Overview: Roadmap to 100% Local Solar by 2030 in the City of San Diego

Bill Powers, P.E., Protect Our Communities Foundation, July 2, 2020
Drivers behind *Roadmap*

- New Community Choice Aggregator (San Diego Community Power JPA) in development, needs a plan.
- Local activist community – the engine behind the CCA – has insisted for years that CCA must prioritize local clean power and follow the state’s “Loading Order”.
- State requires rooftop solar on every new home, but penalizes – through PCIA exit fee – putting solar on existing homes.
- Intent of the *Roadmap* is to stick to the plan – Loading Order, local solar, local battery storage, and competitive generation rates – despite the PCIA.
Economic development: offering programs . . . such as energy efficiency and distributed energy resources.

Local jobs and employment: . . . employing local workers in CCA administration, using local contractors for energy efficiency programs and distributed energy generation.

Prioritization of renewable power development: As the CCA’s portfolio is developed, subject to cost constraints, projects in the City would be given highest priority.

Local citizen input and participation: The CCA will be committed to providing opportunities for citizens to provide input into its programs and policies.
The exit fee is calculated by dividing the utility’s fixed annual exit fee amount, for SDG&E about $450 million in 2020, over SDG&E’s grid power sales. If those grid power sales decline, as they would if more customers take care of themselves with rooftop solar, more and more of the exit fee burden is concentrated on fewer and fewer grid power kilowatt-hours.

An analogy would be the Metropolitan Transit Authority funding all of its capital improvements through bus and trolley ticket sales. If a ticket price of $2.50 is sufficient to cover all the costs with an average of 100,000 riders per day, the cost would need to increase to $5 per ticket if ridership drops to 50,000 per day. More of the burden is placed on public transit riders who do not have access to a car.
Main Elements of Roadmap


- Applies the goals of the 2008 California Long-Term Energy Efficiency Strategic Plan, which embodies the Loading Order, to the specific case of the City as the strategy to achieve 100 percent clean energy.

- Top of Loading Order – EE, DR, solar, storage at point-of-use

**Long-Term Energy Efficiency Strategic Plan targets:**

- Zero Net Energy (ZNE) structures, new and existing
- All new homes ZNE by 2020
- 25% of existing homes near-ZNE by 2020
- 50% of commercial buildings ZNE by 2030
- Major reductions in heating and cooling loads
Main Elements of Roadmap

About 45% of SDG&E grid power is renewable. Will be credited to SDCP. Roadmap - remainder to 100% met with EE/DR, local solar & battery storage.

- City target of 2,100 MW\textsubscript{AC} of new local solar by 2030. The City would continue the current customer-sited solar installation rate of 100 MW\textsubscript{AC} per year over the next ten years.

- Add 110 MW\textsubscript{AC} per year of commercial feed-in-tariff (bid cap with reverse auction) parking lot and warehouse solar over the same time frame.

- 250 MW\textsubscript{AC} of load reduction in the form of central air conditioner (A/C) cycling would also be added in the City by 2030.

- EE target of 25 percent to be achieved by focusing EE upgrade efforts on customers using disproportionately high amounts of electricity.

- An opt-out program structure would be used to maximize the potential gains as fast as they can be achieved. On-bill financing available to all customers would fund much of this local clean energy development.
SDG&E 1-hour Peak Load – Steady Decline

Roadmap, Figure 1, p. 15.
### San Diego Rooftop Solar and Storage Potential

*Roadmap, Table 2, p. 21.*

<table>
<thead>
<tr>
<th>Roof type</th>
<th>2020 MW(_{AC}) potential</th>
<th>2020 GWh potential</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 watts(_{DC}/)ft(^2)</td>
<td>17 watts(_{DC}/)ft(^2)</td>
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<tr>
<td>Residential</td>
<td>1,239</td>
<td>2,106</td>
</tr>
<tr>
<td>Commercial</td>
<td>846</td>
<td>1,438</td>
</tr>
<tr>
<td>Total</td>
<td>2,085</td>
<td>3,544</td>
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</table>
San Diego Total Rooftop & Parking Lot Potential

