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Docket Number:	19-MISC-01
Project Title:	Distributed Energy Resources (DER) Roadmap
TN #:	227345
Document Title:	DER Roadmap Barriers Chart
Description:	N/A
Filer:	Liet Le
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	3/15/2019 1:29:03 PM
Docketed Date:	3/15/2019

DER Roadmap Barriers Chart

	Cost	Valuation	Capability	Coordination	Uncertainty
Energy Storage	• Capital costs high • Competition for components	• Not all benefits compensated • Artificially low alternate customer costs	• Low energy density • MUA controls difficult • Duration limited	• Specialized installation and maintenance • Permitting and safety • Customer acquisition	• Battery life concerns • Third-party controls visibility
Electric Vehicle Integration and Smart Charging	• V2G vehicle costs • V2G EVSE costs • Incentives needed for multiple stakeholders	• Not all benefits compensated		• Aggregation required for feasible participation	• Battery warranty impacts • Vehicle battery availability
Grid Optimal Load Assets	• Building control hardware costs • Lack of financing	• Value stacking difficult	• Inadequate data synthesis • Communication unreliability • Lack of M&V protocols	• Lack of useful grid signals • Limited interoperability • Customer acquisition	• Value to customer is uncertain • Value to utility is uncertain
Smart Inverters & Grid Edge Control			• Insufficient utility controls • Communication unreliability	• Customer acquisition • Limited interoperability	• Value to customer is uncertain • Value to utility is uncertain
Distribution Grid Communications				• Assignment of cybersecurity obligations • Lack of clear architecture	
Distribution Grid Management	• Enabling platform cost allocation	• Cost-of-service ratemaking • Uneven customer reliability value	• Physical network model quality • Limited DER inclusion • Limitations of cloud analytics	• Integration with conventional grid systems • Insufficient communications standards • Impact on critical systems	
DER Aggregation as Non-Wires Alternative		• Limited regulatory incentives • Difficult separating value streams		• Complex coordination between resource types	• DER performance not guaranteed to planner