



Notes regarding submitting comments on this Draft Work Product:

Comments are Due April 20, 2018.

Comments shall be no longer than 5 pages.

Comments should be submitted to LDBPcomments@ebce.org

Considerations Regarding Local Jurisdictional Approvals

for

East Bay Community Energy

Prepared by
Optony Inc.
2855 Kifer Road Suite 201
Santa Clara, CA 95051
www.optonyusa.com

March 2018

TABLE OF CONTENTS

Introduction 3
 Permitting: Background 4
 Permitting: Recommendations 6
 Zoning: Background..... 9
 Zoning: Recommendations..... 9
 CEQA: Background 11
 CEQA: Implications 12
 References..... 14
 Appendix A – Sunrun Permit Cost Estimates..... 15
 Appendix B – CEQA Process Flow Chart 16
 About Optony..... 17

Table of Figures

Figure 1: PV Toolkit documents available for adoption 7
 Figure 2: Solar permit fee limits per state law 8
 Figure 3: Map of major land use constraints in East Alameda County..... 10
 Figure 4:Estimated Costs for typical Residential Solar PV project..... 15
 Figure 5: CEQA Process Flow Chart for public agency approvals. 16

INTRODUCTION

This document assesses the local jurisdictional approvals that affect solar development in Alameda County, and makes recommendations on how this process could be improved. The intent of these recommendations is to be advantageous for *both sides of the counter*. For developers who are seeking approvals, the goal is to reduce their administrative burden and thus lower the development cost of local renewables. For building and planning staff, who are responsible for ensuring the safety of these installations and maintaining the integrity of public land, the goal is to ensure they have all the tools available to safely and quickly make these determinations.

While many renewable technologies are being studied as part of the Local Business Development Plan, this report will focus on solar photovoltaics specifically, as solar makes up by far the largest volume of anticipated projects, and thus is expected to represent the largest portion of jurisdictional approvals.

The jurisdictional approval process has become increasingly analyzed in recent years. This is a result of rapid declines in solar hardware costs, which has left the “soft” costs, including items like permits and approvals, as the main cost drivers in deploying solar. For building officials who must conduct plan review and inspection of these systems, the rapidly increasing volume of projects submitted for approval has left many departments scrambling to ensure they have enough well-trained staff to handle the approvals.

This report reviews the current landscape of approvals and makes suggestions for improvements. We are suggesting a two-pronged approach to improving the local jurisdictional approval process: the first is to leverage EBCE’s influence and relationship with its member jurisdictions to further standardize the permitting process for small, urban systems among the incorporated cities in the EBCE service territory; and the second is to take advantage of EBCE’s member jurisdictions’ control over land use policies to improve and clarify the zoning and use rules for larger systems on County land, with a focus on developable areas in East County.

The report also discusses the CEQA approval process. CEQA review is by necessity a highly customized process, and one that is undergone less frequently, thus there are fewer proactive measures available to help streamline CEQA approval. This report does provide some suggestions for how to smooth this process and ensure sufficient time is allowed for its conduct.

PERMITTING: BACKGROUND

Impact of Soft Costs on Installing Solar

As solar module and equipment costs have dropped rapidly in the last decade, the impact of “soft” costs in going solar has become more pronounced. Soft costs are all the non-hardware costs necessary to go solar – things like permitting, interconnection, financing, and installer overhead. These effects are more pronounced in smaller projects, which have less room to absorb miscellaneous costs. According to the U.S. Department of Energy, **soft costs comprise 64%** of the average cost of a residential solar photovoltaic installation.¹ Among soft cost components, permitting is the area where local jurisdictions have the most involvement.

According to a 2011 study by SunRun,² local permitting and inspection adds around \$2,516 to the average residential solar install. A portion of this is for the actual permit fee, but the bigger contributors are wide variations in the process between jurisdictions and time-consuming review periods and inspection processes. See Appendix A for an itemized cost breakdown. The good news is there are many relatively simple steps that local jurisdictions can take to simplify and streamline their permitting process, without sacrificing safety or jeopardizing the integrity of their review. It is important to note that since this Sunrun report was released, there has been significant movement on these issues, particularly among Alameda County communities.

Among Alameda County jurisdictions, the fees for permitting vary widely. Data for the chart on the following page were pulled from each individual city’s website.

