Temporary Electric Load Curtailment Strategies

Seattle City Light

Who: City Light business customers in a facility or designated area with a temporary reduction in electric service capacity

What: Guidelines to reduce electric load of your facility in the event of a request for emergency load curtailment by Seattle City Light

Why: Steps you can take to preserve electric service in the event of a temporary capacity constraint

How: City Light may contact you directly via telephone or email from the System Control Center, Account Executive's Office, or Trouble Center. The request may be verified via telephone, the City Light website, or media release issued by City Light.

There are a number of situations that may create a need for Seattle City Light to ask customers to temporarily reduce their consumption from the electrical system. These situations may occur due to weather extremes, construction accidents, or equipment failure.

When an emergency load curtailment is requested, City Light needs to have a response within 30 minutes to avert the need to involuntarily disconnect service to an affected area. We recognize that electric service is critical to your business and do not request that you curtail unless it is an urgent situation that requires a reduction in load to preserve the integrity of system-wide electric service.

We have prepared some general suggestions for measures you can take to reduce your load in the event of a request for emergency load curtailment that can be implemented in many commercial buildings with the least amount of disruption to normal operations. The end use data provides some general information regarding what percentage of your total electric load is consumed by each of your building systems. Finally, we have included an example of a commercial office building that was able to reduce its load by over 35% when a request for emergency load curtailment was issued.

Specific end use data for your facility can be determined by using the Seattle Meter Watch program, as well as by monitoring electrically powered equipment in your facilities. Energy Management Analysts from the conservation resources division can help you evaluate the electric loads in your facility. They can provide technical assistance and funding to help you reduce your electric load every day.

These steps are only requested as a last resort and are used to avert a complete loss of electric service. Take care to balance the requested load shed with the need to maintain life, security and safety systems in your building.

Suggested Strategies for Load Curtailment

Implementation of steps 1-3 will typically yield a 25-40% reduction in load, and is sufficient in many situations to stabilize the electric distribution system.

For more information, contact Seattle City Light Account Executive Office at (206) 684-3331

1) **Reduce lighting as much as is safely possible**
Lighting can account for 30% – 55% of the electric load for an office or commercial building. Reduction of lighting is the quickest, most effective way to reduce load.

2) **Adjust setpoints for cooling / heating**
Many load shed events will occur on unusually hot summer days, or during winter cold snaps. Adjusting the temperature set point of your building by 3-5 degrees will significantly reduce the amount of electricity consumed by air conditioning units, chillers, or electric resistance heat (warmer during hot days, cooler during cold days).

3) **Reduce "plug load"**
Ask building occupants to turn off extra office equipment and personal appliances. Items include: secondary printers, copiers, laminators, personal space heaters, coffee/hot pots, personal refrigerators, and the like.

4) **Reduce the amount of ventilation to the appropriate level for building occupancy***
Ventilation rates are typically set for a fully occupied building. Opportunity often exists to reduce the amount of electricity used to power ventilation fans by optimizing ventilation to actual occupancy levels.

**Only implement this step if you have the ability to monitor CO2 levels, and will not compromise indoor air quality.*

5) **Utilize standby generation***
After implementing steps 1-4, City Light may ask for further load reductions. At this point, shift all or a portion of your load to standby generation, especially if generators have the capacity to handle the fully curtailed load of your building (Reduced lighting, HVAC, and plug load).

**Do not implement use of standby generation if your generation capacity is sufficient only for emergency operations.*

Save for the long-term

The first four strategies can be implemented on a temporary basis. For better results, you can retrofit your equipment to permanently reduce your electric consumption, improve occupant comfort and productivity, and reduce your costs. City Light may be able to help pay for new equipment via our cash rebate program, which helps you install energy-efficient systems.

Details are online at: **energysmartservices.com**

City Light energy management analysts are available to help you audit your facility and recommend specific methods to implement these strategies in your facilities. Call your energy management analyst at (206) 684-3254 to learn more.

Average Annual Electric End Use Profiles – Large Office Buildings

NATURAL GAS / STEAM HEAT		
END USE	PERCENTAGE	kWh/sqFT
Lighting	52.3	9.05
Misc. (Office Equip., Motors)	20.5	3.55
HVAC Ventilation	20.5	3.55
Space Cool	6.7	1.15
Space Heat	0.0	0.0
Total	100.0	17.3

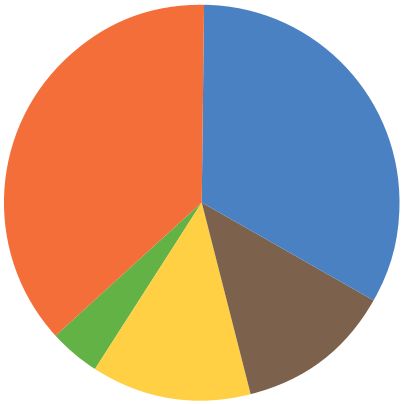
21% Space Cool
21% HVAC
21% Misc. (Office Equip., Motors)
51% Lighting

