



LAUNCHING SOLAR VALLEY

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Introduction

California's counties of Riverside and San Bernardino, here called Inland Southern California, are blessed with one of the best solar regimes in North America. They are very large counties stretching across vast reaches of Southern California, almost from Los Angeles to Las Vegas, and the region is already positioned to be a leader in manufacturing, research, technology development, deployment, and green economy related jobs. True collaboration amongst the various actors and stakeholders can be a powerful force, but takes sustained effort.

Thoughtful policy development and creating a friendly environment for solar to grow in takes local buy-in at many levels, and so if left to itself, frequently does not occur, or does not occur in a coordinated manner. In the case of Inland Southern California, a few local initiatives have occurred, but the full force of the power of markets has not come into play.

Solar Valley proposes a coordinating body, and presents a menu of potential policy and program initiatives. Some are cross cutting, like support for energy storage development and deployment; some are specific like support for solar on all new residences.

Numerous existing programs can be coordinated, and new ones likely need to be developed. Existing training efforts like those through the IBEW, and educated efforts like DOE's SolSmart Program can be part of a whole suite of programs to support a renaissance in solar activities in Inland Southern California. Initiatives like the Inland Empire Growth and Opportunity Project, Workforce Development Centers in San Bernardino and Riverside Counties, and the Inland Advisory Committee of Employers can inform the coordinating body. Installations, research, manufacturing, and solar design science offer the opportunity for private initiative and public policy to merge in support of green activities. The development and implementation of policies to support solar will provide extensive benefits; jobs and economic development associated with the design, engineering, manufacture and deployment of solar power and its related hardware and software.

There is currently a rare opportunity to unite all levels, from residential right through commercial, industrial, and institutional with all levels of government in support of this intended renaissance in solar power. This means that supportive policies and programs developed and implemented at the city and county level can add substantially to the success of this effort. These local governments can, because of their real estate base and overall influence in their territory, help drive the market in the Inland Southern California region.

It also appears that the public would welcome green energy advocates in the political arena, and the proposed Leadership Council supports the development of community capacity in renewable energy policy and community involvement and implementation.

The following document contains a menu of policy and program recommendations. The Appendix lays out the mandate, structure, and activities of the recommended Leadership Council.

The Policy Context

Generally speaking effective policymaking with respect to solar energy needs to focus on short, mid, and long-term goals. The development and implementation of energy policy in California has proceeded like this incrementally for decades, driven by the CPUC, the CEC, the legislature, and the public. A short term focus on reducing cost and simplifying permitting, has been complemented with mid and long term regulatory and legislative policy improvements. This process has effectively kept California in the lead of solar advocacy in the US, while at the same time bringing into effect code improvements and supporting technology development in one of the most effective public-private partnerships ever experienced. As clearly demonstrated over the years in California, smart policy introduced strategically into a stable and relatively predictable business environment can be very effective. Where necessary, to build or fortify the market, the State has stepped up and provided incentives.

This is an excellent model to emulate and in our particular case, we are focused on creating a renaissance for solar power technologies and installations in Inland Southern California. The convening of a Leadership Council is recommended to focus on and substantially increase the amount of solar installed throughout the region, to advocate for a favorable pricing structure for the power, and to support and attract manufacturing facilities and jobs in research, consulting, design, architecture, engineering and the installation of systems. Solar power and green jobs can and should be a substantial part of the economic engine that drives Inland Southern California toward a “clean energy economy”.

Education matters. Once the Council is underway, it may want to consider an educational component to our activities. The area of community capacity could certainly use the Council’s support. Building a cadre of environmentally smart solar energy advocates is an important policy goal. Programs to educate community advocates about solar energy and renewable energy in general should be supported.

Inland Southern California already contains numerous Colleges and Universities that can participate in the coming green wave, and these local institutions can train advocates from engineers, designers, and materials researchers, to business developers, and public policy advocates who will then step into the public arena across this region to hold positions.

Riverside and San Bernardino cities and Counties offer many advantages for solar power. In fact, Riverside County is now hosting three huge solar farms. Solar has also been advancing well throughout the Coachella Valley’s cities with numerous installers focusing on the area. The potential in the region has been clearly recognized by both governments and the private sector. The Federal Government

has evaluated these lands, and has designated large areas as acceptable for solar development.

