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# What to Expect When You Go Solar: 4 Stages to Completing a New Commercial Solar Installation

OCTOBER 12, 2016

## BUSINESS BRIEF

Your organization has committed to going solar. Now what? While you may have experience with other types of construction projects, taking part in a new commercial solar installation may seem like uncharted territory.

This business brief offers a road map of what to expect on your journey from signing the contract to flipping the “on” switch by examining the four major phases of constructing a new solar panel system:

- Due Diligence
- Engineering and Design
- Construction and Commissioning
- Operation and Maintenance



### Due Diligence

Before detailed engineering and commercial solar design work can begin, it's critical for you and your solar provider to have a solid understanding of the physical, electrical and legal attributes of your site. This knowledge protects both parties by helping everyone understand the various factors that could impact the solar installation.

- Physical Evaluation:** This ranges from an initial visual inspection to more detailed topographical, geological and structural analysis, depending on the type of commercial solar installation.
- Electrical Investigation:** This includes a review of your organization's structural "as built" drawings (a record of all of the construction done on the site to date). The review helps identify the best point for the proposed solar power system to tie into the electrical grid. A detailed electrical audit is often performed during this stage and serves as the basis for establishing where the solar conductors are placed.
- Legal Review:** The solar installer will request title reports and other surveys to discover any potential property liens, easements or other encumbrances. A clean bill of health for your organization and its property helps guarantee the project will proceed without any legal challenges.

For simple rooftop projects, the due diligence phase typically takes 2-1/2 weeks to complete. With additional reports and recommendations to finalize, more complex ground or carport installations can run up to 8-1/2 weeks.

While the expense involved with due diligence stage is a relatively small compared to the total cost of a commercial solar installation, it's an important phase. In the unlikely event something is uncovered that would prevent the installation from proceeding, work can stop before significant money is invested. This phase should not delay contract signing or the start of initial design work.



### Engineering and Design

During the previous due diligence phase, a solid schematic basis for commercial solar design is usually established. It shows an overview of solar module placement and orientation. While this basic site plan remains open to changes as due diligence reports continue to come in, any subsequent modifications tend to be relatively minor.

“Scope Lock” for the project is established early in the design process. While more detailed plans will follow, at this stage all parties review and approve the basic placement of solar modules and plans for interconnection to the electrical grid. This stage in commercial solar design helps set expectations about the final form the installation will take.

More detailed design work follows. Permit drawings (which eventually become final construction drawings) are developed next. You will have a chance to review and approve these designs throughout the commercial solar installation process. The solar equipment provider's project manager is usually the main point of contact for project updates and other communication with your organization.

Applying for permits is a subset of the engineering and design phase. You can expect most solar developers to handle the permitting process for you. You should be aware, however, that some jurisdictions are more familiar with and open to the concept of solar projects than others. Once permit drawings are submitted, you'll learn very quickly how the building department in your area operates. Experienced solar developers can often anticipate the preferences of particular permit-issuing officials.

### Construction and Commissioning

The design is set, the plans are filed, and the permits are approved. Now the fun begins—bringing your new solar panel system to life! Typically, this begins with a pre-construction meeting between the solar provider and your organization's facility staff. Roles and responsibilities, contact information, site rules and other details vital to a smooth construction process, are clearly outlined at this meeting.

Mobilization follows where the solar developer, acting as general contractor, establishes an area of site control. This can include the actual worksite and more, depending on the type of project. A staging area is often designated to hold materials that have been delivered but aren't yet ready to be incorporated into the construction. It's also common to set a rally point or a meetings trailer to facilitate communication during a commercial solar installation.



- Rooftop Installation:** These are generally the quickest and easiest to construct, taking only 5 to 6 weeks (or less) to complete. Equipment is moved to the roof using an overhead crane, variable reach forklift or a lift mounted to the side of the building. During this phase, employees may have limited access to the building because of safety concerns. Careful scheduling can limit this potential disruption.
- Ground or Field Installation:** This type of project generally takes 6 to 8 weeks to complete, with limited disruptions to your organization's day-to-day operations. If not already naturally secure due to being in a remote location with little public access, a work area for a field installation may need to be fenced off for safety. Before solar equipment is delivered, it may be necessary to remove vegetation and create access roads. Assuming the geological survey gave a green light to proceed, piles are then driven into the ground to support the new solar array. Trenching for connecting cables will also be necessary at this time.
- Carport Construction:** A favorite among schools and public works facilities, these are the most complex commercial solar installation projects taking 8 to 12 weeks to complete. Additional inspections are often required to satisfy state and federal regulations. (It may be prudent to hire your own architect to monitor holes drilled, rebar and concrete used and the steel being fabricated throughout this process.) Pre-construction demolition and post-construction patching and painting may also be necessary. While a lack of parking may be inconvenient during construction, employees will appreciate the covered spaces once the project is completed.

Interconnection is the final step prior to commissioning your new solar operation. Interconnection refers to both the physical connection of the new facility to the local utility's power grid as well as the regulatory application process.



Physically connecting the new power source requires existing power to be temporarily suspended. This is often scheduled to occur during non-working hours to limit disruption to daily business activities.

While your solar equipment provider can help with the application to request this physical interconnection, it would be a good idea to get your legal team involved at this point. The interconnection application provides proof of insurance and illustrates compliance with all utility requirements. It confirms to the utility that there is a legal and safe process for disconnecting the existing system as well as monitoring any future export of power onto its grid.

Once mechanical, structural and electrical construction is substantially completed, you will need to reach out to the appropriate jurisdictional authority to get permission to operate the new system. This group will review the installation to make sure it's safe, code compliant and substantially built according to plans. This final sign-off is sent to the utility with a request for permission to operate.

Commissioning marks the home stretch to having a fully operational commercial solar installation. At this point, the solar provider confirms that the system was built in accordance with the plan and that it operates within acceptable parameters.

### Operation and Maintenance

After your new installation is commissioned and online, you will want to make sure it stays that way. The level of support you receive for operation and solar panel maintenance from your solar equipment supplier is already specified in your contract. It can range from basic annual inspections and monthly performance reports up to the gold standard for O&M: a performance guarantee. That's where the solar equipment provider guarantees a percentage of available energy will be produced daily, aggregated over one to five years. If that amount falls short, the solar equipment company is required to pay a pre-negotiated amount to make up the difference.

### SUMMARY

While the four major stages outlined in this business brief may have similarities with other types of construction projects, this overview highlights aspects of each stage unique to the solar industry. Proper due diligence helps ensure your commercial solar installation is physically and legally appropriate for your site. The engineering and design phase describes what to expect before the construction begins. Once underway, you can anticipate certain known disruptions to your day-to-day activities based on the type of installation you've selected. Once approved and commissioned, operation and maintenance plans go into effect to help guarantee the generation of commercial solar power benefits for years to come. Finding the right solar provider to guide you through these phases will help ensure a smooth solar panel installation process.

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