



National Conference & Public Power Expo

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Explore Together

2018 APPA Academy National Conference

Store Up the Benefits: Leveraging Energy Storage

Presentation by Reiko Kerr
Los Angeles Department of Water and Power



CUSTOMERS FIRST





Energy Storage is a key strategy for achieving transition to 100% Clean Energy

- 4,000 MW avg. daily load

Castaic Power Plant—LADWP's Crown Jewel of Energy Storage

- 1,265 MW

**LADWP is
transitioning to
100% Clean Energy
that is reliable,
responsible, and
affordable**

- 100% Renewable
Advisory Group



Power Supply Transformation

We are studying all viable Clean Energy Solutions, including:

- Expanding Renewables
- Combinations of Renewables, Natural Gas & Energy Storage
- Energy Storage (Batteries, Pumped Storage, CAES)
- Energy Efficiency & Demand Response
- Expanding Electric Vehicles

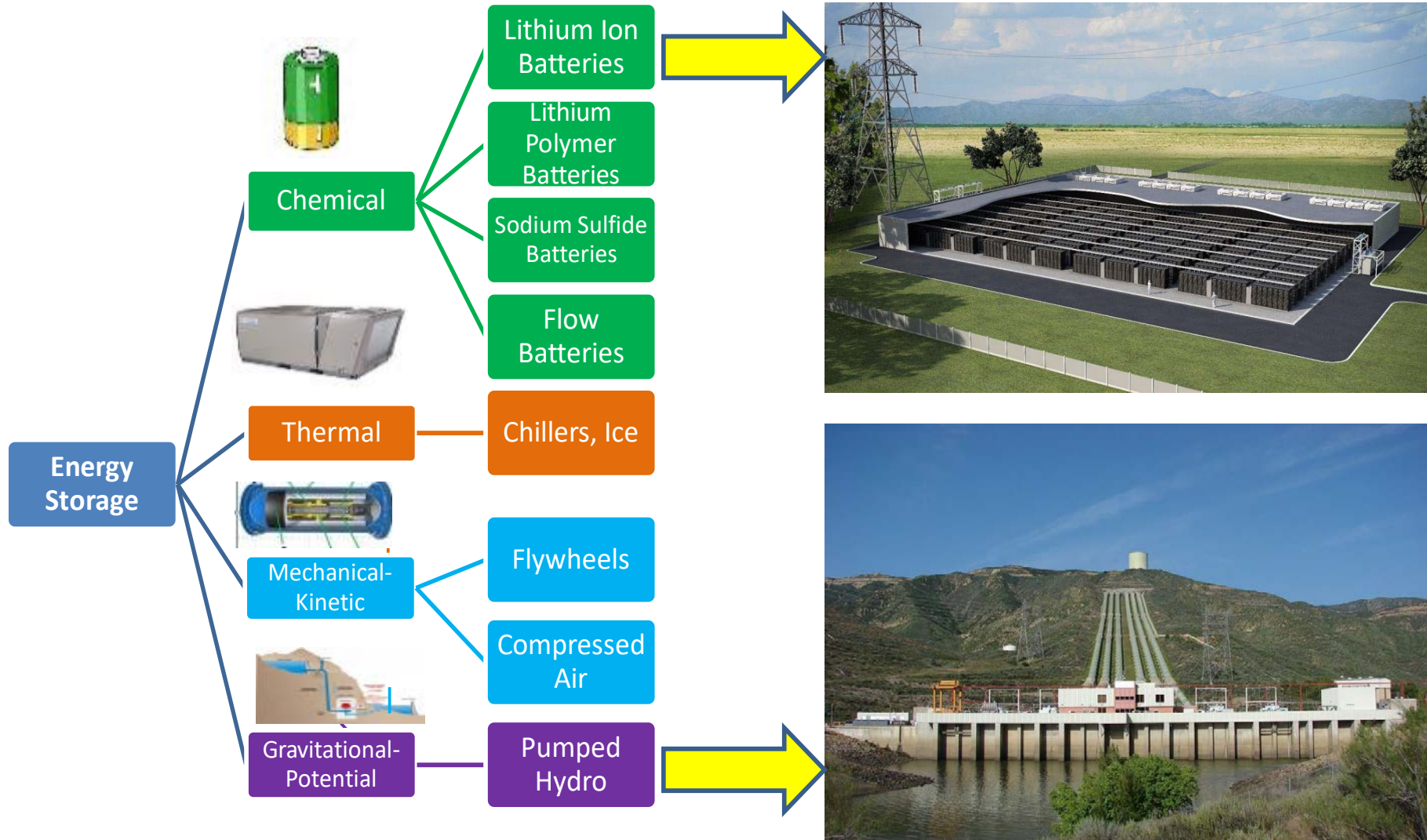


Role of Energy Storage

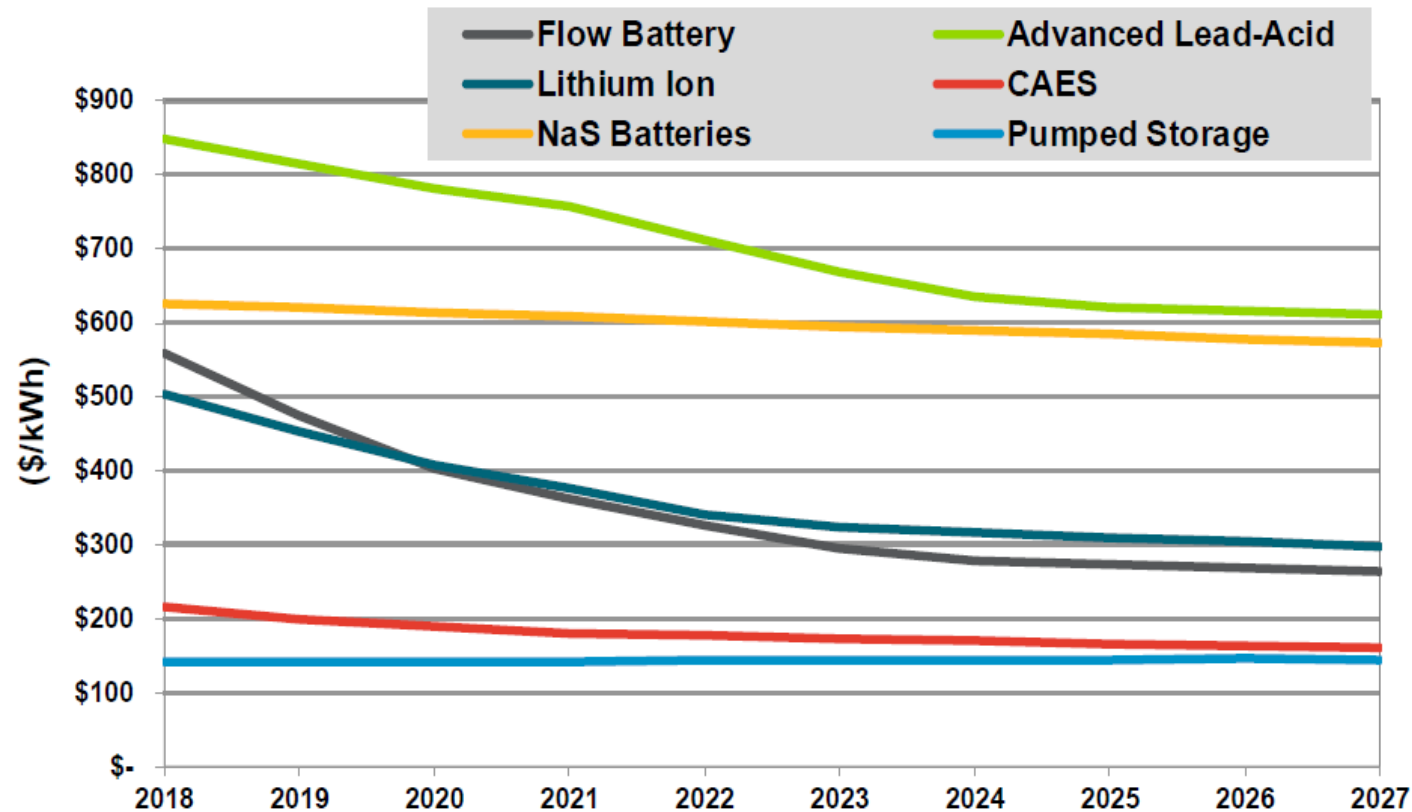
Economical way to –

- Improve capacity of renewable energy
- Transform renewables into “dispatchable” energy resource
- Reduce problem of over-generation
- Minimize curtailing renewables
- Support grid (frequency regulation, voltage stability, VAR control)
- Minimize transmission requirements

