



# California's Distributed Energy Future

Presentation to the  
Distribution System Collaborative

Matthew Tisdale

11.9.16





# Our Objective



Modernize distribution system to accommodate expected DER growth through two-way power flow



Enable customer choice of new electric DER technologies and services



Identify and develop opportunities for DERs to realize grid benefits



Distributed Renewable Generation



Energy Storage



Energy Efficiency



Demand Response



Electric Vehicles

## AB 327 (Chaptered 2013)

Electrical corporations shall prepare distribution resource plans to identify optimal locations for distributed energy resources (Section 769(b)(1))

Identification of tariffs, contracts, or other mechanisms for the deployment of cost-effective distributed resources (Section 769(b)(2))

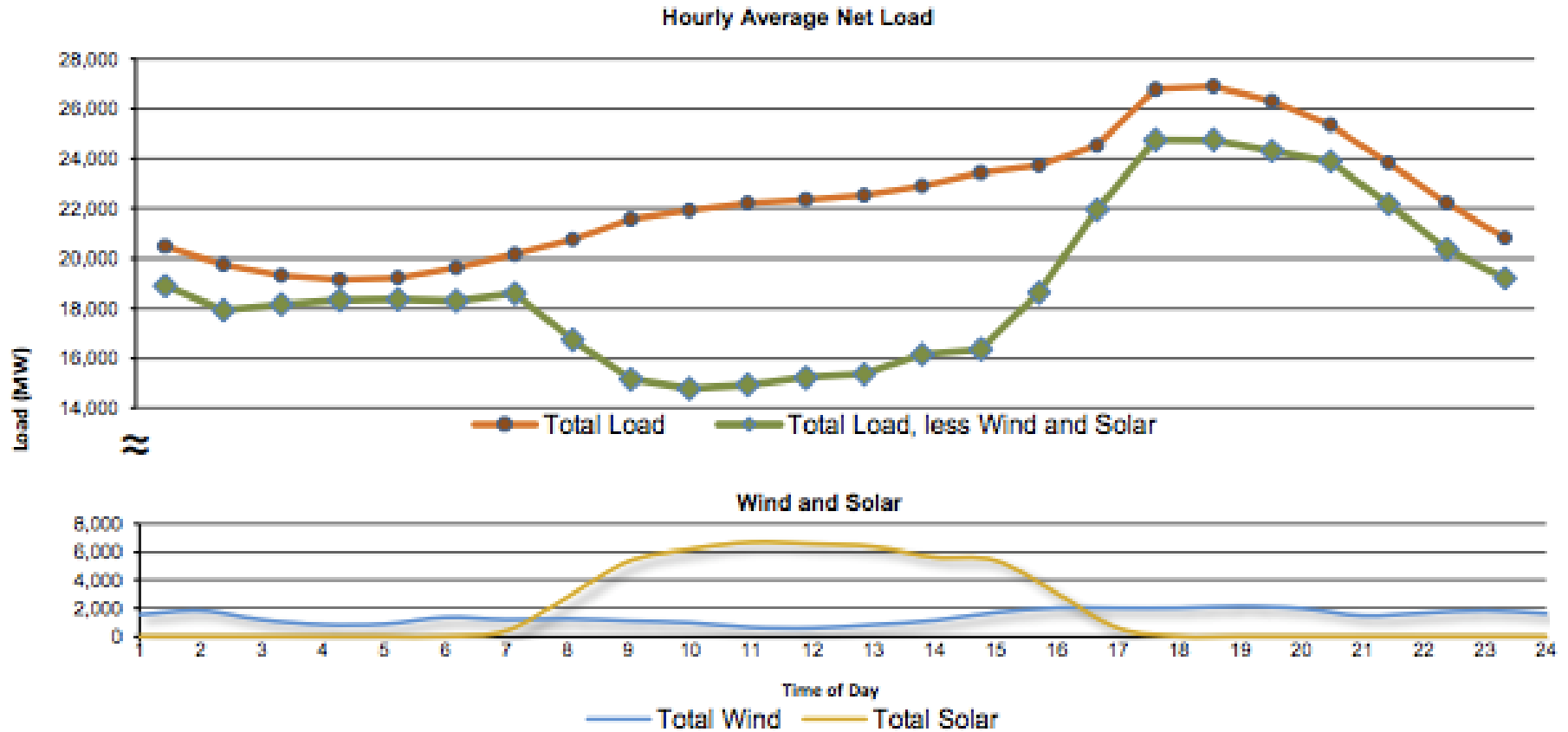
Cost-effective methods of coordinating existing commission-approved programs, incentives, and tariffs to maximize the locational benefits and minimize the incremental costs of distributed resources (Section 769(b)(3))





