

# Saving Big on Cooling for District Energy St. Paul

Chris Peterson

Director of Production – Ever-Green Energy

O: 651-925-8137 | M: 651-248-1683

[Chris.Peterson@ever-greenenergy.com](mailto:Chris.Peterson@ever-greenenergy.com) | [www.ever-greenenergy.com](http://www.ever-greenenergy.com)

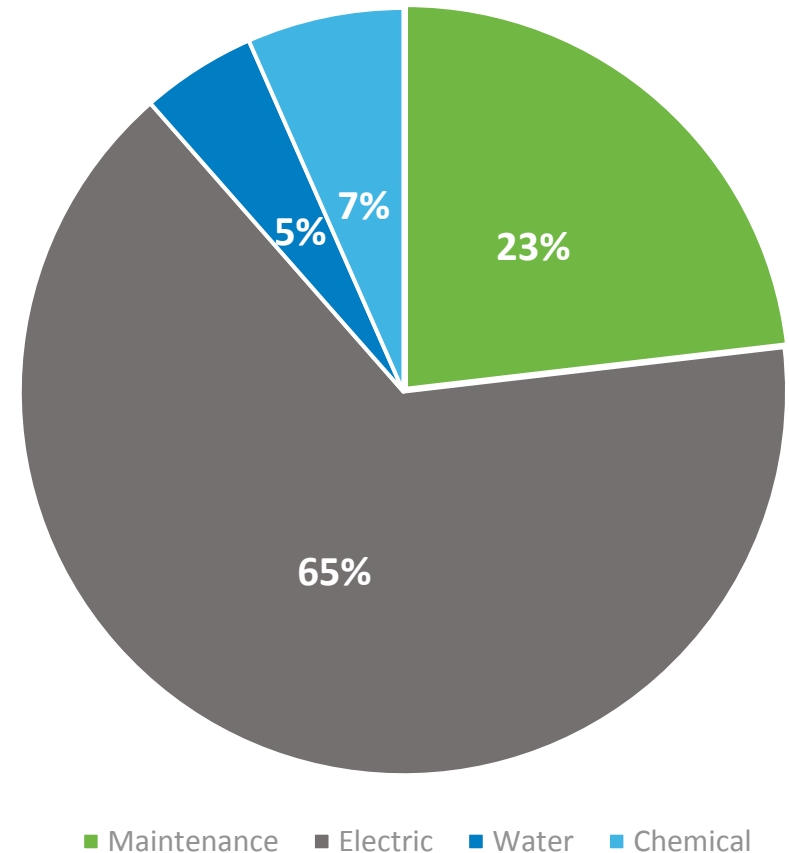
# Background

- District Energy St. Paul
  - Approx. 24,000 tons of chiller capacity
  - Approx. 6.5 million gallons of thermal storage capacity in 2 tanks
  - Approx. 23,000 tons peak load
- 2017 – Project completed to allow dual operation of thermal storage tanks

# The Goal

- Lower the cost of making a cooling ton
  - Shift production of cooling tons to off-peak electrical rates
  - Improve the operation of the facilities to eliminate unneeded electrical usage
  - Improve customer performance to minimize cooling peak demand
  - Change the operating habits that had been established over 20+ years

