







Barriers and Opportunities to Broader Adoption of Integrated Demand Side Management at Electric Utilities

March 8, 2018

Jennifer Potter[†], Elizabeth Stuart[‡], and Peter Cappers[‡]
† Hawaii Natural Energy Institute
‡ Lawrence Berkeley National Laboratory





Outline for Presentation

- Introduction and Overview
- Motivations and Benefits of those Currently Pursuing IDSM
- Regulatory and Utility, Barriers to Implementation of IDSM
- Actions Taken to Implement IDSM
- Opportunities for Expanding IDSM Portfolios
- Optimal Future IDSM Portfolios



Demand Side Management

Demand-side management (DSM) is the planning and implementation of programs designed to influence electric and gas utility customer uses of energy in ways that will produce desired changes in a utility's or customer's energy profile.



Current DSM Program Offerings

Programs that incentivize customers that adopt DG technologies, (e.g. photovoltaics, fuel cells)

Distributed Generation and/or Storage Programs that incentivize Programs that incentivize the Electric Energy deployment of technologies that deployment of EV chargers or grid-Vehicles Efficiency integrated EV smart chargers use less energy Electricity rates paid by Programs that incentivize Timecustomers in which rates Demand customers to change based Response vary for different days, times Rates their load profile of the day, or events

























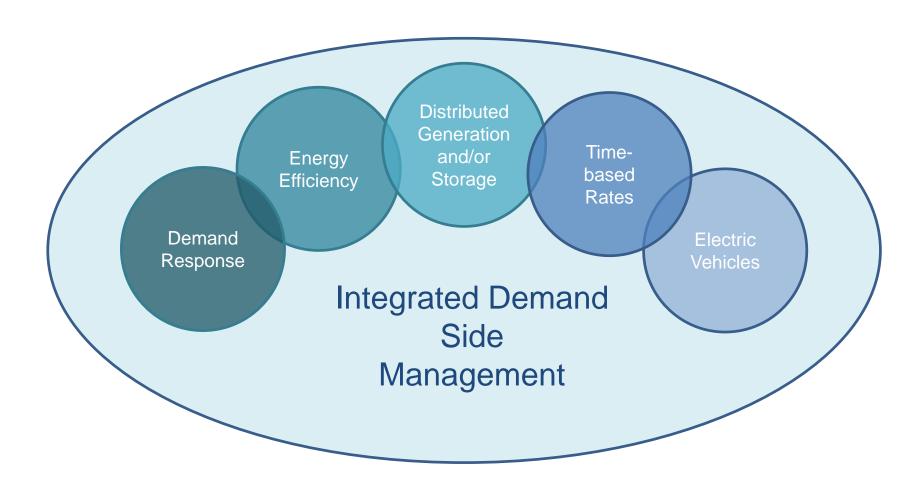


Integrated Demand Side Management

The integration/coordination of delivery for three or more of: (1) Energy Efficiency, (2) Demand Response, (3) Distributed Generation, (4) Storage, (5) Electric Vehicle, and (6) Time-Based Rate programs to residential and commercial electric utility customers.



Current IDSM Program Offerings





Limited Industry Experience with IDSM

New York California • IDSM Proceeding began Reforming the Energy in 2009 Vision (REV) Focused on "duck curve" 40+ customer focused initiatives Massachusetts Grid modernization Hawaii Non-wires alternatives Colorado Current DR docket and **DER** initiatives Perf. based utility • 3rd party administered EE regulation (HB1250)

AMI in progress



Objectives of Scoping Study

- Identify barriers and opportunities for increasing implementation of integrated demand side management (IDSM) programs by:
 - Highlighting examples of programmatic mechanisms that have been or could be deployed for delivering IDSM technologies;
 - Identifying benefits reported by program administrators that IDSM has provided or may provide to the bulk power and distribution system;
 - Identifying a prioritized set of barriers that has been or could be experienced by program administrators to more fully implement IDSM; and
 - Discussing efforts that have been or could be undertaken to overcome these barriers.



Survey & Interview of Program Administrators and Implementors

Organizations participating in the scoping study

Avangrid	Pacific Gas and Electric (PG&E)
DTE Energy (DTE)	Consolidated Edison (ConEd)
Hawaiian Electric Company (HECO)	Southern California Gas (SoCalGas)
Sacramento Municipal Utility District (SMUD)	Hawai'i Energy (Leidos)
Southern California Edison (SCE)	



Reported Motivations and Benefits of those Currently Pursuing IDSM



Program Administrator Motivations for Implementing IDSM Programs

Compliance with regulatory mandates to offer IDSM Ability to deliver increased number or broader range of demand side technology options and services that are capable of optimizing customers' end use energy consumption Reducing the market confusion that customers might experience about different demand side program offerings Increasing customer engagement and satisfaction Ability to improve program delivery cost-effectiveness Ability to deliver IDSM that better meets locational and/or temporal grid needs Reducing duplicative efforts between EE and DR Count of respondents (n=12)



Benefits of IDSM that are Materializing or Showing Potential to Materialize

Reducing peak demand beyond what DR programs can deliver alone

Increasing customer participation in DSM programs/delivering DSM to more customers

