Clean Coalition
Making Clean Local Energy Accessible Now

Examples in Planning for Non-Transmission Alternatives (NTAs)

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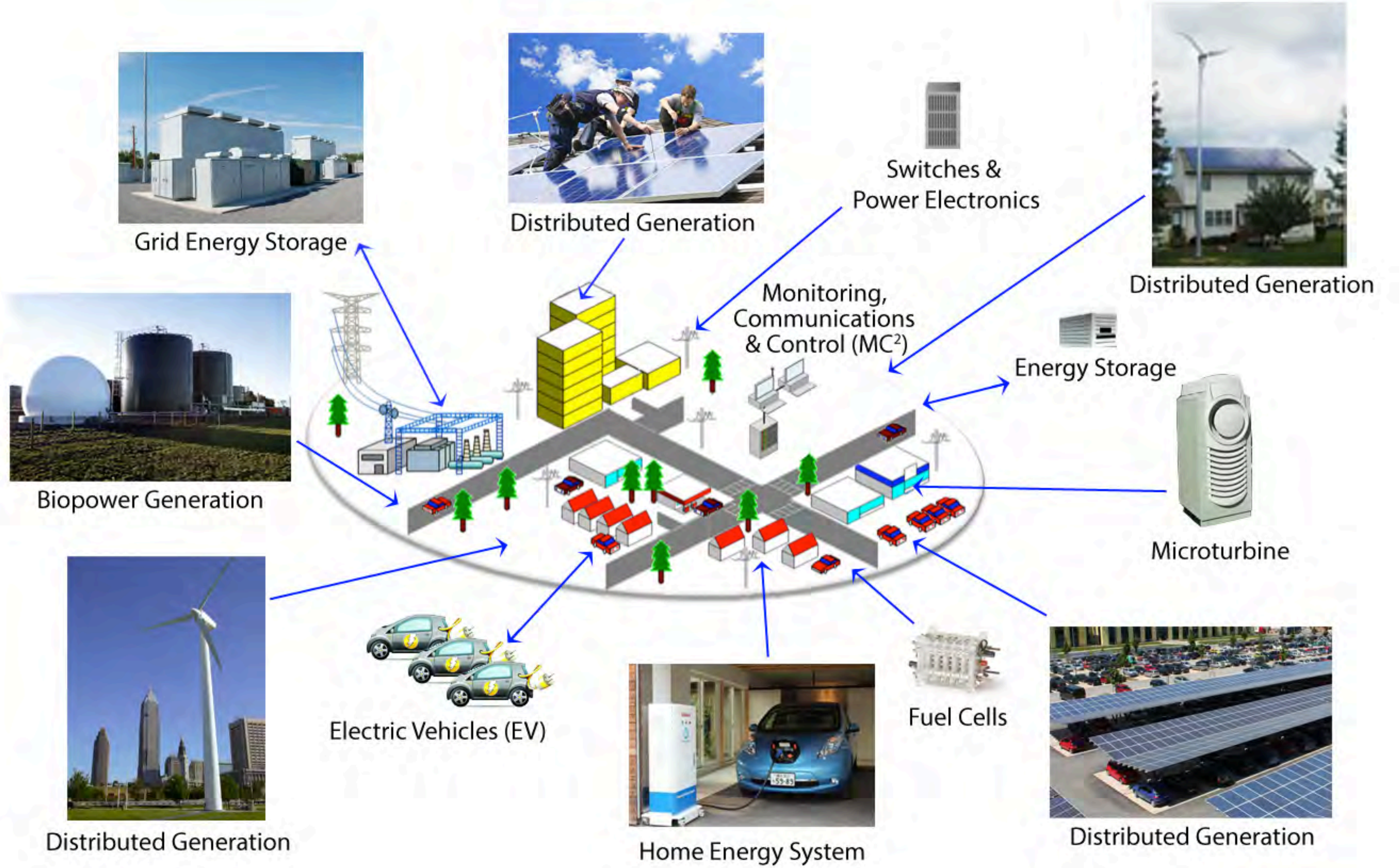
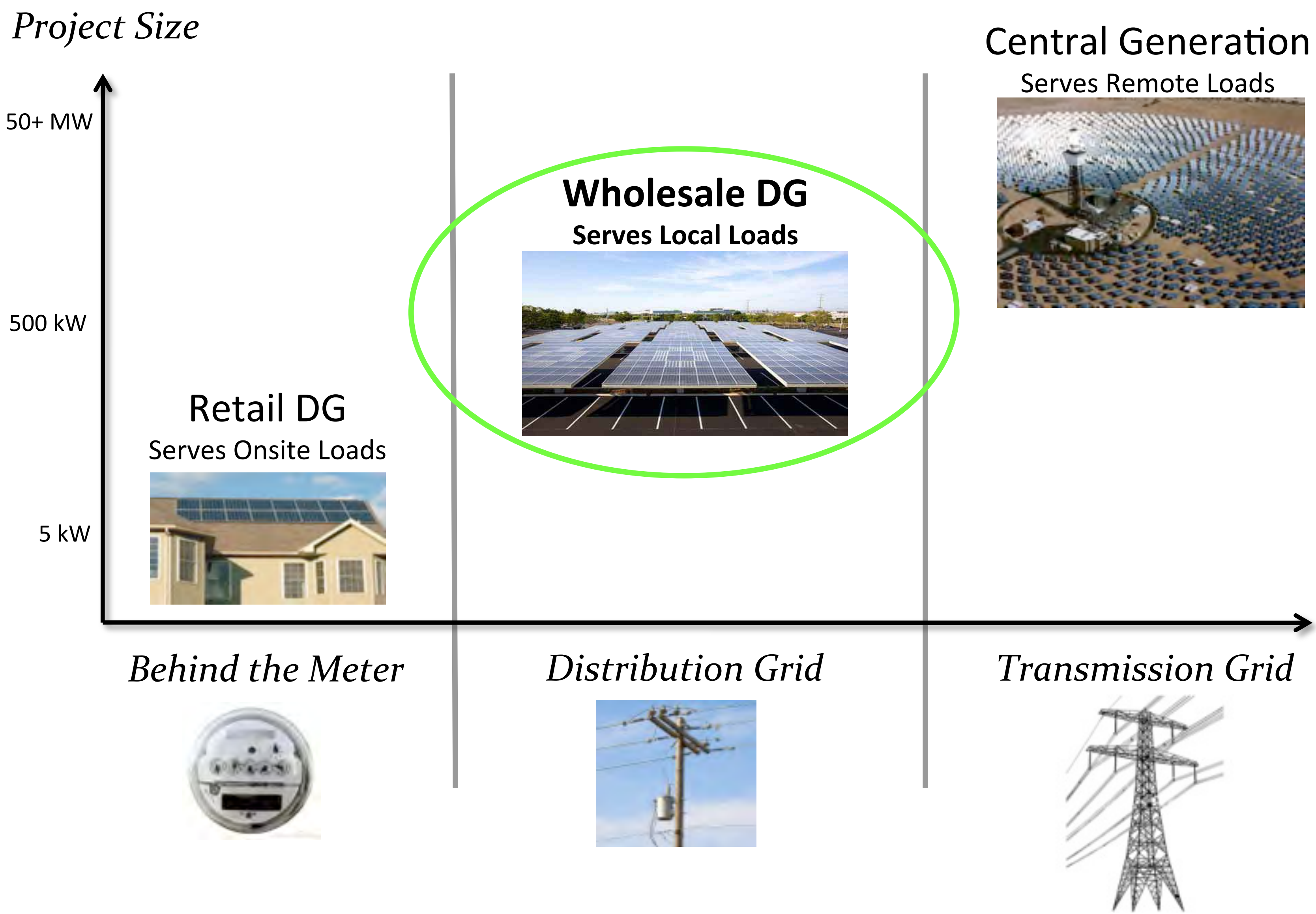
Distributed energy resources (DER)



