

Putting a Price on Solar Systems

Photovoltaic installations create challenges and opportunities for commercial brokers

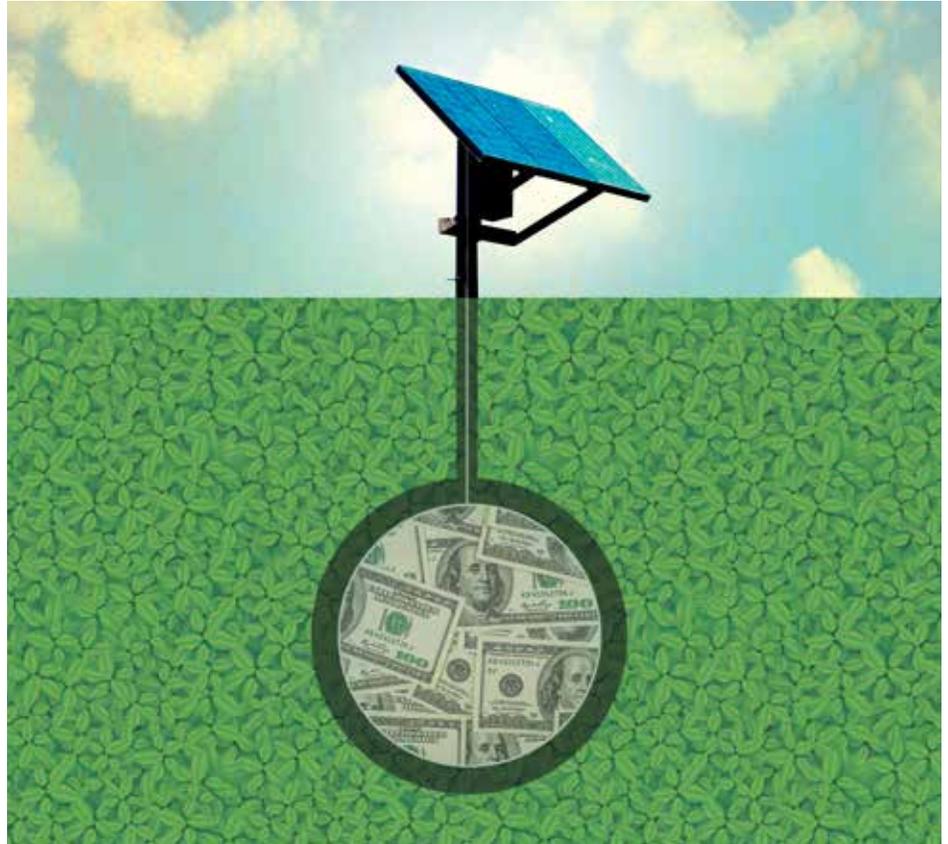
By Clare Broderick

Solar Photovoltaic (PV) systems are becoming an increasingly common feature of commercial real estate developments. As the element performance of PV systems improves and the cost to install and operate them decreases, more and more commercial property owners and developers are looking to PV systems to add value during construction or renovation.

As a result, commercial real estate lenders and brokers are paying greater attention to solar installations and crunching the numbers to calculate the risks associated with them. The question is: How do you accurately assess return on investment (ROI) and put a price on a solar system?

Fifteen years ago, the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) estimated that by 2020, as much as 15 percent of U.S. peak electricity capacity could be supplied by the solar industry. We're on the right track: Clean Technica calculated that between 2010 and 2014, the country's solar capacity more than quadrupled. In addition, the purchase price of solar panels has dropped in certain areas by no less than 80 percent since 2008. As a result, the installed price of solar energy in the U.S. continues to decrease by 12 percent to 15 percent on a year-by-year basis. The issue for commercial brokers is determining the costs, risks and ROI of these installations.

A solar system's output — and thus its value — is impacted by its efficiency, the local weather and market forces, all of which must be considered carefully to get a clear understanding of the system's performance and the ROI that can be expected. When financing a property with a solar system (or the solar system itself), a targeted solar due diligence assessment is needed to give a clear picture of how the system impacts overall property value.