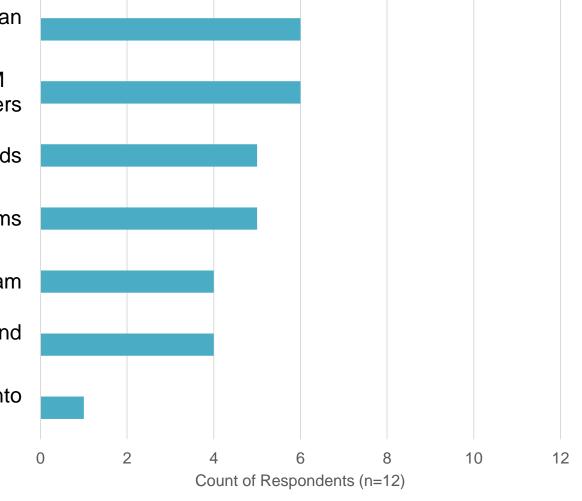
Addressing locational and/or temporal grid needs

Improving the cost-effectiveness of DSM programs

Reducing customer confusion around DSM program

Saving more energy/helping to meet EE targets beyond what EE programs can deliver alone

Increased renewable generation interconnected onto the grid

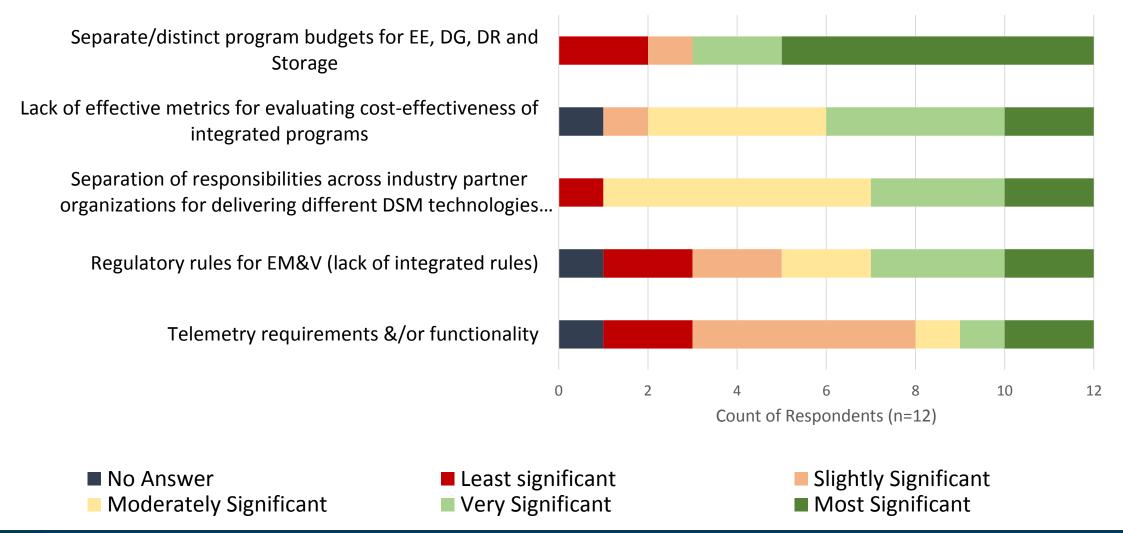




Regulatory and Program Administrator Barriers to Implementation of IDSM

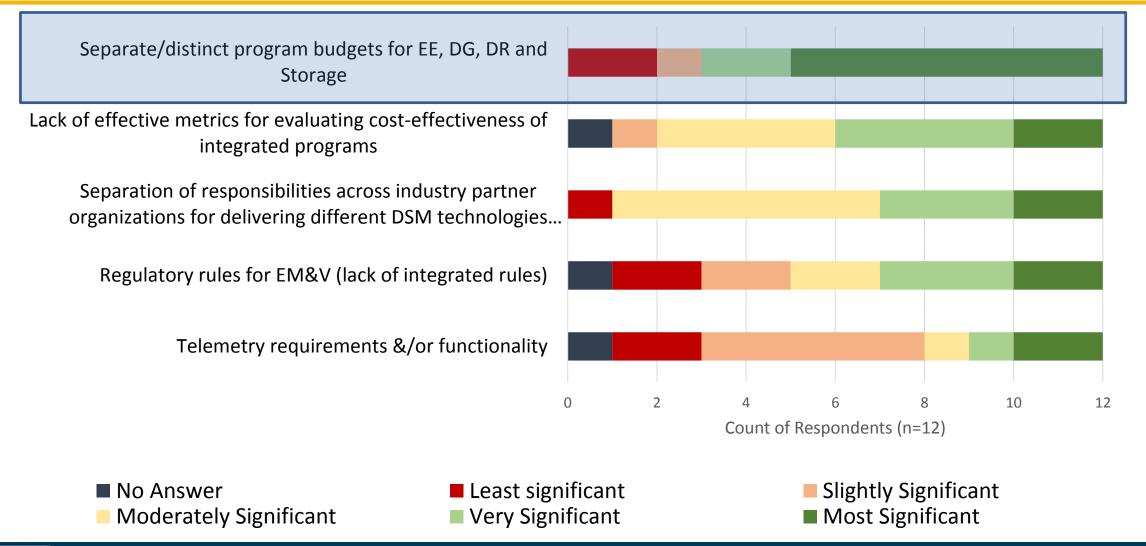


Regulatory Barriers to Implementing IDSM



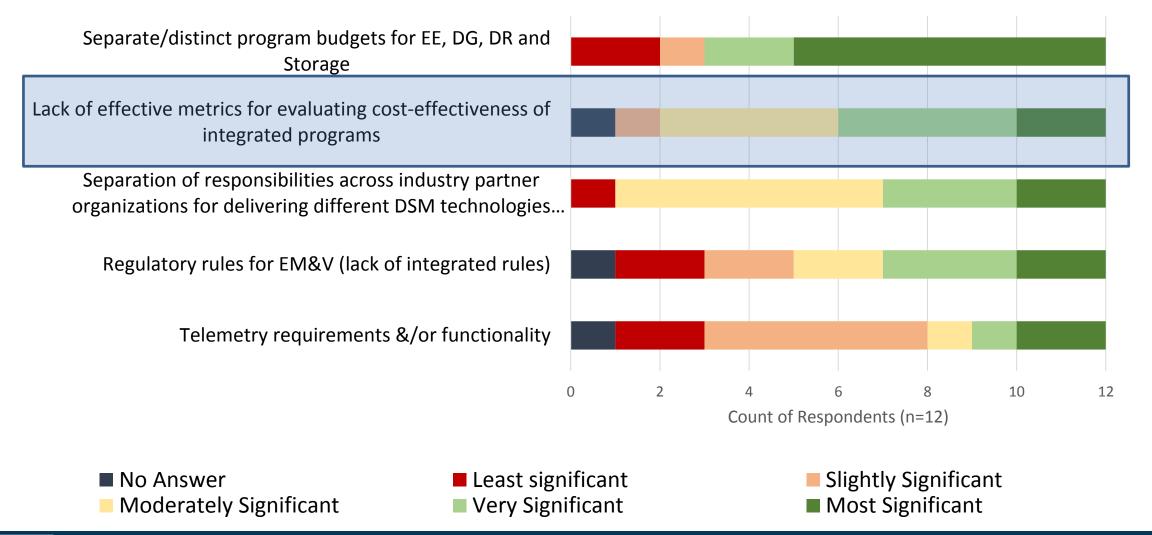


Regulatory Barriers to Implementing IDSM