In addition, local initiatives like carbon neutral programs operated by the city of Santa Monica, and on the University of California's campuses are encouraging the installation of solar power.

With 4 million plus inhabitants, inland Southern California is thriving. At the same time there remains lots of open space for solar systems to be installed. Some 15,000 square miles in the two counties remain "vacant". As mentioned, this land base stretches almost from Los Angeles to Las Vegas. It includes city, county, BLM, American Indian, and military land. Solar production is excellent across the whole of this territory. It is indeed fertile ground on which to build a solar renaissance.

The Leadership Council

Policy Recommendation # 1: Create a Steering Committee – leadership council

Create a Steering Committee of stakeholders and experts focused on dialogue and collaboration, to make Inland Southern California the Solar Headquarters of the United States. Supercharge the installation of all forms of solar power across the region. Communicate to all sectors. Support research, development and deployment.

The Council would be comprised of individuals from stakeholder groups including city and county representatives, industry and community representatives, utility representatives, renewable energy experts, and experienced managers. Group activities would be governed by a charter. A mandate and specifically identified objectives would guide the group.

A key goal of the Council would be to create a solar fund that can support the Council and its activities. The Leadership Council will therefore be soliciting sponsorships and donations in support of its activities.

Residential Policy

Prepare for 100 % Solar in the Residential New Homes Market:

The California 2019 Building Energy Efficiency Standards (Title 24, Part 6) mandate solar on all residential housing applying for permits on and after January 1, 2020. How to properly prepare for the ramp up of solar PV systems on new houses from the current 20 percent to 100 percent and residential multifamily (3 stories and less) from 2 percent to 100 percent in 2.5 years is a definite challenge. This will strain not only the builders and planning departments, but it will also put additional stress on the supply chain of products and labor available that go into these installations. These products include modules, inverters, racking, and balance of plant items (bolts, fasteners, and wire). This increase to 100 percent, enacted by the

State but to be delivered by builders, creates both challenges and opportunities from a policy point of view.

In 2018 there will be roughly 60,000 new homes built throughout California with many of them built in Inland Southern California in a very hot climate. Here, population and the economy are both growing quite quickly and last year home prices grew about 6-7%. Demand for housing continues to increase as the region takes on more students in its Colleges, Universities, and Teaching Hospitals, and grows with the location of new State Departmental facilities and new warehouses. New homes are more efficient than they used to be, but they have a long way to go before they can be called net zero from an energy point of view. Policy should be aimed at creating net zero homes, and solar power (electric and hot water) is a major link in the chain.

For years, builders have been struggling to comply with ever-more stringent energy and other code improvements, and margins are thin if examined on a house-by-house basis. As a consequence, in many cases builders are installing solar to meet code, not the electric load. This situation could use some policy input. Making sure the homes are efficient, and that they all have solar systems (and energy storage) that can meet their load, are both important policy goals.

As builders begin their ramp-up from 20 percent of solar on new homes to the newly mandated 100 percent, County, City, and Utility policies could be put in place that offer assistance and incentives to the builders. Perhaps rebate the incremental cost from code to load, while at the same time offering programs to make sure the houses are super energy efficient. This would involve providing incentives to the builders for building shell measures, tightened ductwork, better windows and doors, high-efficiency lighting, high efficiency appliances, and energy storage.

Residential Policy Recommendations

Policy # 1: Provide Support to Home Builders: A New Inland Southern California Builders Program (ISCBP)

Ramping up to 100% penetration by 2020 will take considerable effort on the part of the builders, and will strain the supply chain of modules, racking, and balance of plant items. Policy 1 suggests a new builder program (the ISCBP) that helps residential builders ramp up from the current 20% solar penetration to 100% solar penetration in 3 years. The commitment could be for a certain amount per unit for solar enhancements, across a whole subdivision. At the same time, work with builders to build model homes that substantially beat Title 24. Model on old PG&E program. Commit \$30k per model in a subdivision (\$15k enhancements, 15K advertising). Sign up a minimum of 10 builders. Promote the ISCBP to the public as a new program and hold tours for the public. Create green events around public open houses.

