ICEBANK®

Ice Storage Systems

REDUCE COOLING COSTS

SAVE ENERGY

CONSERVE RESOURCES

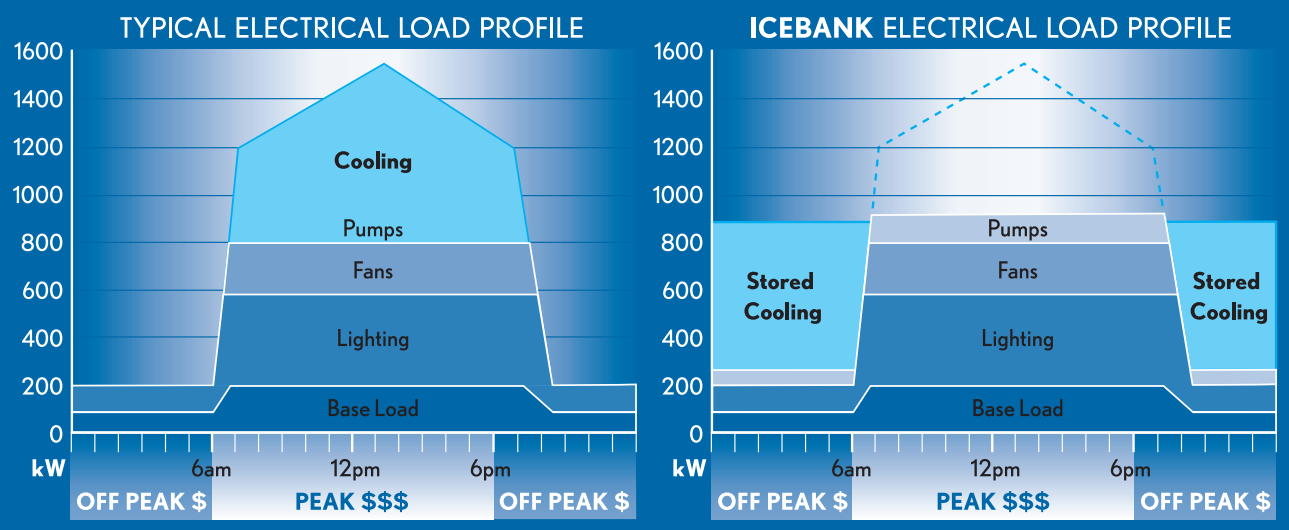
Ice Storage

A COOLING SYSTEM WHOSE TIME HAS COME

ICEBANK® ICE STORAGE is the breakthrough air conditioning product that is designed to minimize the consumption of expensive daytime energy. Ice Storage offers you all the cooling of a traditional AC system, at a fraction of the cost. In fact, the only one who will notice any difference in cooling is the person paying the energy bill!

How does Ice Storage work?

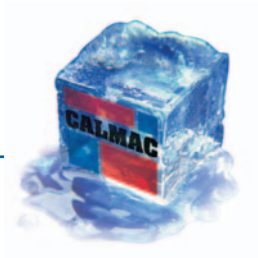
- The system that CALMAC has pioneered utilizes a traditional chiller to produce ice, which is stored in modular tanks.
- Like an "air-conditioning battery," ice storage charges at night, when energy is readily available and costs less.
- During the day the "ice storage battery" discharges, cooling your building cost-effectively while reducing peak demand on utilities.



Do the math: If you're designing a 600 ton, 300,000 sq. ft. building with a monthly demand of $10 per peak kW, reducing electrical demand by 600kW each month can save $6,000!

"Beyond the cost saving aspect, we selected this technology because it reduces peak electrical load on the grid. This lowers the need for building new power plants."