# Why Distribution Planning?

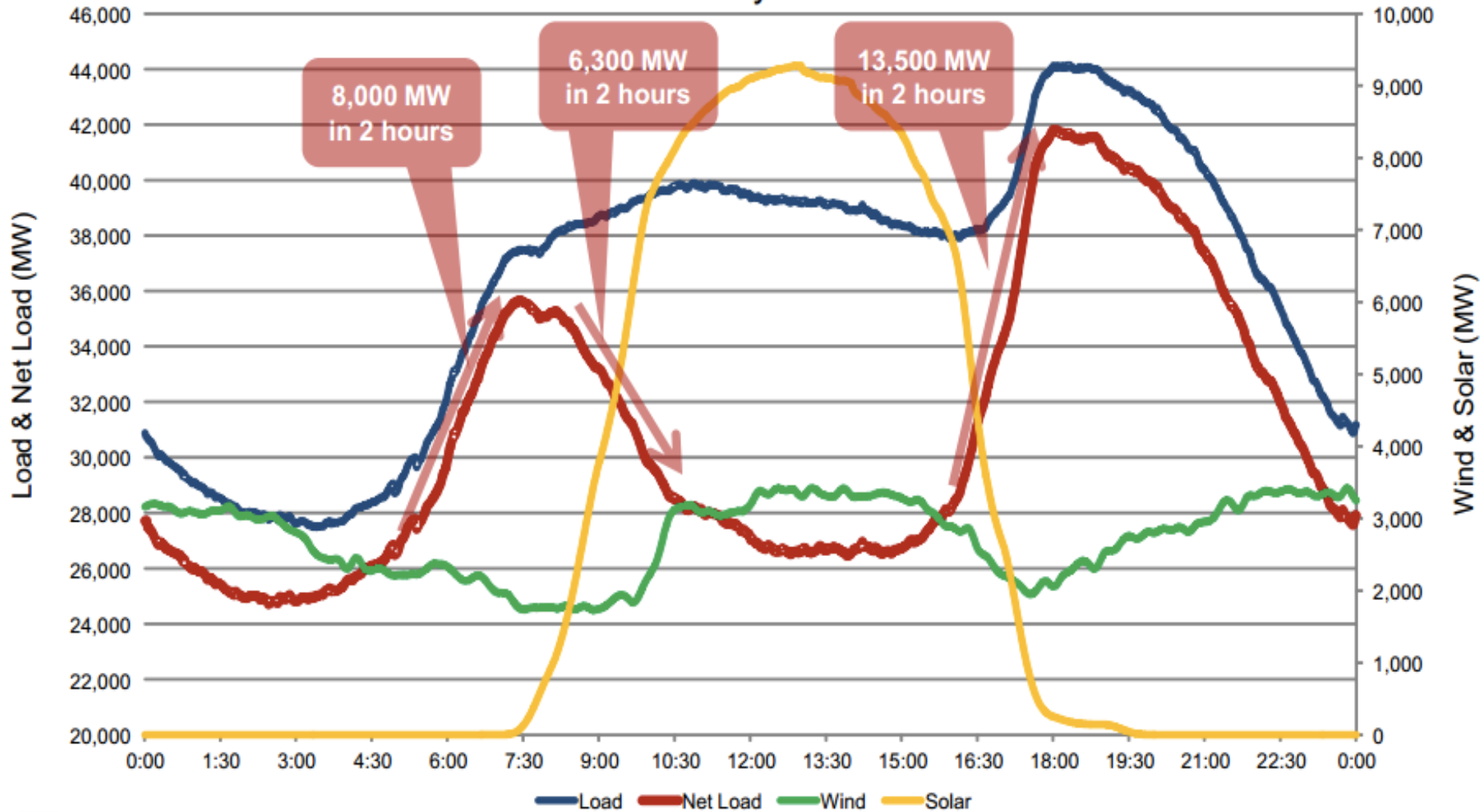
## Reason 1: Enabling GHG reductions through increased renewable integration



