More Than Smart

Overview of Discussions Q3 2014 thru Q1 2015

Volume 1 of 2

March 31, 2015

GREENTECH LEADERSHIP GROUP

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About Us

- **Greentech Leadership Group** (GTLG) is a California 501(c)(3) non profit organization focused on bringing industry and policy-makers together on cutting edge environment and energy topics. http://greentechleadership.org/
- GTLG teamed with Caltech's Resnick Institute in 2013 to develop the "**More than Smart**" (MTS) effort with the support of the Governor's Office. MTS has facilitated an ongoing open dialog among leading industry, non-profits and government leaders to identify how to integrate more DER into CA's grid more effectively.
- **California Institute of Technology** (Caltech) is a world-renowned research and education institution located in Pasadena, where extraordinary faculty and students seek answers to complex questions, discover new knowledge, lead innovation, and transform our future. Caltech was recently named the world's top university for the third year in a row.
- **Resnick Sustainability Institute** is Caltech's studio for sustainability—where rigorous science and bold creativity come together to address the toughest problems that must be solved in order to change the balance of the world's sustainability. http://resnick.caltech.edu/

Introduction

- These volumes of slides represent a summary of the MTS Working Group discussions regarding the evolution of distribution planning in CA to implement the §769 requirements.
- The large number of slides involved necessitated separating into multiple volumes.
  - Volume 1 is provides the context for MTS, the foundational and other key topics related to the new distribution planning process.
  - Volume 2 is focused on the new distribution planning process defined through the MTS WG.
  - Subsequent volumes will be published as MTS WG milestones are reached.
- This compendium includes slides used in the MTS WG over the past nine months to facilitate and summarize discussion.
- The purpose of this volume is to provide a source of information that may be useful to other states/countries considering the need to advance distribution planning to integrate DER at scale and realize its net value potential.
- The views expressed in these slides are those of the MTS WG and do not necessarily reflect the position or policy of the participating organizations or the State of California (except as clearly identified.)

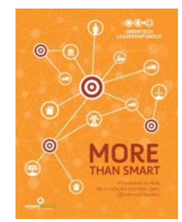
Vol. 1 Topics

- History & California Context
- Purpose & Objectives
- Value of Grid
- DPP Process Alignment Considerations
    - (highlights of current discussion)
- DER Services & Sourcing Structures
    - (framing and highlights of current discussion)

History & Context

More Than Smart Evolution

Discussion of a holistic systems engineering approach to enable scaling renewable and distributed resources in California began at Caltech-Resnick Institute ***Grid2020*** workshop in Fall 2011 – this provided a foundation for the ***More Than Smart*** effort

Oct 2011	Sep 2012	Oct 2013	Jun 2014	Jul 2014	Aug 2014	Oct 2014
Grid2020 Workshop	 **Grid2020** Caltech Report	**MTS Workshop 1**	**MTS Workshop 2**	**MTS** Working Group	 **MTS** Paper	**MTS Workshop 3**

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Grid2020 Paper Overview

- Purpose:
  - Identify the technology and policy gaps that needed addressing to achieve CA's 2020 climate and energy policy targets regarding renewable and distributed energy resources.
- Participants:
  - Caltech-Resnick workshop held Oct 2011 with about 40 experts from academia, national labs, industry and CA policymakers.
  - Paper developed from workshop discussion notes.
- Paper:
  - Identified need for an integrated approach to scale adoption of renewables and distributed energy resources.
  - Identified key issues that needed to be addressed in the development of an integrated grid in California and generally applicable elsewhere.


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Grid 2020
Towards a Policy of Renewable and Distributed Energy Resources
Resnick Institute Report
September 2012

CA Distribution System Related Policies

The following list highlights California policy and CPUC proceedings related to distribution planning, design-build, operations and integration of DER. This is only a representative list to show the range and diversity of policy that directly or indirectly impacts the distribution system.

California Policies (sample)

- AB 32; California Global Warming Solutions Act
- SB1X 2; 33% RPS standard by 2020
- State Water Board Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling; (Once Through Cooling)
- Title 24; Residential & Commercial ZNE building codes
- Executive Order B-16-2012; Electric Vehicle and Zero Emissions Vehicle targets
- AB 758; Energy Efficiency Law
- AB 2514; Energy Storage goals
- SB 17; Smart Grid Systems
- AB 327; Changes to Public Utilities Code Section 769
- AB 340; Electric Program Investment Charge (EPIC)

CPUC Regulatory Proceedings (sample)

- IOU General Rate Cases
- 08-12-009 Smart Grid (annual plan submissions)
- 10-12-007 Energy Storage
- 11-09-011 Interconnection OIR
- 11-10-023 Resource Adequacy & Local Procurement
- 12-06-013 Residential Rate Design
- 13-12-010, 12-03-014, 10-05-006 Procurement Policies & Long-term Procurement
- 13-09-011 Demand response
- 13-11-007, 09-08-009 Alternative Fueled Vehicles
- 13-11-006 Operational Risk-based Decision Framework
- 1405003/4/5 Investor-Owned Utility EPIC Triennial Investment Plans

Section 769: Distribution Resources Plan

- Identifies **optimal locations** for the deployment of Distributed Energy Resources (DERs)
  - DERs include distributed renewable generation, energy efficiency, energy storage, electric vehicles, and demand response
- Evaluates **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
- Proposes or identifies **standard tariffs, contracts, or other mechanisms for deployment** of cost-effective DERs that satisfy distribution planning objectives
- Proposes 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
- Identifies **additional utility spending** necessary to integrate cost-effective DERs into distribution planning
- Identifies **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

More Than Smart Paper Overview

- Purpose:
  - Continue the dialog on the evolution of CA’s power system focusing on its role & attributes to enable customer benefits and public policies related to cleaner and distributed resources
- Participants:
  - Developed originally from MTS workshop 1 (~75 people) discussion notes
  - Further refined by feedback from a subset of people (~20) representing a cross section of stakeholders
- Paper:
  - Focus on distribution system holistically from a full lifecycle perspective
  - Broader than PUC 769 scope to explore the interrelationship to other aspects of distribution and interrelationship to customers, DER development, markets, & transmission
  - Provide a framework for the many aspects to consider in development and operation of an enabling distribution platform for customer participation and DER at scale

MTS Purpose & Objectives

Focus: AB327 Distribution Resources Plan

2014- Q1'15

- Identifies **optimal locations** for the deployment of Distributed Energy Resources (DERs)
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MTS WG Overview

Purpose: Provide an open, voluntary stakeholder forum to discuss core issues toward finding common ground regarding the evolution of California's distribution system and the seamless integration of DER to meet customers' needs and public policy. The results of the discussions will be for the benefit of the participants and will be made public without specific participant attribution.

