For companies that own or lease commercial property – whether retail, industrial or office buildings – solar power may be the perfect solution, or may make sense in the near future, or may not make sense at all. Each property must be assessed individually, using a comprehensive analytical model, and monitored over an extended time-frame to identify attractive solar opportunities. While in general, the economics of solar are improving through lower panel prices and rising electricity costs, and the market is maturing, there are numerous local and property-specific factors that affect the viability of each potential solar project. To make matters even more complicated, the market and policy conditions fluctuate continuously. The “go/no-go” decisions are complex and time-sensitive.

To tap the energy and economic potential of solar, commercial property owners (and long-term lessors) must objectively evaluate the business case for solar on each property and track the projected return on investment (ROI) over time. Internal champions need a consistent, reliable framework with which to educate all of the stakeholders and decision-makers in their organization, including – but not limited to – CEOs, CFOs, property managers, energy managers and corporate boards.

This paper provides a straightforward process to make the business case for specific cost-effective solar projects in your company’s portfolio, so the company can identify, authorize and complete the right solar projects with confidence.

1. Understand your corporate goals.
The first step in making the business case is to understand why your company is considering solar power – or should be considering it. This will help you determine what information you need to include in your solar analysis, as well as how to present the information to your colleagues. Is the company’s primary motivation financial? environmental? marketing? investor relations? At this stage, does the company have a strong commitment to solar? Is this part of a broader commitment to making the company’s business practices more environmentally sustainable? Has the company made any formal public commitments to solar and/or to sustainable business practices? Does your company own or lease (on a long-term basis) the properties that may be suitable for solar? Here are some possible corporate goals that may be fueling your solar investigations: (check all that apply)

- Lower long-term energy costs
- More-predictable energy costs
- Greater control over energy supply and costs
Additional revenue stream (for property owners)
Company sustainability goals, renewable energy goals and/or specific commitments in these areas
Brand, reputation and/or community leadership
Personal commitment of CEO and/or other executives
Tenants that request or require clean renewable energy (for property owners)
Marketing advantage for property owners seeking tenants, now or in the future
Other ______________________________

Regardless of the motivations behind your company’s interest in solar power, intelligent economic analysis is crucial.

2. Determine the criteria for a viable solar project.
If you are going to evaluate properties in your company’s portfolio for their solar potential, you need to know what the criteria are for a “go/no-go” decision. Will a proposed solar project be compared to all other types of capital projects on strictly financial grounds? Or, will the project be considered in the context of the company’s energy strategy and compared to other ways the company can reduce energy costs? What are the financial criteria that matter most? Is there a specific hurdle rate? Are there other non-financial criteria? Is solar more important in some locations than others?

The energy and financial contributions of a proposed solar project will most likely be considered within the context of the company’s overall energy management strategy. This strategy may include energy audits, energy efficiency improvements, demand reduction initiatives and LEED building certifications. Gathering and succinctly summarizing the data related to these areas will enable decision-makers to compare the costs and benefits of the proposed solar project to other energy management projects.

In the process of identifying your company’s criteria, be sure to think about everyone who will take part in the decision-making. While there may be a minimum ROI hurdle (and/or other financial metrics) corporate-wide, you may discover non-financial criteria that you didn’t anticipate. Ideally, you will identify one primary financial metric, or just a few, and a manageable number of other non-financial criteria.

Here’s one example of a company’s criteria:

- Maximize ROI; ROI hurdle 9%
- Payback < 10 years
- Priority to properties that are core to the portfolio
- Capture available incentives
- Consideration for roof age and condition
- Meet the company’s publicly stated goal for renewable energy generation
- Minimize use of staff time and senior management attention
3. Understand the choices involved in commercial solar projects.

In order make sense of your company’s solar options – and present them coherently to company decision-makers – you’ll need to develop a basic understanding of the solar development process and the players involved. For each potential project, you’ll need to consider several major decisions related to implementation: ownership structure, government/utility incentives, technology choice and vendor type.

Ownership Structures

From a financial perspective, there are four possible ownership structures for a solar system:

**OWNER-OWNED:** The property owner purchases the entire system (pays all design, installation and ongoing operating expenses). This choice is best suited for owners that have capital available for long-term projects and/or have sources of lower-cost capital. The property owner must be able to utilize the various tax benefits from owning the system. The owner must be willing to take responsibility for operating the system and monetizing all the production benefits that may result from the system.

**OWNER-FINANCED:** This option is similar to the Owner-Owned model but utilizes debt to mitigate the up-front capital requirements. Qualified owners may be able to leverage the purchase of their system via debt with appropriate terms – in some cases, less than their normal cost of funds. The owner may be able to capture the various incentives and tax benefits. This structure could provide returns on the renewable systems that are significantly better than the intrinsic return on the production of electricity alone.