Breakdown of Cooling Costs



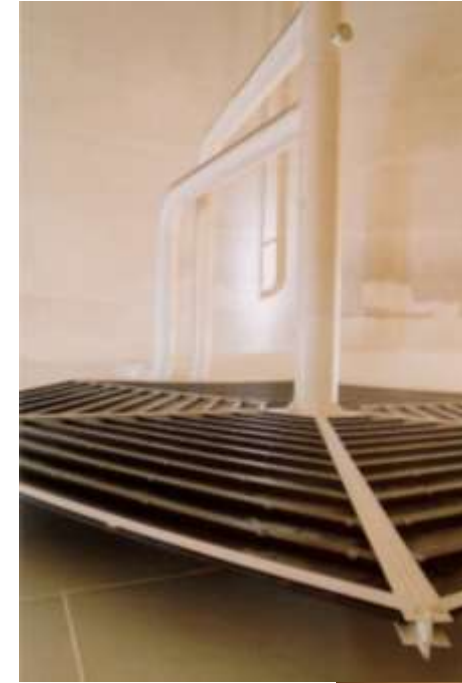
# How – Dual Tank Operation



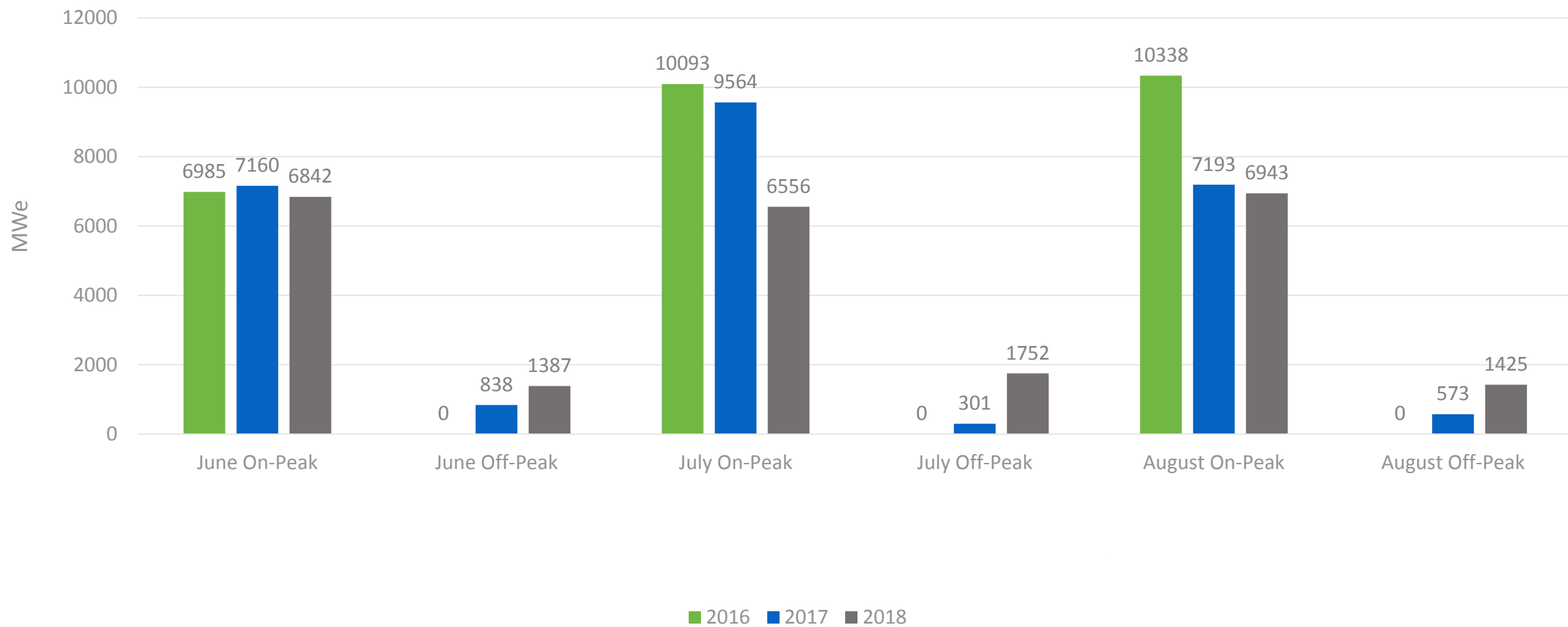
- 2017 Project completed to allow for dual tank operation.
  - Elevation differences (113 ft.) between the 2 tanks prevented dual charge/discharge with the current controls.
  - Previous attempts to operate in dual mode resulted in overflowing of the lower elevation tank.
  - Utilizing in-house talent and a vendor the system controls were upgraded to operate one tank in pressure control and the other in level control

# Benefits – Dual Tank Operation

- Allowed the full utilization of thermal storage capacity.
  - Max flow of the smaller tank is 6,000gpm (3,500 Ton)
  - Max flow of larger tank is 20,000gpm (11,700 Ton)
- Tanks can now be fully discharged during peak electrical hours and recharged during off-peak electrical hours.

