dual Fuel  
4.2¢ - 7.4¢ per kWh

Large Dual Fuel  
3.9¢ - 7.0¢ per kWh

Approximately 15,000  
customer on the rates.

- Heating can be controlled up to 24 hours/day (tariff maximum) with automatic switchover to back up system.
- Water heating can be controlled up to 14 hours/day in emergencies.
- Control has been 2 to 5 hours continuous in nonemergency conditions.
- Cooling systems may be cycled during the summer season.

# REBATES FOR DUAL FUEL AND RDC RATES

Central heating system rebates increased to **\$40/kW**.

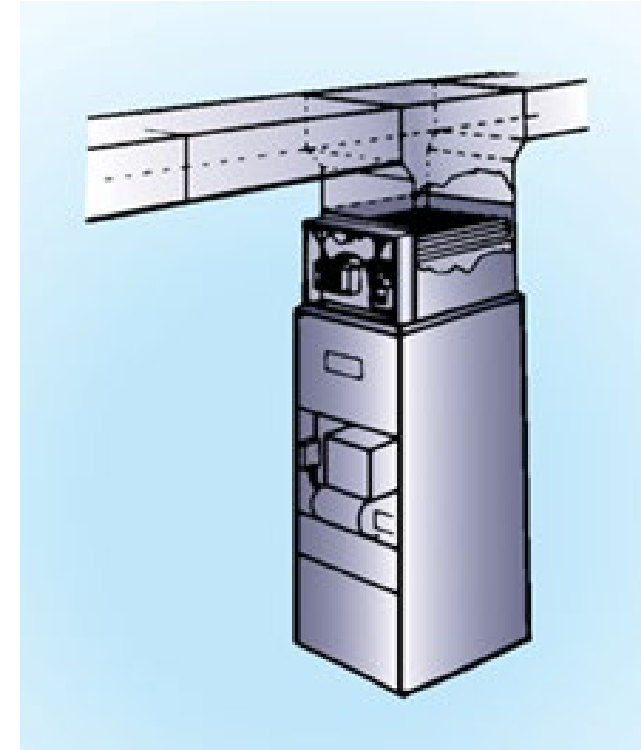
Technologies include:

- **Plenum heater**
- **Boiler**
- **Ducted electric furnace**
- **Underfloor storage heating** (RDC qualifies under thermal storage.)

Noncentral heating rebates increased to **\$20/kW**.

Technologies include

- **Baseboard**
- **Cove heat**
- **Garage unit heater**
- **Non-storage radiant floor-warming**



A minimum of 9 kW installation is required.

Rebates that will total \$10,000 or more require advance approval in ND and SD.

# RESIDENTIAL DEMAND CONTROL RATE

Billing applies to all loads in the home.

Cost based on **customer selected demand** level for control events. (Recommend no less than 3 kW.)

- Billed **Energy** and **demand** charges.

Demand \$8 per kW  
Energy 3.5¢ - 4.25¢ per kWh plus riders.

Approximately 5,700  
customer on the rate.