¹ <https://www.energy.gov/eere/articles/soft-costs-101-key-achieving-cheaper-solar-energy>

² SunRun report, “The Impact of Local Permitting on the Cost of Solar Power”

Solar Permit Fees for Typical Project Sizes¹

		Small		Large	
		Residential	Commercial	Commercial	Utility
		(5 kW)	(100 kW)	(1 MW)	(10 MW)
a	Alameda County	\$ 280	\$ 2,078	\$ 18,363	\$ 77,563
g,a	Alameda	\$ 250	\$ 1,813	\$ 1,813	\$ 1,813
g,a	Albany	\$ 232	\$ 2,107	\$ 10,857	\$ 88,357
g,a	Berkeley ²	\$ 26	\$ 12,014	\$ 94,194	\$ 822,074
a	Dublin	\$ 250	\$ 1,432	\$ 5,415	\$ 46,149
g,a	Emeryville	\$ 250	\$ 1,350	\$ 6,150	\$ 51,150
a	Fremont	\$ 237	\$ 90/hr	\$ 90/hr	\$ 90/hr
g,a	Hayward	\$ 300	\$ 1,350	\$ 6,150	\$ 51,150
a	Livermore	\$ 361	\$ 1,418	\$ 6,218	\$ 51,218
	Newark	\$ 360	\$ 2,327	\$ 12,502	\$ 98,527
g,a	Oakland	\$ 546	\$ 677	\$ 939	\$ 939
a	Piedmont	\$ 300	\$ 300	\$ 300	\$ 300
a	Pleasanton	\$ 250	\$ 1,350	\$ 5,850	\$ 50,850
g,a	San Leandro	\$ 267	\$ 973	\$ 5,773	\$ 50,773
a	Union City	\$ 431	\$ 2,109	\$ 5,669	\$ 21,832

Notes:

1. For valuation based fees, projects costs of \$15K, \$250K, \$2M, and \$17.5M were assumed for the respective categories
2. Permit fees for commercial and utility projects derived using a fee calculator on City's website - may not be accurate

Legend:

g: East Bay Green Corridor participants

a: Adopted AB 2188 ordinance

Many jurisdictions have special fee structures for smaller residential projects, including Berkeley, which caps their residential permits at a low level in order to encourage solar development. The fees for larger projects are based on valuations scales; some agencies may have special permit fee scales for solar which are not readily accessible on the website.

Previous Solar Permitting Initiatives

There have been efforts to simplify solar permitting in Alameda County going back several years. These efforts have been primarily focused on smaller solar installations, where most of the permitting volume occurs and where streamlined review and approval is easier to implement.

The East Bay Green Corridor, a regional partnership for green technology innovation, participated in a U.S. Department of Energy funded effort to streamline solar permitting in 2012.³ Seven Alameda County communities participated in the program. The group developed Residential Rooftop PV Guidelines and a “Rapid PV Permit” guide that allows installers to obtain permits quickly and efficiently at a low cost. Most of the communities adopted over-the-counter permits for qualifying residential projects, and turnaround times at the other communities were less than one week. Jurisdictional staff, solar industry, and third party consultants worked together to develop these procedures.

In 2014, streamlined solar permitting went to the state level. The state legislature passed AB 2188, the Expedited Solar Permitting Act, which required all jurisdictions in the state to adopt an ordinance creating an expedited solar permitting process by September 30, 2015.⁴ Like the East Bay Green Corridor effort, this is focused on smaller rooftop projects that are easier to standardize and fast track. AB 2188 requires:

- Adoption of a checklist of expedited review eligibility requirements
- Quick approval of an application that is complete and meets all prescribed requirements
- The use of electronic signatures on relevant permitting documents
- Allowing electronic submittal of the expedited permit documents
- A single inspection performed in a timely manner
- Some changes making it harder for homeowner associations or other private groups to restrict solar

Permitting: Recommendations

Further Increase Permit Standardization for Small Rooftop Systems

The easiest area to make an impact is in smaller rooftop projects. This is where the highest volume of permit applications will occur, and this is also the segment of installations among which it is easiest to implement a standardized procedure.

The impact on residential system pricing can be significant. According to an LBNL report on city-level permitting processes in California, the cities with the best permitting practices reduce average residential PV prices by **\$0.27-\$0.77/watt** and shorten development times by **24 days** relative to the worst cities.⁵ Many Alameda County communities are already leaders in this space, so the potential improvements are not that dramatic, but there is still room to improve.

