Montana Large Key Account Customers Demand Response Survey Results

EXECUTIVE SUMMARY

NorthWestern Energy was asked by the Montana Public Service Commission if our larger customers would be interested in a 'demand response' (DR) program. In order to gauge interest, we conducted an online DR survey in June/July that was designed to determine if our Large Key Account customers in Montana (54 customers) would be willing or able, to consider scaling back their electrical load for certain duration during times of peak system loads. This report provides background and results on the survey that was completed by 25 companies (46 percent participation). In general, the survey indicated a high percentage (67 percent) of our Large Key Account customers are not interested in a DR program or cannot reduce their loads and this was supported by the results of several survey questions. Because many of these customers are 24-hour operations the survey indicates the customers would definitely need to look at the Cost/Benefits of a DR program before considering it as load reductions can have significant financial impacts on these customers. In addition, our Large Customers are in a variety of industries and the amount and type of load that they would consider reducing varies greatly.

DEMAND RESPONSE SURVEY BACKGROUND

NorthWestern Energy is constantly looking for ways to stabilize the electric rates for our customers. In addition, we are often looking for ways to prevent/defer the construction of new generation or better manage our infrastructure facilities. Recently, during a meeting at the Montana Public Service Commission, we were asked if our larger customers would be interested in a program referred to as 'demand response' (DR).

> *DEFINITION: "Demand response (DR) refers to deliberate load reductions during times of system need, such as periods of peak demand or high market prices. Because reduced consumption and increased generation can both restore a system's supply and demand to equilibrium, DR can be a resource that offsets or defers the need for new generation, transmission, and/or distribution infrastructure."*

In late June and early July of this year, the Large Key Account Customers were contacted via email and asked to participate in an online survey to determine if there is interest in a potential Large Customer DR program. The survey was designed to determine if these customers would be willing or able, to consider scaling back their electrical load for certain duration during times of peak system loads.

LARGE KEY ACCOUNT CUSTOMERS

NorthWestern Energy has 54 Montana customers that are considered Large Key Account Customers because they have at least one meter over 1 MW in peak demand.

- In 2014, they represented a **combined peak demand of over 550 MW** (based on their largest usage meter). Individual customer's demands ranged from 1 MW to 110 MW in size.
- They represent nearly **500 individual meters** on Transmission, Substation and General Service rates.
- **Eighteen customers purchase electric supply from third parties** ('choice') and 36 get their supply from the utility.
- These customers participate in our Large Customer Universal Systems Benefit program and receive credits for energy efficiency projects at their facilities. Many of these customers have been very aggressive in the past in implementing energy efficiency measures within their facilities.
- In 2014, they **represented nearly $91 million in gross electric distribution/transmission revenues** and are a significant part of NorthWestern Energy's electric load in Montana.
- These customers represent a variety of industries including: **coal mines, precious metal mines, hospitals, colleges, generation facilities, cement plants, talc plants, oxygen/nitrogen processing plant, chemical plants, silicon manufacturers, lumber processing facilities, oil pipelines, oil refineries, manufacturers, office complexes, food processors, a state prison, a ski resort and local and federal government facilities.**

SURVEY PARTICIPATION STATISTICS

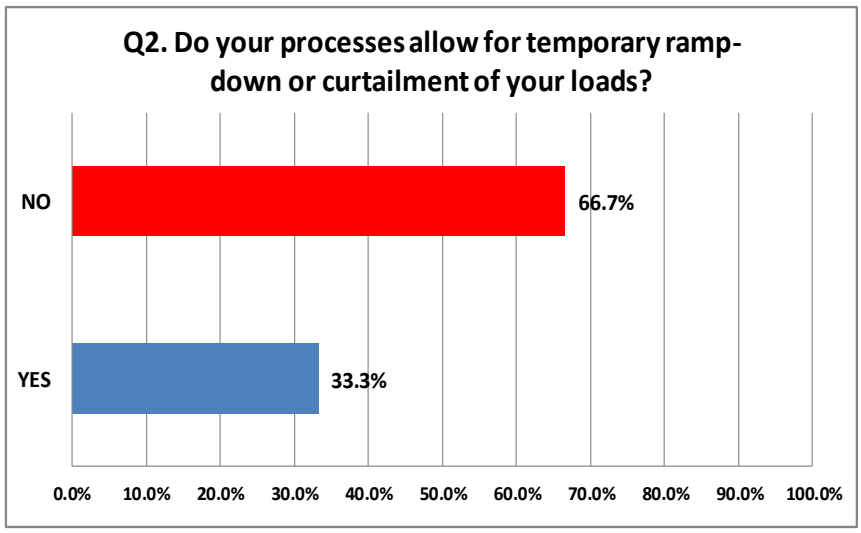
Here are the general survey participation statistics and the results for the individual questions follow. (Note: Survey Question 1 asked for name and company and for confidentiality that info is not included in this report.)