Policy # 2: Solar Energy Business Incentives

Encourage and support solar and solar-related business in the Inland Southern California region. Specifically, provide incentives that support the development and

in-migration of businesses to Inland Southern California that earn their income in or are related to the solar energy business. Work with cities, counties and local Chambers of Commerce to provide incentives.

Policy #3: Support “Code to Load” Increment of Solar

Provide builders the incremental cost to install solar systems to serve full house load, not just meet code. Study this, and make recommendations

Policy # 4: Support to Planning Departments

Provide support to municipal and county planning departments and plan review departments to provide timely, low cost and consistent review and inspection services across the region. Fund inspectors’ training sessions. Partner with IBEW, building industry and HERS rating community. Support the hiring and training of more inspectors.

Policy # 5: Reduce Cost of Permitting

Reduce the cost of all solar permitting activities. Cities like Rancho Cucamonga and Rancho Mirage have taken specific steps to support solar power. For instance Rancho Mirage, through its Energy Authority, rebates \$500 for every residential solar system installed in the City, and Palm Springs provides support to new and retrofit projects that have budgets greater than \$250k. Both these are excellent programs to emulate. City of Denver has adopted progressive policies for residential solar systems under 10 kW that advance the cause of solar. These include streamlined inspections, certifying all inspectors, and reducing permitting fees. Cost saving for these measures is estimated at \$900 per residential installation. Also supporting timely plan reviews would reduce the transaction cost for developers.

Policy # 6: One Stop Shopping

Create one stop shopping at the municipal and county levels for solar installers and customers. Where possible co-locate facilities (Municipal, County, State).

Policy # 7: Support Planning Zoning and Development Departments

Encourage hiring of additional electrical and civil engineering review staff.

Policy # 8: Conduct Review of By Laws and Local Codes

Review and revise planning by laws, and all regulations that impose barriers to solar.

Policy # 9: Create a Government Coordinating Committee

Encourage the coordination of new policies amongst City, County, and State entities.

Community Solar: The Missing Ingredient

“Community solar” refers to both “community owned” projects and third party owned plants whose electricity is shared by a community of individuals. The primary purpose of community solar is to allow members of a community to invest in and share the benefits of solar power even if they cannot or prefer to not install

solar panels on their own property. Project participants benefit from the electricity generated by a community solar farm that typically charges the customer less than the price for electricity that they would normally pay to their electric provider.

Community solar involves community involvement, community advocacy, ownership and control of solar assets, and is enacted from a public policy point of view so multiple customers can benefit from solar generation not on their own property or on property where they live. Community solar empowers a whole new segment of the population to take part in and benefit from solar generation, and opens up the market to multifamily housing, and to properties such as apartment buildings, condominiums, and town-houses where the footprint of the building will not allow enough generation to meet code or zero out the load of the individual units in the building. Community solar can change this.

With Community solar, groups of people, businesses and municipal entities can come together to finance, own, and take electricity from solar power generated on someone else's property. Allowing this enables a new market that deserves policy support and that can contribute to the goal of supercharging the use of solar power in Inland Southern California. Community solar also provides major benefits to its participants.

Community based solar can also provide resilience to the grid. The establishment of solar micro-grids at schools, community centers, police and fire stations, and other public facilities can provide safe electrified facilities in the event they are required.

Community solar is popular around the country, and is now being supported in California with the CPUC offering their "Green Tariff Shared Renewables Program". In Sacramento, SMUD operates a "community solar" program that supplies builders with solar for new homes, and the CEC is currently drafting a policy statement.

The Leadership Council may want to develop approaches to community solar with low income and disadvantaged communities.

As a consequence we recommend the following policies be adopted in Inland Southern California:

Policy # 1: Support Community Solar

Support the development of community solar regulations by the appropriate State agencies. Once regulations are developed, then develop programs in support of community solar (broad interpretation) for the region. Coordinate city, county, utility, state, federal, and local community activities.

Policy # 2: Training to Build Community Capacity

Support training of community members to develop and retain community capacity. Support the creation of courses at Inland Southern California colleges and universities.

Policy # 3: Learn from Other Jurisdictions

Examine other jurisdictions' "community solar" policies to see if they could benefit this region.