Structure:

- Facilitated working group that is open to any stakeholder
- Discussion notes are produced and made available without individual attribution (Chatham House Rules)
- Summary notes on points of common ground are published on GTLG website
- Participants are free to use materials as desired

Funding:

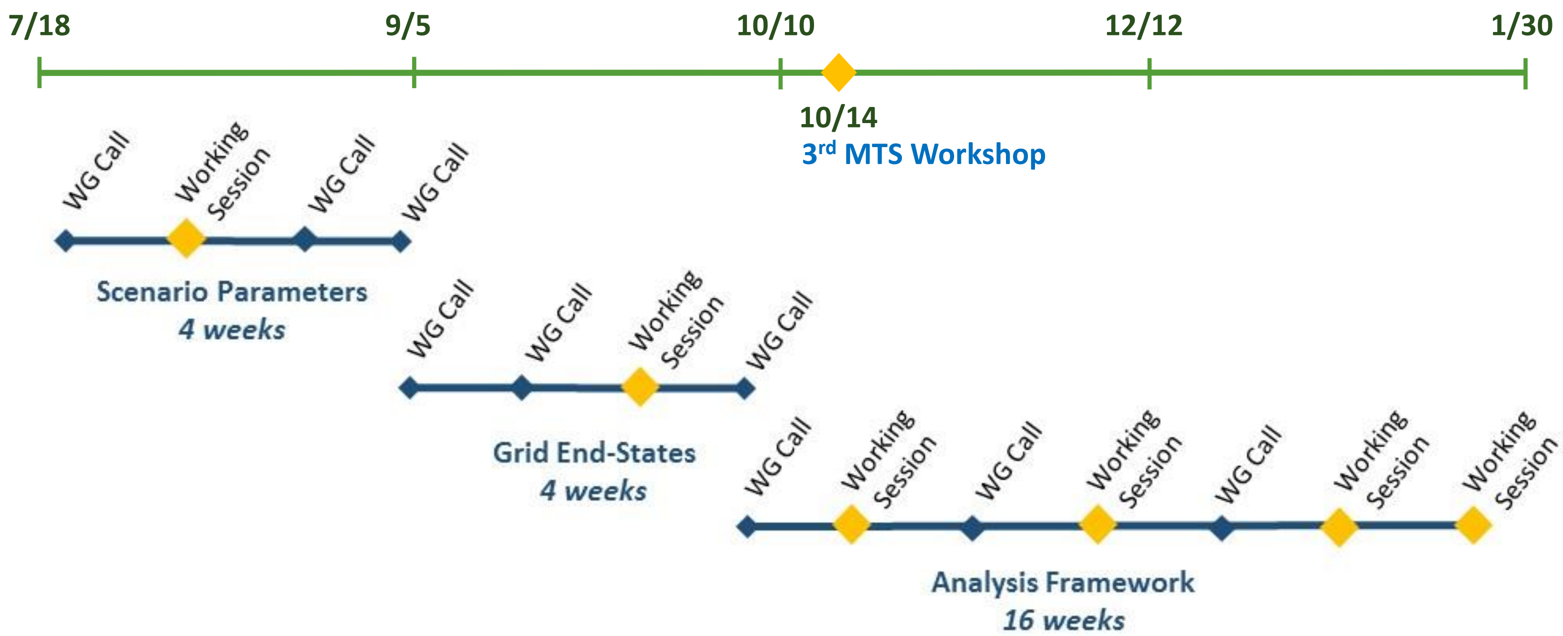
- Facilitation funded by Energy Foundation, PG&E, SCE, SDG&E, SolarCity & Eaton
- Participants have hosted meetings that alternate between SF and SoCal

Table 1: More than Smart Working Group Participants

Petra Systems	Varentec
GridCo	Northern CA Power Association
ICF International	UC Davis Energy Institute
CA Independent System Operator	USD Energy Policy Initiatives Center
Pacific Gas & Electric	Rocky Mountain Institute
Southern California Edison	Inovus Solar
San Diego Gas & Electric	California Energy Storage Alliance
Sacramento Mun. Utility District	Integral Analytics
Burbank Water and Power	Marin Clean Energy
SolarCity	Qado Energy
DECA Power	Electric Power Research Institute
Environmental Defense Fund	NRG
Cal SEIA	Better Energies
Clean Coalition	NextEra Energy
Center for Sustainable Energy	Energy Foundation
Lawrence Berkeley Nat. Laboratory	Siemens
Caltech	Energy Center
SunPower	GridBright
UC CIEE	Strategy Integration
Eaton	Energy Foundation
GTLG	Newport Consulting
Vote Solar	Independent Advocates
Enphase	Advanced Microgrid Solutions

2014/15 Schedule

Focus on Defining Distribution Planning Process & Value Analysis Framework to align with first step in regulatory process



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MTS WG Overview

2014/15 Accomplishments:

✓ Defined the desired distribution grid end-states and identified considerations for grid evolution to meet customers' needs and California's policy objectives.

✓ Define new distribution planning process including:

- Annual Integration Capacity Plans
- Biennial Distribution Resources Plans
- Alignment w/CA statewide planning processes (TPP, LTPP & IEPR)

✓ Defined the integrated engineering-economic framework to conduct distribution planning in the context of AB 327 requirements.

- Defined distribution planning scenarios for DRPs
- Identified & Defined DER Value Components (locational, system-wide and societal)
- Developed a staged approach to DRP implementation
- Defined power system engineering & economic methodology for locational benefits
- Identified DRP planning data requirements

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Value of Grid

Define Distribution Grid End-States

Working Group recognized the need to consider and identify the desired end state for distribution system along with other policy objectives