The best way to do this is to push for further adoption of the Solar Permitting Toolkit⁶ that was developed in conjunction with AB 2188. The Toolkit provides several documents that are easy for local building officials to customize and adopt.

³ <https://www.mercurynews.com/2013/08/06/east-bay-cities-announce-streamlined-process-for-solar-permits/>

⁴ https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB2188

⁵ <https://emp.lbl.gov/news/impact-city-level>, see page 28 of report

⁶ <http://energycenter.org/permitting/guidebook/toolkit>

PV Toolkit Documents	
1. Submittal Requirements Bulletin – Solar Photovoltaic Installations 10kW or Less	PDF Word
2. Eligibility Checklist for Expedited Solar Photovoltaic Permitting	PDF Word
3. Solar PV Standard Plan – Simplified, Central/String Inverter Systems	PDF Word
4. Solar PV Standard Plan – Simplified, Microinverter and ACM Systems	PDF Word
5. Structural Criteria for Residential Rooftop Solar Energy Installations*	PDF Word
6. MOU Regarding Solar Photovoltaic Plan Review and Inspection Services	PDF Word
7. Inspection Guide for PV Systems	PDF Word

Figure 1: PV Toolkit documents available for adoption

Many of the Alameda County jurisdictions are using some of these, but adoption is far from universal. Emeryville is a good example of a jurisdiction that has taken measures to streamline rooftop solar permitting, including a customized webpage⁷ addressing the issue. In order to foster increased adoption among all jurisdictions, the formation of a working group would be the quickest and easiest approach. Such a working group would involve:

- 1-4 representatives from each jurisdiction
 - Lead building official
 - Building official handling solar plan reviews
 - Building official handling solar inspections
 - Sustainability staff lead
- Several industry representatives from both large and small solar installers in County
- 1 organization to serve as convener and to drive the process
 - Could be EBCE staff, or a regional non-profit or advocacy organization

Monthly meetings over a period of 6-9 months would be sufficient to increase adoption of the Toolkit documents and result in **more process standardization across the County**. There is no cost burden associated with adoption of Toolkit documents – the only investment from EBCE and participating agencies would be in staff time.

⁷ <http://www.ci.emeryville.ca.us/1037/Streamline-Rooftop-Solar-Permitting-in-C>

Look at Permit Fee Structures for Larger Systems

Most of the jurisdictions in Alameda County follow a valuation based fee structure for solar permits. This can result in extremely high permit fees for larger systems that are not in line with the cost to administer the permit and conduct the inspection.

Unlike most building construction projects for which the valuation based permit fee scales were developed, ground mounted solar installations follow a highly repeatable design. Thus increases in square footage (and thus project value) do not increase the plan review and inspection burden as much as building construction projects do.

The LDBP team recommends modifying the permit fee structure for larger solar installations. Rather than having an open-ended valuation based fee, we recommend basing the fee on cost recovery – the actual cost to administer the permit. In fact, current state law requires that fees charged by a local enforcing agency for permit processing and inspection cannot exceed the reasonable cost of providing the service for which the fee is charged.⁸ In other words, fee revenue must only be used to defray the cost of permit processing and enforcement and cannot be used for general revenue purposes. These requirements are contained in Government Code Section 65850.55, Government Code Section 66016 and State Health and Safety Code Section 17951.⁹

If a valuation based scale is to be used, implement a “cap” or ceiling on the fee amount in accordance with the following limits. Government Code Section 66015 sets specific limits on the amount local enforcing agencies can charge for solar PV permit fees. Fees in excess of these limits must be explicitly justified and are prohibited unless the municipality determines that it has already adopted a streamlined permit approval process:

Permit Fee Limits for PV

Residential		Commercial	
15 kW or less	\$500	50 kW or less	\$1000
More than 15 kW	\$500 + \$15 per kW above 15	50 kW – 250 kW	\$1000 + \$7 per kW above 50 kW
		More than 250 kW	\$2400 + \$5 per kW above 250 kW

Figure 2: Solar permit fee limits per state law¹⁰

Several of the Alameda County jurisdictions have valuation based structures that supersede these limits, adding unnecessary expense to solar development.

⁸ California Governor’s Office of Planning and Research, “California Solar Permitting Guidebook”, page 11.

⁹ Find code text using the search feature at http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml

¹⁰ Fee limits per Government Code Section 66015. Chart from “California Solar Permitting Guidebook”, page 12.