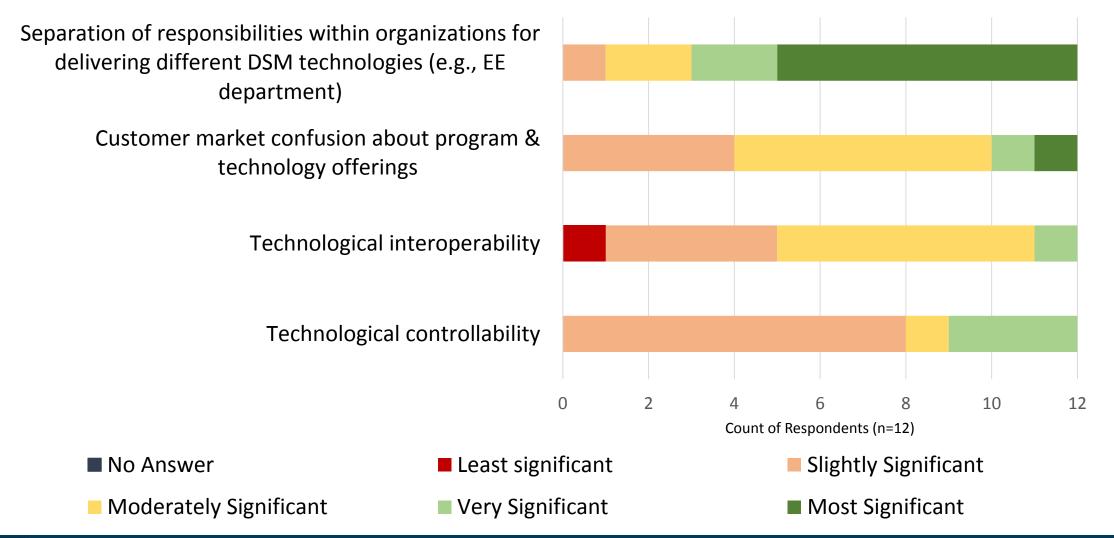


Regulatory Barriers to Implementing IDSM



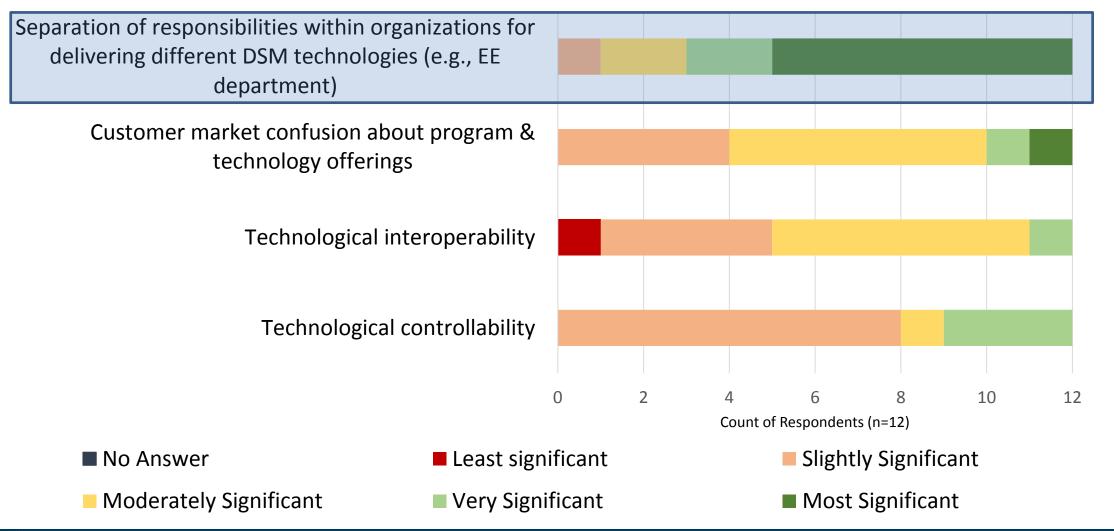


Program Administration Barriers to Offering or Expanding IDSM



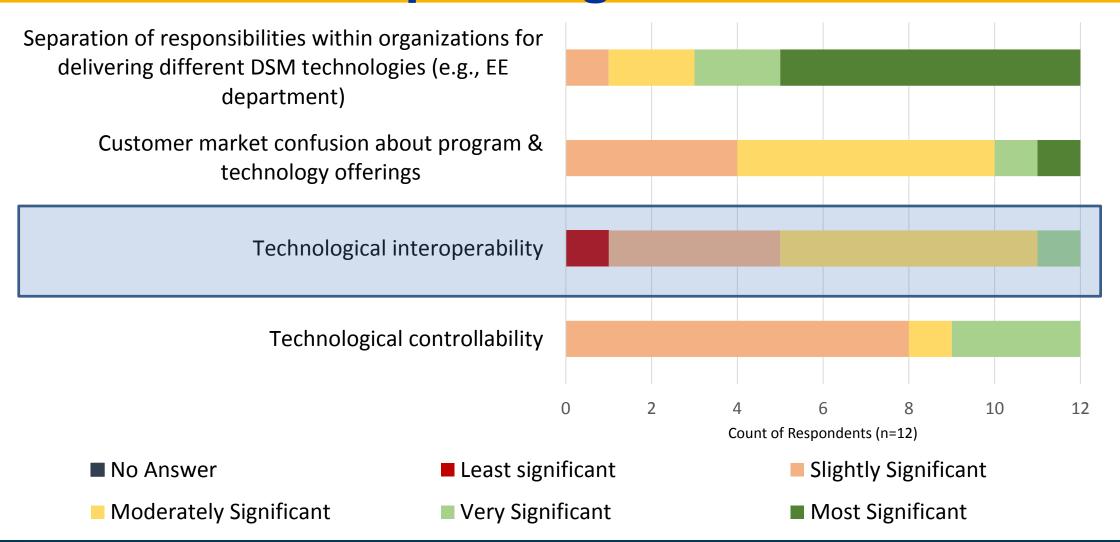


Program Administration Barriers to Offering or Expanding IDSM





Program Administration Barriers to Offering or Expanding IDSM





Actions Taken to Implement IDSM



Responsibilities for delivering some DSM technologies have been consolidated to one or a smaller number of departments within my organization.