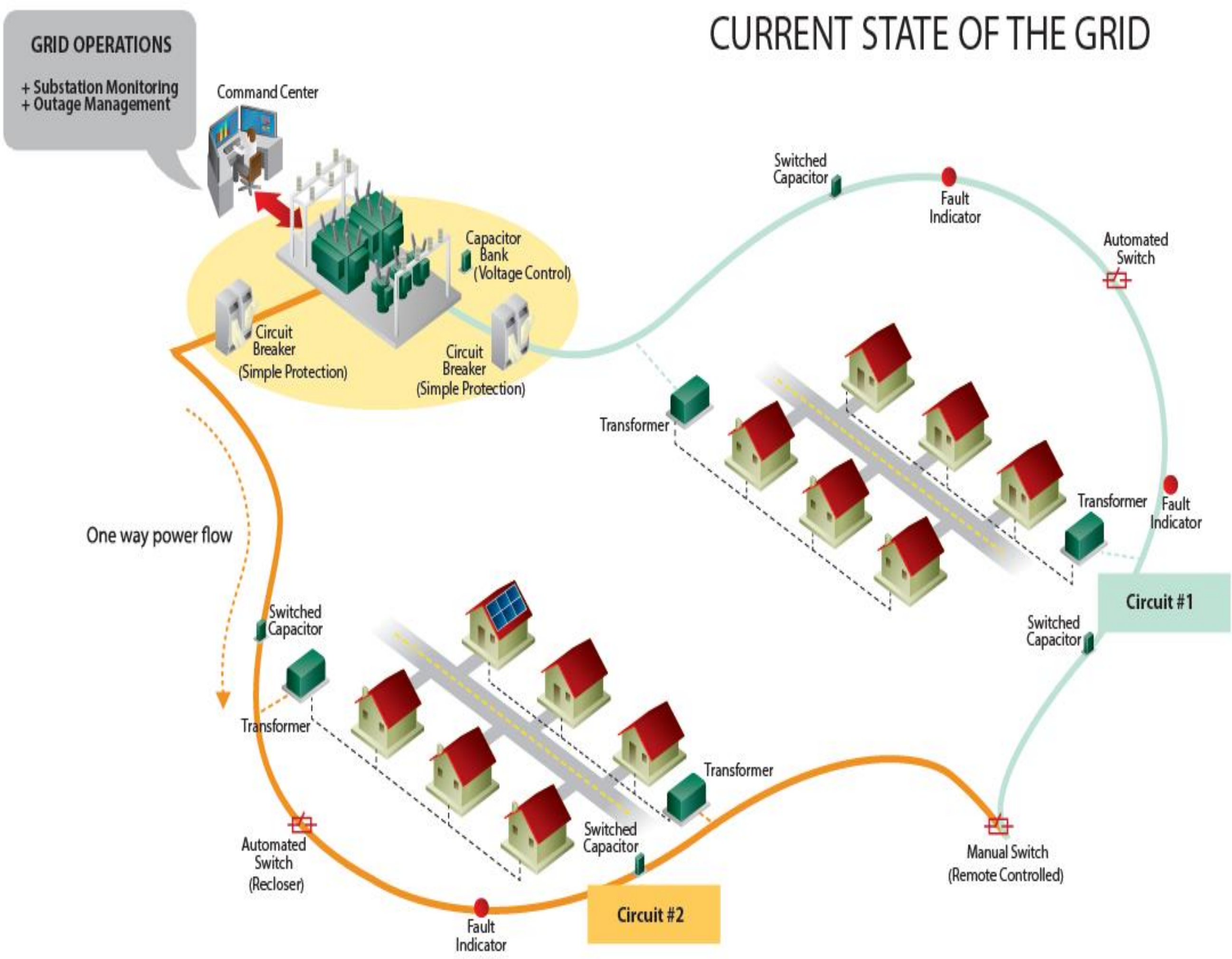
- Define the distribution end-states below in detail sufficient to facilitate discussion of investment plans and scenario implications for the use and functions of the grid.
- Discuss and identify areas for research and development activity to support potential development of network as a platform and convergence end-states.
- Define evolution aspects that would drive when and where the next end-state would evolve

Existing Distribution System: Current Path

More Reliable & Safe + Greater Capacity for DER Interconnection

- Distribution system refresh underway is increasing capacity
  - Continued replacement of aging electric infrastructure
  - Refresh involves upgrading to higher voltage levels in areas with high DER potential
  - Streamlining inventory has standardized on fewer distribution components with slightly larger sizes for wire and transformers, for example
- More Resilient/Reliable/Safe & Visible
  - Extending distribution automation to improve fault isolation and service restoration capabilities
  - Continued upgrades on distribution protection systems (substation communications and analog to digital relays)
  - Integration of field sensors (smart meters, other sensors) into grid operational systems that enable situational intelligence
  - Digitization of field asset information (completing the analog to digital transition)

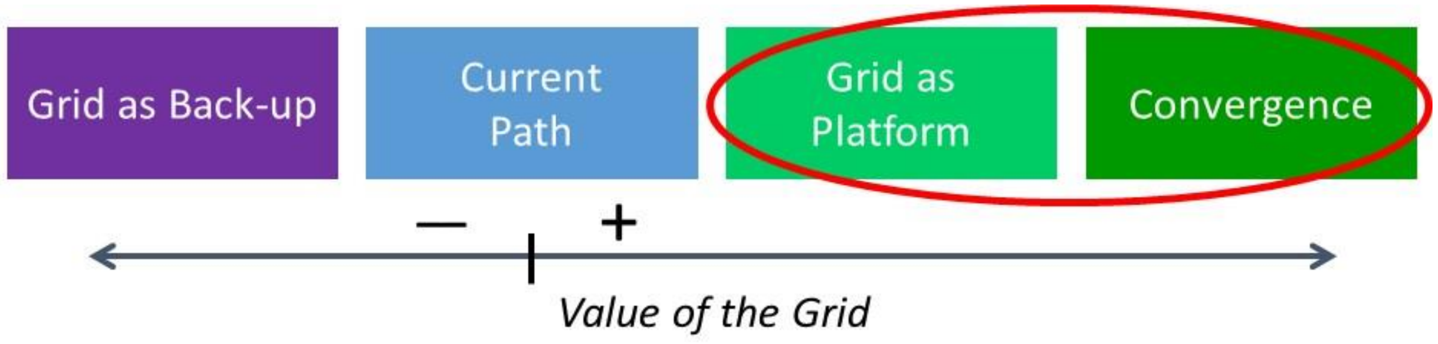
Current Distribution Grid



Current state is based on traditional concepts

- One-way power flow
- Small penetration of intermittent resources
- Focus on flexibility utilizing radial circuit ties
- Straight forward voltage control and protection schemes
- Automation utilized to optimize planning and operations

What Type of Distribution Grid Do We Want?



Seamless:

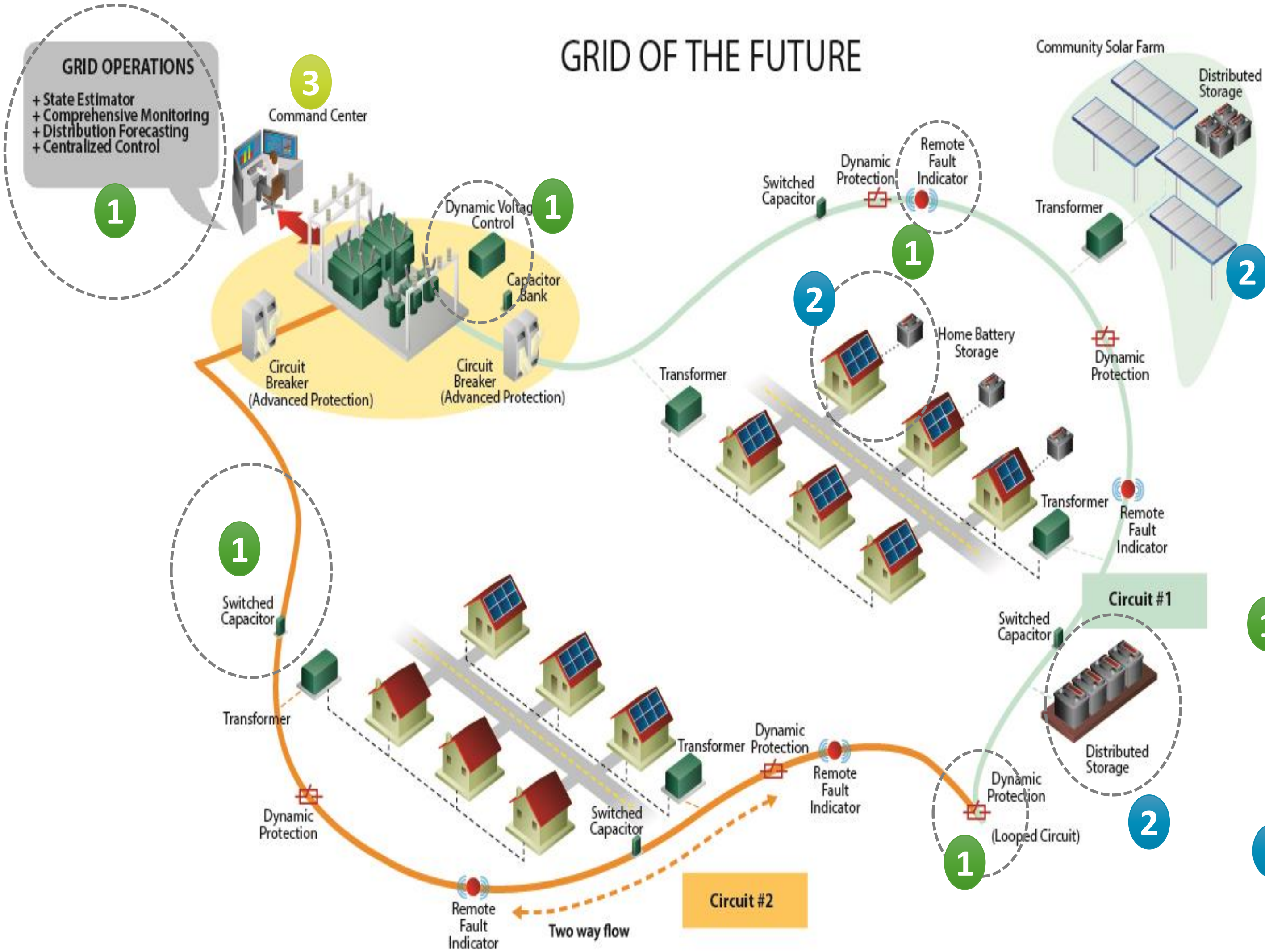
- Enable multi-directional real & reactive power flows
- Enable transactions across distribution with utility distribution company, bulk power operations and wholesale market