Energy Storage Technologies



Energy Storage Price Trends



(Source: Navigant Research)

- **Market Direction**
- **Investment Tax Credit (ITC)**
- **Production Tax Credit (PTC)**

LADWP Energy Storage Projects

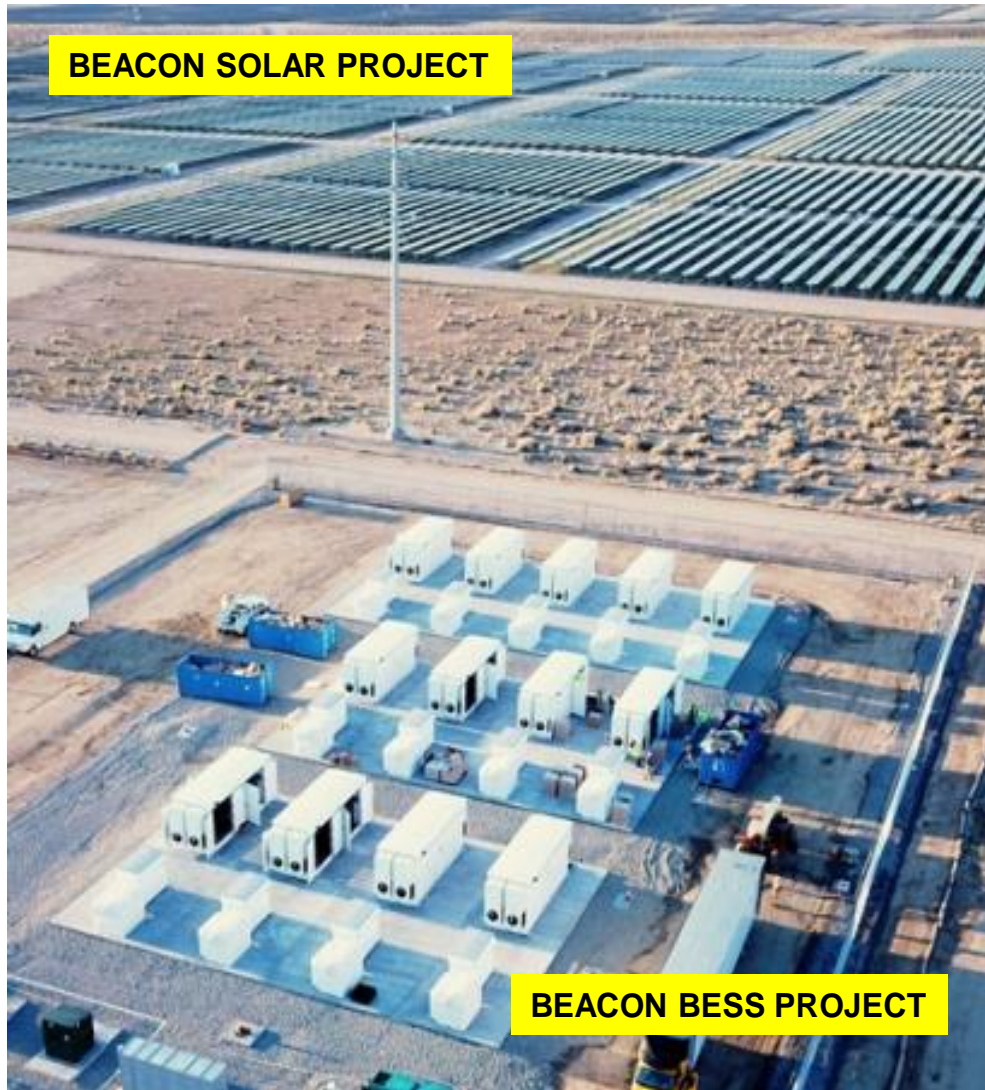
Achieved:

- Upgraded Castaic Power Plant, 21 MW - Completed
- Beacon BESS, 20 MW - Commissioning
- Fire Station 28, 12 kW + Solar Pilot - Completed
- La Kretz Innovation Center, 60 kW - Completed

In Progress:

- John Ferraro Administration Building (JFB) BESS, 200 kW – Evaluating Proposals
- Behind-The-Meter, over 500 interconnection applications, 3.6 MW
- Front of the Meter:
City owned facilities such as LAPD, Rec & Parks, DS-86, LA Zoo

LADWP Energy Storage Achievements— Beacon Battery Energy Storage System

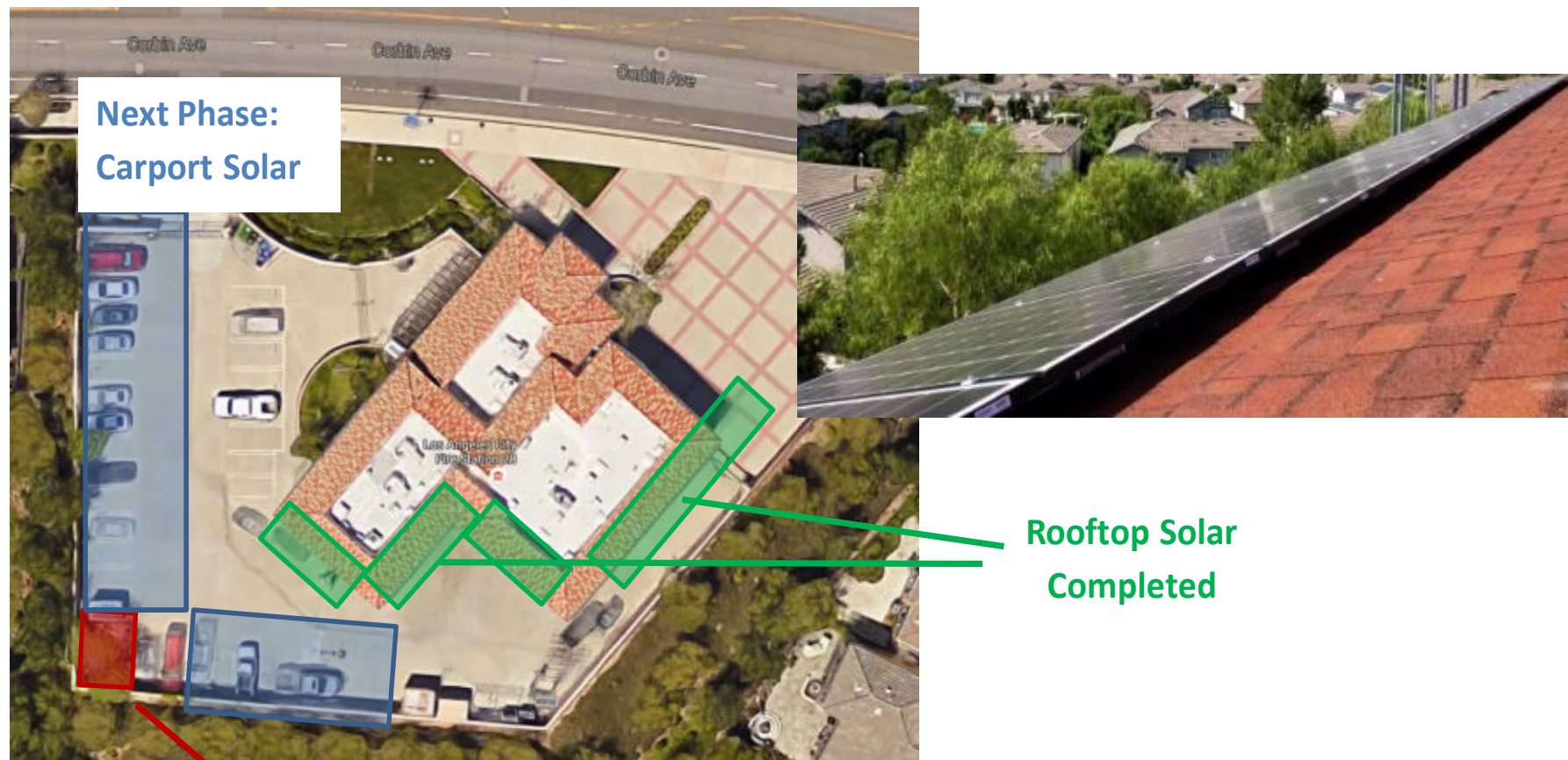


- 20 MW, \$19.2 Million
- Operational – 8/2018
- Provides grid services
- Integrates with variable renewable generation sources (solar & wind)