Developed and transitioned, or are in the process of transitioning, customers to retail rates that align with IDSM objectives (this could include active or pending proceedings and/or rate cases)

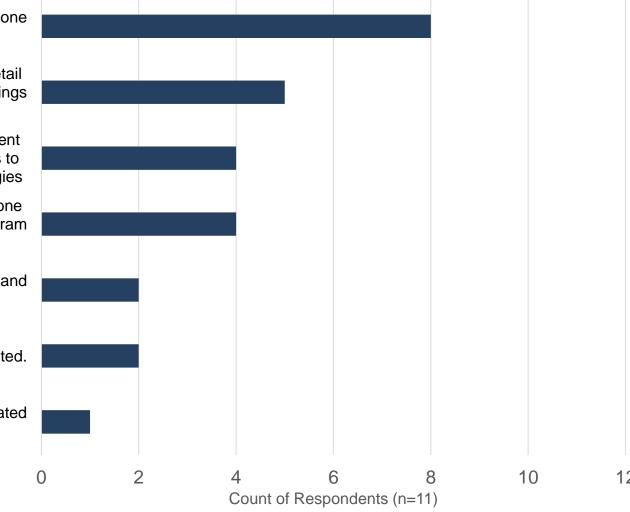
Developed education and outreach material that combined information about different DSM technologies and measures that historically fell under different program types to help customers gain knowledge about value of investing in different DSM technologies

Responsibilities for delivering some DSM technologies have been consolidated to one or a smaller number of different organizations in the market, e.g., aggregators, program administrators.

