



MACQUARIE



Financing Battery Storage

Macquarie Case Study

April 2017

SCE Battery Storage Projects

CASE STUDY



Macquarie Capital has partnered with Advanced Microgrid Solutions (AMS) to develop, construct and operate a 50 MW distributed fleet of battery storage projects in California

Overview

- Dec 2014: AMS secures four energy storage capacity contracts from SCE (50 MW x 4 hours)
- July 2016: Macquarie acquires the 50 MW development portfolio from AMS
- Mar 2017: Close the first project debt financing of a behind-the-meter portfolio with CIT
- Staggered roll-out of ~120 behind-the-meter systems expected over the next 1-2 years
- Located in Southern California Edison's West Los Angeles Basin service territory where the projects will address specific priority and long-term grid constraints in the region

Key highlights

Scale

Portfolio of Battery Storage Projects

1

- **50** MW or up to **300** MWh
- **\$200** million development program
- Four 10-yr capacity contracts with SCE
- ~120 systems capable of being dispatched on both an individual and an aggregated fleet basis

Landmark

Project Financing

2

- One of the **Largest** financing of a battery storage portfolio
- **First** non-recourse project financing of a behind-the-meter battery storage portfolio

Stacked

Revenue Profile

3

- Flexible Capacity
- Resource Adequacy
- Solar Integration
- Voltage Management
- Demand Charge Management
- Time-of-Use Bill Management
- Backup Power
- Etc.

Macquarie Capital's

Roles

4

- Equity Investor
- Project Finance Sponsor
- Development Partner



Large Commercial • Universities • Industrials
Water Treatment • Hospitals • Municipals

SCE Battery Storage Projects

KEY PROJECT PARTICIPANTS



Macquarie have worked with a number of counterparties to formulate a contractual structure that have made the SCE Portfolio financeable in traditional markets

Core - Finance



MACQUARIE



Advanced Microgrid Solutions



SOUTHERN CALIFORNIA
EDISON[®]