Wholesale DG is the critical & missing segment

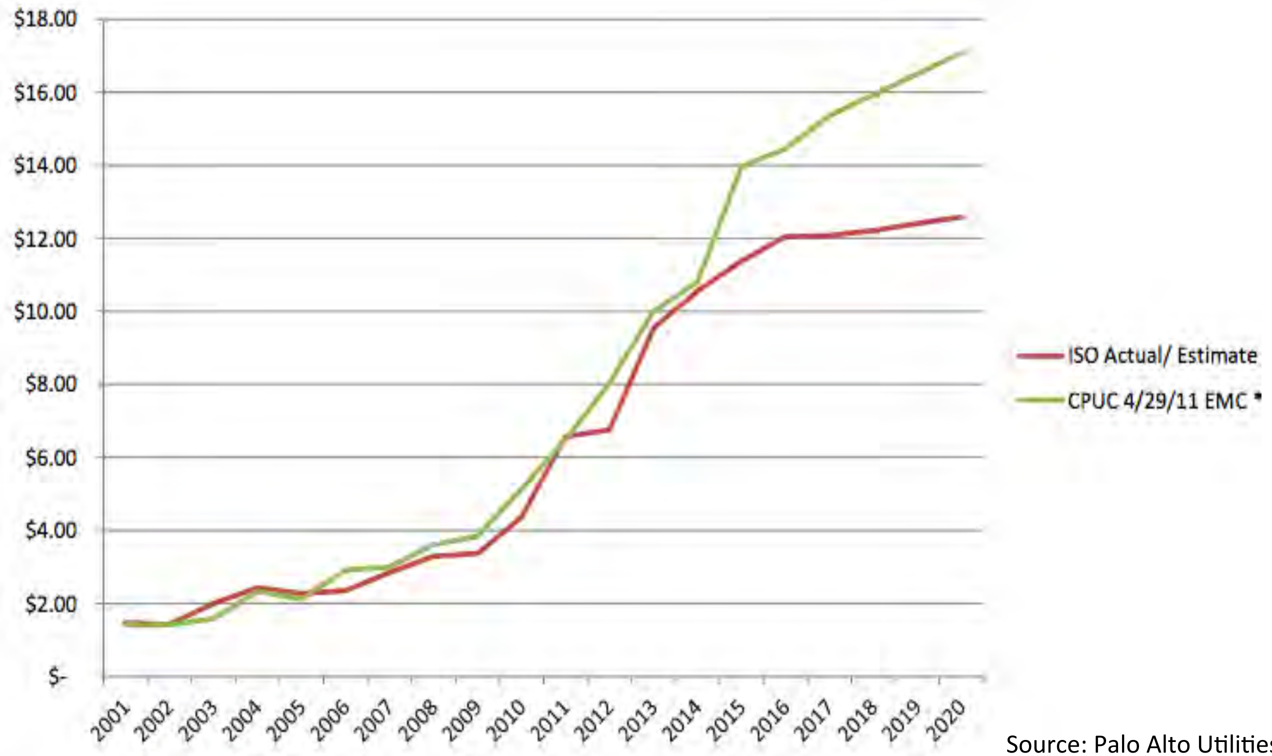


Shift transmission investments into the distribution grid

- Under a business as usual scenario, new incremental transmission investments will reach **$80 billion** over the next 20 years, imposed on California ratepayers
- Levelized over 20 years, this approaches **3 cents/kWh** – or roughly 25% of the wholesale cost of electricity, or 33% of the energy price of centralized solar
- Avoiding half of these charges, for example, would **free up roughly $40 billion** for modernizing the distribution grid, including local renewables, storage, etc.

Historical and Projected High Voltage Transmission Access Charges ($/MWh).

Does not include Low Voltage Transmission Access Charges.