Open & Transparent:

- Low barriers to access physical connections & value monetization opportunities
- Streamlined interconnection rules and processes
- Transparent processes for planning and operations
- Access to distribution planning & operational information (qualified access)
- Transparent locational value determination and monetization

Network & Convergent Value:

- Physical and operational qualities that yield greater safety and reliability benefits
- Qualities that may create greater customer/societal value from each interconnected DER (“network effects”)



Future state based on evolving energy landscape

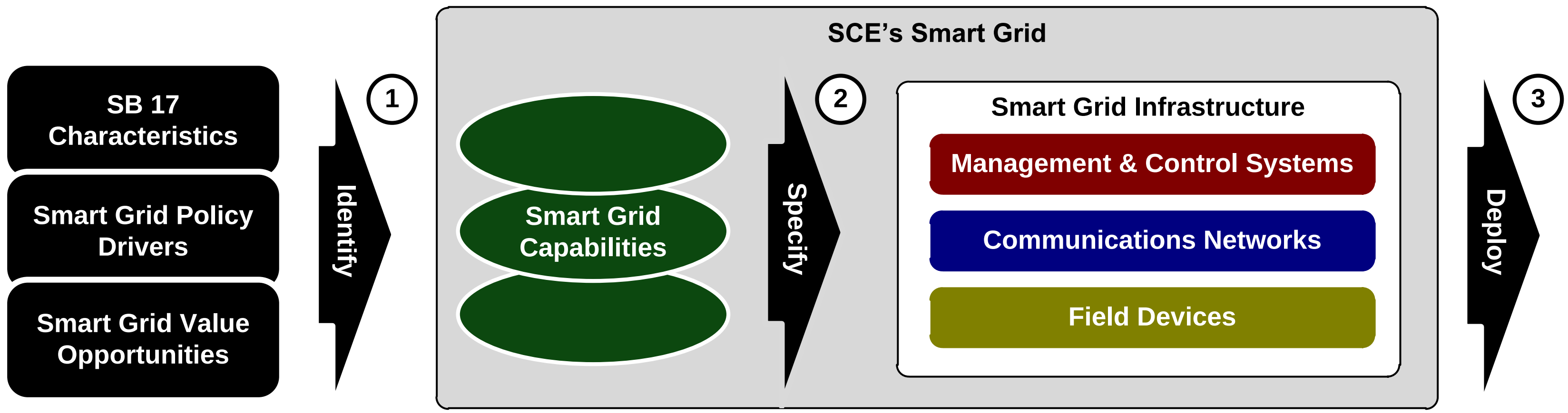
1. More automated and digital, with more sophisticated voltage control and protection schemes
2. Facilitates increasing renewables & two-way power flow
3. Cyber mitigation must be included

Future of distributed solar: not just short-term load reduction in the middle of the day, but a grid resource

CA Smart Grid Characteristics Established in Smart Grid OIR (2011)

1. Be self-healing and resilient
2. Empower consumers to actively participate in the operations of the grid
3. Resist attack
4. Provide higher quality of power and avoid outages
5. Accommodate all generation and energy storage options
6. Enable electricity markets to flourish
7. Run the grid more efficiently
8. Enable penetration of intermittent power generation sources
9. Create a platform for deployment of a wide range of energy technologies and management services
10. Enable and support the sale of demand response, energy efficiency, distributed generation, and storage into wholesale energy markets as a resource, on equal footing with traditional generation resources
11. Significantly reduce the total environmental footprint of the current electric generation and delivery system in California

Further Enhancements Needed



Transitioning to Modernization (2014)

1. Enhance infrastructure to support interoperability of DERs with grid management
2. Improve planning processes and tools to support AB 327
3. Integrate need to procure resources with an evolving integrated grid
4. Identify optimal locations and develop methods to measure, validate effectiveness, and quantify locational costs/benefits