An *EDISON INTERNATIONAL*[®] Company



EPC



BLACK & VEATCH



**OVERLAND
CONTRACTING[®]**



GROUP

Host Customers



IRVINE COMPANY

Since 1864



**The California
State University**



Irvine Ranch
WATER DISTRICT



Invesco

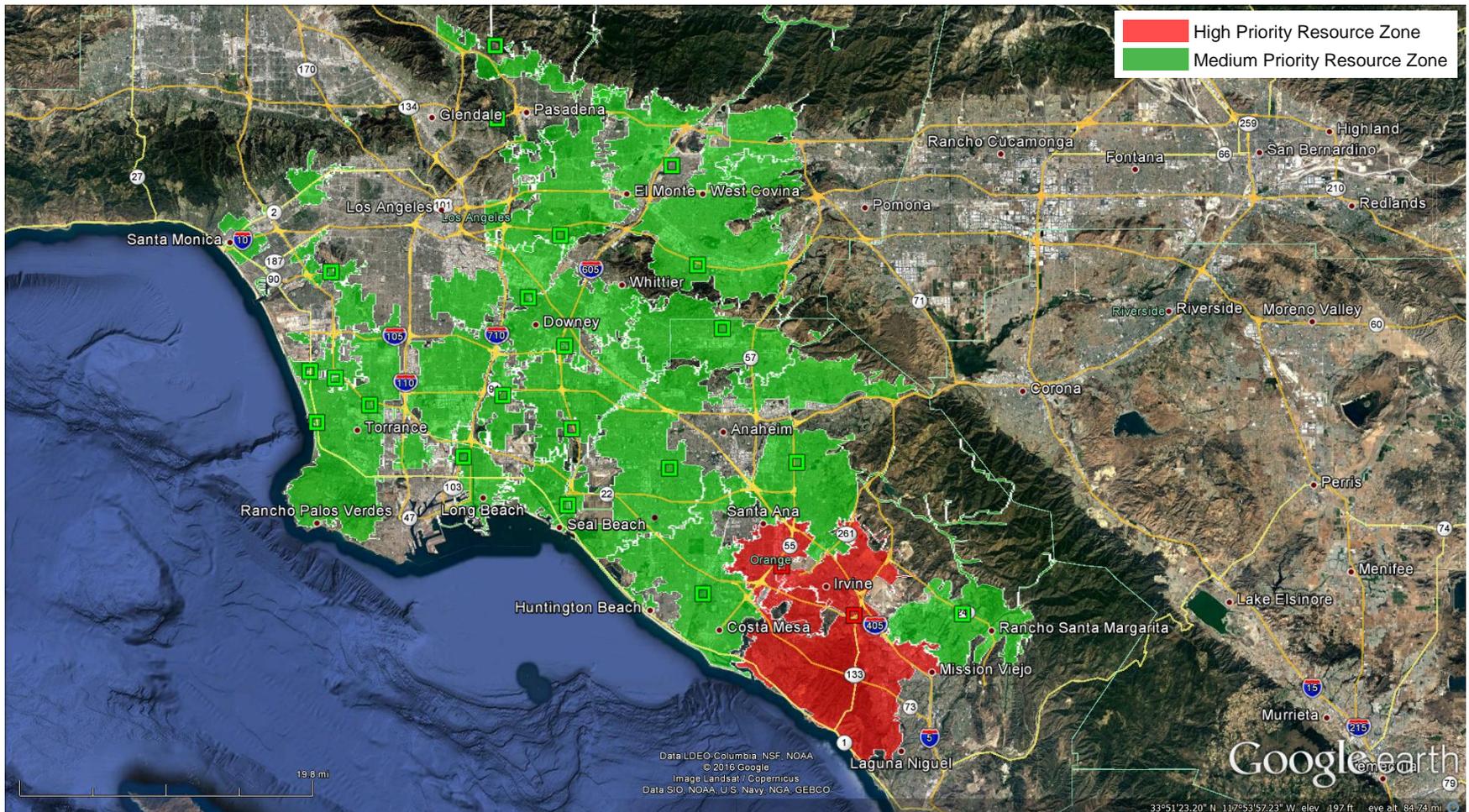


SCE Battery Storage Projects

PROJECT LOCATION

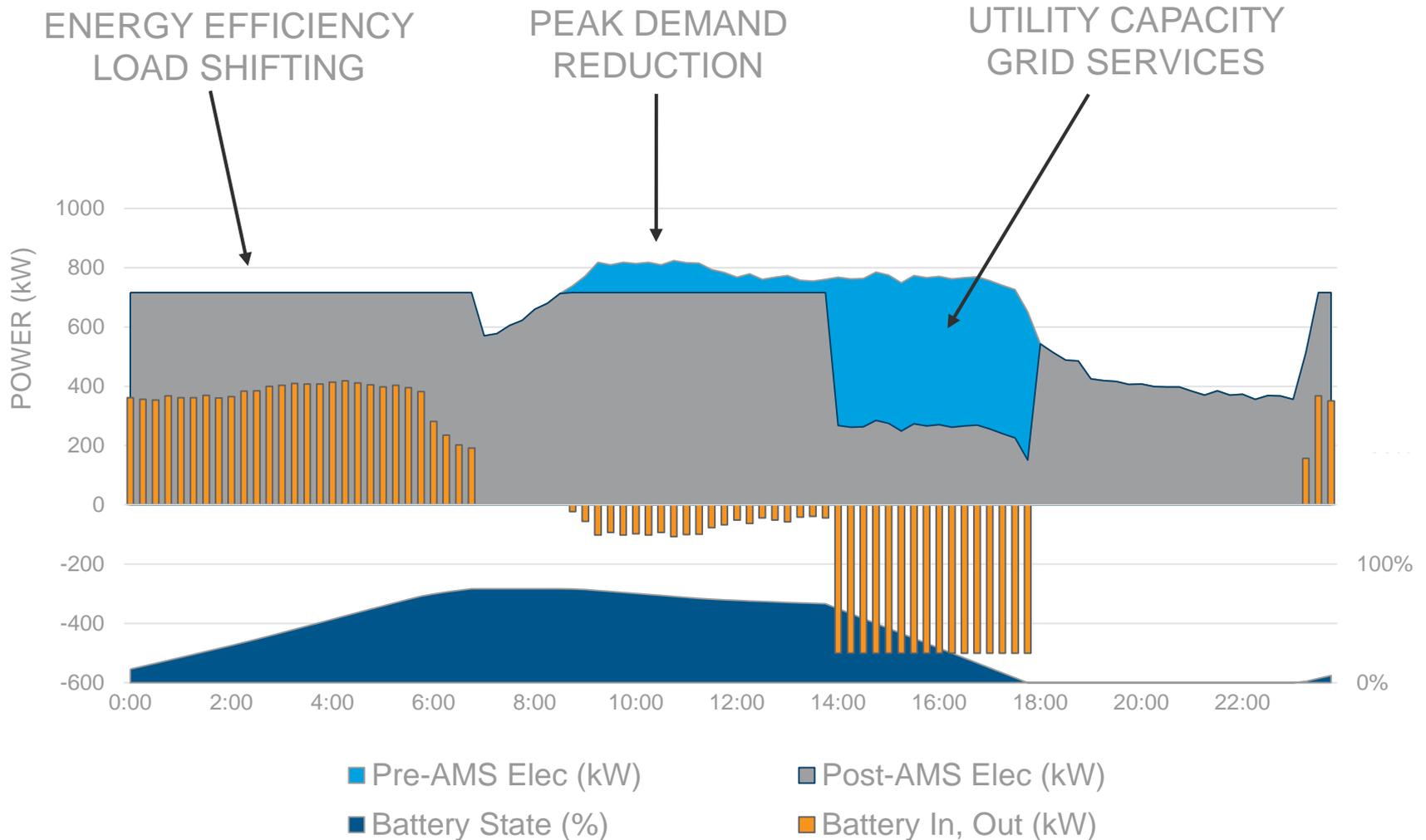


Our projects will allow SCE to shed up to 50 MW x 4 hours of peak load within its resource and grid-constrained West Los Angeles Basin service territory



