



Solar Mandate Considerations

Background: California Title 24 recently adopted a solar mandate for all new residential buildings in their building energy efficiency standards that took effect Jan. 1, 2020. If your municipality or state is considering a solar PV mandate for new residential construction, here are a few things to keep in mind:

Pros	Cons
<ul style="list-style-type: none"> • The price of solar has declined significantly in the past several years and continues to decline. <ul style="list-style-type: none"> ○ More demand in the market could force jurisdictions to streamline processes and reduce soft costs like lengthy and expensive permitting requirements, further decreasing the cost of solar. • Solar photovoltaic (PV) technology is improving greatly. <ul style="list-style-type: none"> ○ Panels are becoming significantly more efficient, e.g. capacity increases as physical size of array stays the same. • If installed and flashed properly per manufacturer’s instructions, panels can protect and prolong the life of the roof through reduced severe weather and sun exposure, potentially saving the homeowner money in the long run. • An increasing number of financing mechanisms are available in the market, making it easier for people to own their system. <ul style="list-style-type: none"> ○ Solar leases ○ Power Purchase Agreements (PPAs) ○ Add to new home mortgage ○ Low-interest loans 	<ul style="list-style-type: none"> • Residential solar is a more expensive way to move toward renewable energy than larger, utility-scale solar or wind installations. • The savings calculated for CA households are based on residential electricity rates (\$0.17/kWh) that might be higher than your local cost of energy. <ul style="list-style-type: none"> ○ Electricity rates vary depending on the region and may make a residential solar mandate less cost-effective. • Federal, state and utility incentives might diminish. <ul style="list-style-type: none"> ○ It will no longer be necessary to provide incentives if they are mandated. ○ With diminished subsidies, solar becomes less cost effective for home owners. • Under California’s provision, leases of solar panels are acceptable. <ul style="list-style-type: none"> ○ Leases offer their own set of obstacles. ○ Leases could make it harder for resale if the potential buyer does not want to take on the lease. • Financial burden of replacing or fixing damaged panels if broken if not covered under warranties. • Appraisal issues

<ul style="list-style-type: none"> ○ Bridge-loans that fill the gap until federal tax credit is received ● Solar can be a good investment for the homeowner. <ul style="list-style-type: none"> ○ Zero to minimal utility bills (depending on usage). ○ Some Leases and PPAs guarantee an energy savings per month from solar generation. ● Distributed renewable energy generation supports the local economy. <ul style="list-style-type: none"> ○ More jobs for local solar installers, electricians. ○ New business for local banks and credit unions. ● Easy maintenance – no physical moving parts, nature tends to take care of cleaning panels and online monitoring software systems alert owners of any technical production issues (third-party owner manages if it is a lease or Power Purchase Agreement). ● Some manufacturer and equipment warranties include replacement of broken equipment if necessary. ● Environmental benefits <ul style="list-style-type: none"> ○ Solar panel systems help reduce millions of metric tons of CO2 from being emitted into the atmosphere. ○ In aggregate, can help reduce the need for/defer expensive gas pipelines (which ultimately are paid for by ratepayers). 	<ul style="list-style-type: none"> ○ There is a need to train appraisers on the potential value of residential solar. ○ Current homes with energy efficiency and green features are not consistently valued. Solar could additionally complicate home valuation if appraisers are not properly educated. ● Solar panel costs are variable. <ul style="list-style-type: none"> ○ The CA Energy Commission assumed a \$2.93/watt that will decline by 17%. However, Lawrence Berkeley National Laboratory estimated the average cost to be \$4.50/watt for installed solar that the policy mandates. <ul style="list-style-type: none"> ▪ Watch for conservative cost figures. ▪ Watch for fluctuating solar panel/install cost. ○ An increased solar panel cost could price out homeowners looking into solar for their already existing house. ● The orientation of houses is not all the same. <ul style="list-style-type: none"> ○ Solar may be less productive on certain properties, affecting ROI. ○ Not all land and acreage are the same for development. <ul style="list-style-type: none"> ▪ Solar mandate may cause more land to be cleared and trees cut to provide optimal exposure for the panels.
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	<ul style="list-style-type: none"> ▪ Some properties are shaded and thus have poor solar exposure. • Improper maintenance of solar panels <ul style="list-style-type: none"> ○ Some homeowners may lack interest in solar and therefore may not practice proper maintenance such as trimming trees, clearing the collector surface, and making sure mechanical/electric equipment are operating properly.
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Additional Considerations/Questions to Ask

- What exceptions to the mandate have been considered to allow for flexibility?
 - Cost effectiveness and system efficiency decrease when there is significant shading on the property – will there be exceptions for sites that don’t have enough solar access throughout the day?
 - If exceptions are not made for sites with poor solar access, clear-cutting trees to gain solar access could defeat the environmental benefits.
 - Will there be guidance within the mandate if the roof space is not large enough to significantly offset the expected energy demand of the home?
- Will there be specific language about limiting the number of trees (or area) cut down?
- How will future energy use be predicted, and how will that relate to solar PV size requirements?
- What is the availability of financing mechanisms in the market? Will consumers have options for leasing, Power Purchase Agreements, and/or purchasing solar through loans or rolling additional costs into their mortgage?
- Does the local utility allow your house to connect to the grid? Is the local utility equipped to handle increasing numbers of interconnection applications, administration of net metering, and more? Does the local utility pay for the excess solar power generated? If so, at what rate?
- Has the jurisdiction considered solar-ready provisions as an alternative to a complete solar mandate, such as plans for future panels, pathways for routing conduit to the building’s electrical service panel, and reserved space on the electric panel for a dual pole circuit breaker?
- Is community solar (off-site solar) an option within the mandate?
- Is there flexibility within the mandate to give builders options to fulfill requirements?

- If the mandate is state-wide, what are the cost implications if jurisdictions decide to make solar requirements more stringent?
- What assumptions were made in the benefit-cost analysis, such as the price of electricity, time-of-use rates, and net metering compensation from the utility?
- What stakeholder work has been done surrounding the mandate to engage affected sectors in order to prepare the market for the changes?
 - Builders
 - Designers
 - Solar installers
 - Efficiency experts
 - Energy raters
 - Utilities
 - Administrators of local rebate programs
 - Equipment manufacturers for all system components
 - Appraisers
 - Real-estate professionals
 - Online monitoring companies
 - Related state agencies
 - Inspectors/other code officials
 - Firefighters
 - Local solar and home builders' associations
- Is there a workforce development plan to prepare the market?
 - If there are not enough high-quality solar installation companies, shortcuts could be taken and bad actors could be more prevalent, increasing fire risk and safety.
 - What is the quality assurance approach for the drastic increase of installations?
 - Have electrical and building inspectors and firefighters been trained on what to look for during inspections and solar-related requirements in the National Electric Code?
 - Do local fire codes impact the solar installation and approval process?
- What efforts have been made to educate consumers on solar, proper maintenance, tax credits, and other topics related to solar deployment?