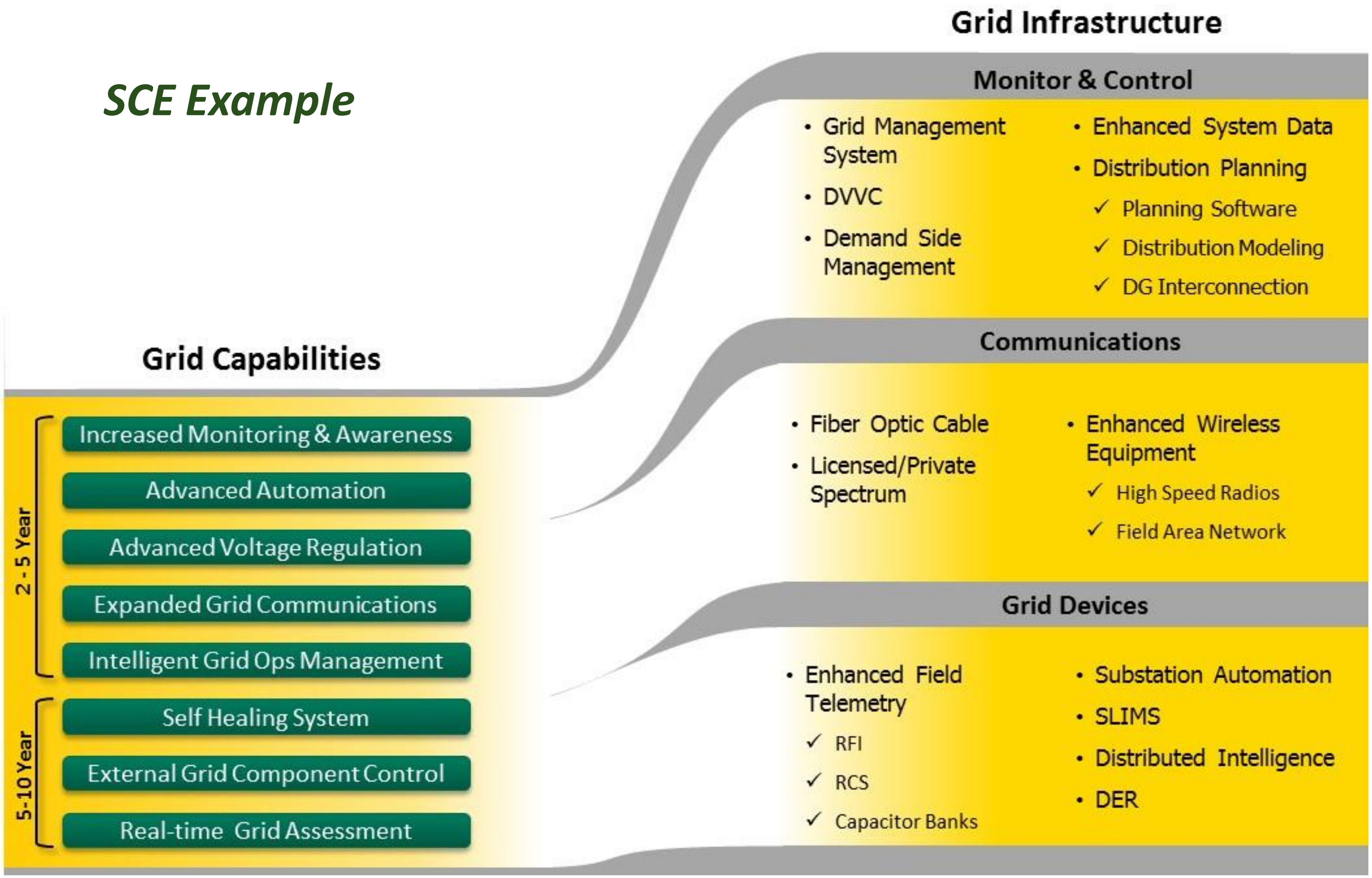
“Least Regrets” Investments

UDC Investments that are fundamental elements of a modern distribution system and necessary to enabling large scale DER integration and value monetization

- Real-time grid sensing
  - Smart metering can provide planning level information regarding load and power quality characteristics (historical 15min or hourly information)
  - Distribution grid sensors (e.g., fault current indicators, inverter output, other sensors) are needed for real-time state information on the distribution system
  - Customer-side DER sensors/measurements devices are needed to augment grid state information, but are not sufficient alone to operate an increasingly stochastic (randomly variable) distribution system.
- Field area communications infrastructure
  - Distribution substation operational telecommunications
  - Field area operational telecommunications network to enable real-time protection and distributed controls
- Situational Intelligence, Grid Optimization and Distributed Controls
  - Situational intelligence systems that integrate various internal and external asset and operational information to create real-time grid state
  - Grid optimization systems that combine grid state with power engineering-economic analytics to support real-time operational decisions
  - Distributed control systems to manage distribution reliability, power quality and integration with bulk power system, for example:
    - Volt/VAr Optimization
    - Distributed Energy Resource Management System (DERMS)

Grid Modernization Framework

SCE Example



Distribution Design-Build Guiding Principles

These Guiding Principles are aligned with relevant federal and state policies, and leverage industry research and best practices as discussed in the MTS WG

Guiding Principles	Potential Requirements
P5: Evolve grid to an open network platform	P5a: Create a node-friendly distribution network that is open, visible, flexible, reliable, resilient and safe P5b: Incorporate full operational risk mitigation considerations into physical designs and protection and control systems leveraging DER/microgrid
P6: Employ flexible designs & layered architecture	P6a: Leverage systems engineering methods to create more flexible designs to address differences in technology lifecycles to mitigate stranded costs P6b: Employ layered, distributed architecture for operational systems to address scale issues involving integration of edge devices
P7: Align deployment timing with customer and policy needs	P7a: Leverage scenario based planning to identify low risk capital investments to keep pace with needs P7b: Identify no regrets utility distribution investments needed in any scenario
P8: Align utility technology adoption	P8a: Establish well defined technology adoption on-ramps into operational deployment P8b: Align EPIC projects, Smart Grid Roadmaps with rate case requests for distribution capital investment

DPP Alignment Considerations
(summary of current discussions)

Distribution Planning Process Alignment

- MTS Working Group recognized the need to align new Distribution Planning Process (DPP) to other CA state-wide planning including:
  - CEC's Integrated Energy Policy Report (IEPR)
  - CPUC's Long-Term Procurement Plan (LTPP)
  - CAISO's Transmission Planning Process (TPP)
- Also, need to align with CPUC ratemaking and rate design processes:
  - IOU General Rate Cases (GRC)
  - Rate-redesign proceedings
  - Energy Efficiency & Demand Response Program funding
- WG is developing draft alignment maps to facilitate discussion among state agencies, CAISO and stakeholders on how the new DPP should align.
- Particular focus is on the information/data that flows into and out of the DPP and the timing of information exchanged.

DPP Alignment Discussion Status

- Subgroup led by L. Kristov (CAISO) is continuing detailed discussion regarding timing and information (type and granularity) dependencies alignment considerations of the key elements of the DPP (i.e., power engineering analysis, integration capacity analysis and the DRP)
- This discussion is also considering the implications of the transition to the ongoing DRP as may occur around 2017-18 as relates to statewide planning and GRC/DSM funding cycles.
- These discussions at the subgroup and with the whole MTS WG are expected to conclude in Q2 2015 with a set of draft alignment maps, recommendations for the state agencies and utilities consideration for further development of an ongoing DPP.