SCE Battery Storage Projects

TYPICAL HOST LOAD PROFILE (BEFORE & AFTER)

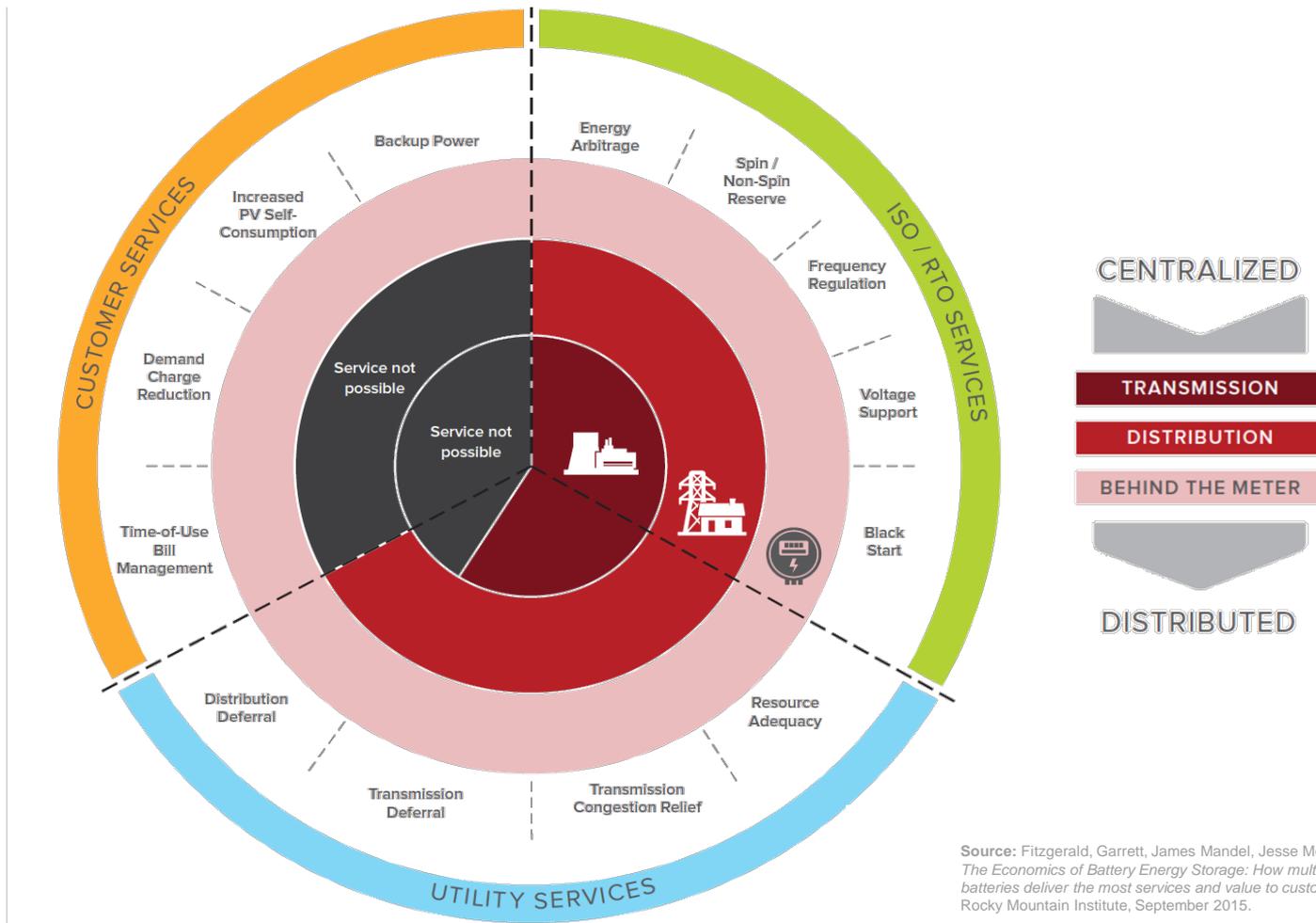


SCE Battery Storage Projects

BEHIND-THE-METER STACKED REVENUE POTENTIAL



The ability to unlock multiple value streams makes BTM projects especially attractive, though it is a long term contracted backbone that have made the SCE portfolio financeable



Source: Fitzgerald, Garrett, James Mandel, Jesse Morris, and Hervé Touati. *The Economics of Battery Energy Storage: How multi-use, customer-sited batteries deliver the most services and value to customers and the grid.* Rocky Mountain Institute, September 2015.