Policy # 4: Low Income and Disadvantaged Communities

Examine the benefits of solar to low income and disadvantaged communities, recommend policies to address these markets.

Policy # 5: Coordinate Council activities with Community Choice Aggregators

CCA communities may be fertile territory for community solar activities. It is recommended that the Leadership Council examine the potential in the CCA market.

Energy Storage (is cross cutting)

Energy storage is an important component of any program whose objective is to support the increased penetration of solar electricity into the grid. In the past, energy storage might have been overlooked, but it is now considered a key component of an efficient grid. Since solar generation is limited to daylight hours, and the State electric peak load does not precisely coincide, the abilities to store electricity and to shift load become key to the management of an efficient grid. Our proposed Leadership Council is encouraged to examine the role that energy storage could play throughout Inland Southern California, with an emphasis on extending storage into all sectors using a variety of long-term storage technologies such as solar thermal with storage, pumped hydro storage, compressed air storage, flywheels, advanced batteries, and other emerging technologies. Universities such as U.C. Riverside have programs focused on energy storage research, materials and systems. Encourage these programs.

Policy # 1: Provide a financial incentive to all utility customers per (kW) for energy storage. Include the incentive for all sectors including residential, commercial, industrial, institutional, and utilities.

Cities and Counties Go Solar

All over the world Cities and Counties are declaring themselves to be on the path to 100% renewable energy. Numerous jurisdictions have signed on, including many cities across the US. There are many examples of groups supporting the push for 100% renewables. Three examples are Renewable Cities.ca, Go 100Percent.org, and 100 Resilient Cities.org .

Cities and the County governments across the region are encouraged to take up this sustainability challenge. So far, eighteen cities in California have committed to go 100% renewable. Many things can be done, virtually all of which improve the environment and can contribute to considerable and sustainable economic growth.

The US Department of Energy operates the SolSmart program, delivering free services and advice to Cities and Counties. The program has caught on from California to Rhode Island, and from Florida to Washington State. It has stringent

requirements, but can be very rewarding for participants! Perhaps the Counties and cities across Inland Southern California could adopt the program.

Separate from this, our region's Cities and Counties control a great number of buildings and much associated land, and they can write policies that encourage the greening of Municipal and County buildings and land itself, and take advantage of the many opportunities available to municipalities to modernize their facilities. Many ESCOS have programs with lending from IOUs to allow cities and counties to improve the efficiency of their buildings with no capital outlay, and savings from the start. Municipalities in fact could play an important role in moving the solar needle in Inland Southern California. Municipal governments can demonstrate commitment to renewables by greening their portfolio of buildings. Inevitably there will be some structures that are not suitable, but there will be, at the same time, a portfolio of acceptable buildings and other sites that can be installed.

Clearly, the potential has been seen by the private sector and by Riverside County, who are now hosting large-scale utility-scale solar farms.

Policy # 1: Consider a path to 100% renewable energy. There are 24 cities in San Bernardino County, and 28 in Riverside County. Connecting with and making use of SolSmart advice and services is recommended. The Council will hold meetings to sound out stakeholders and to create dialogue and consensus around issues.

Policy # 2: Approve the Issuing of Municipal and County bonds to support the installation of solar and efficiency measures at City and County facilities. Combining the solar installations with energy efficiency measures in the buildings lowers the overall cost per unit (kWh) of generation and efficiency combined.

Policy # 3: Examine Best in Class Municipal Programs.
Report back to the Council on findings

Community Resilience Facilities

A whole new focus on community safety has arisen in the last few years, prompted mostly out of necessity. Super storms like Sandy that ravaged the New Jersey shores, and hurricanes like Harvey that inundated Houston with over 40 inches of rain over a few days have elevated the need to create safe emergency facilities in our communities. In California, more than ever, the evacuations from wildfires have underscored the importance of creating such centers.

The category of community resiliency or the hardening of designated public facilities against grid outages and other disasters is an important one for Inland Southern California. Whether community facilities, schools, police or fire stations, resiliency centers are there to provide services in the advent of grid outages or other disasters. Preparation is the key to success in these circumstances. Cities such as San Francisco and Oakland have plans and resilience centers developed and waiting to be used, and they even have designated staff focused on resilience and disaster recovery. The Council will study and report on resiliency centers.