Source: Palo Alto Utilities

Guided siting benefits (locational value, interconnection)

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SCE Share of 12,000 MW Goal

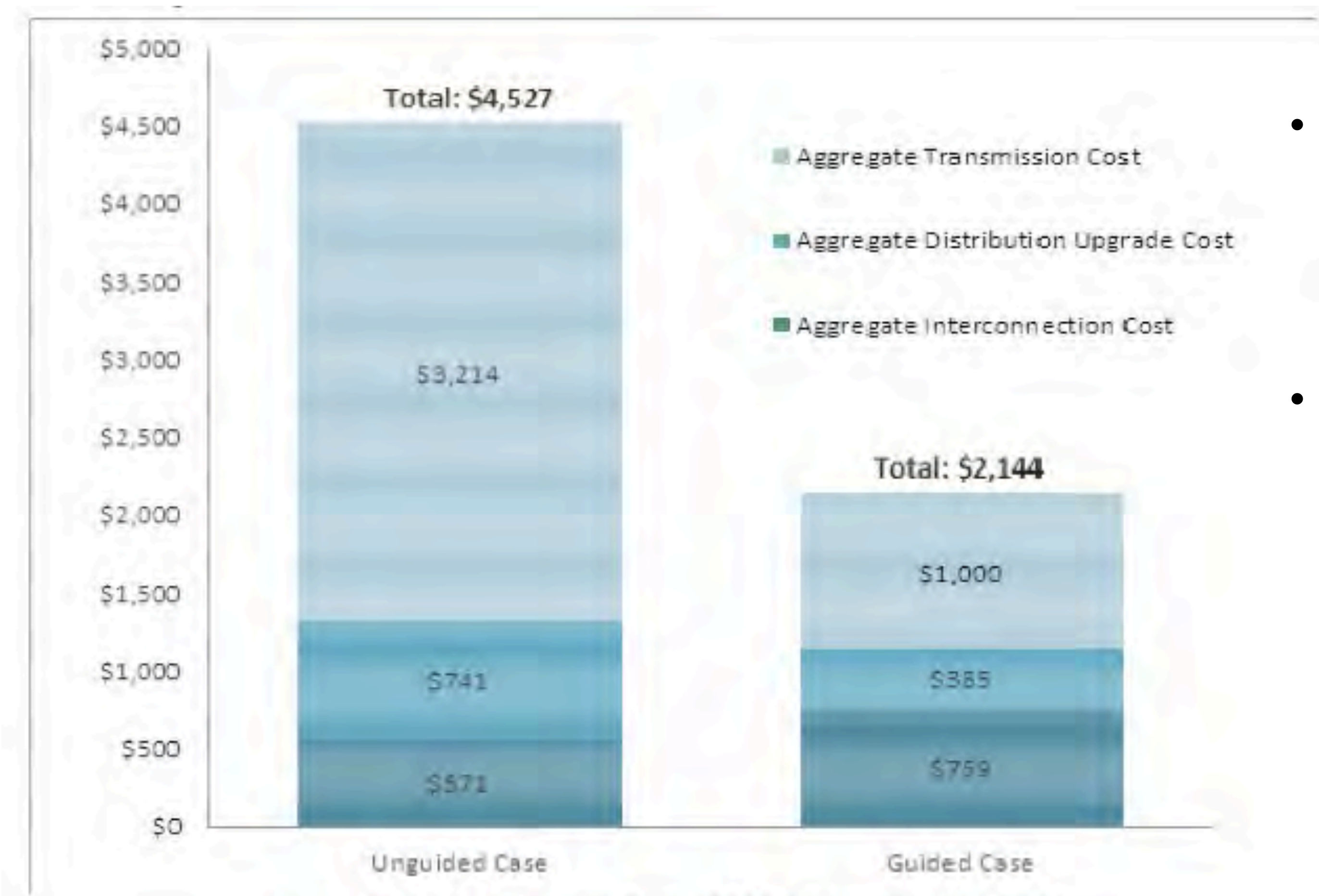

Figure 8: Total SCE System Costs of LER Proposal (Million USD)

Guided Siting Saves Ratepayers 50%

- **Locational value** methodology should include transmission costs.
- **Interconnection** policies should favor high value locations, and reduce cost uncertainty for developers.

Source: SCE Report May 2012

Planning for local resources:

California's Distribution Resource Plans (DRPs)

Distribution Resources Plans

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Requirements per CA Public Utilities Code Sec. 769 – from AB 327 (2013)

- Identify **optimal locations** for the deployment of Distributed Energy Resources (DERs)
  - DERs include distributed renewable generation, energy efficiency, energy storage, electric vehicles, and demand response
- Evaluate **locational benefits and costs** of DERs based on reductions or increases in local generation capacity needs, avoided or increased investments in distribution infrastructure, safety benefits, reliability benefits, and any other savings DERs provide to the grid or costs to ratepayers
- Propose or identify **standard tariffs, contracts, or other mechanisms for deployment** of cost-effective DERs that satisfy distribution planning objectives
- Propose cost-effective methods of effectively **coordinating existing commission-approved programs, incentives, and tariffs** to maximize the locational benefits and minimize the incremental costs of DERs
- Identify **additional utility spending** necessary to integrate cost-effective DERs into distribution planning
- Identify **barriers to the deployment of DERs**, including, but not limited to, safety standards related to technology or operation of the distribution circuit in a manner that ensures reliable service

Stages of DRP optimal location implementation

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Analysis & Planning	Grid Modeling & Optimization	Distribution Resource Plan Design	Distributed Energy Resource Deployment
Full cost and value accounting methods for DER	Siting analysis; powerflow modeling; DER optimization	Design and approval	Implementation: procurement and interconnection programs