**THIRD-PARTY OWNED - LEASED:** Under this scenario, the system is owned by a third party and leased by the property owner and/or the user of the energy. In many ways, this provides a similar leveraged structure as using debt leverage. The key difference is that under this arrangement, the various incentives and tax benefits are captured by the lessor, and some of the resulting economic benefits will be shared with the property owner. There are varying alternative structures within the “Lease” strategy; your tax department may have useful perspectives on the value of each option.

**THIRD-PARTY OWNED - POWER PURCHASE AGREEMENT (PPA):** Perhaps the least-complicated model requiring no capital outlay, the Power Purchase Agreement is a structure under which a third party, the “PPA Vendor” builds and operates the system for a contracted duration, and the property owner (or energy user) pays for the electricity produced by the system for the contracted price. Key factors in PPA contracts are: pricing terms for the generated electricity (both initial and future escalation rate), duration of contract, termination clauses and production guarantees. While you may benefit from this “least involved” method of purchasing renewable power, you will be trading off some of the economic benefits of the system to the PPA vendor to give them an adequate return for their cost of capital and risk.

Third-party ownership, whether through a lease arrangement or a PPA, allows you to benefit from a solar system without making the initial capital outlay and/or incurring debt. However, because the project must generate financial returns for the third-party owner, not all of the project’s benefits will accrue to you, the property owner. These projects make economic sense when the internal rate of return (IRR) can satisfy both the property owner and the company providing the lease or PPA.
As you investigate and present potential ownership structures, keep in mind that not all financing options will be available for every technology choice. For example, mainstream lenders may not be willing to finance newer technologies or materials. Also, your preferred ownership structure or financing plan may or may not be available based on project-specific factors, such as state policies, utility requirements or incentive guidelines.

**Government and Utility Incentives**

In recent years, solar incentives from federal, state or local government bodies, along with incentives from utility companies, have significantly accelerated the deployment of solar power in the U.S. They also create a significant amount of volatility in solar’s ROI, since most incentives are available for a limited time period and/or have capacity limitations. The availability of incentives for your proposed solar project can propel the projected ROI over your hurdle rate – if you act swiftly when the timing is right.

Common incentive types include:

- **Investment Tax Credit (ITC):** Tax credit available to offset certain federal tax liabilities for tax-paying entities
- **Depreciation Benefits:** Offset to income available under certain conditions that result in reduced tax liabilities for tax-paying entities
- **Capacity-Based Incentive:** Incentive based on the system size – paid out upon approval of system installation
- **Expected Performance-Based Buydown:** Incentive based on expected production of energy of the system – paid out upon approval of system installation
- **Performance-Based Incentive:** Incentive based on actual production of energy from the system – paid out on a pre-determined schedule as production is verified
- **Feed-In Tariff (FIT):** Payment for energy produced by the system once in service; payment could come from government entities and/or utilities
- **Solar Renewable Energy Credits (SRECS):** Units of “credits” that represent one megawatt hour of solar energy produced; are traded among, and/or purchased by, utilities or other entities to meet their renewable energy targets

Perhaps the most influential government policy supporting renewable energy is the renewable portfolio standard (RPS), which some states have established as targets for the amount of renewable energy used in the state. For example, in California, the current RPS is 33% by 2020. The RPS targets usually drive the market pricing dynamics in specific states and are subject to change, creating the foundation for volatility in the market for solar renewable energy credits (SRECs).

To be successful in utilizing government/utility incentives to improve the ROI on your solar projects, you need to monitor all of the incentive programs that could apply to one or more properties in your portfolio, continuously. If your company owns 50 properties in 20 states, that may be more than 71 government bodies, plus counties. Add utility incentive programs, and you may need to monitor about 100 different incentive programs.
Each program has its own idiosyncrasies, and the details matter. For example, a program may have restrictions on size, the way that the produced electricity is utilized and the relationship of owner of the system versus the user of the generated power. Thus, for a specific proposed project, the details of the available incentive programs may affect your choice of system size, ownership structure, financing and other project elements.

Remember that incentives can make or break the business case for a particular solar project, so be sure to establish a reliable way to track all of the incentive programs that might be available to one or more properties in your company’s portfolio. In presenting your financial analysis to company decision-makers, you may want to show the project’s IRR both with and without the incentive(s), so that everyone is clear about the value of the incentives and the importance of hitting the right timing and other details.