Policy # 1: Support Community Resilience via Community Solar

Each community could designate facilities that should be made resilient. A collection of these would represent a portfolio of fundable projects. The Cities and Counties of Inland Southern California could investigate and identify the most appropriate facilities to harden.

Policy # 2: Issue County and City bonds for community resilience projects

Each jurisdiction may, after some study, come forward with a proposal to issue bonds, and fund studies and installations

Policy #3: Study resiliency programs in other jurisdictions and make recommendations

The Leadership Council is encouraged to examine the benefits of resilience, how other cities have approached the topic, and how it could be applied in Inland Southern California.

Institutional Micro-Grids

Schools, hospitals and medical facilities, police and fire stations, community centers, and community swimming pools should be installed with solar power backed up by energy storage. These facilities can become safe facilities and can, in emergencies, house thousands. Particularly in this era when storms can be more fierce, fires larger and more frequent, and when earthquakes can threaten, hardened facilities can play an important role in public safety.

Policy #1: Renewable micro-grids at Mission Critical and Public Facilities

Mission critical facilities like police stations and 911 dispatch services need to keep operating through disasters. Solar micro-grid systems allow offices and campuses to be isolated from the grid and to keep functioning during blackouts. Cities and Counties across Inland Southern California should unite to designate facilities for hardening.

Policy # 2: Colleges and Universities; Early micro-grid Adopters

Colleges and Universities in the US Northeast have been leaders in the development and deployment of solar-based micro-grids. At the same time over 1,000 Colleges and Universities use specialized software to scope out projects and manage their campus' energy use.

Policy #3: Utilities to Provide On-Bill Financing

Encourage the Utilities to lend facilities the dollars for combined energy efficiency and solar micro-grid projects. Utility gets paid back through utility bill under a shared savings arrangement. Customer bill is always less than previous.

Commercial, and Industrial Solar for Inland Southern California

The environment for solar systems on commercial and industrial properties in Inland Southern California is extremely good. The solar resource is excellent and

there is lots of roof and ground mount commercial and industrial space in the region. Small commercial, however, has yet to be properly addressed and there are a variety of things that can be done to supercharge the small commercial market. The advent of community solar may also help supercharge commercial installations across Inland Southern California because of the ability to connect a whole new category of new buyers with sellers.

Barriers exist in the commercial sector that need addressing. Property owners need excellent (A) credit ratings to obtain low cost loans and favorable terms. Lenders' spreadsheets do not appear to credit solar installations with the revenue the projects create. The income that is created by their investment can be substantial and could, if credited, result in lower rates and better terms.

It is also recommended that the Council review programs such as the HERO loan program and the PACE community program, although both of these programs could potentially put homeowners at risk of defaulting on their loans. Providing innovative financing mechanisms that allow customers to reduce or eliminate upfront capital cost for small commercial installations will result in explosive market growth.

Policy # 1: Issue Municipal and County bonds to support a subsidy of x cents (per unit) for solar panels installed on commercial/industrial space.

Policy # 2: Hold financing sessions with the financial community, Property owners, and City/County employees/managers. Educate lenders to include the revenue stream/savings from solar in their financial calculations. Educate the community on the benefits and drawbacks of PACE funding.

Policy #3: Utilities To Provide On-Bill Financing

Allow utilities to provide on bill financing for commercial and industrial facilities.

The Utilities

Customers are served in the Inland Southern California Counties by two types of utilities; investor owned ones, and Municipal Utilities. Southern California Edison is an Investor Owned Utility governed by CPUC rulemaking. It delivers electricity to a wide swath of San Bernardino and Riverside Counties. The Municipal Utilities, including Riverside Public Utilities, the Imperial Irrigation District, Colton Electric, Moreno Valley Utility, and City of Banning are not governed by CPUC rulemaking but nevertheless have their own renewable energy programs that they operate. The CPUC Net Energy Metering rules allow the IOUs to limit the amount of solar installed to annual electric use, creating a situation where new homes cannot reach zero net energy (ZNE) using solar since ZNE requires the solar to be oversized to meet the gas load.

