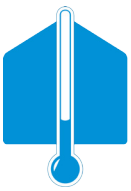
Solar Energy Fact Sheet



International
Association for
Cold Storage
Construction

By the IARW-IACSC Refrigeration & Energy Committee

For the International Association for Cold Storage Construction and the International Association of Refrigerated Warehouses

Solar Energy Fact Sheet

Over the last decade, the adoption of solar energy among the US commercial and industrial sectors has become increasingly common. Benefiting from the federal and state incentives that support solar, US businesses with significant energy needs have leveraged solar power to reduce annual power bills, shrink their carbon footprint, and hedge against rising energy prices in the future. While most sectors can benefit from solar energy, the cold chain is uniquely positioned to take full advantage - and is emerging as a leader in the adoption of this technology.

How does solar power work?

"Commercial scale" solar energy systems are essentially mini power plants located directly on client-owned property. Solar systems can be mounted on a roof or adjacent land, and produce power that offsets a portion of the electric supply that a facility would otherwise receive from the local utility. Solar modules produce electricity through the "photovoltaic effect", converting sunlight to direct current (DC) electricity. A solar inverter – also part of the system – then converts DC power to AC power for use on site.

What service models are available?

There are essentially three paths to solar:

- *System Ownership* – invest in a system yourself
- *Power Purchase Agreement* – buy the electricity from a system another party finances and operates on your property; no capital needed
- *Operating Lease* – finance through a 3rd party who can use tax incentives to reduce the lease rate, this may be of interest when companies do not want to deal with the tax issues; no capital needed
- *Site Lease* – lease your roof or unused acreage to a party interested in siting a solar energy system on your property

How can solar benefit my business financially?

The financial benefits of a solar energy system follow the service models outlined above. Generally, these include:

- *System Ownership* – Immediate savings on your annual energy bill are not the only financial benefit that accompany solar. Investment in a solar array is encouraged by federal income tax credits and tax shields worth up to 65% of total equipment cost. In certain states there are additional incentives that can be applied, such as state tax credits, rebates, grants and the sale of Solar Renewable Energy Credits (SRECs). As such, solar investments can be characterized by rapid capital recapture (3-5 years) and a strong ROI.

- *Power Purchase Agreement* – The first financial benefit with a PPA is the avoidance of any capital expenditure. Instead of investing in solar equipment, a third party is responsible for financing, owning, operating and maintaining the solar array. Meanwhile, your responsibility is purchasing the electricity produced at prices set below what you

would otherwise pay to the utility. The outcome is annual energy savings and the peace of mind that accompanies budgeting certainty for a portion of your bill.

- *Property Lease* – This one is fairly simple, and the answer is "found revenue". Solar development firms interested in siting solar projects in certain areas may be willing to offer property owners an annual lease payment in exchange for site access. For property owners with appropriate roofs or land with minimal alternative use, these assets can be set to work as generators of an annual income stream.

- *Saving Analysis* – A reliable saving analysis is the basis for any financial model. The estimation of savings can be as easy as every kWh generated saves a certain dollar amount or as complicated as different savings for different times of the day and additional potential savings for kW demand charges, typical called Time of Use (TOU) tariffs. Whenever utilities charge for kW demand, using average dollar amount per kWh will lead to incorrect saving estimates. The only method to estimate savings In these cases using hourly data for usage and generation is recommended to estimate savings.

Are other cold chain businesses "going solar"?

Yes. In fact, the cold chain is considered a leader among business sectors with respect to the adoption of solar energy. From California to Maryland and New Jersey, IARW-GCCA members are already capturing the benefits of solar power.

How do I find credible vendors?

You can start with solar organizations such as Solar Energy Industry Association (SEIA) or Solar Energy Power Association (SEPA) or with state lists of contractors who had applied for rebates such as "Go Solar California / California Solar Initiative (CSI)". None of these organizations, though, have a qualification process implemented.

State Contractor License Boards have a list of all contractors, and it is a good idea to check license, insurance and bonding. The North American Board of Certified Energy Professionals (NABCEP) offers a qualification for solar installers; all qualified installers are listed on their website.

The easiest way to find a qualified contractor may be to ask your colleagues, persons who work in your industry and members of the association for a referral.

When engaging with possible vendors, there are also some basic questions you can ask up front:

- How many projects of a similar size and client type have you completed?
  - Contact references
  - You may want to tour an existing solar energy system
- In what state have you completed solar projects?
- What equipment manufacturers do you tend to recommend (panels, mounting system, inverters, monitoring)?
  - Warranties and Guarantees

- What scope of services do you recommend for system operations and maintenance (O&M)?
- If this is a PPA solution, can you provide proof of financing capabilities?

How do I know if my facility is suitable for solar?

The ideal site profile for installing a solar energy system includes:

- Roof mounted systems:
  - At least 100,000 square feet of flat roof space
  - Less than 5 years since last re-roof
  - Building is owner-occupied
  - Building is three stores or less
- Ground mounted systems for land lease:
  - 10+ acres of cleared land, ideally with a slope of less than 6° Fahrenheit
  - Limited obstruction and shading
  - Power lines nearby or close proximity to a utility substation
- Ground mounted systems for electricity offset
  - 2+ acres of cleared land, ideally with a slope of less than 6° Fahrenheit
  - Limited obstruction and shading
- Solar Carports
  - 150+ parking lots

Will the installation of a roof mounted solar energy system puncture my roof?

The exact type of solar mounting system varies depending on the specific type of roof, but many solar mounting systems are ballasted – a highly engineered solution that secures the solar array without roof penetrations or risk of damaging the roof.

How can I learn more about solar energy?

The following links are good resources for learning more about solar energy and available incentives & rebates:

- Solar Energy Industries Association
- Solar Electric Power Association (SEPA)
- Renewable Energy Access
- US Department of Energy (renewables site)
- Interstate Renewable Energy Council
- NREL (National Renewable Energy Laboratory)
- Solar Buzz
- Solar Today
- www.dsireusa.org

More Information about solar technologies is available in the Solar Photovoltaic System Guidelines published by the IARW-IACSC Construction and Codes Committee. This document can be found on the GCCA website.