

Solar Photovoltaic (PV)

Solar

Photovoltaic (PV) represents a significant part of the experience that Internat Energy Solutions (IES) has with renewable energy. Through our design and implementation projects we have gained an understanding on how to best bring this energy source to those projects that offer a real benefit to its user. As with all of the renewable energy systems that IES has worked with we would like to offer some of the basics behind the science and design.

Photovoltaic

systems can offer the following advantages:

No

Fuel Cost: Since no fuel source is required, there are no costs associated with purchasing or transporting fuel.

Durability:

Most of the PV modules available today show no degradation after a decade of use. Many manufactures even offer a guarantee of production up to 80% after 20 years.

Low

Maintenance Costs: When compared with transitional energy sources for remote building sites, PV covers very low cost for maintenance or service work. Usually they only require some occasional inspection after installation.

Reduced

Sound Pollution: PV operates silently with minimal movement

Independence

and **Electric Grid Decentralization:** Small-scale decentralized power stations reduce the possibility of outages on the electric grid.

Some of

the disadvantages that can be associated with Photovoltaic:

Initial

Cost : When evaluated in an economic prospective to existing alternatives the return on investment may be less attractive. However, it is necessary that the complete life-cycle of the systems be taken into account when building the cost models. Items such as fuel costs can only be estimated and leave error into the calculation. Also, as manufacturing technologies improve for the PV cell it is expected that these initial costs will decrease to allow more projects prospective candidates for Solar Energy.

Variability

of Available Solar Radiation: Weather will greatly affect the power output of a PV system. Variations on climate conditions from day to day and season to season can vary the production of the energy. However, the latitude of Southern Ontario (equivalent to Southern France) provides a sufficient amount of solar radiation to have PV as a significant contributor of electricity in our energy mix.

Energy Storage:

If the PV systems is not tied into a local grid where net metering can be done, then storage is required for the electricity produced. This can increase the initial investment that is required for installation.

Education:

Although it is a developed technology and industry, PV still needs to be understood for its feasibility and potential value. There are a large variety of design systems that can be implemented for PV.

The

direction of decentralization of energy production is one that is now being taken by the current Ontario Government and is one that provides interesting opportunities for both the residential and commercial building owner. The creation of the "smart grid" will allow one to provide energy directly to the main electrical network when the PV system is in operation. The electricity that is provided to the grid will be sold at a cost that can offset the costs of the electricity used at a building and provide the payback for the initial costs. Below is a simplified diagram of how the system would work.

Through

our experience in the French market, we have had the opportunity to specialize our engineering designs for building-integrated photovoltaic (BIPV). As the french feed-in tariffs offer an incentive for BIPV, IES have worked in collaboration with architects on numerous BIPV projects. A Building-integrated installation brings about new design implications with regards to waterproofing and ventilation.

Not every building or surface area is a good candidate for PV systems. Such items as shading, roof durability or slope along with other local environmental conditions need to be taken into account. However, as experience grows in this new market more successful samples will be promoted and those projects that offer a solid advantage to its users will grow. It is the intention of IES to provide energy analysis and system design to those projects that will be examples of success to the market. Please refer to our references at the home page to understand our past and current projects.