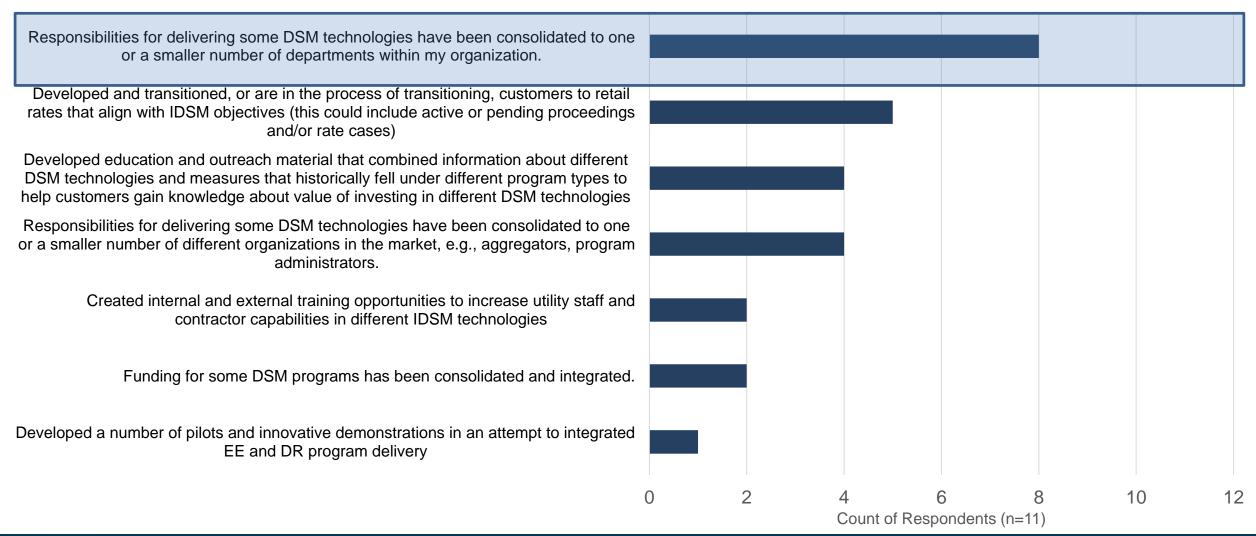
Created internal and external training opportunities to increase utility staff and contractor capabilities in different IDSM technologies

Funding for some DSM programs has been consolidated and integrated.

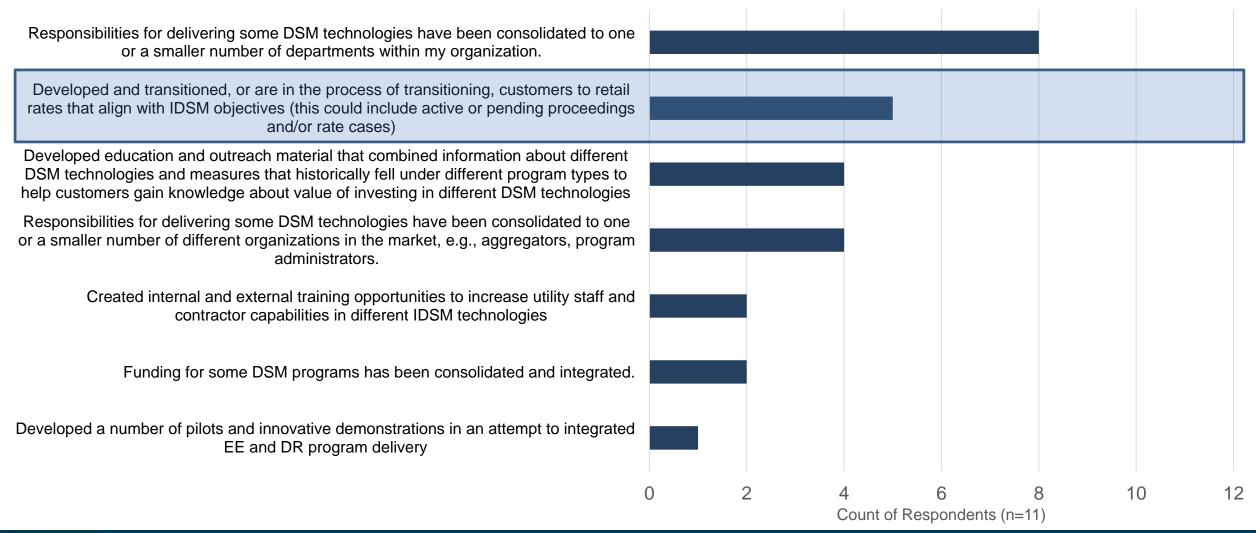
Developed a number of pilots and innovative demonstrations in an attempt to integrated EE and DR program delivery