Evolution of DRP optimal location benefits analysis

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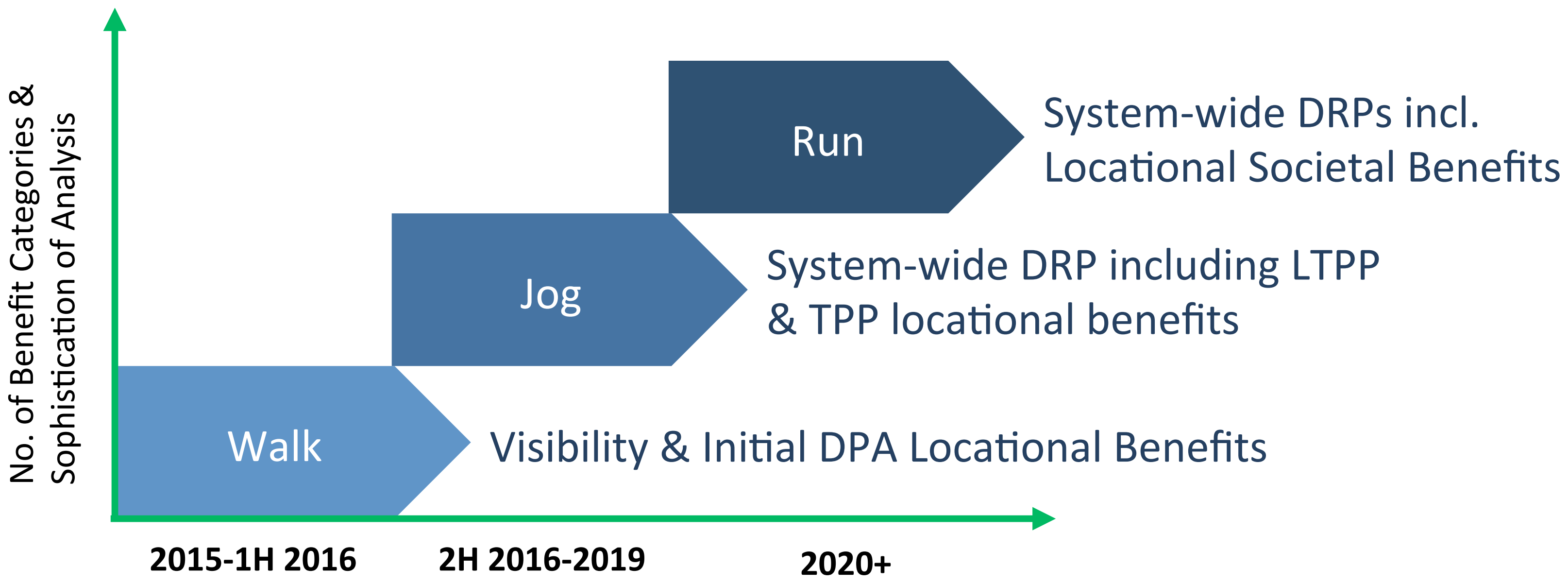
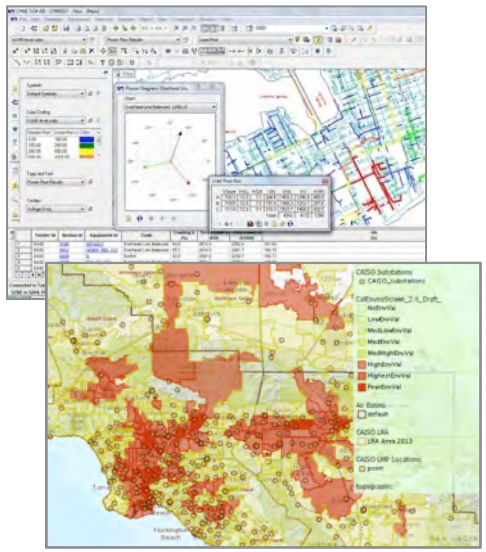
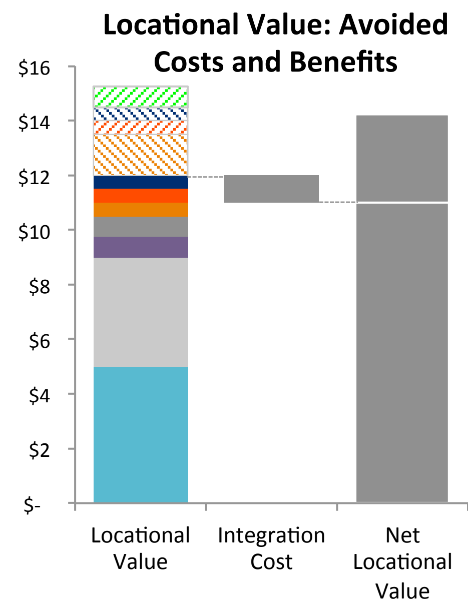
- Staged evolution in the planning and analysis process
  - Expanding to incorporate both a full analysis of value and system wide geographic application as automated modeling and methodologies are employed over subsequent planning cycles

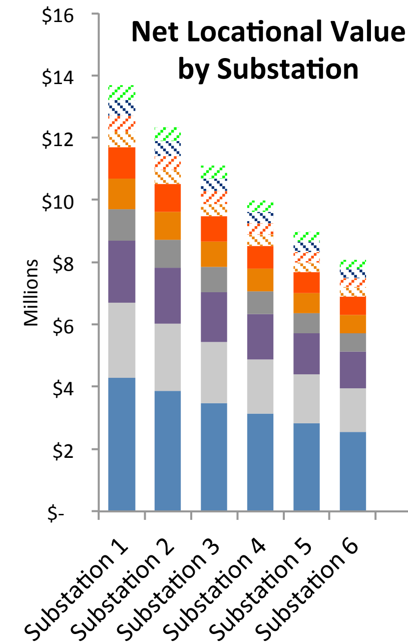


DRP analysis process

Identify DPA & Substations → Perform Planning Analyses → Calculate Locational Net Value → Rank Substations by Locational Net Value