Macquarie Group and Battery Storage



Macquarie's businesses are placed to facilitate widespread strategic partnerships within the Battery Storage Sector across a number of initiatives / touch-points

Macquarie's capabilities

Principal Investor	Long-term Asset Manager	Development Partner	Global Lesser	Advisor
<ul style="list-style-type: none"> Macquarie balance sheet is a permanent source of flexible capital, not limited by time frame, fund raising dynamics or LP-imposed constraints \$US 4.3bn invested since 2008 in this capacity 	<ul style="list-style-type: none"> Top 50 global asset manager with \$US366b AUM Across over 50 funds, Macquarie manages over 130 portfolio businesses, ~300 properties and ~2.8 million hectares of farmland 	<ul style="list-style-type: none"> Macquarie's Austin-based development team invests in early-stage projects and structures for an optimized capital structure Contract structuring, development and construction management, EPC and O&M negotiation 	<ul style="list-style-type: none"> Global provider of specialist finance and asset management solutions, with \$US30.2b of loans and leases Expertise in asset finance in aircraft, motor vehicles, technology, manufacturing, industrial, energy, rail and mining equipment 	<ul style="list-style-type: none"> Market-leading global franchise offering a full suite of advisory services; ability to raise funds across the capital structure Extensive coverage across a universe of sponsors Raised or arranged over \$US112bn of equity and debt in FY16

Opportunities

<p>Platform for flexible equity financing partnership across a range of projects</p>	<p>Long-term asset management of storage infrastructure through Macquarie funds business</p>	<p>Project development support and contract negotiation</p>	<p>Equipment and Project leasing support for Battery Storage products and services</p>	<p>Advising Battery Storage Players on Project finance structures and capital raising opportunities</p>
---	---	--	---	--

Important Notice



"Macquarie Capital" refers to Macquarie Capital Group Limited, its worldwide subsidiaries and the funds or other investment vehicles that they manage. Macquarie Capital Group Limited is an indirect, wholly-owned subsidiary of Macquarie Group Limited.

This document and its contents are confidential to the person(s) to whom it is delivered and should not be copied or distributed, in whole or in part, or its contents disclosed by such person(s) to any other person. Notwithstanding the foregoing, the recipient (which includes each employee, representative, or other agent of the recipient) is hereby expressly authorized to disclose to any and all persons, without limitation of any kind, the tax structure and US federal income tax treatment of the proposed transaction and all materials of any kind (including opinions and other tax analysis) if any, that are provided to the recipient related to the tax structure and US federal income tax treatment.

This document does not constitute an offer to sell or a solicitation of an offer to buy any securities. It is an outline of matters for discussion only. You may not rely upon this document in evaluating the merits of investing in any securities referred to herein. This document does not constitute and should not be interpreted as either an investment recommendation or advice, including legal, tax or accounting advice.

Future results are impossible to predict. Opinions and estimates offered in this presentation constitute our judgement and are subject to change without notice, as are statements about market trends, which are based on current market conditions. This presentation may include forward-looking statements that represent opinions, estimates and forecasts, which may not be realized. We believe the information provided herein is reliable, as of the date hereof, but do not warrant its accuracy or completeness. In preparing these materials, we have relied upon and assumed, without independent verification, the accuracy and completeness of all information available from public sources.

Nothing in this document contains a commitment from any member of Macquarie Capital to subscribe for securities, to provide debt, to arrange any facility, to invest in any way in any transaction described herein or otherwise imposes any obligation on Macquarie Capital. Macquarie Capital does not guarantee the performance or return of capital from investments. Any participation by Macquarie Capital in any transaction would be subject to its internal approval process.

None of the entities noted in this document are authorized deposit-taking institutions for the purposes of the Banking Act 1959 (Commonwealth of Australia). The obligations of these entities do not represent deposits or other liabilities of Macquarie Bank Limited ABN 46 008 583 542 (MBL). MBL does not guarantee or otherwise provide assurance in respect of the obligations of these entities.

CIRCULAR 230 DISCLOSURE

Macquarie Capital does not provide any tax advice. Any tax statement herein regarding any US federal income tax is not intended or written to be used, and cannot be used, by any taxpayer for the purpose of avoiding any penalties. Any such statement herein was written to support the marketing or promotion of the transaction(s) or matter(s) to which the statement relates. Each taxpayer should seek advice based on the taxpayer's particular circumstances from an independent tax advisor.

© 2017 Macquarie Capital (USA) Inc.