



# Demand Response Facts and Frequently Asked Questions



**GLOBAL COLD CHAIN**  
ALLIANCE®

## Global Cold Chain Alliance

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## About the Refrigeration & Energy Committee

The Refrigeration and Energy Committee provides guidance on creating and maintaining efficient, effective, and safe industrial refrigeration systems.

The Refrigeration & Energy Committee is a working committee. Working committees offer members the opportunity to engage in focused, high-level strategic discussions about the industry and/or association programs. They offer members a unique chance to learn from peers while giving back to the association by sharing their time and experience.

Committee members make a yearlong commitment to participate in electronic discussions, conference calls, and in-person meetings as required. Members are able to volunteer to serve on the Refrigeration & Energy Committee and other committees in May each year.

## Background

During the 2011 Global Cold Chain Alliance Assembly of Committees in July 2011, the GCCA Refrigeration & Energy Committee discussed various refrigeration and energy related topics effecting GCCA warehouse members and the public refrigerated warehousing and logistics industry.

One of the issues identified during this discussion was the prevalence of demand response programs being offered by some utility companies. The committee agreed that there would be value in an association-developed resource that facilities could use to evaluate demand response programs.

A subcommittee, consisting of Jim Romine (Richmond Cold Storage Company) and Mike Lynch (United States Cold Storage, Inc.), was formed to further examine the issue of demand response and draft a resource document that could be used by members to evaluate demand response programs and determine whether they are appropriate for individual facilities.

### Facts about Demand Response

One energy management best practice that directly benefits the cold chain is demand response. Unlike other energy projects that require upfront investment and do not yield results until years later, demand response actually pays cold storage businesses to change their energy use habits to benefit the grid at large.

Demand response is not a new practice, but its prevalence and acceptance has grown exponentially in the past decade. Many commercial and industrial sectors participate, but few industries are as well-fit for participation as the cold chain.

#### ➔ **What is demand response?**

Because electricity cannot be stored efficiently, electric grids struggle balancing supply and demand, especially during times of peak demand. This is a significant expense for electric grid operators, who traditionally turn to peaking power plants to meet a rise in demand. Demand response is another solution to this problem. During times of grid stress, grid operators turn to energy service companies who pay businesses, such as refrigerated warehouses, to reduce electric consumption for a brief period of time – often only a few hours, several times a year. Asking facilities to reduce energy in *response* to peaks in energy *demand* is a cost-effective and cleaner way to ensure communities have electricity when they need it – and most importantly, the energy service companies pay businesses substantially for their participation.

#### ➔ **How do cold chain organizations benefit financially?**

Businesses are paid for their participation in demand response programs. Depending on the specific program, payments could be offered year round just for enrolling, and again when they are actually called upon by the electric grid to reduce load. These payments can add up to tens or even hundreds of thousands of dollars each year – providing organizations much-needed cash to hire additional staff, fund equipment upgrades, or reinvest in energy efficiency projects. Programs in the United States Mid-Atlantic region might pay \$30,000/MW annually, while programs in Western Australia could pay over \$70,000/MW. Specific amounts depend on the programs available in your region.

#### ➔ **How do the cold storage organizations participate?**

For most cold chain participants, the major uses of electricity are refrigeration, lighting and battery charging. These are typically the targets for demand response energy reductions: shutting off or adjusting refrigeration, turning off compressors and battery chargers, reducing internal and external lighting, or making other minor operational changes. Businesses with back-up generation units can often participate by switching load to those as well. Often, these changes have virtually no effect on business operations, especially when advance notice is given and businesses pre-cool their refrigeration units. Energy reduction can be manually done by facility managers or automated and controlled remotely, at the discretion of the individual business.

### ➔ **Where demand response programs are offered?**

Demand response programs are most developed in the United States, Canada, U.K., and Australia. However, because electric grids are often cross state, province, and even national borders, programs vary widely. The simplest way to determine if your region offers demand response programs is to reach out to a demand response service provider or your local utility.

## **Frequently Asked Questions about Demand Response**

### **1. What are Demand Response (DR) programs?**

The Program Sponsor (usually an Independent System Operator, public utility, or 3rd party integrator) pays the customer for making its load subject to interruption (curtailment). Facilities which have the capability to curtail or interrupt their energy consumption when the “grid”, or power delivery infrastructure, is nearing capacity are candidates for demand response programs. This can be an automated or manual process in which facilities can maximize energy savings or develop an additional source of revenue.

### **2. Are DR programs available in all utilities?**

No, but demand response services are currently available in 21 states. Most programs are available in California, Mid-West, Mid-Atlantic and New England states. More information on the availability of Demand Response programs can be found at the U.S. Department of Energy’s website: <http://www1.eere.energy.gov/femp/financing/energyincentiveprograms.html>

### **3. What types of DR programs are available?**

The three most common types of demand response programs are

1. *Emergency Load Response Programs* – End-users receive financial incentives for agreeing to reduce a set amount of kW demand during system emergencies.
2. *Synchronized Reserve Programs* – End-users receive financial incentives for reducing electricity consumption on short notice in case of an unexpected emergency event (e.g., a power outage or transmission line failure).
3. *Economic Load Response Programs* – End-users receive financial incentives for voluntarily reducing electricity consumption during times of high wholesale prices.