Monday, November 6, 2016



## CAISO Load, Wind & Solar Profiles – High Load Case January 2020



# Why Distribution Planning?

Reason #2: Targeting ratebase to increase economic efficiency

Figure 1.4: 2015 Ratebase

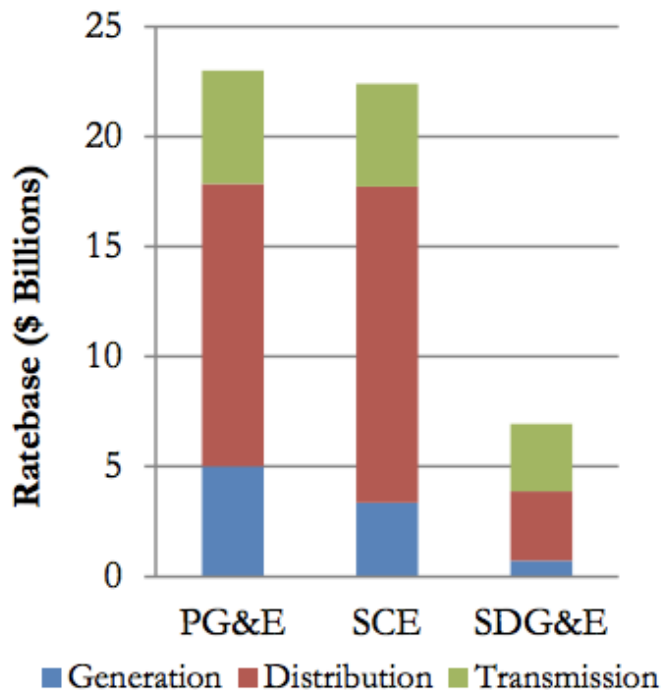
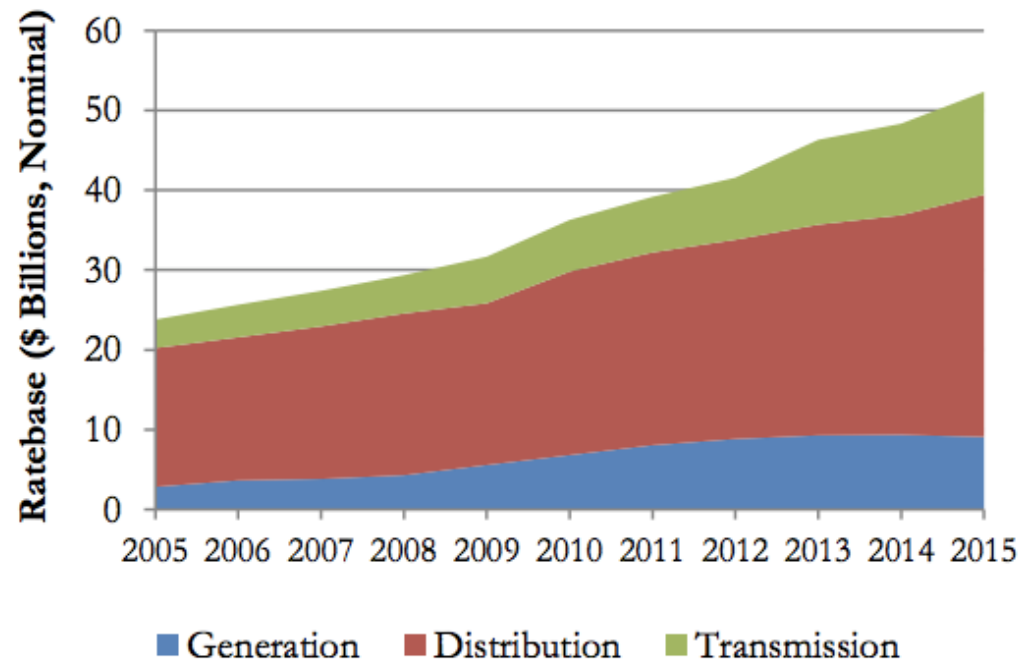