Average Annual Electric End-Use Breakdown Gas / Steam Heat

ELECTRIC HEAT		
END USE	PERCENTAGE	kWh/sqFT
Lighting	33.4	9.05
Misc. (Office Equip., Motors)	13.1	3.55
HVAC Ventilation	13.1	3.55
Space Cool	4.2	1.15
Space Heat	36.2	9.8
Total	100.0	27.1

37% Space Heat
4% Space Cool
13% HVAC
21% Misc. (Office Equip., Motors)
33% Lighting

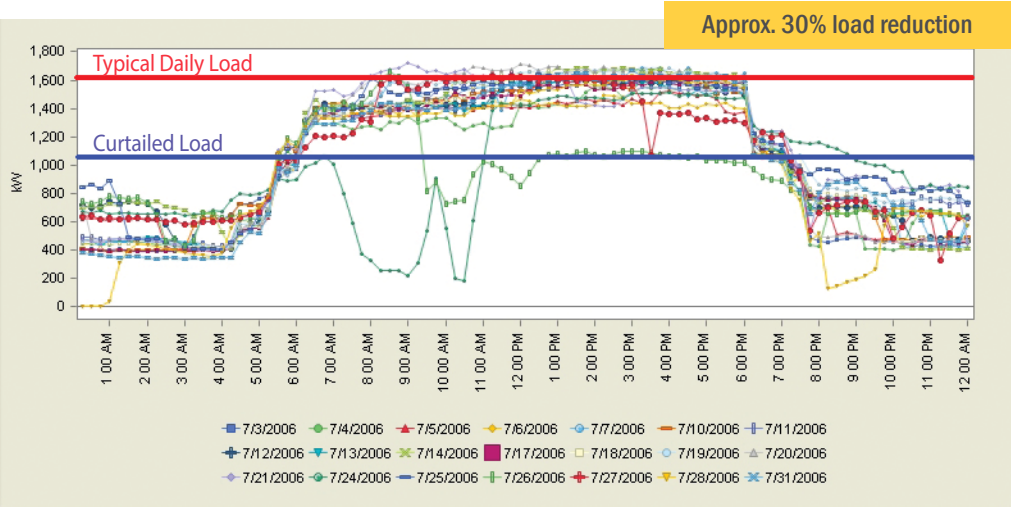
Average Annual Electric End-Use Breakdown Electric Heat

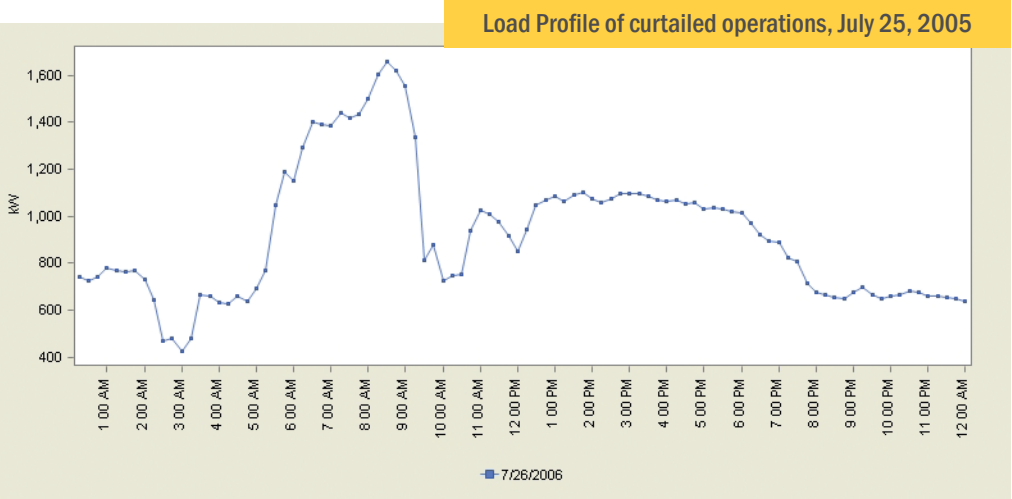


Source: Seattle City Light Conservation Division
2002 Building End Use Data Example of Load Curtailment

Commercial Office Building Weekly Load Profiles, July 2006

A request was issued for load curtailment on July 26, 2006. Expected high temperature was to be more than 90 degree F. There was an overload situation due to construction in a substation. Electric load profiles for a 225,000 Sq Ft. office building show a sustained load reduction of more than 30%.





The reductions were accomplished “on-the-fly” by the building engineer after the request for a load reduction. It serves as an example of the type of adjustment that may be possible in your facilities given a request to reduce load due to a constraint on the capacity of the utility service.

Load reduced by approximately 30%

- Average weekday load was 1.6 MW (1,600 kW)
- Reduced to 1.05 MW (1,050 kW)

Reductions from:

- Lighting: Reduced on unoccupied levels in office spaces
- HVAC: Setpoints increased to reduce cooling load; Rooftop compressor units and air handlers cycled so only one unit was operational at a time