

Exhibit to Agenda Item #2

Board Energy Resources & Customer Services Committee
Wednesday, February 20, 2019, scheduled to begin at 5:30 p.m.
Customer Service Center, Rubicon Room

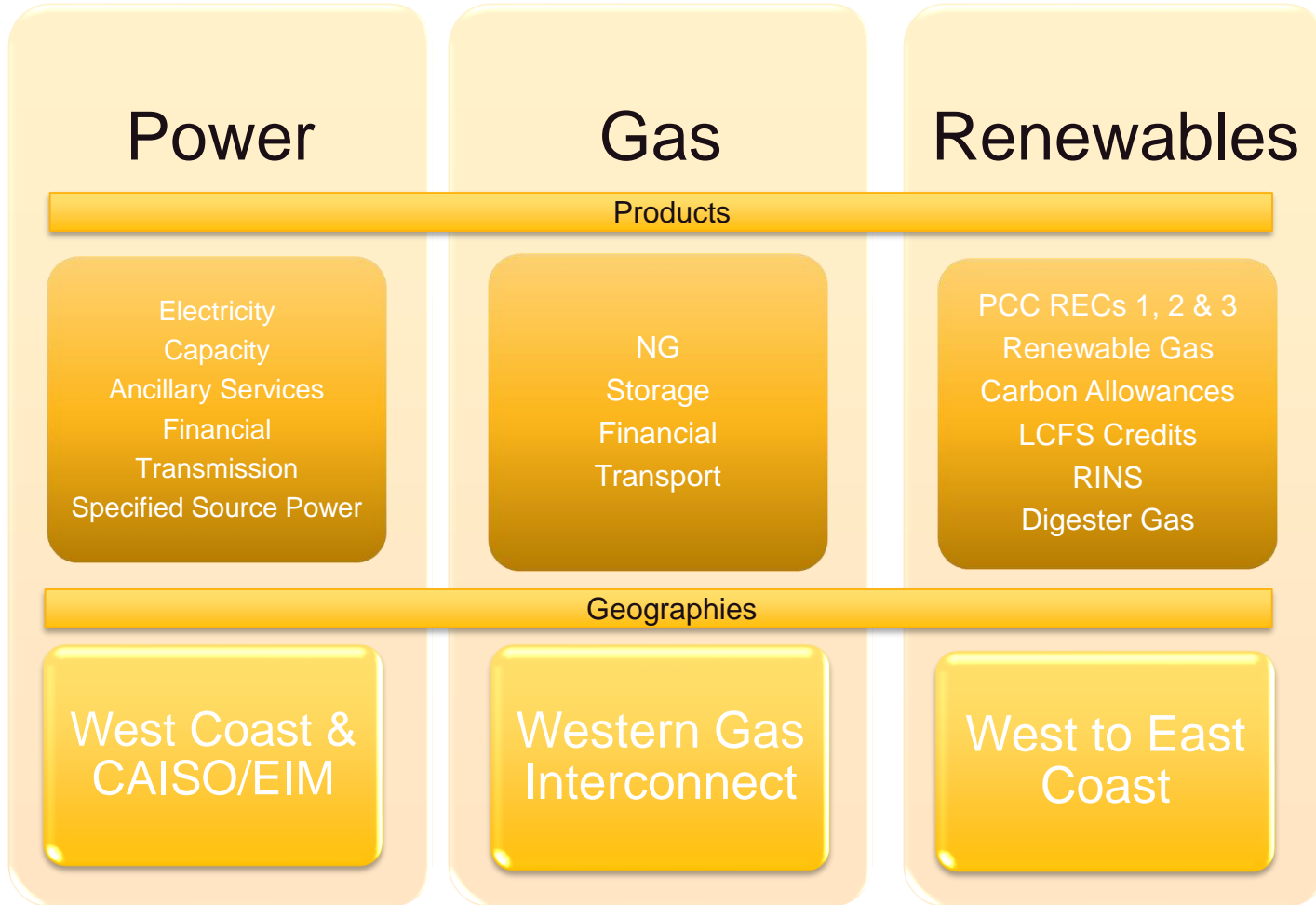
Managing SMUD's Assets

- Principles
- Markets
- Tools
- Day in the Life of Energy Trading
- Operational Efficiencies