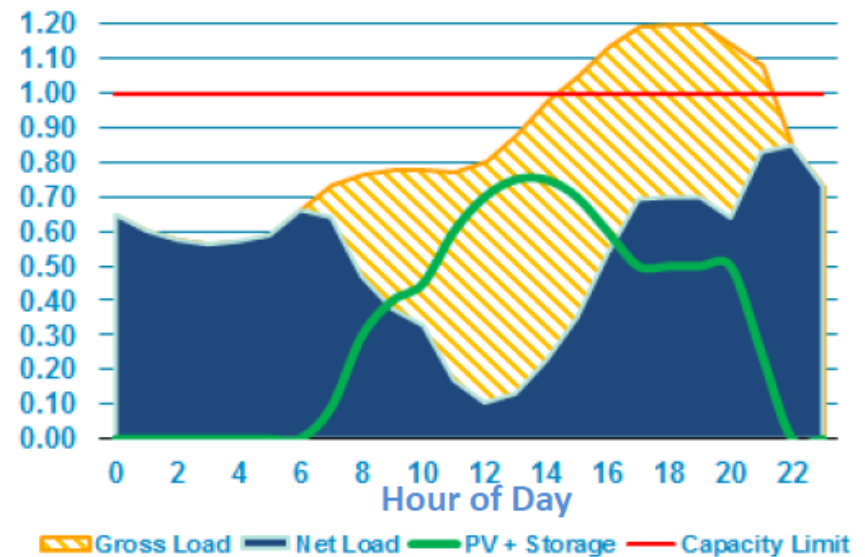
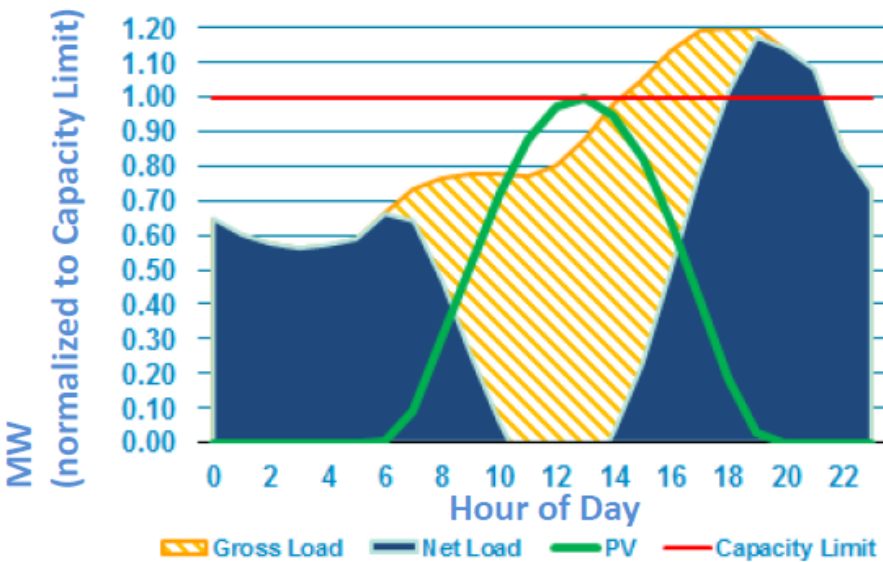
Figure 1.5: Trends in Ratebase