ZONING: BACKGROUND

Zoning Rules in Alameda County

Smaller PV arrays located behind-the-meter in urban areas, which are the focus of the previous section, are likely to make up the vast majority of permitting approval volume. However, many of the larger installations which could become an important part of EBCE's energy strategy will be ground mounted systems on open land. Many of these will be under County jurisdiction. For this reason, it is important to look at the existing zoning and use rules for these arrays in Alameda County.

There has already been significant time invested by the County in investigating this topic. In 2011, at the direction of the Board of Supervisors, the Planning Department began a review of existing county policies applicable to the development of larger solar arrays, as well as consideration of new policies to facilitate and inform the review of proposed arrays.¹¹ This was at a time when there was significant interest from developers in building large solar systems in the County. The committee directed staff to initiate a public process to amend the County General Plan, with a goal of setting guidance that balanced solar development with competing natural and agricultural land uses. Unfortunately, after receiving community input at a series of public meetings beginning in January 2012, this process was suspended indefinitely.

At the time, four key priorities were laid out:

1. Restore agricultural land after closure of solar array
2. Preserve productive agricultural soils
3. Enact a local host impact fee
4. Limit solar arrays in the South Livermore Valley Area Plan

This process went so far as to go through several revisions on a draft amendment to the East County Area Plan (ECAP).¹² The solar general plan policies detailed therein addressed each of the priorities above, while also delineating the existing ECAP policies that would apply to solar arrays.

Zoning: Recommendations

Zoning and Use Considerations for Larger Ground Mount Systems

We believe the comprehensive review of land use policies for large solar arrays on County land should be re-opened, and recommend that EBCE leverage its relationship with the County to take advantage of the County's authority over land use policies to make changes that would further streamline approvals of beneficial large-scale solar systems. There is already significant progress in this area, including a draft solar amendment to the East County Area Plan (ECAP) and a set of public comments on these rules.

The end result of such a process would likely be to finalize the Amendment to the ECAP, as well as assisting Planning Department Staff in reviewing applications for solar arrays. The focus of this effort should be to:

1. Formalize where solar arrays are permitted and/or conditional uses

¹¹ <https://www.acgov.org/cda/planning/landuseprojects/solarpolicies.htm>

¹² <https://www.acgov.org/cda/planning/archive.htm#solar>

- a. Solar is not currently a category that is specifically addressed. There are similar categories such as “public utility” and “privately owned wind generators” but nothing specific to solar. The new category for solar would likely be split into tiers with acreage thresholds, such that there would be distinct use rules for arrays of different sizes and in different zones.
- 2. Formalize the review and approval process for solar applications
 - a. Determine which arrays may be administratively approved, which require approval by commission, and which may be subject to longer approval processes potentially involving community input. Define the studies and procedures that must be followed for those arrays requiring detailed review.
- 3. Establish “renewable energy zones” hotspot map where development of renewable facilities is prioritized.
 - a. These would be the zones without high value soil or competing interests in which the approvals process for larger solar arrays would be streamlined.

The creation of favorable renewable energy zones would be a key outcome of this process, as it would funnel developers to the best spots and reduce the County’s burden of reviewing speculative applications in unfavorable locations.

Community Development Agency staff created a high level version of such a map as part of previous efforts to develop solar policies in 2011:

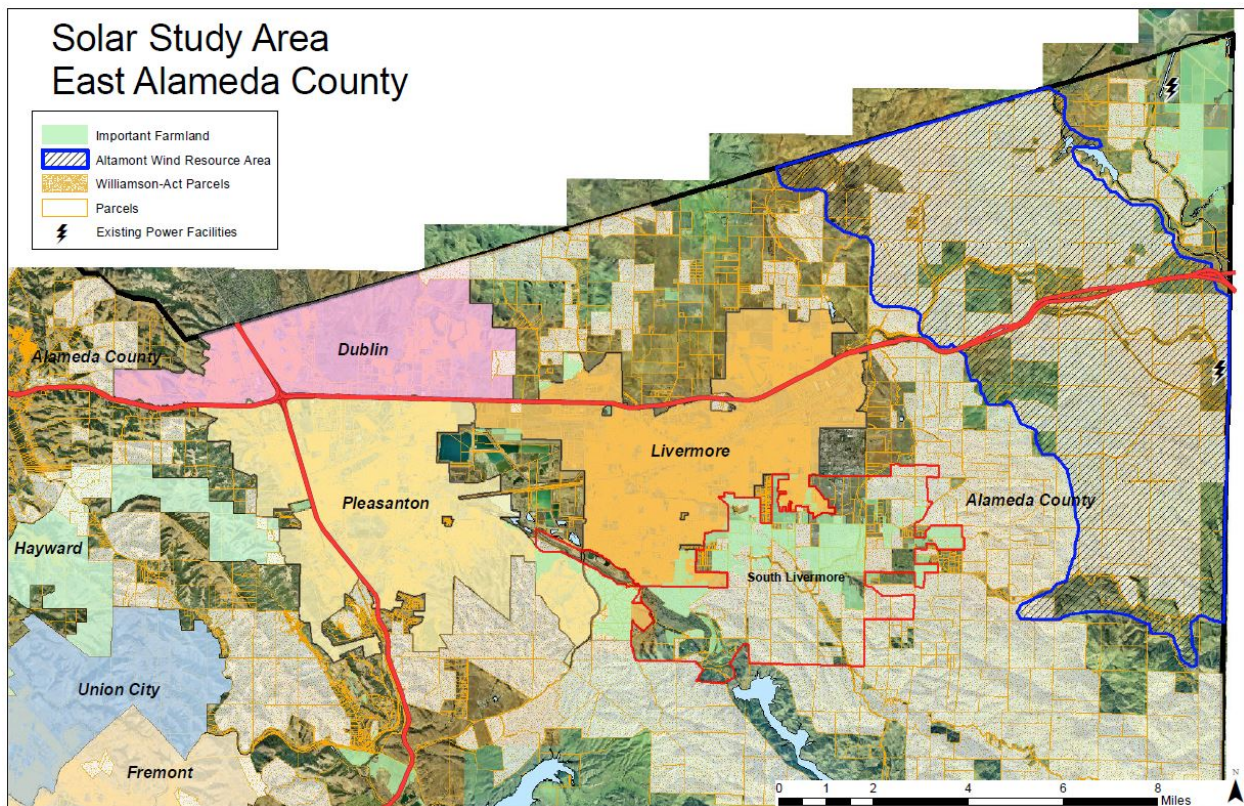


Figure 3: Map of major land use constraints in East Alameda County

This map shows areas of important farmland, Williamson Act¹³ parcels, and areas where wind development is prioritized. The density of this map highlights the significant challenges in finding suitable land for large scale solar arrays, and emphasizes the need to provide the development community with a solar priorities map.

There is precedent for developing and publishing these types of maps. The U.S. Department of Energy and Environmental Protection Agency developed both static maps and interactive mapping applications to guide the location of utility scale solar arrays.¹⁴ The maps consider the solar resource as well as land priorities. These tools could serve as a model for the County to follow in publishing their own local map.

In addition, since the original draft solar amendment was developed by the Alameda County Community Development staff, there has been a lot of activity nationally on developing appropriate standards for large solar arrays. The American Planning Association has a significant library of model planning and zoning rules for solar energy¹⁵ which could prove to be a useful resource for County staff. This library includes case studies of other public agencies that have added solar-specific provisions to Comprehensive Plans.

CEQA: BACKGROUND

The California Environmental Quality Act (CEQA) requires state and local public agencies to analyze the environmental impacts of proposed physical development projects and adopt measures to mitigate those impacts.¹⁶ This applies to both publicly undertaken projects and private projects which must be approved by public agencies.

There is no state level enforcement; each public agency is entrusted with determining which projects are subject to CEQA, and for undertaking the required review process for projects that are subject. The review protocol is specified in the CEQA Guidelines – see Appendix B of this report for a flow chart describing this process.

For solar:

- Rooftop systems are statutorily exempt from CEQA review.
- Carport systems are also exempt, provided they are over existing parking lots (existing for at least 2 years) and do not require the removal of any protected trees.
- Ground mount systems will generally require CEQA review

When CEQA review is required, the lead agency (which generally would be Alameda County) will first evaluate the project to determine whether it may have a significant effect on the environment, and thus whether an Initial Study is necessary. If an Initial Study is necessary, the lead agency is responsible for

¹³ The Land Conservation Act of 1956, known as the Williamson Act, allows for agreements between local governments and private landowners to restrict land use to agricultural or open space use in return for below market value property tax assessments. Learn more at <http://www.conservation.ca.gov/dlrp/lca>