Principles

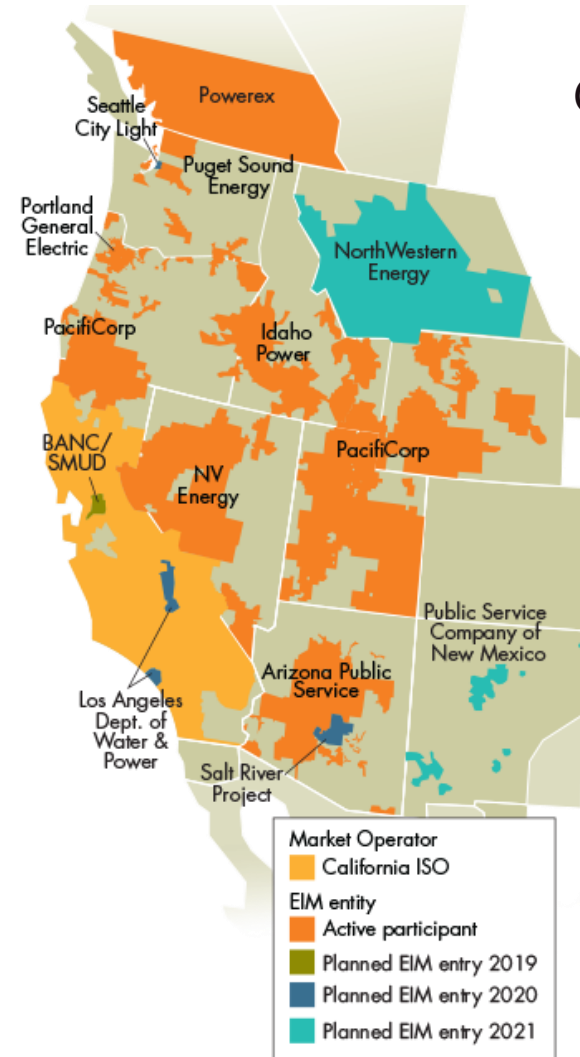
- Asset Optimization – the optimization of any SMUD resource resulting in a reduction to the commodity budget
 - Thermal, hydro and renewable assets
 - Transmission, power contracts
 - Natural gas storage, pipeline transport contracts
 - Hedged gas and power supply positions
- Least Cost Supply – the minimization of costs incurred to meet SMUD obligations
 - Lowest cost options for supply of gas, power and renewables across multiple markets and geographies
 - Self supply vs market supply
- Reliability – ET&C passes a feasible solution to Power System Operations at the beginning of the Operating Hour (8,760 times/year) as well as a joint review of the next 24 hours (365 times/year)

Markets



Markets - The EIM Footprint

Gross economic benefits since start of EIM = \$564.68M



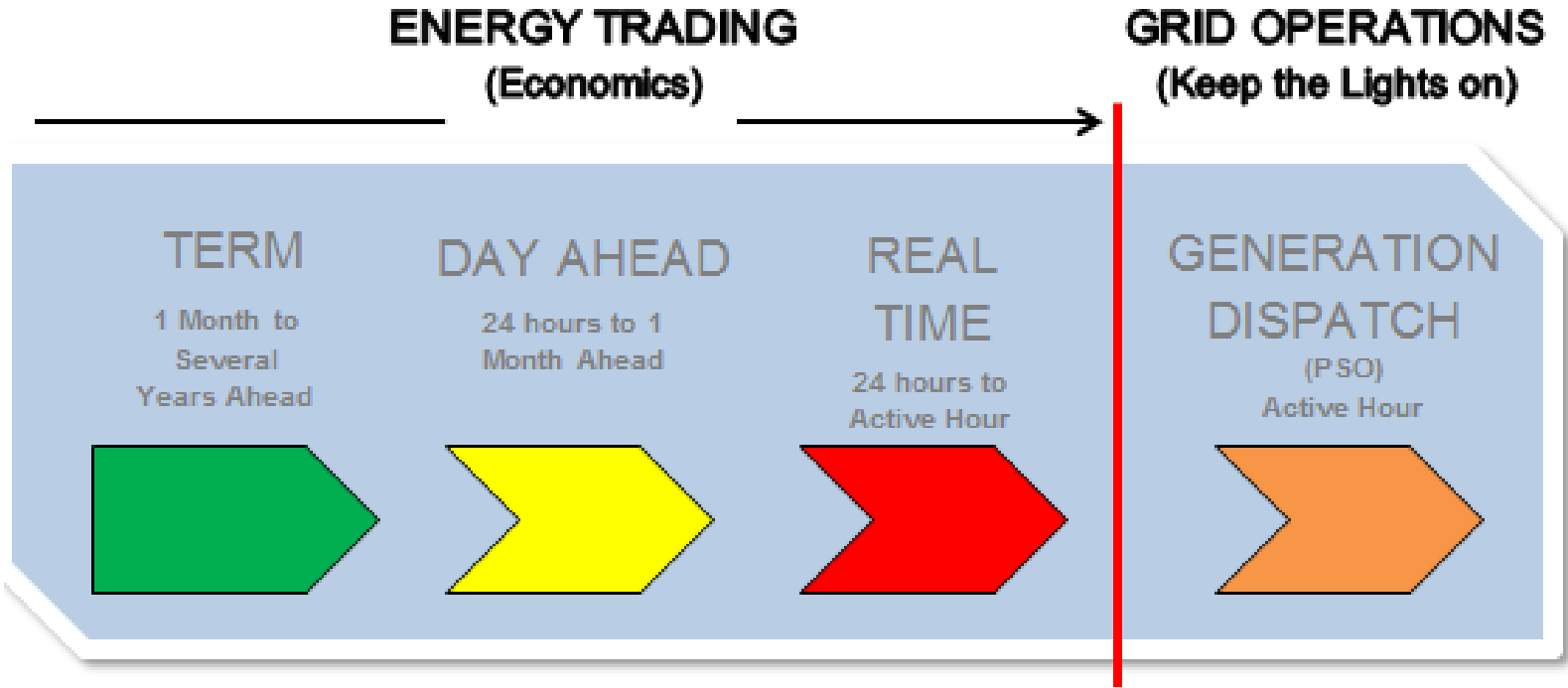
(millions \$)