LADWP Energy Storage Achievements— La Kretz Innovation Center



LADWP Energy Storage Achievements— Fire Station 28 Solar + Storage

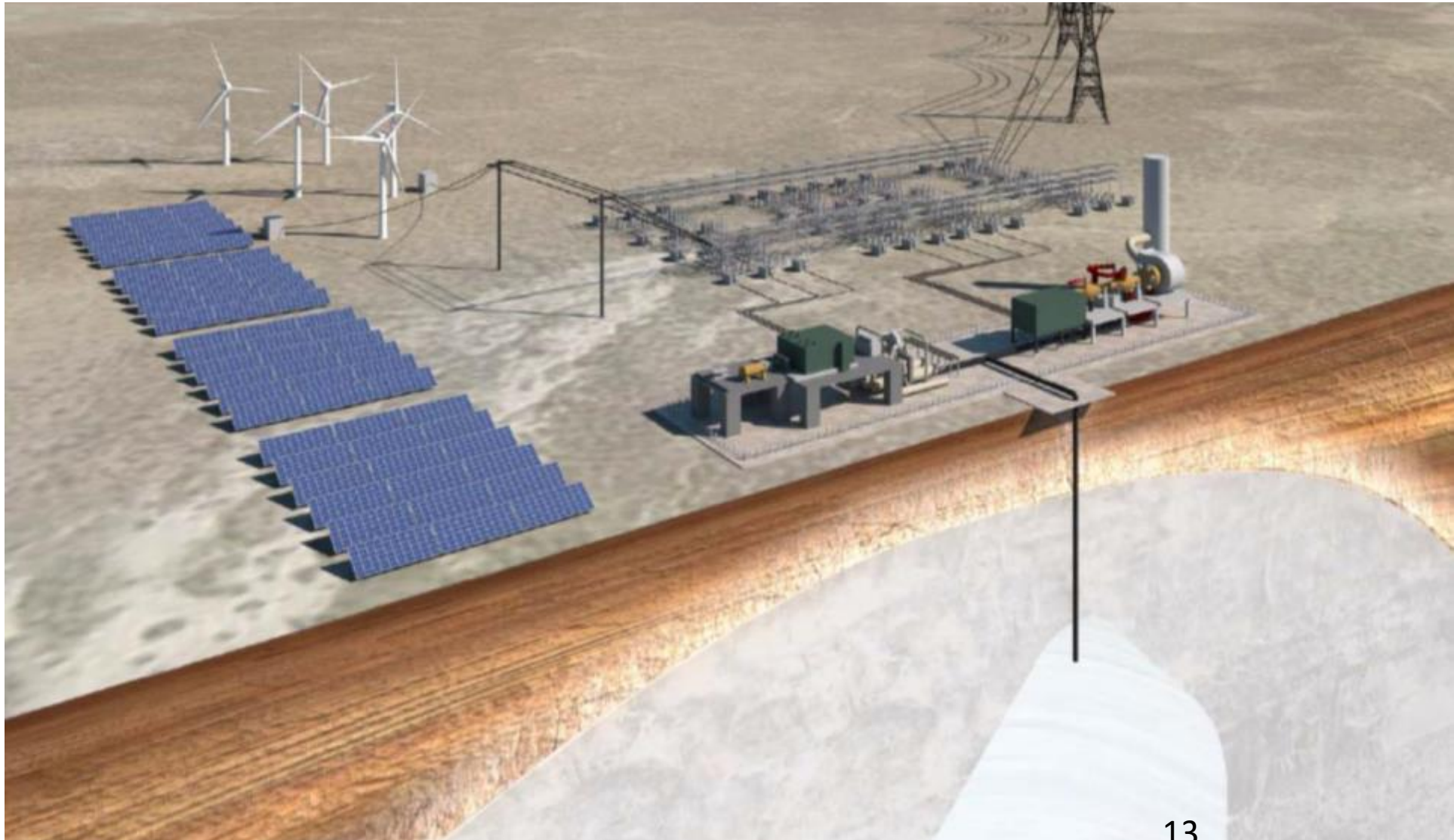


Next Phase:
Carport Solar

Rooftop Solar
Completed

Battery Energy Storage
Completed

Compressed Air Energy Storage



California Policy Context

LADWP Energy Storage 2021 Targets

CONNECTION LEVEL	PRE-2010 ENERGY STORAGE	2021 TARGET	ACHIEVED
Generation	1,265 MW (Castaic)	21 MW (Castaic Upgrade)	21 MW (Castaic Upgrade)
Transmission		128 MW	20 MW
Distribution		25 MW	
Behind the Meter (Customer-owned)	9.08 MW	4 MW	1.8 MW
TOTAL		178 MW	42.8 MW

Post-Aliso Canyon Legislation

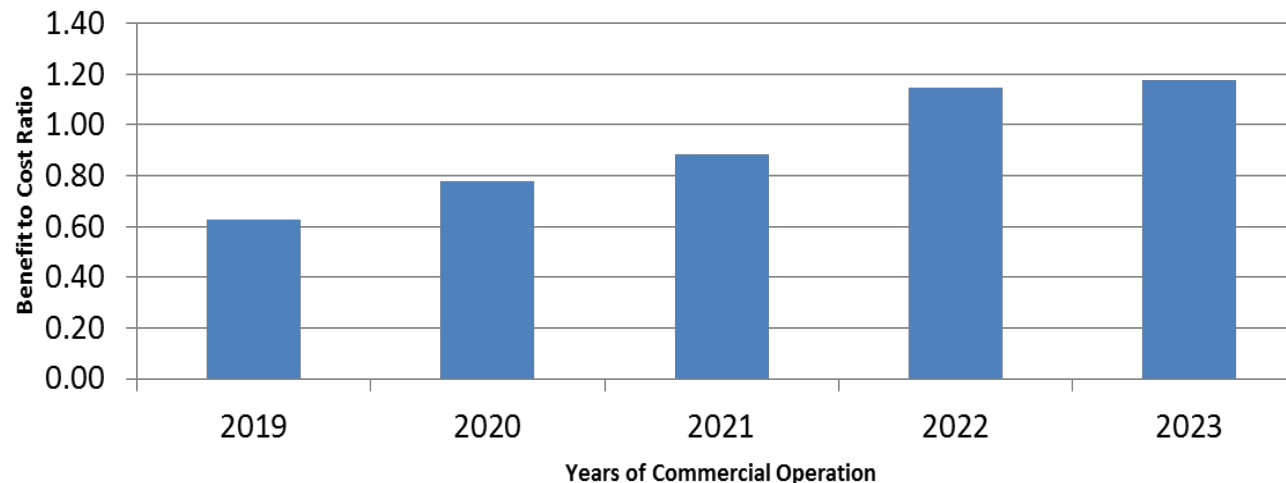
SB 801 requires LADWP in coordination with LA City Council to conduct cost-effectiveness & feasibility study of 100 MW, 400 MWh energy storage by June 1, 2018.



SB 801 Cost-Effectiveness & Feasibility Study

- LADWP engaged Electrical Power Research Institute (EPRI) to perform in-depth cost-effectiveness study
- Evaluated 100 MW/400 MWH Battery Energy Storage System paired with a 200 MW solar system.

Benefit to Cost Ratios of Solar and Battery Storage Systems from 2019 - 2023



Challenges with Energy Storage Today...

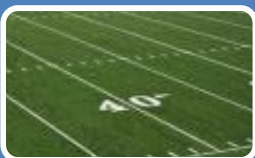


Needs a generation source



Evolving technology

4 hr. battery life; Not available 24/7



Requires large amount of land

100 MW=4 football fields



Battery disposal/recycling issues



Cyber-security risks

What's Next?

- Continue building partnerships with external stakeholders, including customers and vendors, for Solar and Energy Storage Solutions
- Procure Solar and Energy Storage solutions targeted in 2019 and in-service in 2022
- Install Energy Storage at City-owned facilities
- Encourage technology development & evolution
- Investigate sustainable opportunities

Questions?