DER hosting capacity analysis

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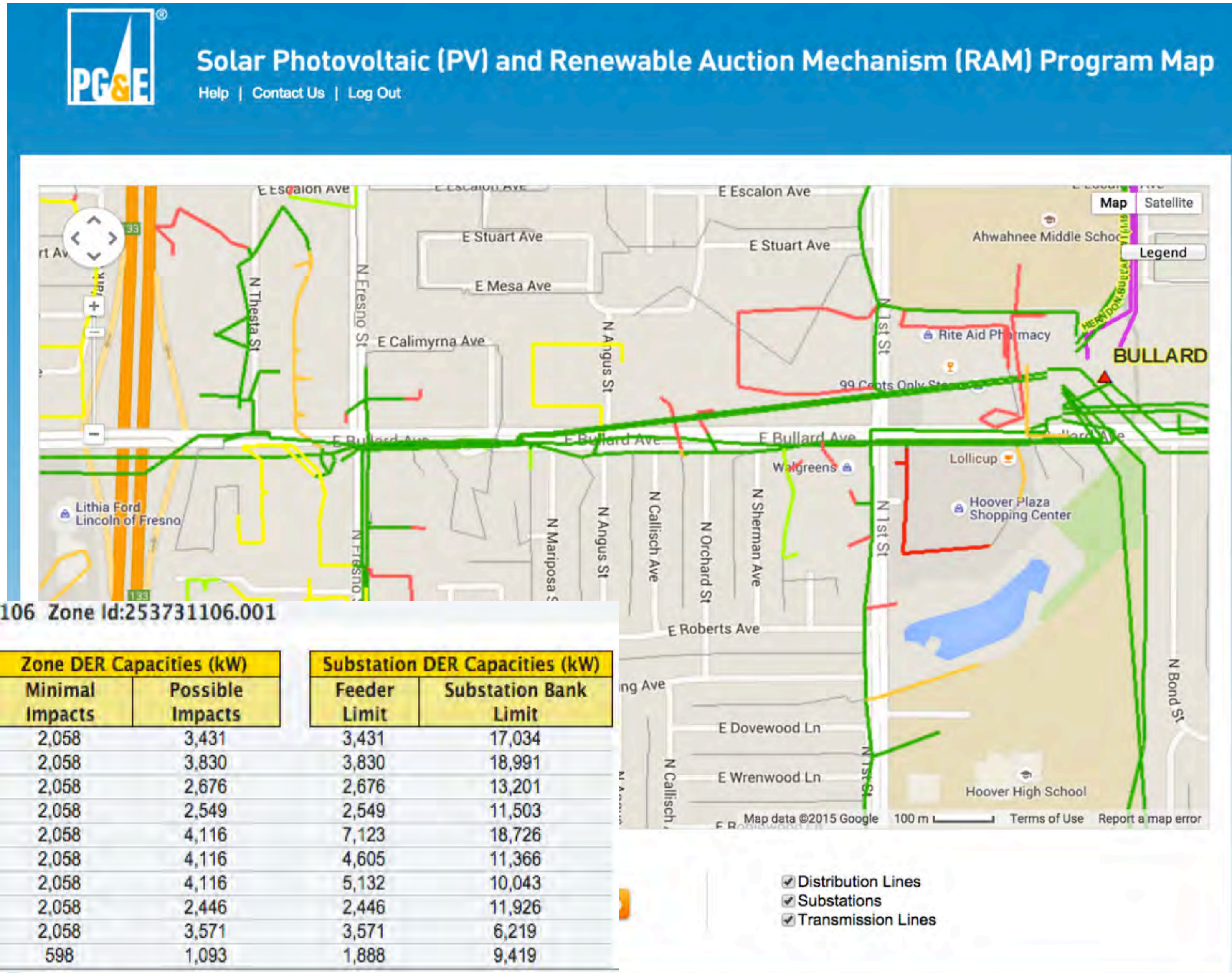
Maps of existing low cost distribution grid hosting capacity for wholesale and behind-the-meter DER suppliers



Feeder name: WEST FRESNO 1106 Zone Id:253731106.001

DER	Zone DER Capacities (kW): Minimal Impacts	Zone DER Capacities (kW): Possible Impacts	Substation DER Capacities (kW): Feeder Limit	Substation DER Capacities (kW): Substation Bank Limit
PV	2,058	3,431	3,431	17,034
PV with Storage	2,058	3,830	3,830	18,991
PV with Tracker	2,058	2,676	2,676	13,201
Storage - Peak Shaving	2,058	2,549	2,549	11,503
EV - Residential (EV Rate)	2,058	4,116	7,123	18,726
EV - Residential (TOU Rate)	2,058	4,116	4,605	11,366
EV - Workplace	2,058	4,116	5,132	10,043
Uniform Generation (Inverter)	2,058	2,446	2,446	11,926
Uniform Load	2,058	3,571	3,571	6,219
Uniform Generation (Machine)	598	1,093	1,888	9,419