EIM PARTICIPANTS	2014	2015	2016	2017	2018	TOTAL
Arizona Public Service Entered 10/2016			\$5.98	\$34.56	\$45.30	\$85.84
California ISO Entered 11/2014	\$1.24	\$12.66	\$28.34	\$36.96	\$67.94	\$147.14
Idaho Power Company Entered 04/2018					\$26.88	\$26.88
NV Energy Entered 12/2015		\$0.84	\$15.57	\$24.20	\$25.55	\$66.16
PacifiCorp Entered 11/2014	\$4.73	\$26.23	\$45.47	\$37.41	\$61.68	\$175.52
Portland General Electric Entered 10/2017				\$2.83	\$27.57	\$30.40
Powerex Entered 04/2018					\$7.84	\$7.84
Puget Sound Energy Entered 10/2016			\$1.56	\$9.86	\$13.68	\$25.10
TOTAL	\$5.97	\$39.73	\$96.92	\$145.82	\$276.44	\$564.88

Tools

- EIM Software
 - Communicate & Transact with marketplace
 - ET&C, PSO, Settlements
- ETRM
 - Capture, value, & settle all commodity transactions
 - Ability to manage more complex strategies
 - Risk Management tool to measure and report on exposures and other commodity risk analysis
- PCI
 - Constrained economic dispatch (resource optimization)
 - Scheduling integration
- EMS
 - Spectrum Power 7
 - First install of Siemen's new platform in North America
- Approximate spend of \$19M

Day in the Life



Day in the Life



Day in the Life

- EIM Features
 - Adds a 15 & 5 min market clearing for resource dispatches
 - Adds regimented processes and timelines
 - Regional diversity of resources and loads
 - Increases opportunity for Asset Optimization and Least Cost Supply in Real Time
 - Requires increased coordination with Energy Trading, Grid Operations and Substation/Line personnel
 - Successfully completed Parallel Operations testing, go-live April 3, 2019
- EDAM Features
 - Extension of hourly EIM into the Day Ahead timeframe
 - Requires participants agreement on the treatment of transmission assets
 - Significant upside for optimizing the participants portfolio
 - Earliest possible go-live in 2022

Operational Efficiencies

Category	Value Impact
Portfolio Management – 3 year avg	\$30M+
Transmission Sale	\$3M
Ancillary Services	\$1M
EIM Projected Net Savings (annual)	\$4M

Questions...

Glossary

- CAISO – California Independent System Operator
- DA – Day Ahead Market
- EDAM – Extended Day Ahead Market in the EIM
- EIM – CAISO’s Western Energy Imbalance Market
- EMS – Energy Management System software
- ET&C – Energy Trading & Contracts
- ETRM – Energy Trade & Risk Management software system
- IRP – Integrated Resource Plan
- LCFS – Low Carbon Fuel Standard program
- MKT – Market
- NG – Natural Gas
- PCC – Portfolio Content Category
- PSO – Power System Operations
- RA – Resource Adequacy
- RECs – Renewable Energy Certificate
- RINs – Renewable Identification Number
- RT – Realtime or Hour Ahead Market
- Term – One month to multiple year trading horizon
- VER - Variable Energy Resource
- WECC – Western Electricity Coordinating Council