# DER Targeting Distribution Needs

**Determining DERs' Impact:** Distribution engineering tools are used to determine DERs' ability to meet criteria for

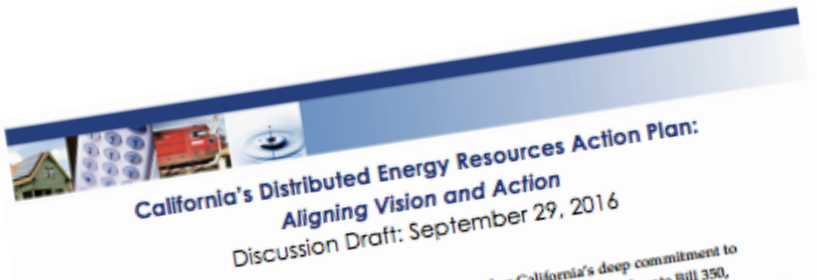
- Right Time (Coincides with a deficiency that requires investments)
- Right Availability (Performs in hours that coincide with deficiency)
- Right Location (Can be connected at a location that mitigates deficiency)
- Right Size (Can assure magnitude of impact is sufficient to mitigate deficiency)



Source: PG&E Distribution Resource Plan



# CPUC DER Action Plan



## Introduction

The California Legislature recently enacted legislation to further California's deep commitment to reducing greenhouse gas emissions and deploying distributed energy resources. Senate Bill 350, approved by the Governor in 2015, commits California to reduce 2030 greenhouse gas emissions (GHG) by 40% below 1990 levels, increases to 50% the share of electricity to be produced by renewable generation, doubles targets for energy efficiency, and encourages widespread transportation electrification. Assembly Bill 327, approved by the Governor in 2013, requires reform of utility distribution planning, investment, and operations to "minimize overall system cost and maximize ratepayer benefits from investments in preferred resources," while advancing time- and location-variant pricing and incentives to support distributed energy resources.<sup>1</sup>

Distributed energy resources (DER), which are defined as distribution-connected distributed generation resources, energy efficiency, energy storage, electric vehicles, and demand response technologies, are supported by a wide-ranging suite of California Public Utilities Commission (Commission) policies.<sup>2</sup> The Commission is actively considering augmentations and refinements to many of these policies in Commission proceedings.<sup>3</sup> This DER Action Plan (Action Plan) seeks to align the Commission's vision and actions to shape California's distributed energy resources future.

Senate Bill 350 requires the Commission to implement an integrated resource plan (IRP) process to identify optimal portfolios of resources to achieve the state's GHG goals and meet the challenge of renewable integration, and DERs will play an important role.<sup>4</sup> The Commission anticipates that this Action Plan will inform, and be guided by, IRP as that process takes shape.

At the July 14, 2016 voting meeting, the Commission adopted fifteen strategic directives to guide staff activities throughout the agency. This DER Action Plan furthers several of those directives. Specifically, accomplishing the vision described in the Action Plan will support the directives related to rates and affordability, climate change, environmental sustainability, economic prosperity, and coordination with other governmental entities.

## Purpose

This DER Action Plan continues the Commission's support of DER, accomplishing four objectives:

- 1) Provide a long-term vision for DER and supporting policies;
- 2) Identify continuing efforts in support of the long-term vision;

<sup>1</sup> Public Utilities Code §16964  
<sup>2</sup> See Appendix A, a table of existing DER enabling mechanisms.  
<sup>3</sup> See Appendix A, a table of existing DER enabling mechanisms.  
<sup>4</sup> Distributed Resource Plans R.13-09-023; Integrated Distributed Energy Resources R.12-04-025; Energy Efficiency R.13-02-021; Energy Storage Assistance Programs R.13-02-022; Demand Response R.13-09-021; Distributed Generation R.11-11-025; Energy Storage R.12-03-025; Alternative Fuel Vehicles R.13-10-027; Combined Heat and Power R.13-02-023; Renewable Portfolio Standards R.13-02-021; Time of Use R.13-02-022; Recombinant Rate Schedule R.13-09-021; Net Energy Metering R.13-02-023  
<sup>5</sup> Public Utilities Code §169.51 and §169.52