To accurately quantify the risk and potential value a solar system brings to a property, the due diligence process should evaluate physical considerations and solar market issues. Physical attributes include the system's current condition as well as the estimated maintenance costs. Market issues to check include available rebates, revenue the system is expected to generate over its lifetime and the extent to which local market forces reward buildings with lower environmental footprints.

A consistent assessment method and standard should be used, which will help investors and lenders better understand and compare systems, improve the underwriting process and reduce risks in business decisions. The due diligence process should include a review of

the following: system feasibility, system performance and durability, incentive programs and zoning requirements. Let's look at each of these in more depth.

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System feasibility

Photovoltaic cell technology has advanced rapidly in recent years, with new developments greatly improving the quality and reliability of solar systems. Various software programs are available that help determine the feasibility of a system by modeling its long-term performance, including lifecycle costs and feed-in tariffs.

When modeling the performance of a module or cell configuration, assessments should consider: system output (in watts); energy output (in watts-hours) and the conversion efficiency. This efficiency is calculated as power output from the sun's array/power input and then multiplied by 100 to express it as a percentage.

The profitability of a solar system is directly impacted by its energy output, so the feasibility study should include an analysis of all issues that can affect the system's energy production. A shading analysis of the panel design determines when surrounding objects, vegetation or other panels in the solar system will shade the panel in question and hamper production. A meteorological review based on solar irradiance forecasting will establish how local weather trends affect energy output.

Performance and durability

Like many building components, solar PV systems have a "useful life," which is the period before the system's condition deteriorates to the point where it no longer delivers the required output. Many factors impact a solar panel's energy output, including system efficiency and environmental issues, which is why all solar systems produce less energy than their theoretic maximum output levels.

Many major solar panel manufacturers guarantee that panels will maintain 90 percent of their original output through year 10, and about 80 percent after 25 years of operation. On average, solar output levels dip about

0.5 percent for every year of operation because of efficiency degradation.

Of course, as solar technology continues to advance, so will the output and durability of solar systems, but useful-life calculations continue to be an important consideration when determining the long-term value a solar system will add to a real estate asset. A system condition assessment will help owners and investors quantify the performance that can be expected of a PV system.

Incentive programs

In an effort to encourage sustainable development, many national, state and local tax rebates and incentives are available to offset the upfront costs of solar installations. Additionally, an increasing number of available programs and schemes can help improve the ROI of solar systems.

For example, lenders should consider if a green rating, such as Leadership in Energy and Environmental Design (LEED), has been or can be obtained as a result of on-site solar energy production to counter energy consumption and environmental footprint. Solar investments that are recognized with a LEED or similar certification can improve an asset's ROI, not only through reduced operational costs, but also by increasing property values as a result of market forces that reward sustainable properties.

On-site solar production also can provide access to rebates, incentives and resale schemes, such as the Renewable Energy Certificate (REC) program. In addition, the energy produced may be sold through programs such as the Solar Power Purchase Agreements (SPPA), further allowing property owners and investors to capitalize on the presence of a solar system.

Zoning requirements

For a ground-based solar installation, the due diligence process also should consider compliance with applicable zoning codes.

These systems are usually controlled by local legislation that sets standards for their placement, design, construction, operation, monitoring, modification and removal. These standards are aimed at addressing public safety issues, minimizing impacts on natural resources and ensuring that when the time comes, the cost of decommissioning the system is provided.

Location and site arrangement are normally controlled by designating suitable sites in accordance with local zoning requirements, including site-coverage buffer zones and structures. An American Land Title Association (ALTA) survey will help delineate the impact these zoning requirements have on the solar installation. The due diligence process should additionally confirm that a title insurance policy has been issued.



Investing in solar systems can offer commercial real estate owners and investors great returns. As the number of incentive programs grows, system productivity increases and installation and operational costs decline, the financial argument for investing in solar systems will continue to gain momentum. The availability of solar-energy-resale schemes and market forces that increasingly favor green buildings also are making on-site solar production an increasingly effective way to enhance an asset's value.

Before investing in or lending on solar systems or properties that contain them, however, it is critical for mortgage brokers and investors to fully understand the performance of the system, consider all limitations and investigate available incentive programs. A thorough due diligence process helps ensure accurate values are assigned, risks are adequately managed and ROI is optimized for installed solar systems. ■