DPP Process Alignment for CPUC, CAISO, CEC

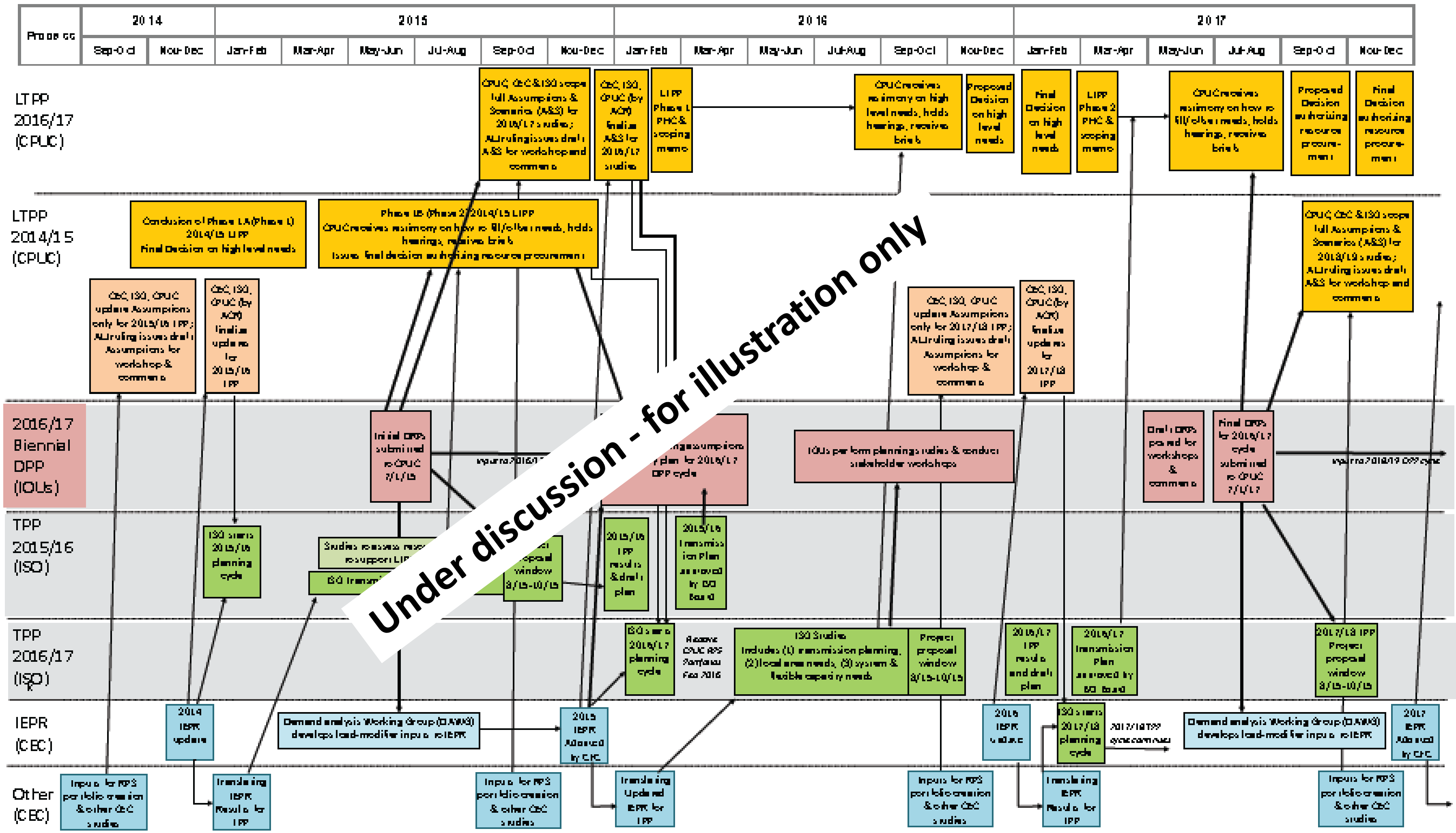
- The new DPP should align with the LTPP-TPP-IEPR timeline
- Main points to consider:
  - When is it optimal to have a new DRP, i.e., the final result of the biennial DPP, to feed into the other processes? That is, where on the alignment timeline do we want the DPP to conclude?
  - What are the key process steps of the DPP, what is the sequence in which they must be performed, and what inputs do they require from other processes?
- Currently, first DRP due in July 2015. If July 2017 is the next deadline then:
  - DRP would provide useful and timely input to the IEPR demand forecast, which is planned to be released in draft form in September 2017 and finalized by December 2017.
  - Likely that July 2015 DPR will not be as informative for the 2015 IEPR, still we should consider to what extent it will inform that forecast.
  - CPUC, CECS, and CAISO will collaborate between September-December 2017 to develop “assumptions and scenarios” for TPP and LTPP for cycles beginning in January 2018.

Bi-annual DPP Alignment w/CA Planning

- DRP Scenarios
  - Use DER adoption scenarios to stress-test existing integration capacity and investment requests in GRC, Smart Grid Roadmaps & EPIC funding requests
    - DRP Scenarios could show shifting RPS, bulk power, and wholesale generation to DG, and its impacts on the larger system.
  - 3 scenarios using a) variant of LTPP "Trajectory" case, b) "High DER" customer adoption, and c) expanded policy driven preferred resources case
  - Time horizons:
    - 10 years at DPA level regarding scenario driven system-wide locational benefits analysis
- Locational benefits conducted at the distribution substation level
  - Feeder level is too granular as the engineering options are considered at the distribution substation level for time periods >2 years
  - Net benefit of deferral of traditional capital investment
  - Net benefit of DER provided operational services (voltage, reactive power, etc.)
- Planning assumptions linked to CPUC/CEC inputs to IEPR/LTPP/TPP for consistency, but:
  - Data and forecasts need to be more granular and linked to distribution infrastructure locations (perhaps a more local forecast required to provide data between the DPP and CEC)
  - RA contribution from DER
  - DER considerations for Transmission deliverability analysis
- Bi-annual DPP Process timing aligned with CA Joint Agency planning schedules to inform process
  - Adapt Joint Agency planning process map elements to identify DPP and GRC linkages

Potential DPP Alignment Map w/CA Planning

Potential Alignment of Biennial DPP with LTPP, TPP and IEPR – DRAFT #3 *1/26/15*



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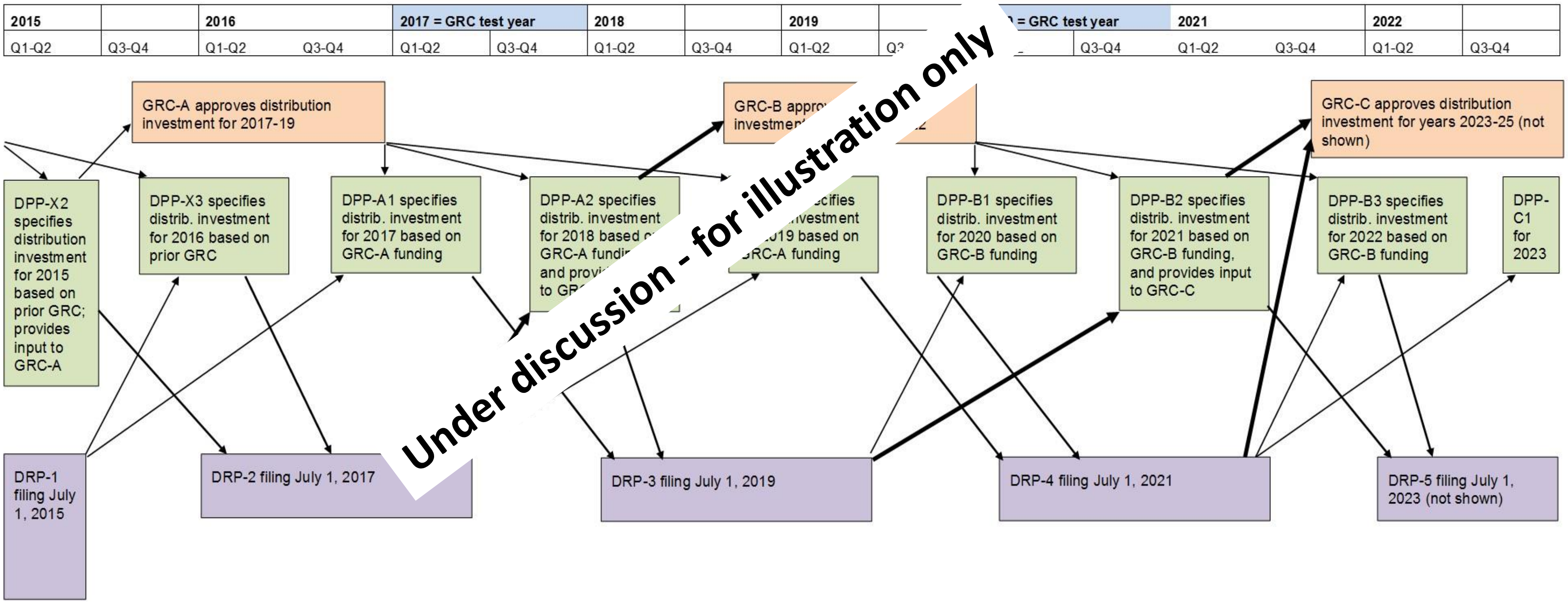
DPP Alignment Map for GRCs (working draft)