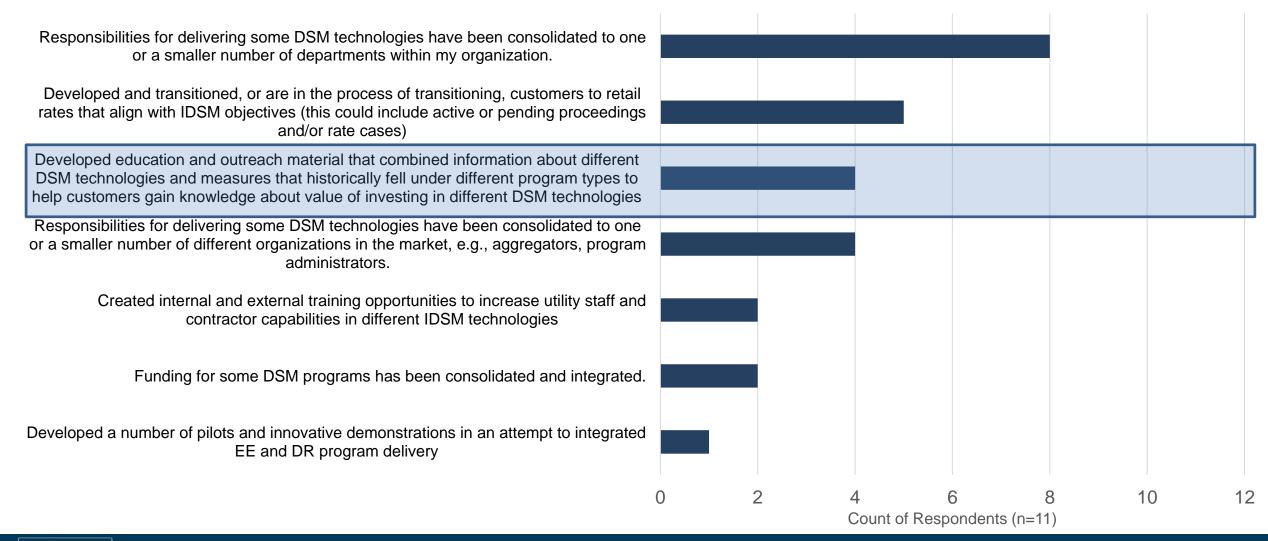




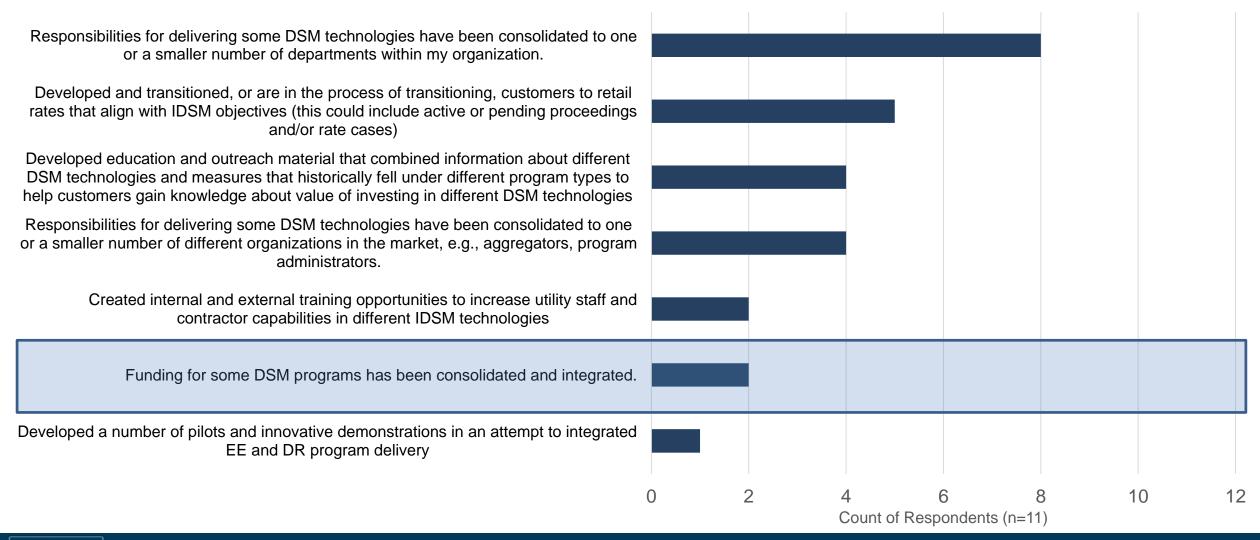










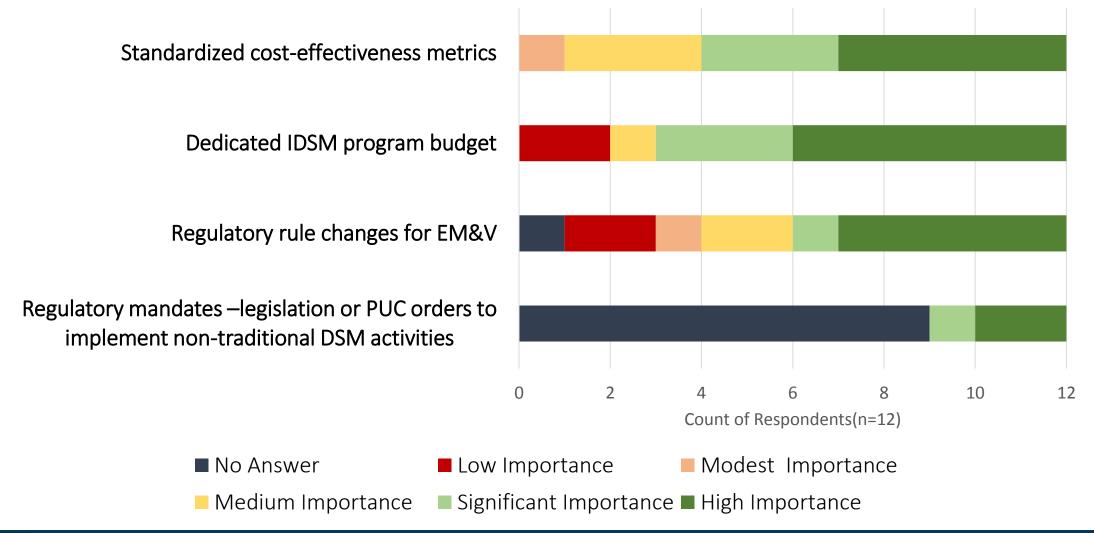




Opportunities and Recommendations for Accelerating Adoption of IDSM

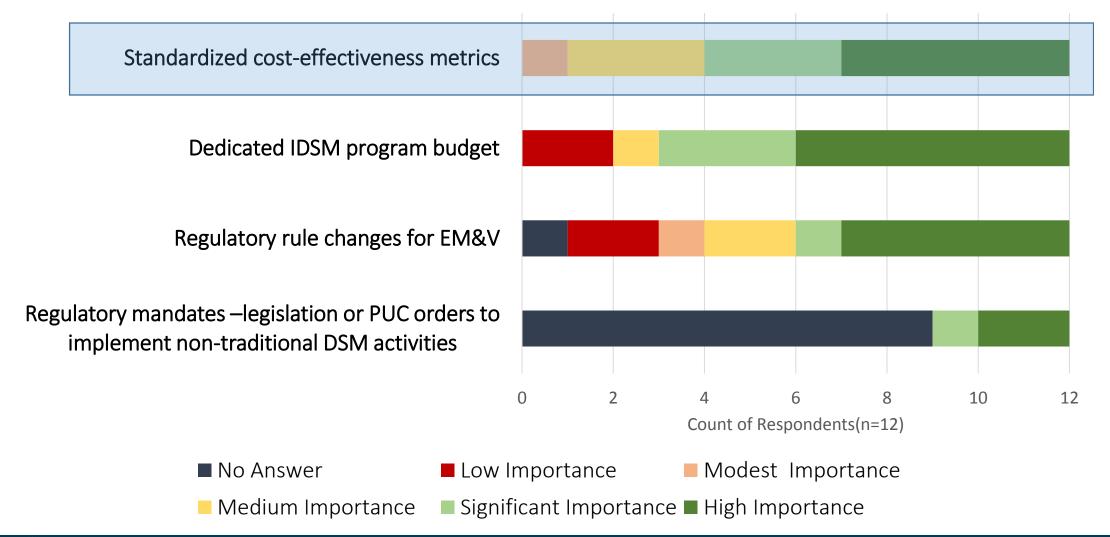


Regulatory Opportunities for Expanding IDSM



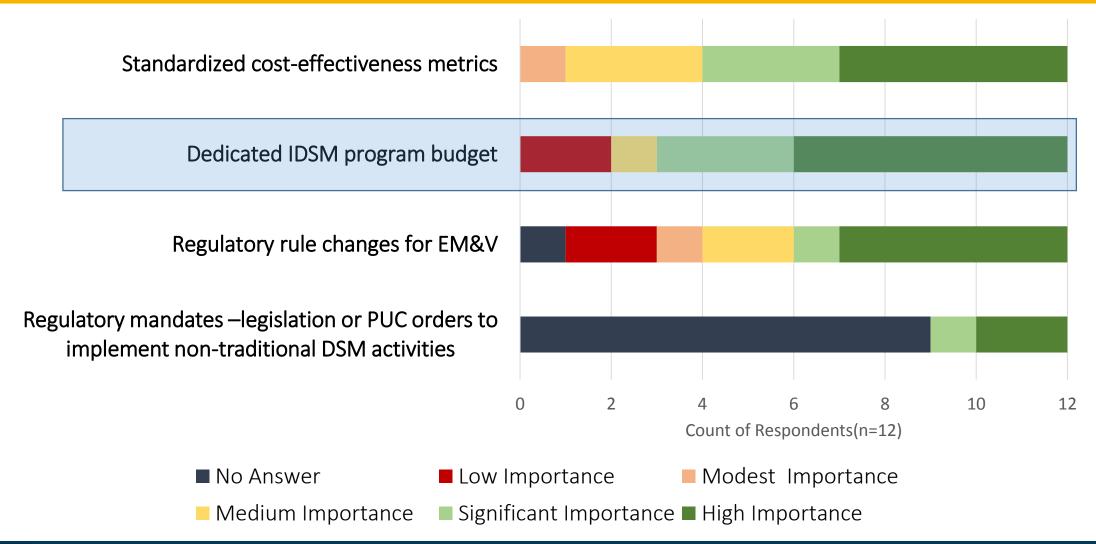


Regulatory Opportunities for Expanding IDSM