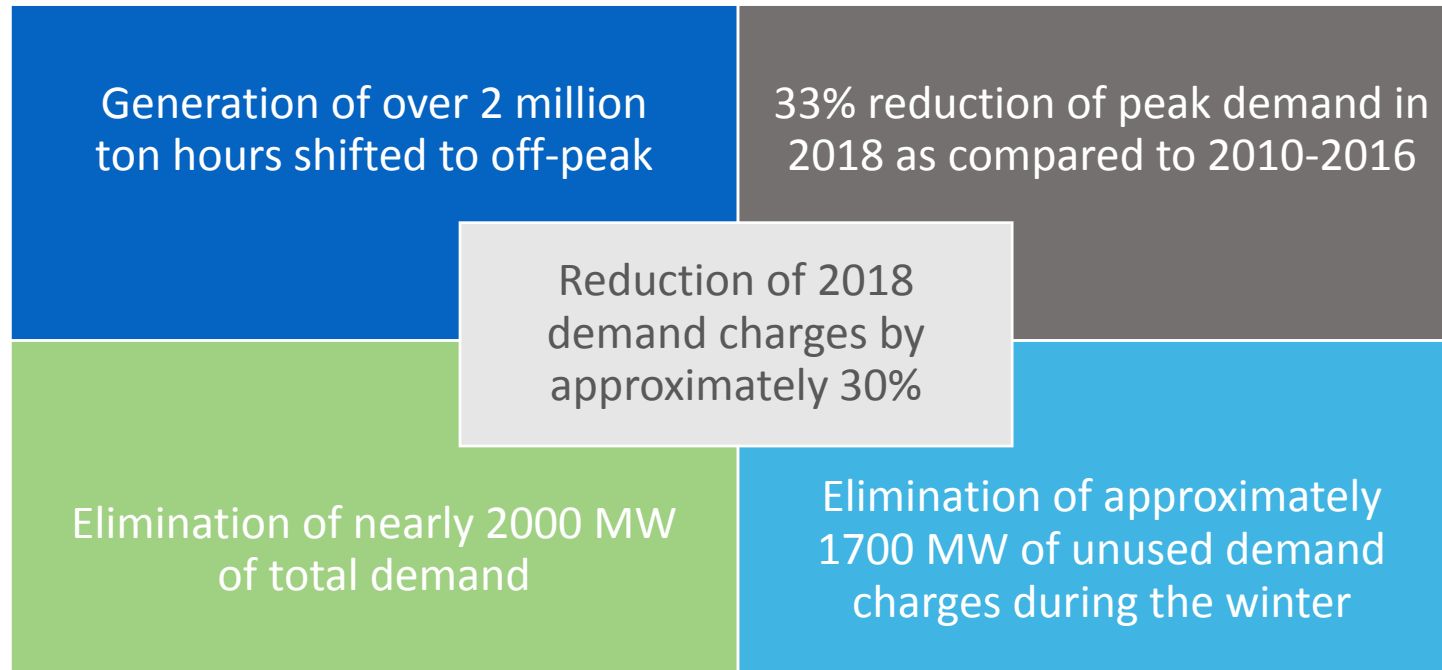


## Impact – Dual Tank Operation



# Impact – Shift From Peak to Off-Peak

Peak demand charge is approximately 7 times the off-peak demand charge



# How We Got There

## Eliminate Unneeded Electrical Usage

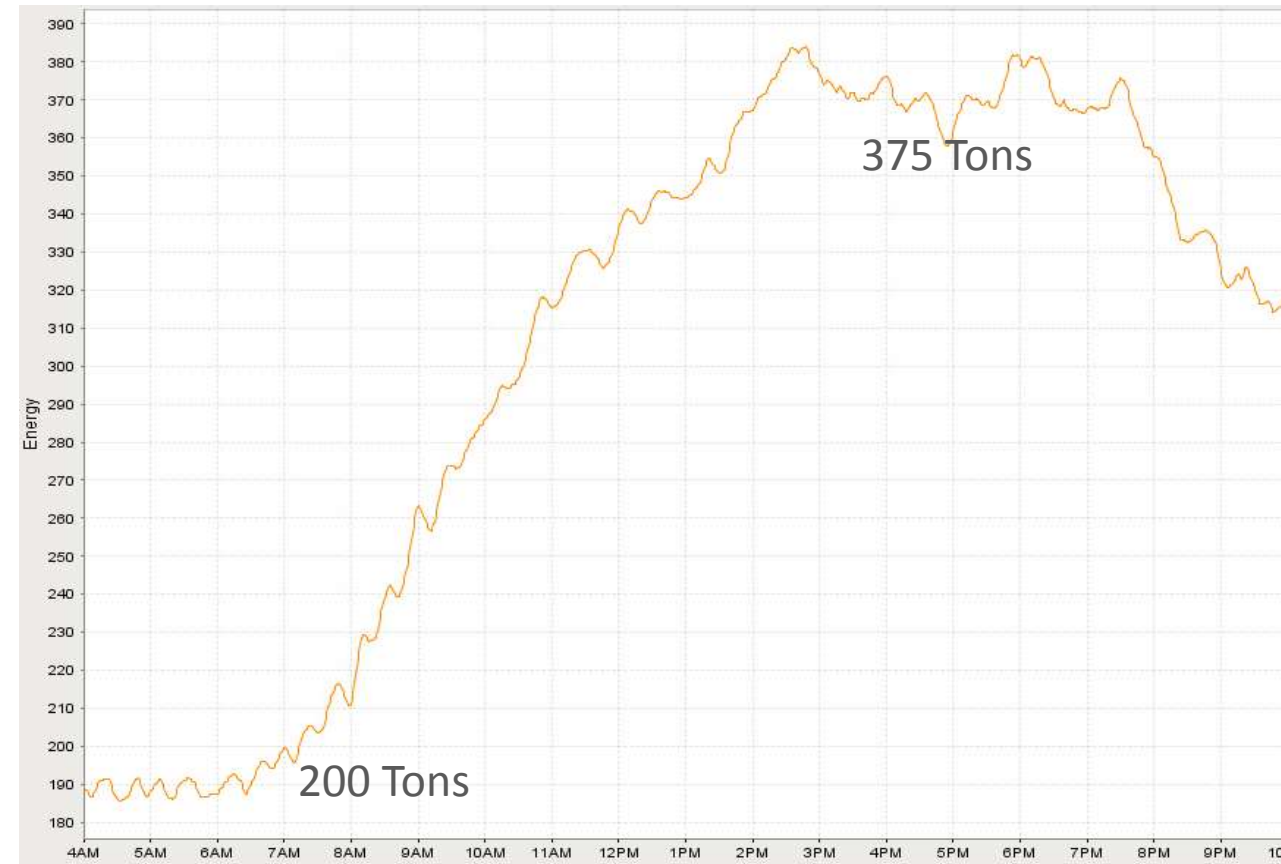
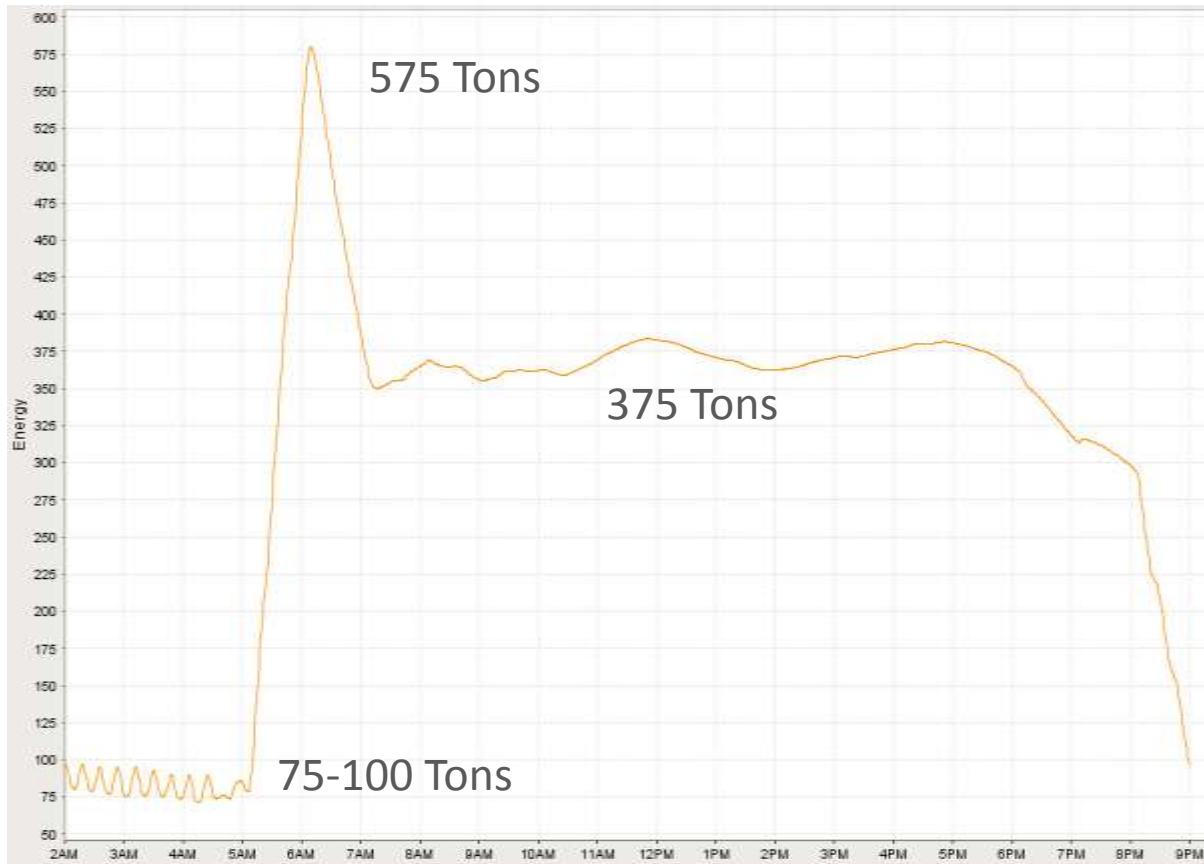
- Cooling tower fans running at 100% trying to achieve a unachievable basin temperature
- Utilizing outside wet bulb temperature and a transmitter, basin temperature was set with a offset from outside temperature
- Lowered fan speeds, while maintaining the same chiller efficiency and performance





# How We Got There

## Improving Customer Performance



# How – Change the Operating Philosophy



# Putting It All Together

33%  
Reduction in  
peak demand  
usage

5%  
Reduction in  
electrical usage

32%  
Savings in  
electrical from  
2016/2017 to  
2018

Cooling Days by Month

Month	<70F			70-79F			80-89F			90-100+		
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
June	7	2	0	13	10	11	8	13	10	2	5	9
July	1	1	0	12	5	3	15	20	20	3	5	8
Aug.	3	2	1	9	18	8	19	11	14	0	0	8

# Thank You

Chris Peterson

Director of Production

O: 651-925-8137 | M: 651-248-1683

[Chris.Peterson@ever-greenenergy.com](mailto:Chris.Peterson@ever-greenenergy.com) | [www.ever-greenenergy.com](http://www.ever-greenenergy.com)