GRC (orange) = IOU General Rate Case, 3-year cycle; proceeding begins with IOU filing about 15 months prior to first or "test" year (blue), ends with CPUC decision near beginning of test year.

DPP (green) = Existing IOU annual Distribution Planning Process – runs approximately from October each year to June of the following year.

DRP (purple) = New biennial Distribution Resources Plan process, to be established by CPUC; diagram assumes July 1 will be IOU filing date for future DRP cycles.

Bold arrows indicate linkages from DRP to GRC.



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DER Services & Sourcing Structures

(framing for continuing discussion)

§769 DER Services & Value Realization

Focus on 769 requirements 3 & 4 below

- Identifies **optimal locations** for the deployment of Distributed Energy Resources (DERs)
  - DERs include distributed renewable generation, energy efficiency, energy storage, electric vehicles, and demand response
- Evaluates **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
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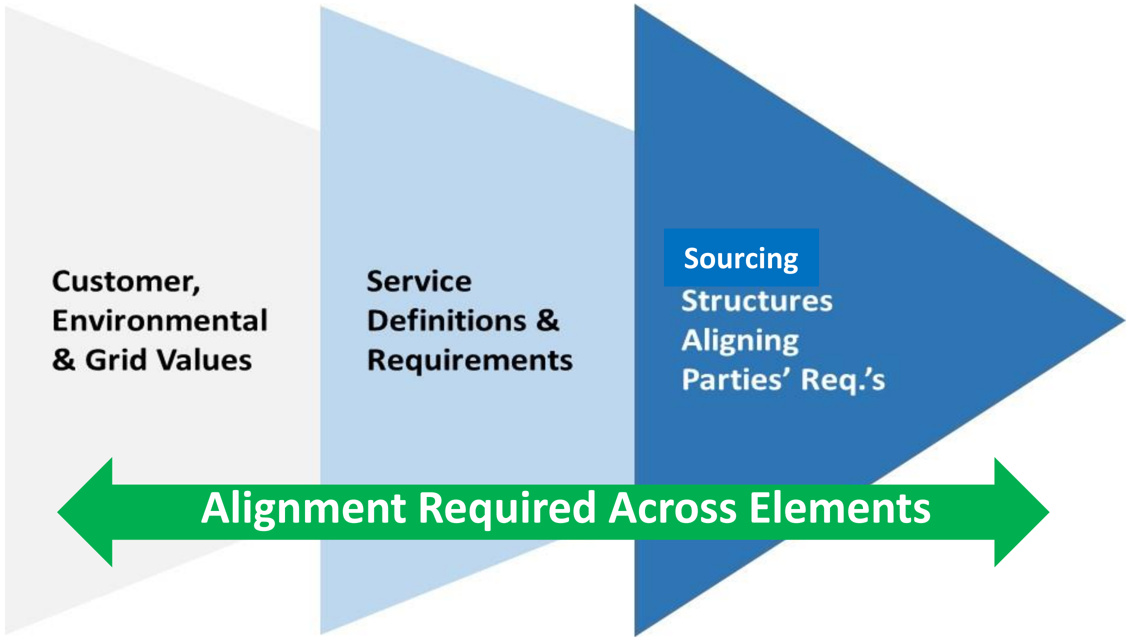
DER Services & Structures Discussion Status

- Subgroup led by P. De Martini (Caltech/Newport) is continuing discussion regarding the definition of services aligned to MTS identified value components and the value realization structures (not unlike most of the distributed market structure discussion in NY REV)
- Initial set of services to be defined are based on scope of value components included in the CPUC's final guidance Feb. 6, 2015. The MTS effort is **excluding** any wholesale market services that are with the CAISO's domain.
- Preliminary discussion of services has been underway during the discussion of the role of DER in the distribution planning conversations, particularly in Q1 2015.
- Part of these discussions has resulted in a few useful frameworks including the recognition and roles for the ***3 P's***:
    - **Pricing**:
        - Retail rate designs and specialty tariffs
        - Market based pricing (extending wholesale LMP as appropriate)
    - **Programs**:
        - Realignment of existing utility EE & DR programs
    - **Procurement**:
        - Utility procurement based sourcing approaches (e.g., RFP/RFOs)
- The discussions at the subgroup and with the whole MTS WG are expected to conclude in Q2 2015 with a set of DER service definitions, performance requirements and distilled set of applicable monetization structures for each service. The outline for the discussion slides follow.

Distributed Services & Sourcing Design

Distribution Services Design has 3 Integrated Elements



- Service definitions & requirements to align with value components identified
- Need for services to align with engineering and operational requirements to achieve net benefits for customers consistent with §769 requirement
- Sourcing structures to expand on prior MTS discussions regarding the **3 P's:** ***Price, Programs & Procurement***