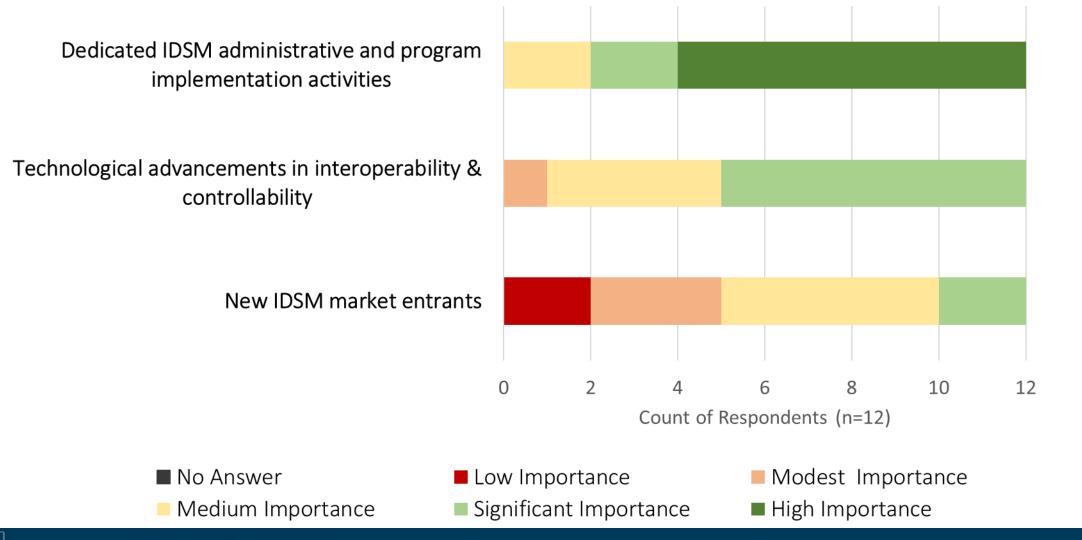


Regulatory Opportunities for Expanding IDSM



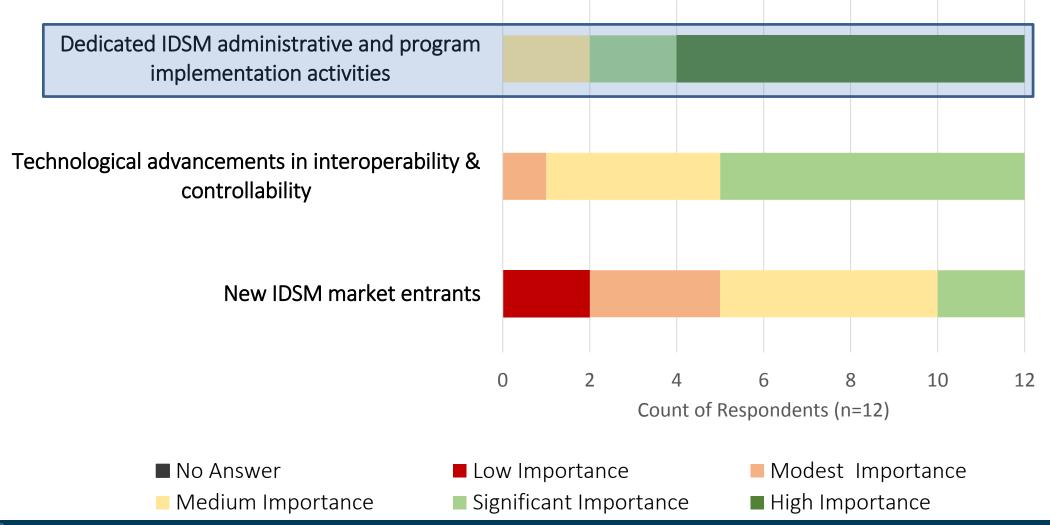


Program Administrator Opportunities for IDSM



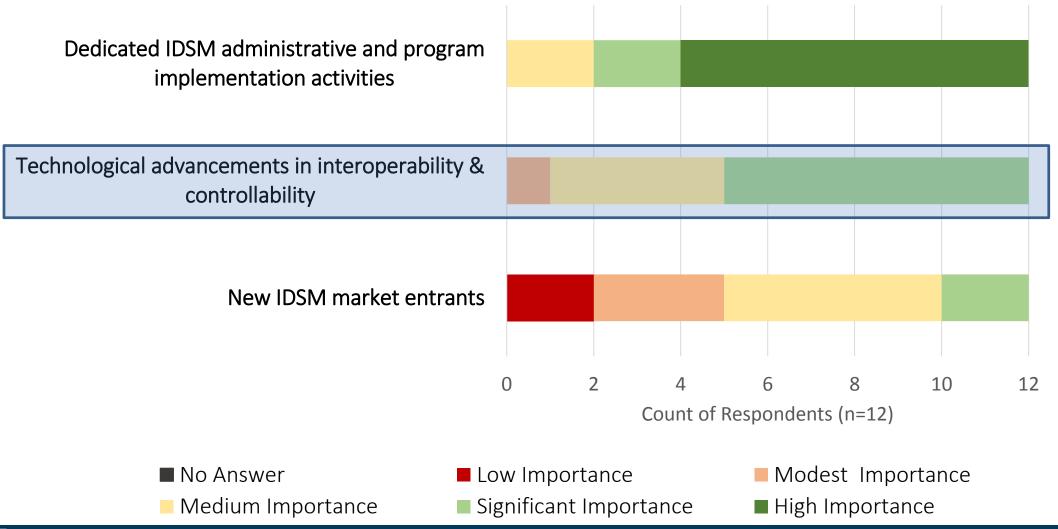


Program Administrator Opportunities for IDSM





Program Administrator Opportunities for IDSM





Future Opportunities for IDSM: Promising IDSM Technologies and Measures Over the Next 10 Years



Promising C&I IDSM Programmatic Opportunities













Promising Residential IDSM Programmatic Opportunities







Battery Storage







Advanced Solar Inverter



Thank you!



Jennifer Potter

808-669-7623

Jmpotter@Hawaii.edu



Elizabeth Stuart

510-495-2370

estuart@lbl.gov

Peter Cappers

315-637-0513

pacappers@lbl.gov