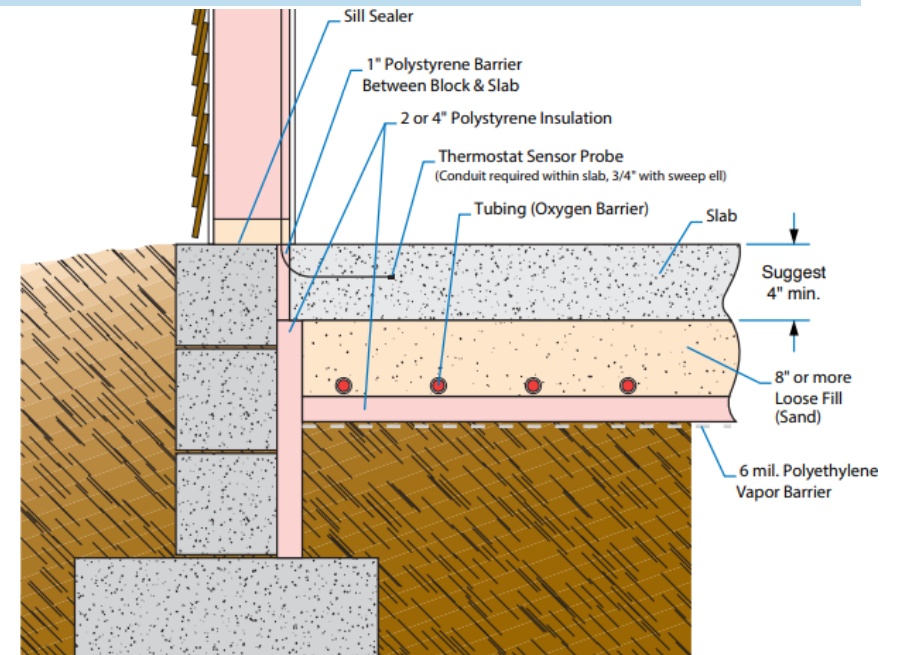
# DEFERRED LOAD RATE

All-in (energy and all riders) prices based on average October 2023 billing.  
(Prices vary by state and usage. See page 7 of the 2024 Program and Services Guide.)

5.4¢ - 9.0¢ per kWh

- Heating, water heating, EV chargers can be controlled up to 14 hours/day (tariff maximum) in emergency.
- Provide recovery period after 5 hours of control.
- Cooling systems may be cycled during summer season.
- Systems must be sized for adequate storage to get through maximum control periods.

Approximately 1,500 customers on the rate.



Adequately sized system buried in **8 inches or more** of sand fill.



# FIXED TIME OF DELIVERY RATE

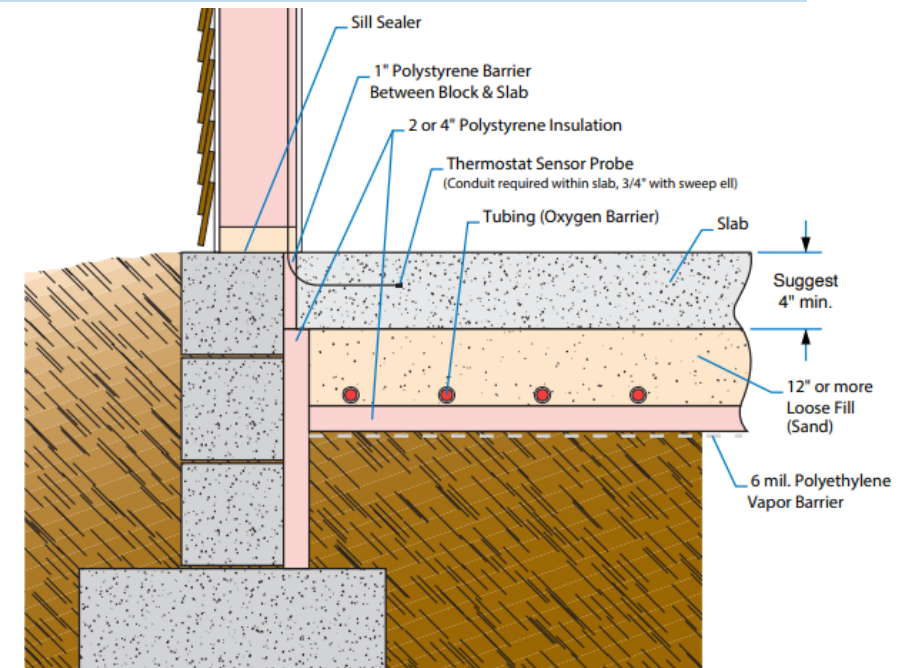
All-in (energy and all riders) prices based on average October 2023 billing.

(Prices vary by state and usage. See page 7 of the 2024 Program and Services Guide.)

3.8¢ - 5.7¢ per kWh

- Energy is delivered only from 10 p.m. to 6 a.m.
- Systems must be sized for adequate storage to get through 16 hours of no energy delivery.
- Loads may include heating, cooling, and EV chargers.
- Rate is not appropriate for non storage systems such as heat pumps.

Approximately 1,000 customers on the rate.



Adequately sized system buried in **12 inches or more** of sand fill.