¹⁴ <https://www.epa.gov/re-powering/re-powering-mapping-and-screening-tools>

¹⁵ <https://www.planning.org/pas/infopackets/eip30.htm>

¹⁶ <http://resources.ca.gov/ceqa/>

preparing this study and obtaining public comments. The Initial Study is a preliminary analysis which will generally lead to either:

- Negative Declaration (no significant impacts)
- Mitigated Negative Declaration (identified potentially significant impacts can be mitigated to a less-than-significant level through the adoption of mitigations)
- Environmental Impact Report (impacts cannot be mitigated and further study is required to assess impacts and consider alternatives)

The lead agency will generally lean on the project developer to provide information and documentation to support the Initial Study. The developer will be required to participate in one or more scoping meetings. If necessary, the lead agency is also responsible for developing the Draft and Final Environmental Impact Reports and responding to any public comments. Developers may continue with their project following issuance of a Final Environmental Impact Report.

See Appendix B of this report for a flow diagram of the CEQA process.

CEQA: Implications

In general, CEQA review for large solar arrays can be a lengthy and time-consuming process. It is not uncommon for these reviews to extend for over 1 year and for the reports to be hundreds of pages in length. The review period will also be affected by the extent of public comments and any potential challenges.

A typical CEQA review will result in many manageable mitigation measures to be followed during construction. Reviews do not typically result in substantial changes to the design of the solar facility, though they may dictate that the footprint of the array shrink or relocate. Typical construction phase mitigations include:

- Dust control measures to reduce airborne particles. Typical measures include watering soil, street sweeping, and limiting vehicle speed.
- Limiting idle time of diesel equipment to reduce emissions
- Training for construction personnel in areas such as environmental awareness and cultural resource awareness
- Flagging or fencing the project boundary to avoid incursion into neighboring areas
- Sealing all food related waste in containers each day to avoid attracting predators
- Checking for animals on/under any construction equipment left overnight before moving it the next morning
- Periodic inspections by a biologist during construction to check for nesting/presence of sensitive animals
- Erosion control and storm water runoff prevention plans
- Fire risk management plans. Typical measures include clearing brush around welding/grinding operations, spark arresters on all hand tools, and presence of fire extinguishers.
- Limited hours for noisy construction activity

Developers should include these activities in their installation plans in order to minimize the number of mitigation measures during the CEQA review. It would also behoove the County to maintain a list of such measures, based on previous project approvals, so that developers can plan for these in advance.

Some sample CEQA filings for solar projects of various sizes are provided below. Visit the hyperlinks provided in the footnotes to access these filings.

- An Initial Study¹⁷ (59 pages in length) and Mitigated Negative Declaration¹⁸ (22 pages) for a 2.5 MW project. Lead agency San Diego County.
- A Notice of Preparation (8 pages in length) and Final Initial Study (595 pages) for a 10 MW, 75 acres solar array.¹⁹ The Initial Study resulted in a mitigated negative declaration. Lead agency Sacramento Municipal Utility District.
- The full set of documents, including the Notice of Preparation, Final EIR, planning commission meeting notes, and public comments, for a 168 MW, 1490 acre collection of solar projects.²⁰ Lead agency San Diego County.

A summary of typical environmental impacts of utility scale solar projects, based on extensive review of existing research and findings from over 100 sources, was published in Renewable and Sustainable Energy Review in January 2014.²¹ This report is a good starting point for agencies undertaking their first CEQA review.

Any large scale solar facilities developed as part of the LDBP process should be directed to favorable solar development zones to the extent possible. This will not only ensure that land use priorities of the County are not jeopardized, but also shorten the CEQA review timeline by limiting the quantity of public comments received.

The approval process for any solar arrays of more than 10 acres should begin 1 to 2 years before the desired start of construction. It will likely be difficult for any such projects to qualify for the federal investment tax credit at the current level; reduced ITC levels should be assumed in any economic assessment of energy procurement including large solar arrays built in the County.

Finally, the fee level should be considered. The City of Piedmont charges fixed fees of \$30K for an Initial Study / Negative Declaration and \$50K for a full Environmental Impact Report.