### **4. How do I sign up to participate in DR programs?**

Third party demand response providers manage program participation on behalf of the Program Sponsor. They can assist in identifying curtailable loads, enable the use of back-up generation (where applicable), and assist to establish a demand response procedure with facility personnel.

### **5. Is there a cost to enroll?**

No. For most demand response programs, a 15-minute interval pulse meter will be required for verification of demand load reduction. Economic programs may require the installation of 1-minute interval pulse meters. If new meters are required, typically the third party demand

response supplier will install the meter at no cost and will be paid for out of the first demand response payment.

### **6. How is an event initiated or notified?**

You could be notified by a text, email, or automatic signal sent from the utility or DR aggregator directly to DR control hardware in the facility. For example, this DR hardware may send a digital signal directly to a refrigeration control system to initiate a process of shedding refrigeration system load (e.g., shutting off compressors, raising space temperature, turning off cooling zones, etc). If it is a text or email, it is often a manual process where site staff takes pre-determined steps to manually reduce load (e.g., turn off equipment or start a generator).

### **7. What happen when a DR event is declared?**

If an event is declared by the Program Sponsor, you will receive advanced notice from your third party demand response supplier that your capacity is needed. The amount of advanced notice you receive depends on the programs in which you are participating. You will be notified by phone and e-mail through a pre-determined number of contacts. Typically this includes the plant manager, the operating engineer and other personnel that will be responsible for reducing the facility energy consumption. Notification may also be sent directly to a refrigeration control, or SCADA, system whereby an automatic signal may initiate an auto transfer to generator or initiate a series of DR reduction changes via the plant control system.

### **8. What is the performance period?**

Capacity programs are typically referred to as summer programs. They typically run from June 1 through September 30.

### **9. What is the minimum kW commitment amount?**

The minimum kW commitment is typically 100kW for most programs.

### **10. When can I expect to be notified to curtail load?**

For Emergency programs, you would be notified to curtail load between 12:00 p.m. and 8:00 p.m. during non-holiday weekdays. Synchronous Reserve programs are 24/7 but end-users can limit the hours of participation that are convenient for operations to reduce load but the potential revenue will reduce since payment based on the hours of availability.

### **11. How much notice will I have before an event?**

It can range from 10 minutes to 2 hours depending on the demand response program. Emergency programs typically provide 2 hour notification while Synchronous Reserve programs can be as little as 10 minute notifications.

### **12. What is the maximum number of DR events per year?**

The maximum number of emergency program events per year varies by contract. A typical program can be called up to 10 times for a maximum of 6 hours each event. There is a one hour test event in the beginning of each performance season. If no events are called during the performance seasons, the test will serve as the measure for compliance. Synchronized Reserve programs do not have limits but typically no more than 5 events are called per month.

### 13. Are there any penalties for non-compliance?

There are no out of pocket penalties but payments are reduced proportional to the number of events missed and the kW shortfall from the commitment level. Typically if more than one facility is enrolled in a single ISO, public utility, or 3<sup>rd</sup> party integrator, you can aggregate the load so if one location falls short of their kW commitment level and another facility over performs by the same amount of the kW shortfall or above, no reduction in revenue will be applied since the total kW commitment was achieved in the same ISO region. However, if there is a severe lack of participation, there is a contractual clause that eventually nullifies the contract due to lack of participation.

### 14. Are the deadlines to enroll in demand response programs?

Yes, see the attached schedule below.

### 15. How much DR revenue can I realistically earn?

Revenues depend on the ISO and utility. Some PRWs can realistically earn \$20,000-\$70,000 per MW per year prior to revenue splits between the participating company and Program Sponsor. Revenue is predicated on the number of events called and actual performance compared to contractual performance obligations.

### 16. What percentage of the revenue can I expect to receive?

It is best to identify all facilities within the same ISO and aggregate the total demand response load and bid out to several demand response providers. The larger the aggregated MW load drop, the higher the revenue split the end user can negotiate with the demand response provider. Typical revenue splits for the end user can vary from 70%-90%.

### 17. When are DR payments received?

They can vary from monthly, quarterly or annually depending on the ISO.

### 18. How are DR curtailment baselines determined?

There are several different methods for determining baselines. The method USCS has used is the Guaranteed Load Drop "GLD" method. This method uses a combination of Comparable Day and Same Day load evaluations.

- **Comparable Day** – The end-users actual hourly loads on a non-interruption day judged to be similar in other respects to the interruption day. These loads may be adjusted for differences in weather conditions or an average of the end-users actual hourly on peak days.
- **Same Day (Before/After Event)** – The end-users actual loads on the same day of the interruption, from the hours surrounding the event. This option is appropriate for high load factor customers with no weather sensitivity.



## More Information

- <http://www.demandresponseinfo.org/>
- [http://www.iso-ne.com/genrtion\\_resrcs/dr/broch\\_tools/rt\\_pric\\_prog\\_faq.pdf](http://www.iso-ne.com/genrtion_resrcs/dr/broch_tools/rt_pric_prog_faq.pdf)
- [http://en.wikipedia.org/wiki/Demand\\_response](http://en.wikipedia.org/wiki/Demand_response)
- <http://energy.gov/oe/technology-development/smart-grid/demand-response>
- <http://www.pge.com/mybusiness/energysavingsrebates/demandresponse/whatisdemandresponse/>



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