# DEFERRED LOAD, FIXED TIME OF DELIVERY, AND RDC REBATES

## Thermal storage technologies

Rebates increased to **\$75/kW** for the following:

- **Underfloor cable and panel heating**  
(installed under new slabs)
- **Storage furnaces** (such as Steffes)
- **Storage room units**
- **Cooling storage systems**



# DEFERRED LOAD, FIXED TIME OF DELIVERY, AND RDC REBATES

## Thermal storage technologies - continued

- A minimum of 9 kW installation is required.
- Rebates that will total \$10,000 or more require advance approval in ND and SD.
- Rebate is limited to 500 kW in ND and SD.
- **Systems are sized to store heat adequate to supply the space during the maximum control period allowed by the rate.**
- Underfloor systems (cable or panels) must be embedded in a sand bank to create a heat store.
- Contractor Cash from Smart Heat is **increased to \$25 per kW for up to 200kW.**



# HEAT PUMP ENERGY CONTROL REBATES

**Minnesota** – An additional **\$40/ton** DR rebate may be **stacked** with ECO rebates.

For AWHP on our Dual Fuel Rate.

Or for ECO-rebate eligible CCHP and GHP on our Dual Fuel, Deferred Load, or RDC Rate.

**South Dakota** – An additional **\$100/ton** DR rebate may be **stacked** with EEP rebates.

For AWHP on our Dual Fuel Rate.

Or for EEP-rebate eligible CCHP and GHP on our Dual Fuel, Deferred Load, or RDC Rate.



## HEAT PUMP ENERGY CONTROL REBATES, CONT.

**North Dakota** – Require off peak rate. HSPF is requirements are unchanged.

- **\$400/ton** for air-to-water heat pump on our Dual Fuel Rate.

Served on our Dual Fuel, Deferred Load, or RDC Rate.

- **\$400/ton** for ductless cold-climate heat pump
- **\$600/ton** for ducted cold-climate heat pump
- **\$700/ton** for geothermal heat pump

IRA requirements are different. Customers may want both rebate and IRA benefits.

# CONTROLLED WATER HEATING RATES

All-in (energy and all riders) prices based on average October 2023 billing.

(Prices vary by state and usage. See page 7 of the 2024 Program and Services Guide.)

5.4¢ - 9.0¢ per kWh metered  
Or \$8 to \$10 per month bill credit  
served through firm service meter.

Approximately 15,000  
on metered rate,  
1,200 on credit option

An additional 12,000 water heaters are served on heating rates such as Dual Fuel.

- Water heating can be controlled up to 14 hours/day (tariff maximum) in emergency.
- Otter Tail provides recovery periods after 2 to 5 hours of control.

# WATER HEATING REBATES

- **Electric water heating rebates are beneficial for both summer and winter control.**
- 90% UEF
- Receipts, AHRI certificate, and Customer Rebate Application form must be submitted!

Domestic/light duty tank	NEW controlled	Replacement controlled
50 to 79 gallon	\$200	\$100
80 gallon or greater	\$400	\$200



- **Heavy-duty commercial \$50/kW**  
minimum of 12 kW and 120 gallons storage capacity.  
Maximum rebate is \$5,000.

# HEAT PUMP WATER HEATER REBATE

## Minnesota ONLY

- **HPWH** are eligible for **\$200 appliance rebate**.
- Controlled service is not required.

## **HPWH** may qualify for DR rebates **in any state** if placed on control.

- Rebate is based on gallon capacity.
- OTP defers to HPWH manufacturer recommendations regarding control.
- One rebate per unit.





# COOL SAVINGS

## AC cycling program.

Residential receive a \$8.25/month credit  
Commercial receives \$6/ton  
connected cooling credit

Approximately 3,200 customers  
participate on the rate.

- Cycles central cooling systems on and off every 15 minutes during summer peak conditions.
- Two-stage units operate with one stage on, the other off throughout.
- 300 hours of control (tariff maximum). Otter Tail provides recovery periods after 2 hours of continuous control in non emergencies.
- Program applies to summer season (June – September).
- Systems served on Deferred Load and Dual Fuel Rates do not qualify.
- Systems on firm service rates and RDC **DO** qualify.

THANK YOU!