- **25 Large Key Account Customers participated** out of 54, or a **46 percent participation rate**.
- **27 surveys were completed**; two companies had two individuals complete the survey.
- The companies that participated represent a number of different industries and customer types including: **City Government, County Government, Federal Government (military), Healthcare Facilities, Office Buildings, Higher Education, Forest Products Manufacturer, Food Processors, Cement Plant, Asphalt & Gravel, Industrial Manufacturers – Gases and Silicon, Mining – Coal, Talc, Platinum/Palladium (included smelting), Petroleum Pipelines and Petroleum Refinery.**
- Geographically the companies that participated included: **13 - Billings Division, 2 - Bozeman Division, 1 - Butte Division, 6 - Great Falls Division, 1 - Helena Division, and 2 - Missoula.**

Q2. DO YOUR PROCESSES ALLOW FOR A TEMPORARY RAMP-DOWN OR CURTAILMENT OF YOUR LOADS?

Answered Question	**27**
Skipped Question	**0**

	# Responses	*Percent*
NO	**18**	**66.7%**
YES	**9**	**33.3%**
Total	**27**	

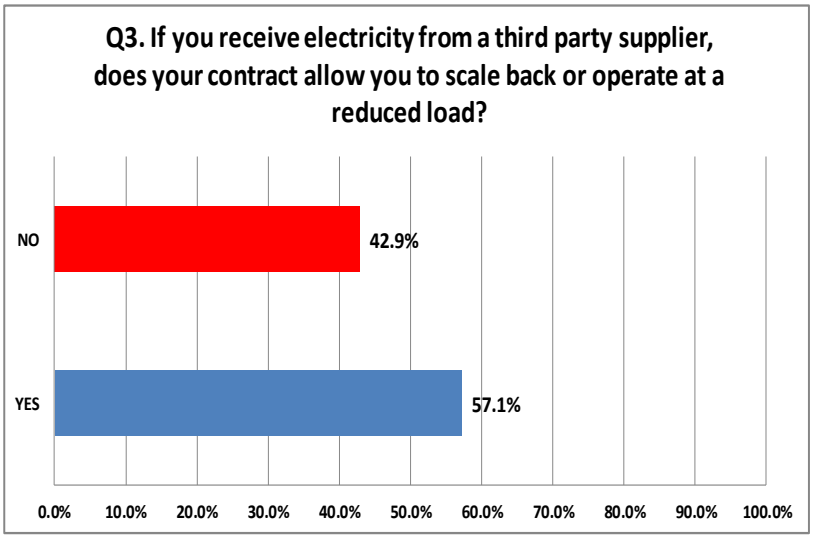


COMMENTS:

- *At the Smelter in Columbus*
- *Not unless we install a co-gen system.*
- *Half of our 6 MW load could be curtailed on short notice.*
- *Limited - depending on time of year and circumstance.*
- *Summer water demand has two daily peaks 3 to 9 am & 5 to 9 pm system storage must be replenished daily.*
- *A whole system would need to be shut down to meet a curtailment.*
- *Routinely ramping a refinery up and down is not possible.*
- *We typically plan for reductions in load for months in advance (production outage).*
- *Only when the plant is off line. While we are running we provide our own power. We would not be able to ramp down during a startup.*
- *At other sites in the company, potentially at sites served by NorthWestern.*
- *During the Northwestern Energy system peak times, MSU is not at peak and may be able to further curtail load.*
- *Only if the Electric generation plants that we supply coal to would allow curtailment of coal deliveries.*
- *We could (if given enough notice) ramp-down if demand allows for us to be down.*
- *However because of emergency generators we could reduce our loads for a period of time.*
- *We run 24/7 and are a continuous batch process operation: that means once we get started we cannot stop or else we ruin product quality.*
- *When we operate, it's 24 hrs/7 days /week.*

Q3. IF YOU RECEIVE ELECTRICITY FROM A THIRD PARTY SUPPLIER, DOES YOUR CONTRACT ALLOW YOU TO SCALE BACK OR OPERATE AT A REDUCED LOAD?