¹⁷ <https://www.sandiegocounty.gov/content/dam/sdc/pds/PC/151211-Supporting-Documents/NLP%20Valley%20Center%20Solar/Initial%20Study.pdf>

¹⁸ <https://www.sandiegocounty.gov/content/dam/sdc/pds/PC/151211-Supporting-Documents/NLP%20Valley%20Center%20Solar/Mitigated%20Negative%20Declaration.pdf>

¹⁹ <https://www.smud.org/en/Corporate/About-us/Company-Information/Reports-and-Statements/CEQA-Reports>

²⁰ <https://www.sandiegocounty.gov/pds/ceqa/Soitec-Solar-EIR.html>

²¹ “Environmental impacts of utility-scale solar energy”, available at <https://www.sciencedirect.com/science/article/pii/S1364032113005819>

REFERENCES

1. Efficient Solar Market Partners of Northern California. "Rooftop Solar Challenge Final Report Narrative." Published June 27, 2013. Online document. Available at <https://www.energy.gov/eere/solar/rooftop-solar-challenge-round-1>
2. SunRun. "The Impact of Local Permitting on the Cost of Solar Power." Published January 2011. Available at <https://www.sunrun.com/solar-lease/cost-of-solar/local-permitting>
3. Lawrence Berkeley National Laboratory. "The Impact of City-level Permitting Processes on Residential Photovoltaic Installation Prices and Development Times." Published April 2013. Available at <https://emp.lbl.gov/news/impact-city-level>
4. California Governor's Office of Planning and Research. "California Solar Permitting Guidebook." Third Edition published winter 2017. Available at <http://energycenter.org/permitting/guidebook/toolkit>
5. Alameda County. "Community Development Agency – Solar Policies for Rural Alameda County." Webpage. Accessed February 2018. Available at <https://www.acgov.org/cda/planning/landuseprojects/solarpolicies.htm>.
6. United States Environmental Protection Agency. "RE-Powering Mapping and Screening Tools." Webpage. Accessed March 2018. Available at <https://www.epa.gov/re-powering/re-powering-mapping-and-screening-tools>.
7. American Planning Association. "Planning and Zoning for Solar Energy." Webpage. Accessed March 2018. Available at <https://www.planning.org/pas/infopackets/eip30.htm>.
8. California Natural Resources Agency. "CEQA: The California Environmental Quality Act." Webpage. Accessed March 2018. Available at <http://resources.ca.gov/ceqa/>.
9. California Code of Regulations. "CEQA Guidelines." CCR Title 14, Division 6, Chapter 3, Sections 15000-15387.
10. RR Hernandez, et. al. "Environmental impacts of utility-scale solar energy." Renewable and Sustainable Reviews. Published by Elsevier, January 2014. Available at <https://www.sciencedirect.com/science/article/pii/S1364032113005819>.

APPENDIX A – SUNRUN PERMIT COST ESTIMATES

The table below estimates costs for obtaining a typical residential solar permit. The costs are calculated from the bottom up assuming fully-loaded labor rates.

Table 1. Cost data

SUMMARY

Process for local permitting and inspection	Avg. cost/ install
Complete permit application	\$505
Draw system plans	\$250
Structural calculation	\$176
Zoning application	\$46
Determine requirements	\$27
Print out permit packet	\$6
Submit permit application in person	\$149
Pay permit fee	\$431
Variation in building requirements	\$581
Smaller system due to fire setbacks	\$202
Unable to install supply side tap	\$167
Add extra disconnect	\$116
Labeling	\$38
Double flashing	\$32
Extra attachments	\$26
Field inspection	\$329
Wait for inspector	\$121
Travel to and from customer's home	\$96
In-process inspection	\$60
Rework and re-inspection	\$40
Inspector conducts inspection	\$13
Sales and marketing costs	\$520
Lower close rates from higher cost	\$400
Cancellations due to delay	\$70
Reduced customer referrals	\$50
TOTAL COST	\$2,516

Figure 4: Estimated Costs for typical Residential Solar PV project.

This table is from Sunrun's report "The Impact of Local Permitting on the Cost of Solar Power." This report was published January 2011 and is available at <https://www.sunrun.com/solar-lease/cost-of-solar/local-permitting>

APPENDIX B – CEQA PROCESS FLOW CHART

The table below is from Appendix A of the 2016 CEQA Statute and Guidelines. It describes the process a public agency must undergo when reviewing environmental impact of a potential solar project.