Understanding local capacity potential

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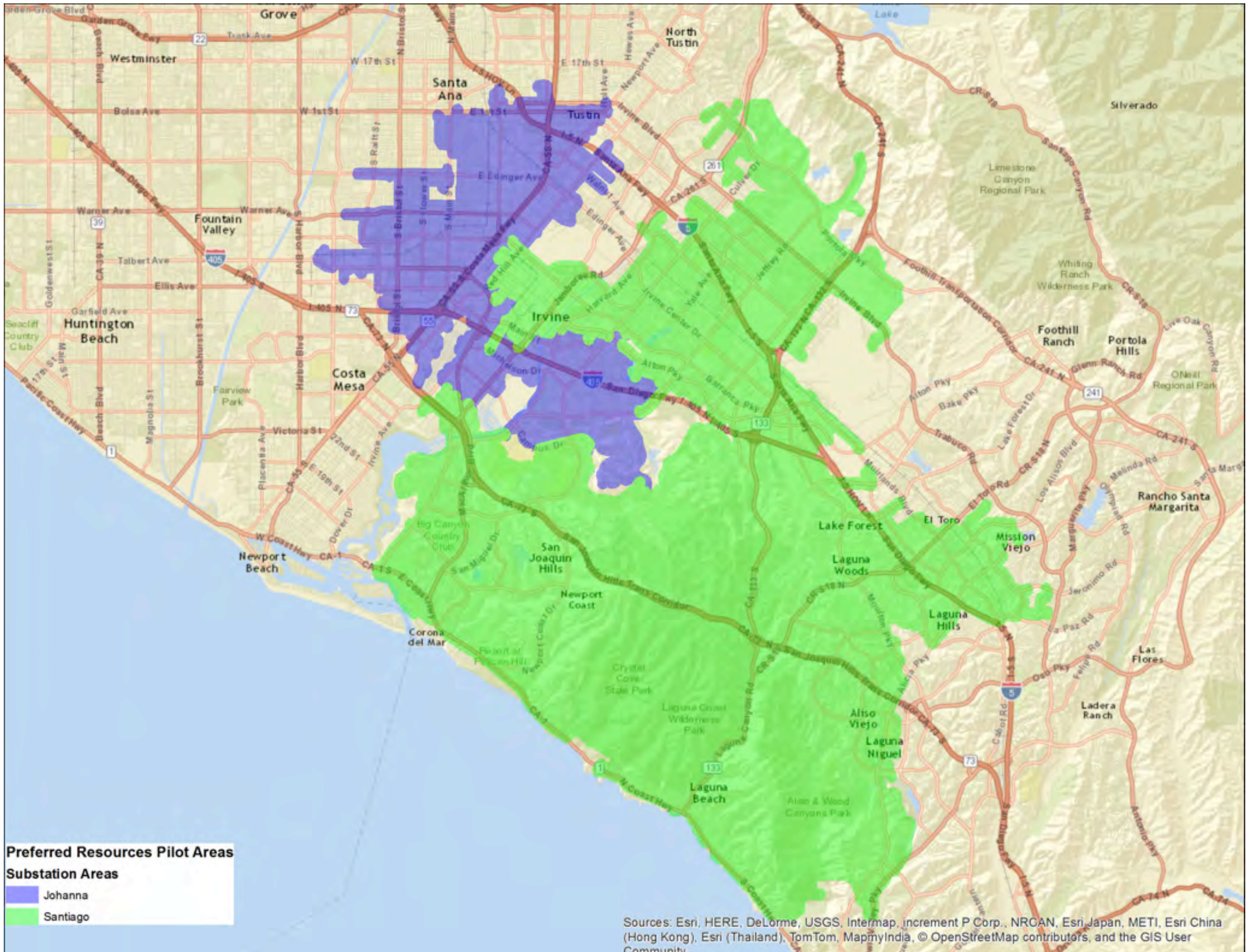
Southern California Edison's transmission-constrained Preferred Resources Pilot (PRP) area