This question was designed to be answered only by the 'choice supply' customers, so we are only showing the statistics based on the answers from 'choice supply' customers.



CHOICE SUPPLY CUSTOMERS

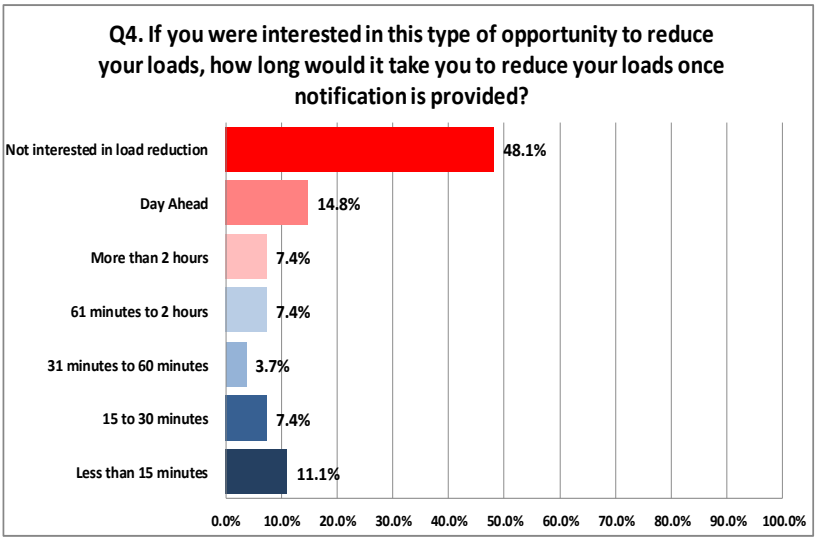
	# Responses	Percent
NO - Choice customers	3	42.9%
YES - Choice customers	4	57.1%
Total Answering Question	7	
Skipped Question - Choice	3	

COMMENTS:

- *We currently have fixed price quantity purchase.*
- *Only during planned production outages though.*
- *With 24h notice. May be able to arrange for shorter notice.*
- *I'm not completely sure, but I believe WAPA, MSU's third party provider, would be receptive.*
- *I do not know the answer to this. I believe they can resell our committed quantity not used and issue us a credit, but would need to clarify.*

Q4. IF YOU WERE INTERESTED IN THIS TYPE OF OPPORTUNITY TO REDUCE YOUR LOADS, HOW LONG WOULD IT TAKE YOU TO REDUCE YOUR LOADS ONCE NOTIFICATION IS PROVIDED?

Answered Question	27
Skipped Question	0



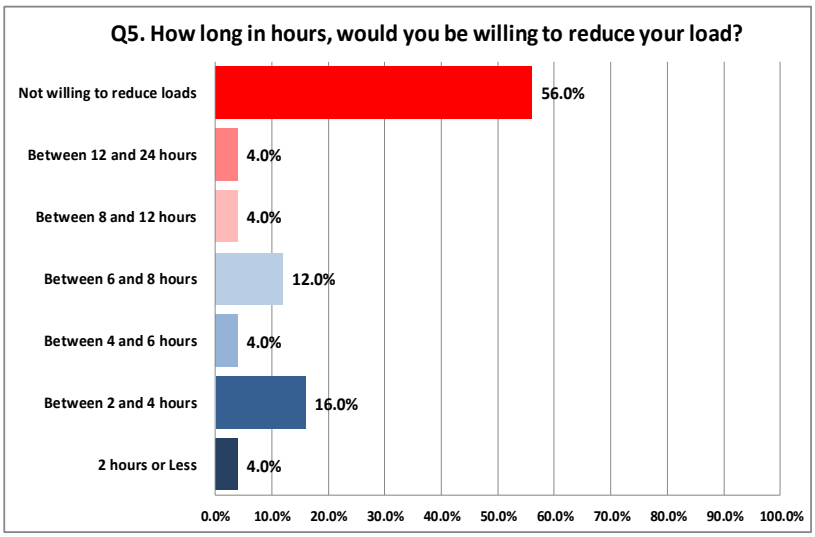
	# Responses	Percent
Not interested in load reduction program	13	48.1%
Day Ahead	4	14.8%
More than 2 hours	2	7.4%
61 minutes to 2 hours	2	7.4%
31 minutes to 60 minutes	1	3.7%
15 to 30 minutes	2	7.4%
Less than 15 minutes	3	11.1%
Total	27	