*Roadmap, Table 2, p. 21.*

<table>
<thead>
<tr>
<th>Type</th>
<th>$MW_{AC}$</th>
<th>GWh per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential rooftop</td>
<td>2,106</td>
<td>4,716</td>
</tr>
<tr>
<td>Commercial rooftop</td>
<td>1,438</td>
<td>2,865</td>
</tr>
<tr>
<td>Commercial parking lot</td>
<td>1,436</td>
<td>2,702</td>
</tr>
<tr>
<td>Total</td>
<td>4,980</td>
<td>10,283</td>
</tr>
</tbody>
</table>
High % Coverage Parking Lot Solar Examples
Parking Lot Solar Cost-Effectiveness

- CCA basic generation charge, $0.055/kWh to $0.06/kWh (without admin & overhead).
- Single 120 kW solar/storage parking lot array cost-of-production: ~$0.05/kWh.
- Multiple similar parking lot projects (10x, 50x) under same contract: ~$0.04/kWh?
- Project structure: in-front-of-meter, wholesale power, price cap with reverse auction (lowest price by qualified bidder gets work).
- To control costs, CCA handles customer acquisition, assures interconnection, bundles individual projects for bid.
Parking Lot Solar and Storage Potential
Residential Solar Cost-Effectiveness

Roadmap, pp. 51-52.

- Assumed 6 kW solar system gross cost: $2.75/watt
- Battery, Tesla Powerwall, 13.5 kWh, $9,800, with $0.25/watt SGIP incentive payment.
- Cost-of-production, 100% financed under on-bill financing program = $0.12/kWh
- Retail cost of SDG&E residential electricity = $0.35/kWh
Tesla Now Marketing “Cookie-Cutter” Residential Solar at $2.00/watt

electrek.com, *Tesla Solar now 30% less expensive than industry average with new pricing*, June 20, 2020: https://electrek.co/2020/06/20/tesla-solar-less-expensive-than-solar-industry-average-new-pricing/
Skyline Neighborhood, San Diego – Moderate Income, High % Home Ownership & % Solar
Virtual Net Metering of Solar On Apartment Building – One Option for Rental Units
Adding Some Storage at Substations to Allow Islanding of Neighborhoods

**HOW IT WORKS**

1. Switchgear disconnects from transmission grid, creating a **distribution island**

2. Substation energy storage **re-energizes feeder circuit** long enough so that,

3. **DERs can sustain** the entire distribution island
On-Bill Financing – Assuring Equity

- Customers pay their electric bills, low default rate.
- As a result, electric bill payment is a high grade, secure financial asset.
- With on-bill financing, the payment obligation is tied to the electric meter, not the customer behind the meter.
- Whether the customer is owner or renter, good credit or not good credit, is not a factor to determine eligibility for on-bill financing.
- Only requirement is timely payment of electric bill for at least 12 months.
Assuring Equity and Fast Pace in Rooftop Solar Development – On-Bill Financing + Opt-Out

- Model – Hawaii GEM$ on-bill financing program: owners, renters, solar + storage.
- Funded by $150 million bond.
- CCA on-bill financing efforts [River City Bank, MCE].
- Potential of local credit unions to provide OBF funding.
- Combine with opt-out neighborhood-by-neighborhood.
Final Note: IOU Onboard – PG&E
Advocates for Broader On-Bill Financing
PG&E, Comments on Self-Generation Incentive Program Order Instituting Rulemaking OIR, June 29, 2020, p. 18.

- **PG&E also suggests that the [scope] be expanded to include an evaluation of a broader on-bill financing (OBF) option for customers. PG&E understands that for some customers the upfront costs are a barrier and an incentive is less valuable.**

- **PG&E (has) suggested an OBF option in SGIP with incentives to be offered in conjunction with the SGIP incentive. With this approach, the ERB (equity resiliency budget) could not only be offered at a lower cost than other incentive programs, but also could encourage customers to ensure that projects are implemented and managed to ensure that bill savings are realized over the life of the loan.**