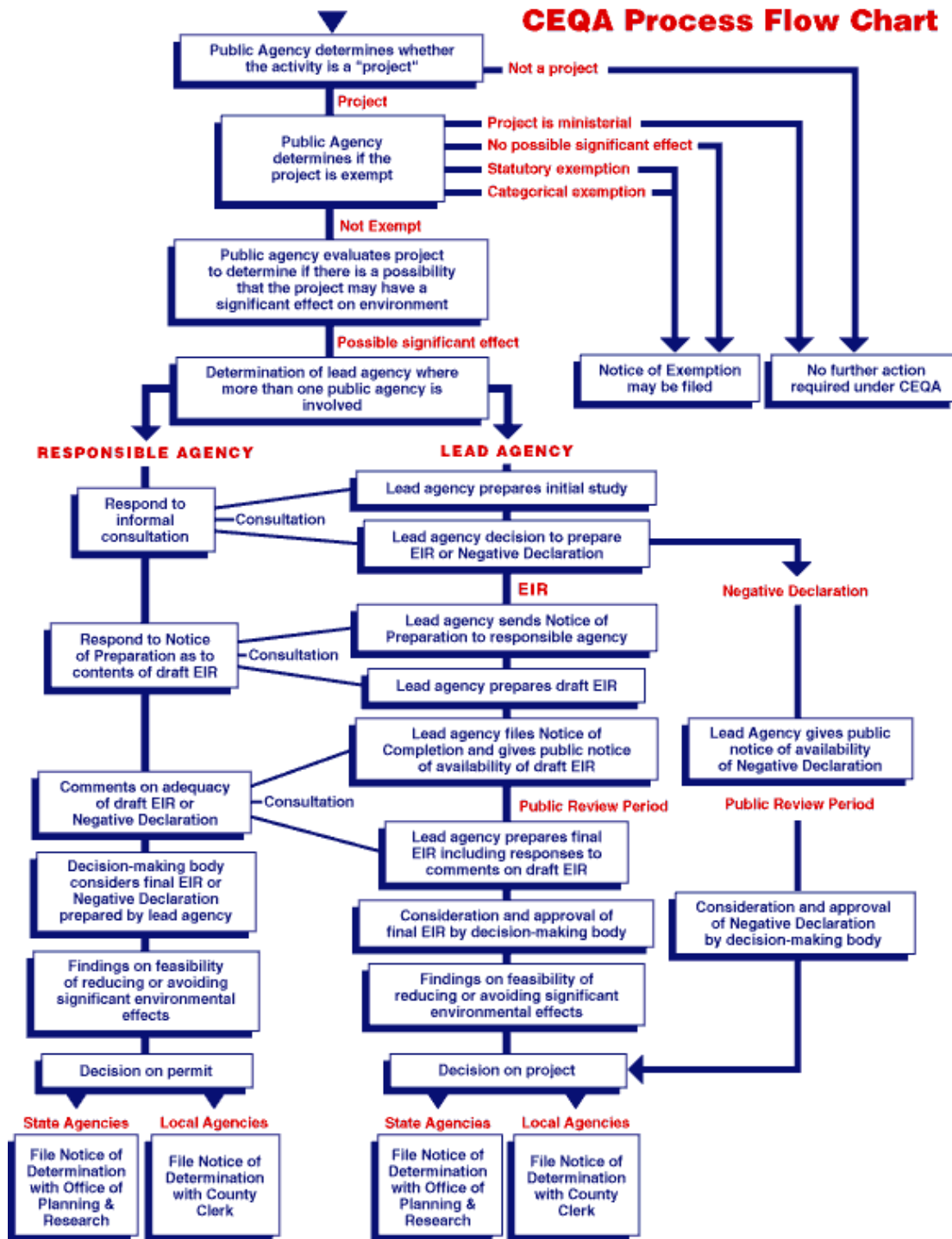


Figure 5: CEQA Process Flow Chart for public agency approvals.

ABOUT OPTONY

Optony Inc. is a global research and consulting services firm focused on enabling government and commercial organizations to bridge the gap between clean energy goals and real-world results. Optony's core services offer a systematic approach to planning, implementing, and managing commercial and utility-grade renewable power systems, while simultaneously navigating the dramatic and rapid changes in the solar industry; from emerging technologies and system designs to government incentives and private/public financing options. Leveraging our independence, domain expertise and unique market position, our clients are empowered to make informed decisions that reduce risk, optimize operations, and deliver the greatest long-term return on their solar investments. Based in Silicon Valley, Optony has offices in Santa Clara, Chicago, and Beijing.

For more information, visit: www.optonyusa.com