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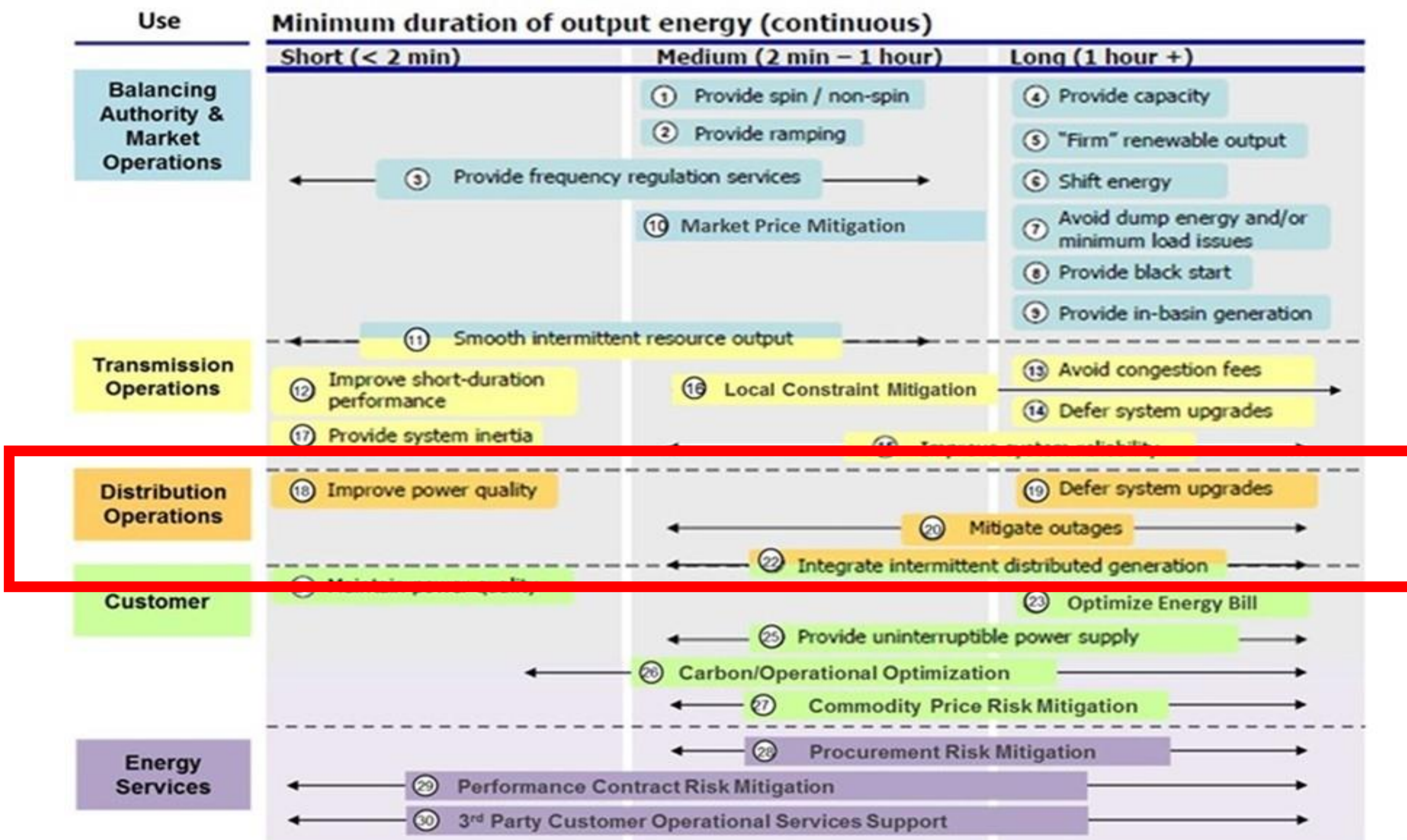
DER Services Opportunities

Leverage Thinking at SCE, Sandia, Smart Inverter WG, Energy Storage Proceeding & others in the context of all DER for Distribution



Source: SCE, Adapted by Newport Consulting

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DER Value Components for Distribution

Propose to Select 2-3 Value Components to Define Specific Services & Performance Requirements that may be Demonstrated

	Value Component	Definition
Distribution	Subtransmission, Substation & Feeder Capacity	Reduced need for local distribution system upgrades
	Distribution Losses	Value of energy due to losses between wholesale transaction and distribution points of delivery
	Distribution Power Quality + Reactive Power	Improved transient & steady-state voltage, reactive power optimization and harmonics
	Distribution Reliability + Resiliency+ Security	Reduced frequency and duration of individual outages & withstand and quickly recover from large external natural, physical and cyber threats
	Distribution Safety	Improved public safety and reduced potential for property damage

DER Provided Distribution Services 1/2

Service	Description	Functional Requirements	Technical Requirements
Distribution Capacity	Load modifying or supply service capable of reducing net loading on desired distribution infrastructure	Continuously dispatchable firm resource up to 6 hours duration without limitation on number of consecutive dispatch periods. Resource or aggregator's control system must be capable of re[illegible]g and confirming utility dispatc[illegible] well as continuously providin[illegible] measurement of [illegible]esponse during operat[illegible]	• Response time • Measurement granularity • Interface Protocols for measurement & control system • Cybersecurity requirements • Communications bandwidth & latency reqs • Other..
Steady-state Voltage	Feeder level dynamic voltage management service	Feeder l[illegible]ge management service cap[illegible]namically responding to [illegible]s outside voltage limits as well [illegible]pporting conservation voltage [illegible]rategies in coordination with utility voltage/reactive power control systems. Resource or aggregator's control system must be capable of receiving and confirming utility dispatch signal as well as continuously providing discrete measurement of resource response during operation.	• Response time • Measurement granularity • Interface Protocols for measurement & control system • Cybersecurity requirements • Communications bandwidth & latency reqs • Other..

Working Draft for Discussion

DER Provided Distribution Services 2/2

Service	Description	Functional Requirements	Technical Requirements
Power Quality	Transient voltage and/or power harmonics mitigation service	Feeder level transient voltage and/or power harmonics mitigation service capable of dynamically responding to unacceptable fast transients and harmonic components in coord[illegible]ation with utility voltage control [illegible]tection schemes. Resource or a[illegible]s control system must be cap[illegible]ceiving and confirming utili[illegible] signal as well as continuous[illegible]g discrete measur[illegible]esource response du[illegible]ion.	• Response time • Measurement granularity • Interface Protocols for measurement & control system • Cybersecurity requirements • Communications bandwidth & latency reqs • Other..
Reliability + Resilience	Load modifying or supply service capable of improvin[illegible] local distribution reliabil[illegible] and/or resiliency	[illegible]ion or feeder level firm [illegible]patchable resource up to xx hours without limitation on the number of consecutive dispatch periods. Resource or aggregator’s control system must be capable of receiving and confirming utility dispatch signal as well as continuously providing discrete measurement of resource response during operation.	• Response time • Measurement granularity • Interface Protocols for measurement & control system • Cybersecurity requirements • Communications bandwidth & latency reqs • Other..

DER Services Sourcing Structures

Example framework to facilitate working group discussion

	Price		Program		Procurement	
Service	**Retail Rates**	**Special Tariff**	**EE**	**DR**	**RFO/RFP**	**Other (e.g., Auction)**
Distribution Capacity	✓	✓	✓		✓	✓
Steady-state Voltage		✓			✓	✓
Power Quality		✓			✓	✓
Reliability + Resiliency		✓		✓	✓	✓
Lead Time to Operation	3 years	[illegible] years	3 years	2 years	1-2 years	1-2 years

Under discussion - for illustration only

- Framework and checked boxes represent potential options based on preliminary MTS WG discussions to-date
- Objective to identify preferred sourcing methods for Walk and Jog phases including the lead time to operational readiness related to each options

MTS Working Group

http://greentechleadership.org/mtsworkinggroup/

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