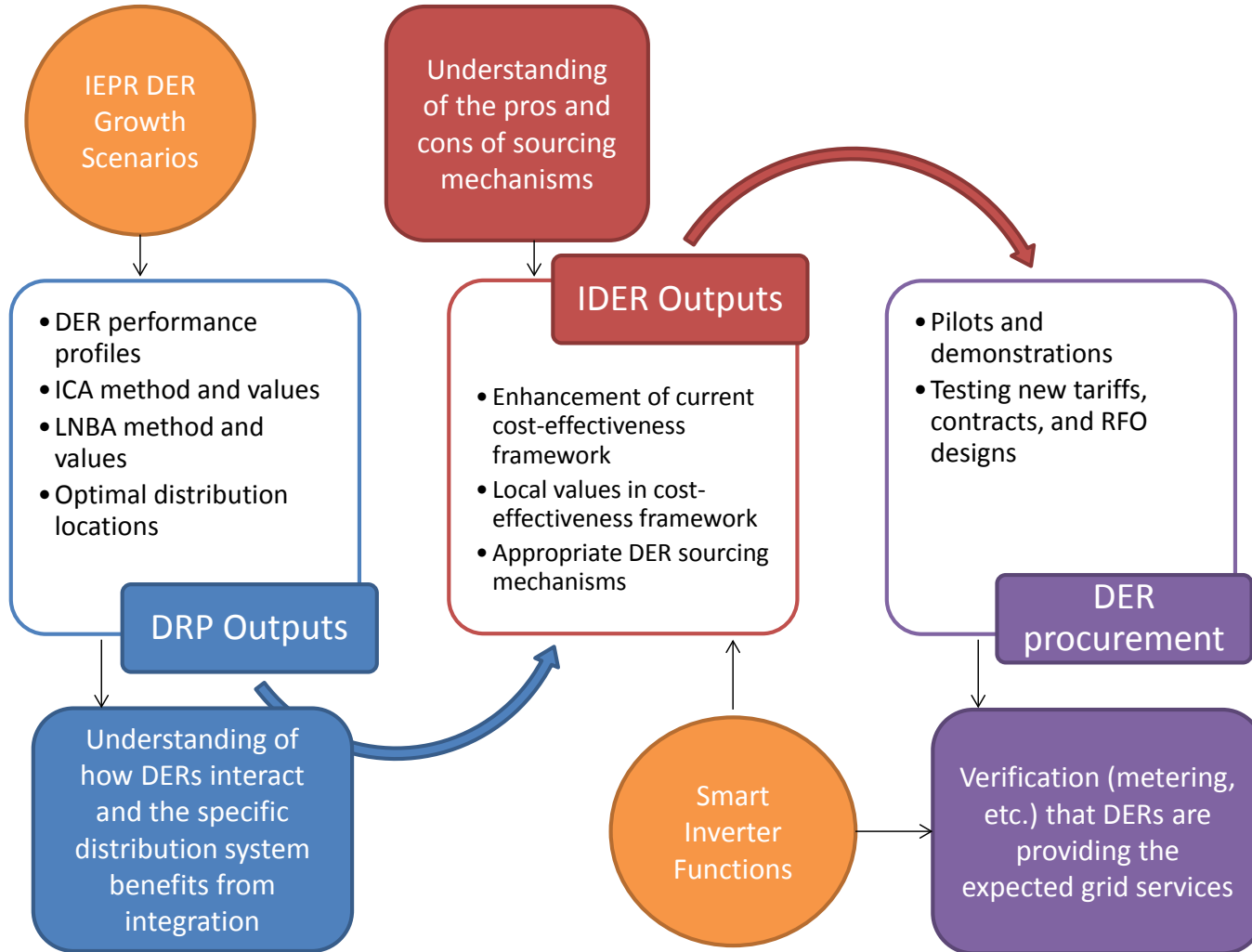
*This DER Action Plan will serve as a roadmap for decision-makers, staff, and stakeholders working in support of California's DER future in order to facilitate proactive, coordinated, and forward-thinking development of related DER policy.*







## DRP – IDER High-Level Relationships





Thank you!