**Technologies**

The technology choice will be driven by your goals for the solar system, the location, weather conditions and the specific property’s characteristics. Some technology combinations may be better suited to meet your particular goals — such as maximum offset or most cost-efficient generation. And, some may be better suited to the specific property’s roof type or other characteristics. The type of installation (roof vs. ground mount) may require differing formats and structural features. The engineering team will design a system that suits each property and meets your company’s goals.

For a typical commercial solar project, the main technology variables are:

- **Photovoltaic Technologies**
  - Medium-Efficiency Poly-Crystalline Silicon Photovoltaics
  - High-Efficiency Single-Crystalline Silicon Photovoltaics
  - Thin-Film Photovoltaics
  - Concentrated Photovoltaics
  - Flexible vs. Rigid Panels
  - Building Integrated (PV integrated into building materials)

- **Inverter Configurations:** Micro Inverters vs. Standard Inverters

- **Sun Tracking Options:** Single or Dual Axis Tracking

In sorting through the available information about various technologies, consider the source of the information and the potential biases. A preferred vendor may specialize in a specific type of technology or be more familiar with specific solar products, thus biasing their view toward an approach that may not fit your needs. Depending on your company’s expertise and resources, you may want to work with a consultant that helps you evaluate the technology options in an objective, unbiased way.
You may already be receiving sales calls or proposals from solar vendors. Who are all these people and what exactly do they do? There’s a wide range of roles and skills in the solar world. Here’s a quick run-down on who might be involved in completing your solar project.

- **Engineering company**: Provides the solar, structural and electrical engineering work needed to design a system appropriate for a specific property.
- **Procurement company**: Sources, procures and provides logistics for products required to build the system.
- **Installer/Construction company**: Builds the system according to the design specifications provided by the engineering team.
- **EPC (engineering, procurement and construction contractor)**: Offers all three of these services.
- **Integrator**: Takes on all responsibility for design, permitting and EPC tasks, and may provide financing.
- **Product manufacturer**: May offer a fully integrated solution, based on the goal of creating demand for their own products, and thus will use their own products exclusively.
- **PPA vendor**: Negotiates and enters into power purchase agreements (PPAs) and then ensures that the solar system is designed and built appropriately to deliver the contracted level of electrical power to the customer.
- **Facilities-related businesses such as roofing and HVAC vendors**: May offer some information on solar deployment options in partnership with solar vendors.
- **Consultants and brokers**: Seek out potential projects and provide these leads to the vendors above.

Keep in mind that the vendor you are talking with may be sub-contracting out key parts of the project to other companies. Also, depending on location and size of the project, the number and availability of qualify vendors may be limited.

Once you understand who the players are, you can better evaluate their proposals and their roles in successfully completing your solar project as designed. After all, a well-conceived solar project that looks economically viable on paper must be designed, installed and operated properly in order to reliably produce the projected amount of electricity and provide the projected financial returns.

### Getting It Done

Once you have selected a “go solar” property (described in more detail below), the procurement process will involve three basic steps.

- **Develop an RFP**, including the property-specific information (such as location, available surface area and roof characteristics) and a full description of the desired system characteristics (such as minimum/maximum production desired and target energy usage offset based on historical usage).
- **Send your RFP** to qualified vendors and respond to their questions so they can develop a valid, detailed proposal that is ready for you to evaluate.
- **Qualify and evaluate the bids**, and select a vendor or team of vendors.
4. Analyze your portfolio to identify the best projects.

Your own thorough, objective analysis is the cornerstone of your business case. Be sure that whatever information you include in your analysis and your proposal is objective and reliable. While information from solar vendors may help you understand market conditions and assess your options, be aware that all solar vendors are likely to have some bias. In some cases, that may be easy to discern. For example, a panel manufacturer who offers design or installation services clearly is going to favor their products over other options. In other cases, the bias may come from the company or salesperson’s cumulative experience with a particular technology or approach.

To evaluate the potential economic value from solar on each property in your portfolio, use a comprehensive, robust solar analytics model that incorporates:

- Geo-specific meteorological data
- Property-specific electricity usage data
- Property-specific electrical load and meter data
- Utility-specific rate data
- Roof orientation, age, condition and idiosyncrasies
- Property-specific structural issues
- Technology type best suited for your performance priorities, location and property characteristics
- Ownership structures - availability and pricing
- Incentives at the federal, state, local and utility levels
- Upcoming incentives and legislation
- Geo-specific prices for panels, inverters, balance of systems and installation

The key to robust, objective modeling is capturing the most accurate data. Many levels of preliminary analysis will have to be performed to feed accurate data into the model. For example, is the proposed incentive limited in any way? Is it possible to meet the demands of several “meters” with one system? Does “splitting” the system output into different meters (“load splitting”) allow you to better capture the intended incentives? How will the utility rate structure influence how you design the system – e.g., is it better to maximize the generation of electricity at certain times of the day when the rates are highest? What is the best way to offset as much of the “demand charges” if your rate is biased heavily towards that structure? Will the structure of the property support the type and location of the system? How would the location of the meters and electrical rooms influence the design and capacity of the system?