COMMENTS:

- *Hard to answer the question.*
- *24 hr. notice in late fall to early spring only.*
- *Need to have cost/benefit analysis to answer.*
- *Again, our process won't allow temporary load reduction.*
- *Depends on the incentive, but at least 30 minutes.*
- *The load curtailment would need to be automatic. No staff is available to dispatch DR commands.*

Q5. HOW LONG IN HOURS, WOULD YOU BE WILLING TO REDUCE YOUR LOAD?

Answered Question	**25**	
Skipped Question	**2**	
	# Responses	*Percent*
Not willing to reduce loads	**14**	**56.0%**
Between 12 and 24 hours	**1**	**4.0%**
Between 8 and 12 hours	**1**	**4.0%**
Between 6 and 8 hours	**3**	**12.0%**
Between 4 and 6 hours	**1**	**4.0%**
Between 2 and 4 hours	**4**	**16.0%**
2 hours or Less	**1**	**4.0 %**
	25	



COMMENTS:

- *Upper management would need to decide on this. May be able to go longer.*
- *Again could answer that if i know more about our options and how much we need to reduce.*
- *Mid spring to mid fall weather and rainfall dependent.*
- *Need to have cost/benefit analysis to answer.*
- *However, we possibly could reduce our load if we knew months in advance and could plan for it.*
- *This total depends on the strategy implemented. For example, a dispatched natural gas generator could operate for hours. HVAC shutdowns for much less time.*
- *Providing the electric generating plants would allow for curtailment for the proposed period of time.*
- *Would look at any time period 8 hours or less.*

Q6. PLEASE INDICATE IN THE BOX BELOW THE MAXIMUM AMOUNT OF LOAD IN KW THAT YOU MAY BE WILLING TO REDUCE IN A LOAD REDUCTION EVENT?

COMMENTS:

- *Unknown at this time possibly 100 to 300 kW*
- *700 kW*
- *Roughly 1,500 to 2,000 kWh (respondent indicated kWh but may have meant kW)*
- *2,000 kW*
- *3 MW/hr*
- *4000 kW*
- *6,500 kW*
- *6 to 7 MW*
- *10,000 kW*
- *90% of load at any site*
- *Need to have cost/benefit analysis*
- *5 respondents indicated "zero"*
- *6 respondents indicated "Unsure" or NA*

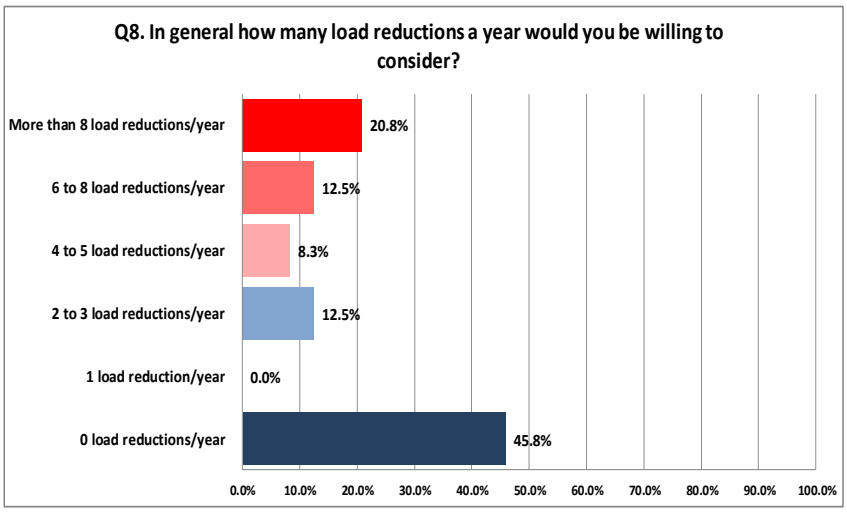
Q7. BASED ON YOUR ANSWER IN QUESTION 6 REGARDING THE AMOUNT OF KW YOU MAY BE WILLING TO REDUCE, WOULD YOU PLEASE DESCRIBE THE TYPES OF LOADS YOU MAY BE WILLING TO REDUCE. (EXAMPLES: LARGE MOTORS (HP), PUMPS, PRODUCTION EQUIPMENT, CHILLER CONTROL, AIR HANDERS, HVAC SYSTEMS, LIGHTING, REFRIGERATION SYSTEMS, ELECTRIC HEAT, OR CERTAIN PROCESSES, ETC.)