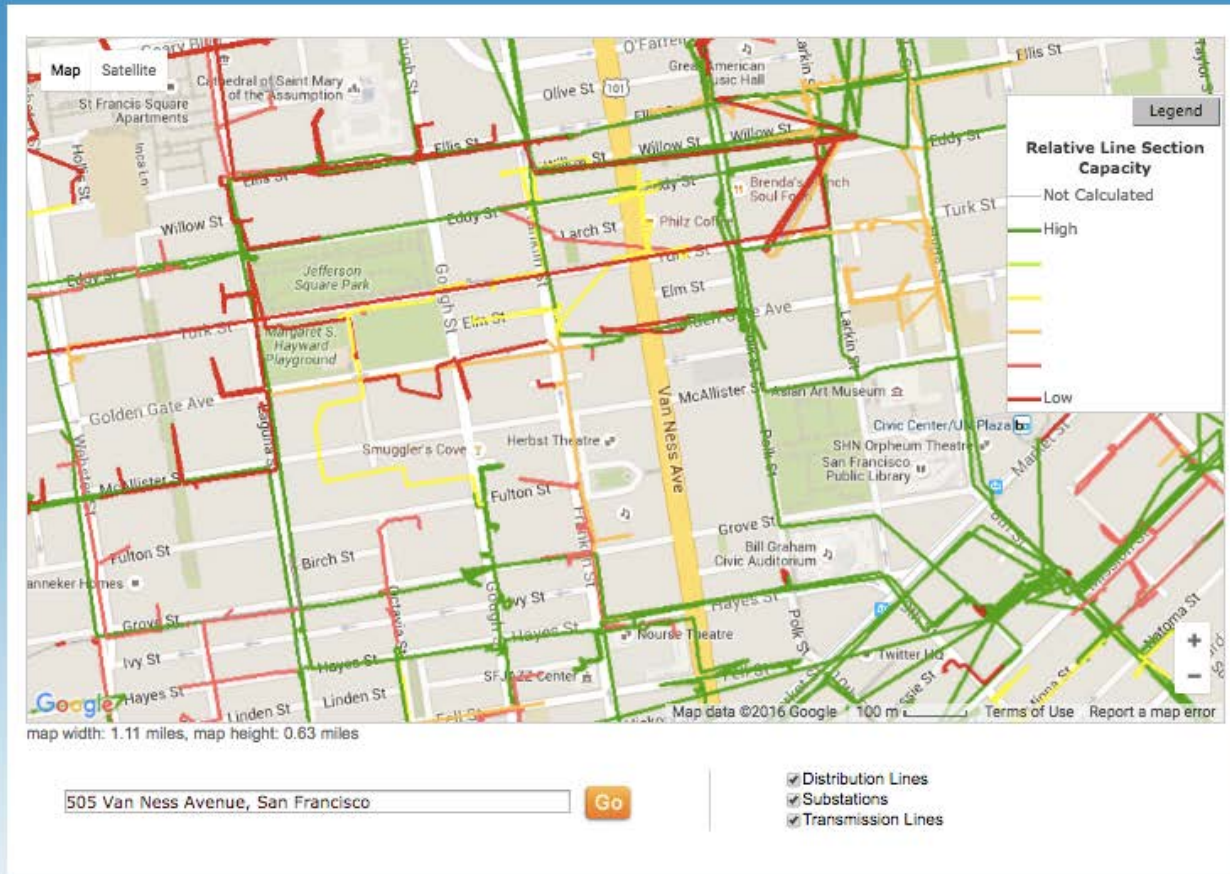


# Analyzing Grid's DER Capacity



## Solar Photovoltaic (PV) and Renewable Auction Mechanism (RAM) Program Map

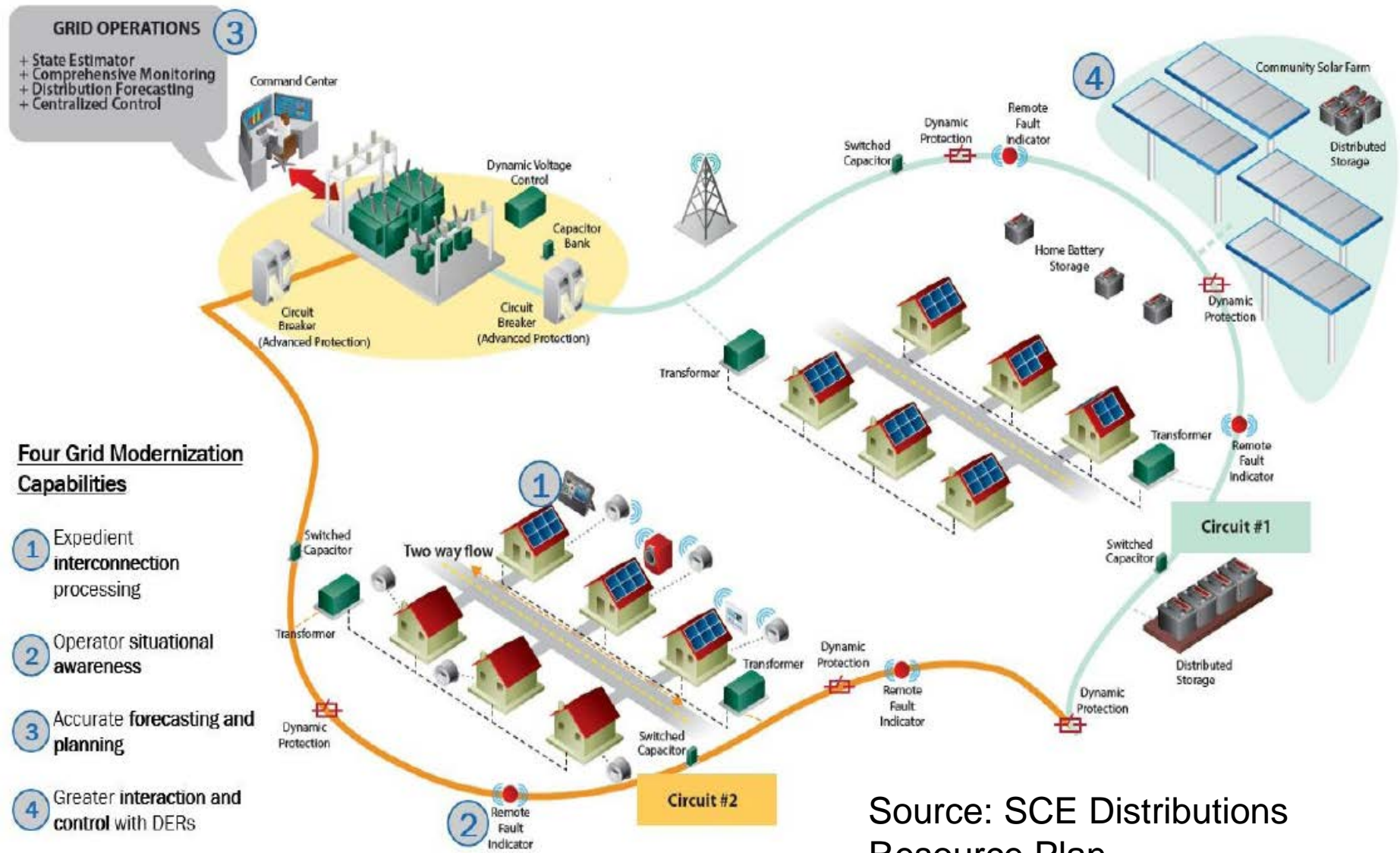
[Help](#) | [Contact Us](#) | [Log Out](#)



Source: PG&E Website, Solar Photovoltaic (PV) and Renewable Auction Mechanism (RAM) Map



# The Grid of Our Future



Source: SCE Distributions Resource Plan



## CPUC DER Reference Proceedings

- Distribution Resource Plans (R.14-08-013)
- Integration of Distributed Energy Resources (R.14-10-003)
- Alternative Fueled Vehicles (R.13-11-007)
- Demand Response (R.13-09-011)
- Distributed Generation (R.12-11-005)
- Energy Efficiency (R.13-11-005)
- Energy Storage (R.10-12-007)
- Smart Grid (R.08-12-009)
- Water-Energy Nexus (R.13-12-011)
- Energy Upgrade California Marketing Education & Outreach (A.12-08-008)
- Residential Rate Reform (R.12-06-013)