• Jody Durst, Co-President, The Durst Organization



INTRODUCING **ICE STORAGE**

A green design cue from nature

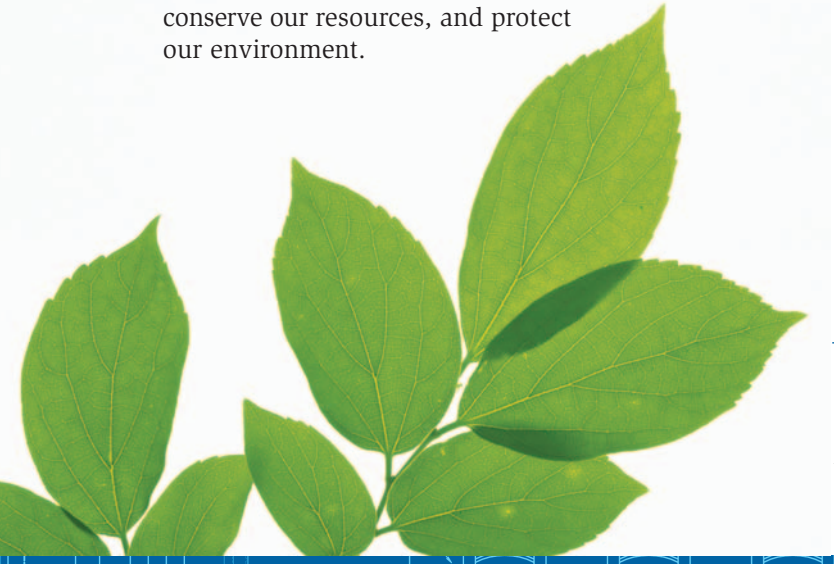
Storage is an integral part of our world. From the food in our cupboard to the water in our reservoirs, it's how supply and demand is balanced. Imagine how inefficient life would be if we had to search for food or water each time we become hungry or thirsty!

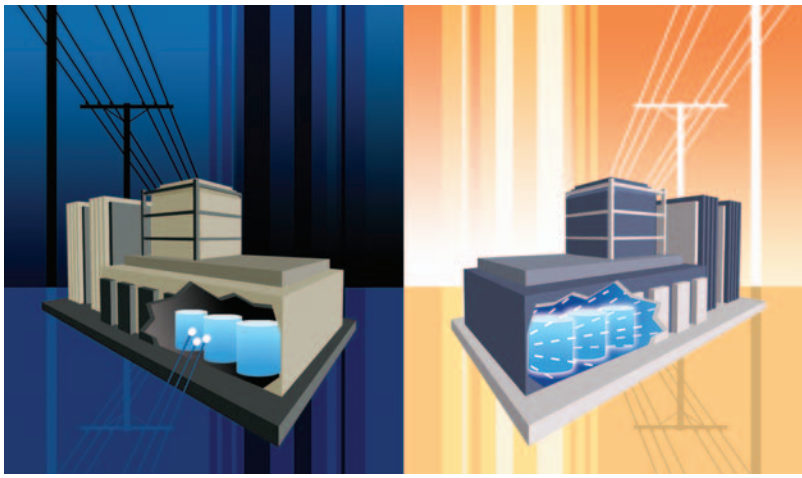
Yet this is the "on demand" system we currently use to meet our air conditioning needs. In fact, North America now has approximately twice as many power plants as it really needs — because electricity at night is barely utilized.

Electricity is not only more plentiful at night-time, it is usually less expensive and more efficiently produced. "For two major California utilities, it required 10-30% less energy to create and deliver power at night versus the day."[1] As stated by the Natural Resources Defense Council in *The New York Times,* "peak shifting results in lower greenhouse emissions."

Store ice at night to cool more efficiently

Instead of building more power plants, and increasing our dependence on foreign natural resources, we can use the concept of energy storage to make better use of the night-time power we already have in abundance. That's the idea behind IceBank Ice Storage from CALMAC — the efficient, reliable, ingeniously simple technology that creates and stores ice at night to cool your building the next day. It's the natural solution for designers who want to save energy, conserve our resources, and protect our environment.





Make ice at night... ...to cool buildings during the day

A better design

Most conventional designs require 20% more chiller capacity to accommodate larger than expected cooling loads or equipment failures. This safety factor/redundancy investment is rarely used, and requires larger ancillary support that makes the cooling system run at less than optimum efficiency.

The Durst Building, 1155 Ave. of the Americas, New York City: Energy Star rated office building

Ice Storage is a much more efficient cooling system design, because you can meet your safety factor and redundancy needs with stored ice. As a result, you can install a smaller, more efficient cooling system that minimizes part-load losses and still provides the extra cooling capacity and redundancy required by today's building users — affordably!