PRP Solar Siting Survey

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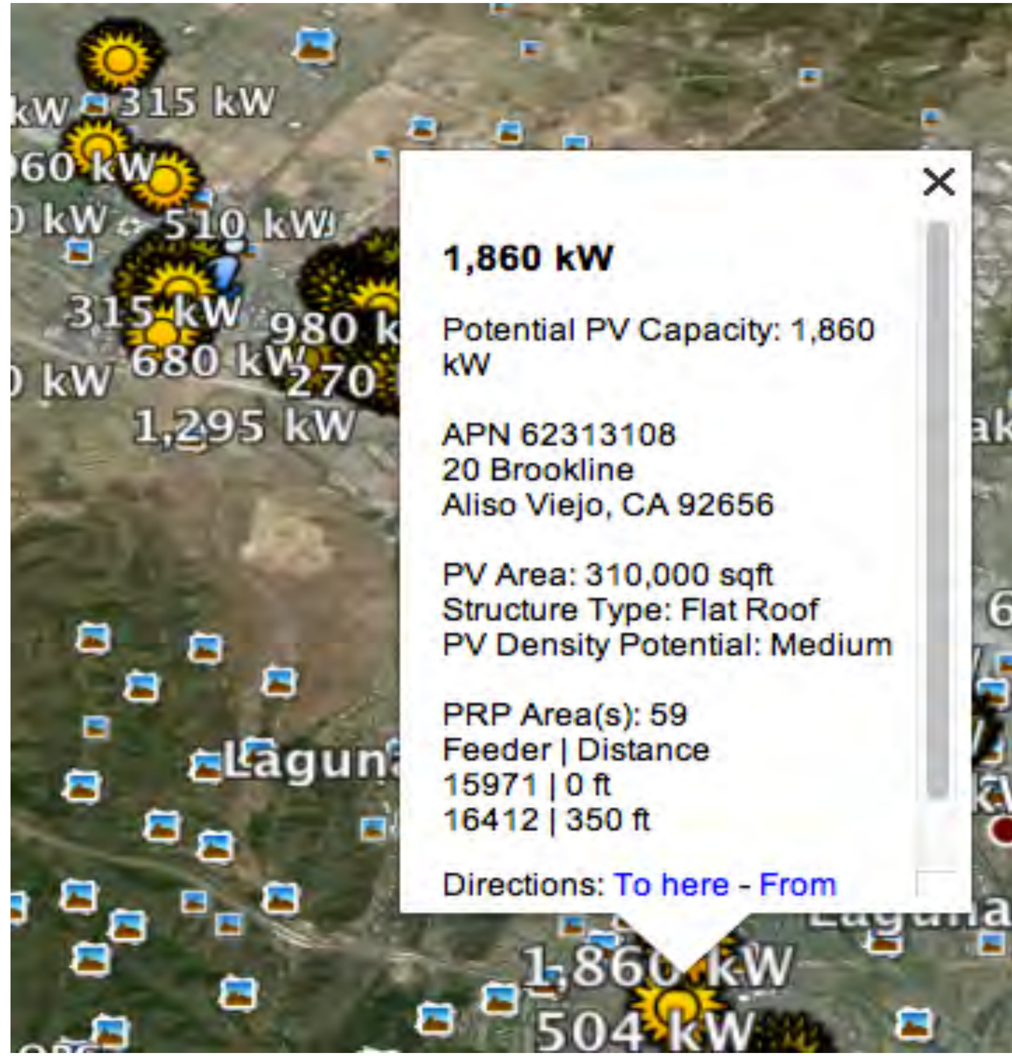
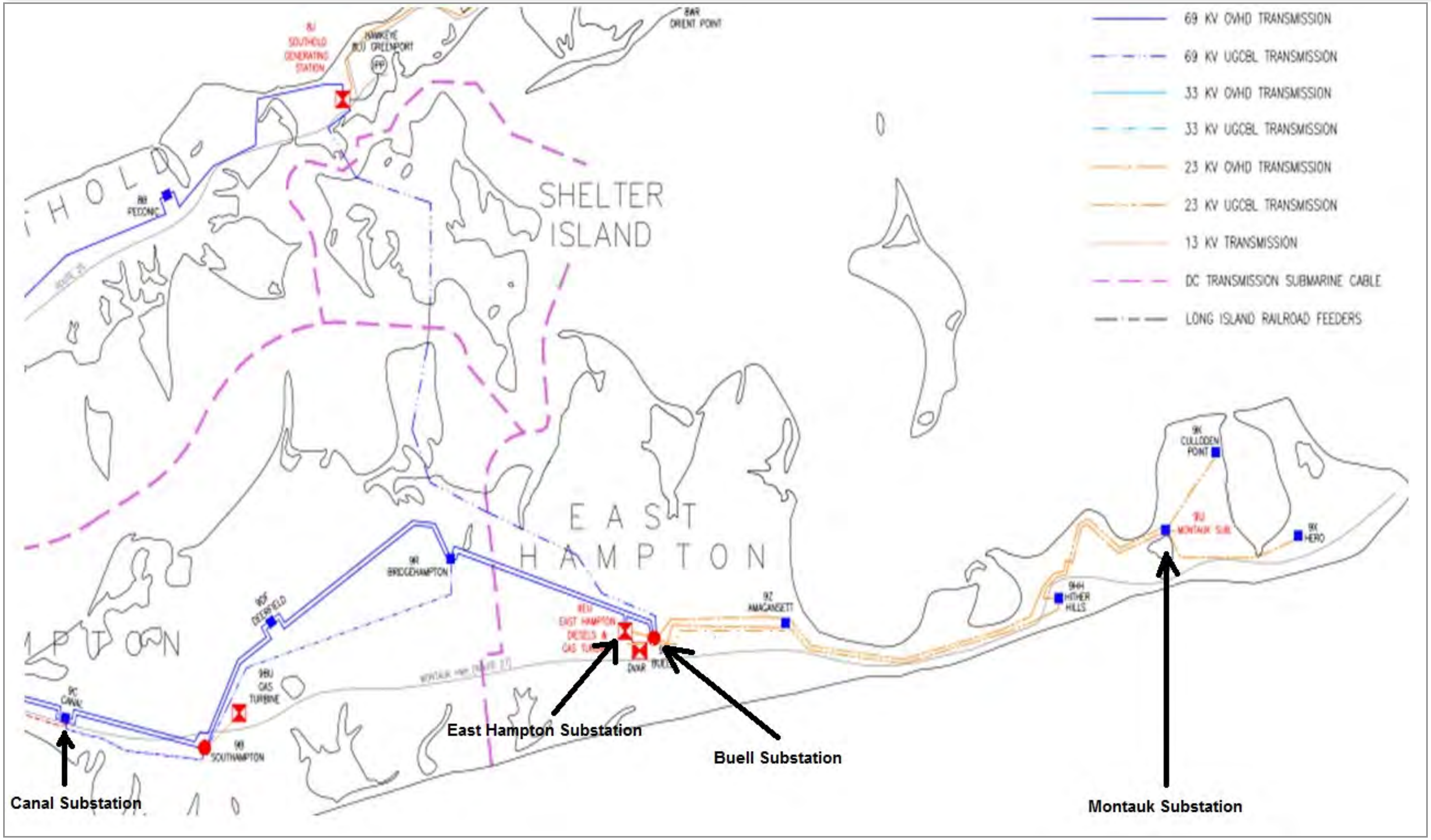
- Identified over 160 MW of technical solar potential within the PRP grid area
- Assessed large commercial rooftops with at least 500 kW of potential
- Provided the following details for each site: address, generation potential, distance to closest feeder, available square footage for PV, installation-type, etc.