COMMENTS:

- *Large mill motor and associated equipment*
- *All but lighting and refrigeration systems*
- *City has converted to VFD's and soft starts at water and wastewater treatment plants and all pump stations.*
- *Could possibly take a dragline off line for the identified period providing the electric generating plants would allow curtailment of deliveries.*
- *Electric process heating*
- *Production equipment in our mills and packaging lines which is the bulk our electricity load*
- *Production equipment with large motors - ie Dragline*
- *Pumps (account for >90% of load at most sites)*
- *Select chillers in the summer. Dispatched natural gas gen set possibly. Summer HVAC. Winter DR besides dispatched gen set would be difficult due to student and campus activity.*
- *Columbus Smelting furnaces*
- *Large motor*
- *The only way that we can load shed is by running our generators. The incentive will need to more than off set the cost of running these. We have about 6MW total in generator power. The maximum above may be able to be increased.*
- *None – three respondents*

Q8. WE UNDERSTAND THE DURATION OF THE LOAD REDUCTION IS CRITICAL FOR YOU TO CONSIDER, AS IS THE NUMBER OF TIMES IN A YEAR YOUR OPERATIONS COULD REDUCE LOADS. HOWEVER, IN GENERAL HOW MANY LOAD REDUCTIONS A YEAR WOULD YOU BE WILLING TO CONSIDER?

Answered	**24**	
Skipped Question	**3**	
	# Responses	*Percent*
More than 8 load reductions	**5**	**20.8%**
6 to 8 load reductions	**3**	**12.5%**
4 to 5 load reductions	**2**	**8.3%**
2 to 3 load reductions	**3**	**12.5%**
1 load reduction	**0**	**0.0%**
0 load reductions	**11**	**45.8%**
TOTAL	**24**	



COMMENTS:

- *If we stop production, we reduce the load, but it is flat for the entire day.*
- *May be less*
- *This depends on the time of the year.*
- *Late fall to early spring*
- *Need to have cost/benefit analysis to answer.*
- *Only if advanced notice were given*
- *Dispatched gen set could operate daily*
- *Pending timing and duration.*
- *Business demand would be our main constraint.*
- *I have to consult my team on the actual number.*

Q9. REALIZING WE ARE ONLY GATHERING YOUR INITIAL THOUGHTS ON DEMAND RESPONSE (DR) , DO YOU HAVE AN IDEA ON THE PRICE POINT THAT WOULD MAKE A DR PROGRAM A CONSIDERATION FOR YOUR COMPANY? *THE PRICE POINT COULD BE DEFINED AS THE INCENTIVE PER OCCURRENCE, OR $ PER KW DEMAND THAT IS REDUCED, OR $ PER KWH (KILOWATT HOUR), ETC. PLEASE INDICATE AN AMOUNT OR RANGE OF INCENTIVES THAT WOULD INTEREST YOU.*

$/kW Demand Incentive Amount

- *$0.03 (Respondent indicated this number but may have meant $.03/kwh or $30/kw so hard to determine from answer.)*
- *Need to have cost/benefit analysis to answer.*
- *N/A or not sure – 5 respondents*

$/kWh (kilowatt hour) Incentive Amount

- *PWD does not have a dollar amount*
- *Need to have cost/benefit analysis to answer.*
- *N/A or not sure – 5 respondents*

$ Per Occurrence Amount

- *$10,000*
- *Need to have cost/benefit analysis to answer.*
- *N/A or not sure – 5 respondents*

Other

- *We'd need to negotiate this*
- *As much as possible*
- *$50,000 per year is intriguing for us to look at program and how to incorporate into our business model*
- *The DR would need to be for a 24 hr. period.*
- *Not sure what we would need??*
- *Around $70/ MW but again this depends on the time of year and our immediate needs for cement.*
- *$5,000 per hour*
- *Not qualified to answer this question*
- *N/A – 3 respondents*

Q10. PLEASE ADD ANY ADDITIONAL COMMENTS OR QUESTIONS YOU MAY HAVE ON THE SUBJECT OF DEMAND RESPONSE PROGRAMS IN THE BOX BELOW.