Southern California Edison: Electricity

Southern California Edison (SCE) is one of the three big California Investor Owned Utilities (IOUs). For decades now, they have been intensely involved in the deployment of solar power to meet the State Renewable Portfolio Standard. SCE has met or come close to meeting the State's RPS over the years, and in 2017 SCE was number one in new battery energy storage in the State. In 2017 they were also number two in solar megawatts installed in California. They have robust solar and energy storage programs, and they are active on many different fronts, including attending and presenting at conferences and workshops.

Imperial Irrigation District (IID): Electricity and Water

IID has roughly 5,000 solar systems, and just north of 68 megawatts installed. IID offers net metering, (they call it "net energy billing") for residential solar. They have committed that 50% of retail sales will be renewable by 2020. IID now delivers 100% coal free electricity, and has interconnected over 4,000 rooftop systems. Full development of solar potential in IID territory is estimated at @29 GW. They are also demonstrating an energy storage system with a 30 MW - 20 MWH battery storage system. Currently IID's electricity is 30% renewable. IID has just signed a new geothermal power contract due in large part to their proximity to the large geothermal field centered on the Salton Sea. By 2019, IID will have over 400 MW of renewables in its grid.

Riverside Public Utilities: Electricity, Water, Waste

Riverside Public Utilities (RPU) has interconnected roughly 30 MW of solar systems throughout its service territory (under the NEM 1 rules they were allowed 30.2 MW).

The Federal Push for Large Scale Solar: Bureau of Land Management (BLM) Sites, and Tribal sites.

The Bureau of Land Management is currently evaluating 3,000 MW of solar projects in California and Nevada. Three large solar farms are moving ahead in the Southland. First Solar is building the 450 MW Desert Quartzite plant. EDF Renewable Energy is building the 500 MW Palen Solar plant. Recurrent Energy is building the 450 MW Crimson Solar plant, all in Riverside County. It is recommended that the Leadership Council meet with the BLM to explore further possibilities. American Indian Tribes can play a special role in Inland Southern California, and it is recommended that the Council meet with Tribal representatives to discuss opportunities to work together.

The Importance of Electric Transportation

One major way to combat climate change is to reduce fossil fuel combustion and go 100% renewable in our generation portfolio. Another major step would be to eliminate the combustion of fossil fuel for transportation. To this end, electric and hybrid electric vehicles can play a large role in the transformation of our transportation sector, and combating climate change and pollution is a major motivator. Solar Valley believes that, to the extent possible, Inland Southern California should support the use of electric and hybrid-electric vehicles, for both transportation fuel, and as backup power (battery power) to the grid. This is particularly true for State agencies and UC Campuses.

Policy # 1: Transportation between UC Campuses

Support the use of electric vehicles and charging for all trips between UC Campuses

Monitoring and Verification

Truth and facts matter. Know what you want, state the goals clearly, and monitor, monitor, monitor all technologies and projects.

APPENDIX I

The Leadership Council

The Leadership Council (Council) is proposing to help jump-start and guide the process of ramping up solar across all sectors in Inland Southern California. The intent is to benefit the environment, both human and natural, and to make green business a major economic engine for the region and its inhabitants.

The Council will have approximately 12 members that will be sourced from stakeholder groups like City and County administrations, from the utilities, from industry, from the community, and from advocacy groups. It will be co-chaired by U.C. Riverside Professors Alfredo Martinez-Morales and Ronald Loveridge, and it will have staff to operate and advise the organization.

Funds to support the Council's activities and staff will be solicited in the community through the Council's extensive network of connections. The aim is to supercharge Inland Southern California with businesses, research, and installations of all forms of solar power and related technologies.

Local Institutions are already well on the way to distinguishing themselves in the solar energy field (examples are UCR CE-CERT, SC-RISE, and the Winston Chung Global Energy Center), and local Colleges and Universities are expected to play a large role in the ramp-up of solar across the region.

Stakeholders will be clearly identified and heard. This “hearing” process will be fed into a multi-year plan created by a Strategic Growth committee of the Council. The Strategic Growth committee will be informed through expert advice and reports, and with the assistance of Institutions such as the UC Learning and Academic Resource Center.

The Council will issue an annual report card and the Council will hold public meetings annually that highlight its activities and advance the cause of solar power across Inland Southern California.

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