[1] Tabors Caramanis & Associates/California Energy Commission, Source and Environmental Impacts of Thermal Energy Storage Report #500-95-005. (www.energy.ca.gov/reports/reports_500.html)

[2] For more design information, go to ASHRAE Green Guide, Chapter 9, page 86.

Ask about the latest generation of ultra-compact Model C tanks, which provide more cooling in less space, along with unsurpassed reliability.

Get LEED points with Ice Storage

Ice Storage is an excellent way to obtain credits for LEED certification. Credits in the Energy & Atmosphere section of LEED are earned by reducing energy costs over a conventional design. Ice Storage can dramatically reduce cooling costs between 20-40%, thereby earning LEED credits.

Rely on IceBank Ice Storage

When you analyze and develop an Ice Storage Solution, you'll find an invaluable ally in CALMAC. Our experienced customer support team will show you how to replace a standard oversized cooling system with a smarter HVAC alternative using ice storage that:

- Is simple and less expensive to operate and maintain
- Makes more efficient use of energy, natural resources, and existing infrastructure
- Reduces greenhouse gas emissions
- Reduces energy use during peak demand periods, relieving the strain on our nation's utilities.

Hewlett Foundation, Menlo Park, California: The first LEED Gold Certified building in CA.

Three ways to save money with Ice Storage

1. *Pay less for your energy*

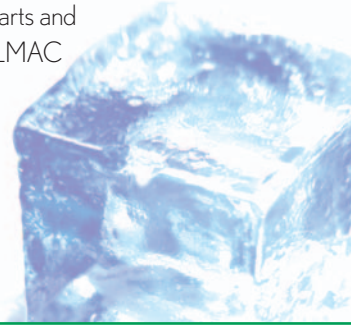
Save as much as 20-40% on cooling costs during the 20-30 year life span of the system. Energy rates are lower at night. Plus, utilities are willing to negotiate lower rates for reducing peak demand.

2. *Install a rightsized HVAC system*

Typical rightsizing with ice storage is accomplished with chillers that are at least 20% smaller than the conventional designs required to meet peak capacity.[2]

3. *Lower your maintenance costs*

Fewer chillers mean fewer moving parts and lower maintenance costs. Plus, CALMAC tanks are rust proof and virtually maintenance free.



"Thermal energy storage offered us tremendous benefits on the energy side, the cost side, and the comfort side." • Stu Reeve, Energy Manager, Poudre School District

"Based on the performance of the systems so far, we project a $28 to $35 million energy savings over the 40-year life of these 19 schools. That is not a trivial sum." • Bill Gilbert, Energy Director, Johnston County Schools

Commonly asked questions about Ice Storage

Is my HVAC project a good Ice Storage application?

If your building meets at least two of these three parameters, your HVAC installation is a good candidate for ice storage.

- A building over 100 tons
- Cooling system that employs chilled water
- Sufficient time to make ice (Even with night-time loads, you can benefit from ice storage.)

Do I have enough space to fit the tanks?

Tanks can be conveniently located in a basement, on roofs, inside or outside, or even buried underground. A system that provides about one third of a building's total cooling requires just 0.25% of the conditioned space.

Are ice storage systems easy to install?

Ice storage uses standard air conditioning chillers with factory mounted ice-making controls, so installation is fast and simple.

Are installation costs comparable to traditional systems?

Yes. Rightsizing with ice storage allows you to use smaller chillers and smaller ancillaries, which typically offset the ice storage costs. You may even be eligible for incentives from your local utilities or government. And with the energy savings of a Partial Ice Storage system, you can typically expect payback in two years or less.

With no moving parts, our system is simple, reliable, and practically maintenance free.

Why should I choose CALMAC?

- CALMAC is the only manufacturer whose core business is ice-based energy storage.
- Our technology has been proven in over 3000 installations and 36 countries.
- Our engineering and customer support services are without equal in the industry.
- Our tanks are backed by a 10-year limited warranty — the best warranty in the business.
- The tanks come in a variety of sizes so they are perfect for retrofit applications or small spaces. Simply said, IceBanks store more energy in less space.

Interested?

If the concept of Ice Storage intrigues you, get all the facts on how CALMAC's IceBank tanks can translate into BIG savings for your building. Contact CALMAC for more details, including a quick FirstPass analysis to see if Ice Storage could enhance your next project.

CALMAC Ice Storage keeps some of the world's best companies cool!

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