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Keeping Green Energy Efforts Out of the Red

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Environmentally friendly and a hedge against rising utility costs, alternative energy systems including wind, solar and co-generation plants are seeing strong interest and adoption at campuses across the country. But ensuring these efforts to go - and save - green are a long term success requires an understanding of possible risks and how best to manage them.

This article will provide an overview of the types of alternative energy systems seeing strongest uptake at higher education institutions today, discuss key risk considerations that each present to institutions, as well as measures that can be taken to mitigate and offset the risks and potential liabilities presented.

It is difficult to travel on any road today and not see solar panels on houses, larger solar farms or even wind turbines in the distance. With larger initiatives to create more environmentally sustainable energy and reduce carbon footprints, many businesses are reviewing their options for alternative energy sources, including many Universities.

Three of the most common types of alternative energy solutions being installed today are: Solar panels, wind turbines and cogeneration plants. Let’s take a closer look at each of these, their benefits and risks and what you can do to best manage any of these at your facility.

Solar (Photovoltaic) Panels:

Solar panels convert sunlight to electricity. The individual panels are comprised of multiple photovoltaic cells. Typically, the panels will be installed as part of a solar array either on a roof or mounted in a field. Solar is one of the fastest growing segments in renewable energy and it’s easy to see why. With low maintenance costs and high reliability, they can lower overall electricity costs and add some independence from the electrical grid and its peak prices.

But, the additions of solar arrays do bring with them some potential risk that needs to be understood and taken into account, including:

- Roof penetrations that can lead to leaks
- Wind load requirements – ballasted assemblies versus mechanically attached. Perimeter and Corners should not be used

- Snow load – weight of panels plus securement if ballasted requires structural analysis
- Electrical hazard – solar panels are “always on” and need a way to be isolated from the inverter system.
- Fire hazard potential of the panels and conduit located on a rubber membrane roof covering.
- Hail Damage to the solar panels.

In addition to, and in conjunction with, these specific hazard considerations, it’s also important to understand who will be responsible for the array. They tend to be owned by a third party and that can complicate risk mitigation and damage repair efforts.

Wind Turbines

Wind turbines convert kinetic wind energy into electricity; using it to turn the blades of a rotor that is connected to a main shaft which spins a generator to create current. Along with solar, it’s the other rapidly growing renewable and one of the most visible of the so-called green energy sources. Like solar, it has some key benefits to recommend its adoption, including its use of a free, abundant resource (wind) to create the electricity and relatively low operational costs. Like solar, wind also has risks that should be factored into planning, installation and operation, including:

- Noise – at large scale, the whirring of the rotors can be quite noticeable
- Equipment breakdown – replacement parts are expensive and lead times long. Catastrophic failures can also present projectile dangers (i.e. blades) to humans and buildings
- Installation Risks – falls, confined space, fire, electrical hazards, machine guarding, arc flash, elevation (~300 ft. above ground)
- Project could take as long as two years, start to finish

Cogeneration

Cogeneration systems are so-named because they produce both heat and power. The excess thermal energy produced in the production of electricity is captured and used for heating buildings or water, or even for powering absorption refrigeration to provide building cooling. Like both solar and wind, co-generation can provide a measure of grid independence and insulating against price spikes and outages, and – in many areas – providing an income stream from excess energy sold back to the utility.

Like the systems themselves, the downsides of cogeneration can be a bit more complex, they include:

- Substantial initial investment in equipment and building upgrades/construction
- Complex systems requiring experienced operators and mechanics
- Presence of pressurized oil lines near heat sources

No matter the project under consideration some basic principles should be applied to ensure the types of risks mentioned above are well-managed and minimized, including:

- Ensure early, open and regular communication between risk management and the design team.
- Involve your insurance broker and carrier early to gain a full understanding of potential insurance implications of the project.
- As with any project, a general construction guide should be followed and include risk management and insurance company involvement.

- Obtain credentials, licensing and insurance certificates for all contractors involved. Ensure the contractor is experienced and reputable. This applies to both installation and subsequent third party operation.
- Obtain proper warranty documentation for any new equipment.

As technologies have matured, environmental concerns grown and other fuels become more unpredictable in their cost, going green has gained real momentum. So, bringing some form of renewable energy on campus is likely not a question of “if” but, rather, “how.” Risk is real, but with some foresight and planning, it could be easy to be green.

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