Implementing local capacity

South Fork Transmission System



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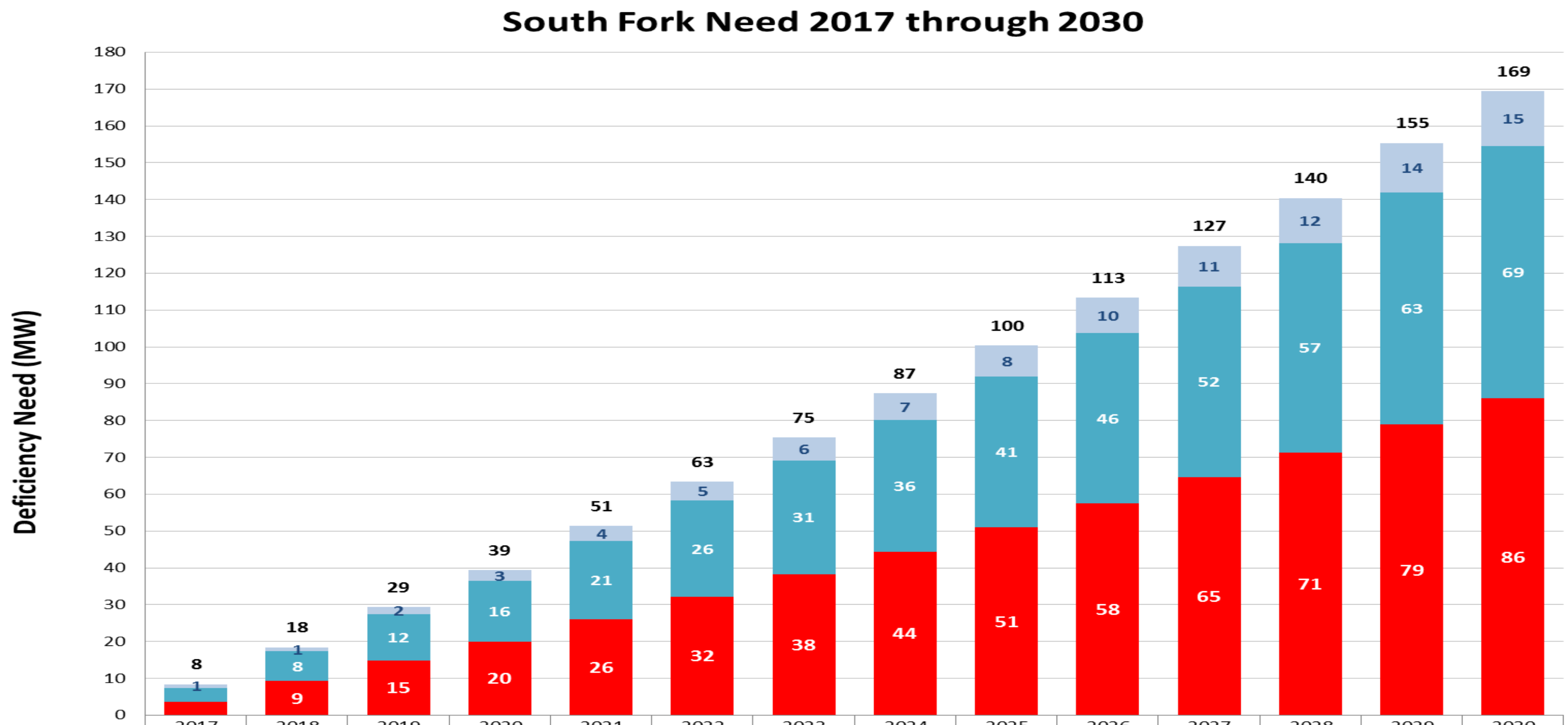
South Fork – Forecasted Deficiency



	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Need E/O Amagansett Only	1	1	2	3	4	5	6	7	8	10	11	12	14	15
Need at Buell/E. Hampton or East	4	8	12	16	21	26	31	36	41	46	52	57	63	69
Need E/O Canal	4	9	15	20	26	32	38	44	51	58	65	71	79	86
Total SF Need	8	18	29	39	51	63	75	87	100	113	127	140	155	169

Request for Proposals (RFP) for South Fork are seeking 63 MW of capacity

Step 1 - Long Island Power Authority's solar FIT

Clean Coalition

- Supported Long Island Power Authority (LIPA) in design and implementation of its Clean Solar Initiative – a FIT program – to bring 150 MW of local solar online
- Locational premium of 7¢/kWh offered to solar projects at critical points on LIPA's grid to $84m in transmission investment deferrals; expecting a net savings of $60m over the 20 year contract term

Step 2 - Long Island Community Microgrid Project

Clean Coalition

- 15 MW of local solar (via Feed-In Tariff) combined with a 5 MW / 25 MWh battery system
- Almost 50% of total annual energy from local renewables while minimizing use of existing fossil generators, including local diesel peakers and backup facilities
- NY Prize Community Microgrids Competition grant award. Collaboration with PSEG Long Island, Long Island Power Authority (LIPA), and NYSERDA covering a substation in East Hampton, NY that serves thousands of customers.
- Indefinite and ongoing power backup to multiple critical facilities, including a fire station and two water pumping/filtration facilities
- Establishes replicable transmission and fossil generation alternative model

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Community Microgrids in Six Steps

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1. Goals:

Desired goals and performance metrics of the target grid area based on local resources and known or anticipated grid issues.

Includes renewables penetration goals, grid reliability & power quality performance targets, and power backup requirements.

2. Baseline Grid Analysis:

Inventory of the existing grid assets including load profiles, voltage regulation, feeder and transformer capacities, and existing generation.

Includes identifying prioritized services that require backup power during outages.

3. Renewable Siting Survey:

Comprehensive survey of the renewable energy potential in the target grid area specific to local resources & site characteristics.

Informs other requirements such as energy storage capacity needs and control system functionality.

4. DER Optimization:

Design of optimal DER portfolios combining renewables, energy storage, and demand response.

Incorporates Baseline Grid Analysis and Renewables Survey to achieve optimal outcomes based on local resources and grid assets.

5. Economic Analysis:

Full analysis of the cost-benefits and net value including reductions in T&D investments, ratepayer benefits, and local job creation.

Includes bulk procurement & interconnection that achieve a "plug-and-play" model, further reducing costs.

6. Deployment Plan:

Final system design, financial model and operational plan for the Community Microgrid.

Includes vendor analysis (e.g. RFIs, RFPs) appropriate to the final design criteria, financial model, and operational requirements.

Result: Distributed energy resources can deploy at scale in months rather than years.
A massive acceleration of "one rooftop at a time…"