COMMENTS:

- *The smelting furnaces can be ramped down very quickly but this would stop production. Depending on the timing and duration it may have little impact.*
- *After reviewing the interval load information you provided I do not believe there is a practical way for us to control the peak demand for a typical day. We start warming up the building at about 5:00 AM. We increase the warm-up at about 6:00 AM. By 7:00 AM we have the building mostly up to temperature. By 7:00 AM tenants start to arrive. They continue to arrive until 8:30 to 9:00 AM. Looking at the entire month we see all of our peaks happen after 7:00 AM with most of them happening after 8:00 AM. A lot of the peaks are around 8:30 AM. That indicates to me the tenants are controlling the power consumption by then with turning on equipment or turning up the thermostat a little more to take the chill off the office. The information also shows that we may have a peak first thing in the morning but demand remains close to that level all day into late afternoon.*
- *Water demand and weather drives the City's PWD electrical needs. (PWD is Public Water Department.)*
- *It is too difficult to answer these questions without a suggested benefit from Northwestern. We have these programs in other states we operate in and participate. The reason we participate is because the shut downs are not disruptive to our production schedules and there is a cost benefit. In the other states the operations are on 5 day work week. In Montana, we have some systems that are working 6+ days a week and would have a larger labor (fixed) cost to cover to gain any benefit for shutting down.*
- *With the proper incentive and advanced notice, our company may consider load reduction.*
- *We don't see how we could ramp down or curtail our construction operations. The main thrust of our business is customer driven on their time schedule.*
- *We are an event driven company it would be really hard for us to reduce loads on any kind of schedule because ours changes weekly.*
- *I am not familiar with the standard practice of amounts for per kW reduction, so the answer to the last question may not be meaningful.*
- *We currently run 24 hours a day, 7 days a week based on demand. We have minimal on site storage so most of our production is loaded out to customers as it comes off the line. With a 3 day lead time on orders, ramping down would be difficult but if incentive was attractive enough we would look at how our business model could handle it.*
- *The incentive amount will have to more than offset the cost of running our generators.*
- *We might be interested, during planned shut downs (which last several days to several weeks). We cannot stop production for several hours, then restart.*

CONCLUSIONS

The survey results show some general trends that should be considered in evaluating a potential Demand Response Program at NorthWestern Energy in Montana.

- **HIGH PERCENTAGE OF THESE LARGE CUSTOMERS INDICATED THEY ARE NOT INTERESTED IN A DEMAND RESPONSE PROGRAM OR CANNOT REDUCE THEIR LOADS**

  Survey Question 2 reveals that almost 67 percent of the respondents indicated that their processes do NOT allow for a temporary ramp-down or curtailment of loads. Question 4 and Question 5 supports that perspective, with 48 percent in Question 4 not willing or interested in a load reduction program and 56 percent in Question 5 indicated not willing to reduce loads. In Question 8, nearly 46 percent of those that responded indicated 'zero' load reductions per year. Reducing loads thru a Demand Response program may be difficult for many of these customers. A lot of these customers are 24-hour operations and considered critical loads, and reducing demand can be complicated for large industrial customers. Some customers indicated in their comments that loads could only be reduced at certain times of the year.

- **CUSTOMERS WOULD NEED TO LOOK AT COST/BENEFITS**

  Based on comments and responses to the questions, these customers would need a lot more detailed information to determine the cost/benefit of a demand response program. For many of these customers the cost to them of reducing their loads could have major financial impacts. For example, one of these customers is a mining company that has provided us with very detailed assessments of what happens if they have to reduce loads that leads to a lost 8-hour shift and the costs for labor/lost revenues for that company would be over $1 million for one occurrence.

  The majority of the customers that answered Question 9 were unsure of what would be the desired pricing for a Demand Response program. Comments ranged from $10,000 per occurrence, $5,000/hour, $70/MW, to $50,000 per year.

- **AMOUNT & TYPE OF LOAD CUSTOMERS WOULD BE WILLING TO REDUCE VARIED GREATLY**

  Question 6 was designed to get an idea of the size of load that customers would be willing to reduce and the responses varied from a low of 100 kW up to 10,000 kW. Question 7 was designed to define some of the types of loads that could be reduced and answers ranged from large motors, process equipment, electric furnaces, pumps chillers, draglines to only if they could utilize back-up generation.