The appropriate solar analytics model will take all of your data and the results of the above preliminary analysis and transform them into a few crucial, meaningful measures of your solar project’s viability: IRR, payback, electrical offset percentage, net present value (NPV) and other metrics that may be part of your company’s decision-making criteria. These results provide you with a sound, systematic way to make a “go/no-go” decision on each potential property in your company’s portfolio – and keep tabs on each property’s solar potential as market and policy conditions change.
Note that during this analytical process, you will make choices about ownership structure, incentives, technology and vendor-type. In making the business case for a particular “go solar” project, you’ll need to explain these choices to company decision-makers.

While you may be focused on reaching an objective “go/no-go” choice on solar projects today, be sure to consider a longer time-frame. Use a model that enables you to monitor your company’s entire portfolio over time to identify viable projects as market and policy conditions change. If you use a consistent analytical framework for all of the properties in your portfolio and stick with that methodology over time, future proposals will be even more straightforward than the first.

5. Present your recommendations to company decision-makers.
The solar decision-making process is complex and can be confusing for people who are not familiar with the intricacies of commercial solar projects. It’s best to evaluate your team’s level of knowledge before you develop your proposal or presentation. Introduce them to the key elements of a solar project as well as the major players and important terminology. When you present the analysis of your company’s portfolio, put it in context of the broader market, as much as possible. Your first proposal demands the most attention to education; subsequent proposals developed within the same framework will require far less background material.

For a detailed sample presentation, go to www.alta-energy.com/sample-presentation/.

Here’s an outline that may suit your needs:

1. Solar market conditions and opportunities
2. Company goals and context
3. Company criteria for solar projects
4. Solar project decisions, procurement and players
5. Company portfolio and solar potential
6. Viable solar projects – today
7. Getting it done: procurement road map for these projects
8. Future trends and prospects
9. Next steps

No matter how clear and complete your proposal, you are likely to get questions. Be prepared to answer questions about trends in the solar industry, the structure and timing of incentive programs, the marketplace for vendors, the process of installing solar, the sources of your information, the model used in your analysis and more.

Regardless of the outcome of the presentation, your efforts will have prepared all of the decision-makers to take action promptly when potential solar projects in your company’s portfolio become cost-effective.
Final Considerations

Most industry observers expect that solar systems will continue to become more economical and that policy and cultural conditions will increasingly favor clean, renewable energy. A recent McKinsey study concluded that the cost of a commercial-scale rooftop system could be reduced by 40% by 2015, from about $2.9 per Wp to $1.70 per Wp. Experts project that within 2-3 years, the cost of solar energy generated at the place of usage will be equal to the cost of traditional generation and transmission (known as “grid parity”). In many areas this condition of grid parity (or better) already exists, due to the high cost of electricity and/or the value of available incentives. Some experts predict that solar will provide up to 14% of U.S. electricity supply by 2030. [“SunShot Vision Study,” U.S. Department of Energy, February 2012]

While it’s likely that installation costs will continue to fall and more projects will become economically viable, your company’s solar investment decisions must be made based on your own thorough, objective analysis. When you analyze all of your company’s solar options in a consistent, objective model and monitor those opportunities over time, your company can identify viable solar projects and move quickly when the time is right. If you couple that with an unbiased approach to procurement, your company can complete sound projects with vendors you can trust and terms you can count on. Your company can participate in the shift to clean, renewable energy in ways that make economic as well as environmental sense.

About Alta Energy

Alta Energy is a solar analytics and procurement company that enables commercial property owners to identify and complete cost-effective solar projects with confidence. As an objective third party, Alta Energy helps owners of retail, industrial and office buildings evaluate the business case for solar using a consistent, comprehensive model, and then monitors market and policy conditions for the best solar deployment opportunities. Alta Energy’s multiple bid process ensures that property owners select the right solar vendors and the best terms for each project. Alta Energy’s proprietary solar analysis tools and auction-based procurement process are vendor-technology-, and financing-neutral. As a result, property owners get an unbiased view of their solar options across all properties and all markets, and can choose the most cost-effective, timely installation for every property in their portfolio.

Learn more at www.alta-energy.com or call 650-345-2582.