Los Angeles Department of Water & Power

Date: 6/19/18
Submitted in ECC&EJ Committee
Council File No:
Item No.: 6-14
Deputy: Adam R Lid

UPDATE: LADWP POWER SYSTEM

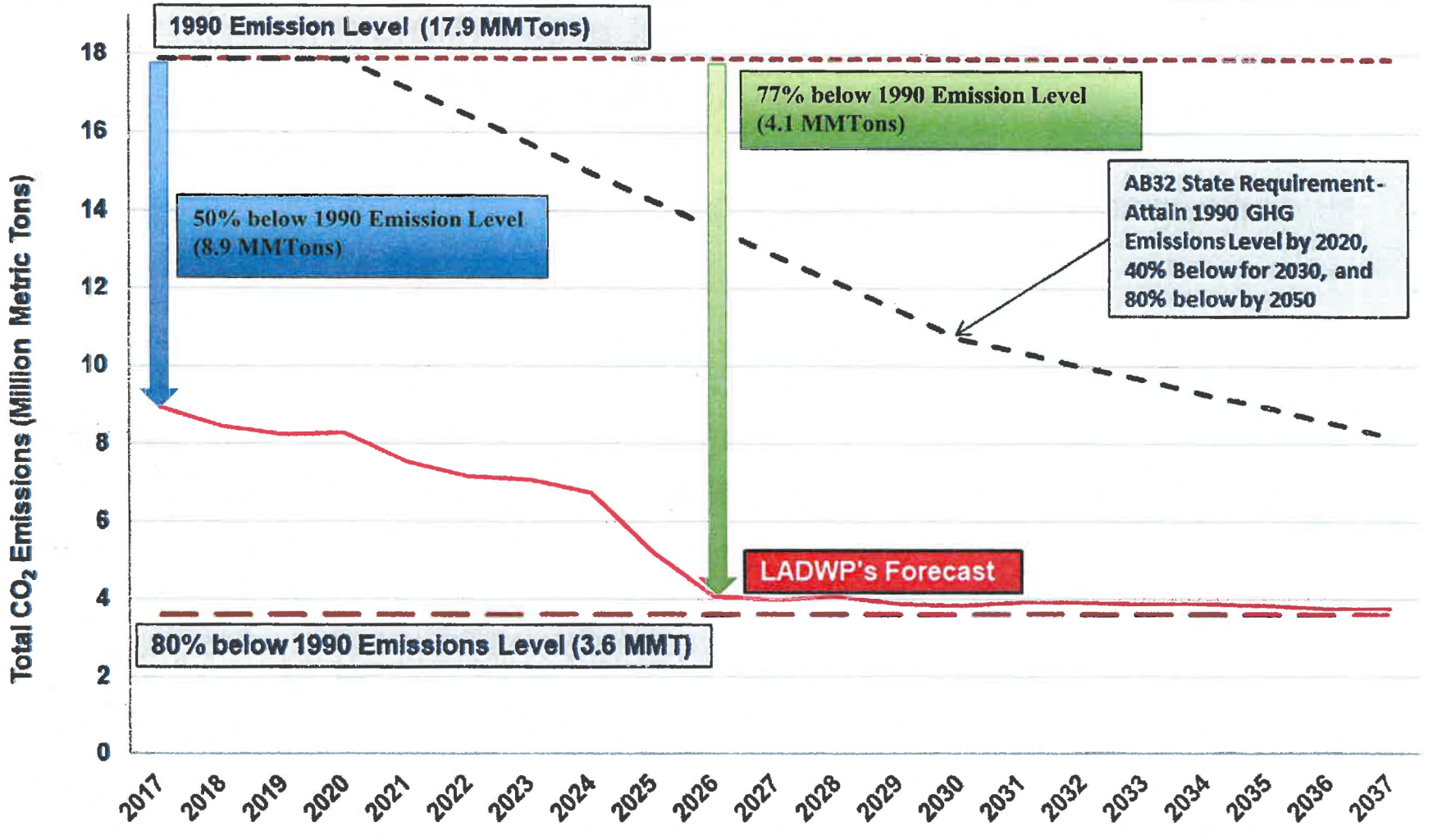
Energy, Climate Change, & Environmental Justice Committee

June 19, 2018

LADWP Historical and Recommended Goals

Year	2006	2010	2016	2020	2025	2030	2036	
California RPS		20%	25%	33%	45%	50%		
LADWP'S RPS Target	6%	20%	30%	39%	50%	55%	65%	↑
Renewable Generation (Solar, Wind, Geothermal)	331 MW	900 MW	1700 MW	2900 MW	3900 MW	4500 MW	5700 MW (2035)	↑
Distributed Energy Resources (DER)								
Energy Storage			24 MW	178 MW (2021)	404 MW	404 MW	404 MW	↑
Energy Efficiency (EE)		Baseline	7%	15%	15%	30%	30%	↑
Demand Response (DR)			30 MW	200 MW	500 MW (2026)	500 MW	500 MW	↑
GHG Reduction	6.7%	23.5%	41%	49.1%	68.1%	72%	76.7%	↓
Rate Impact (Estimated) per kilowatt-hour (kWh)	9.6¢	12.0¢	14.8¢	17.8¢	22.1¢	24.5¢	25.8¢	↑

GREENHOUSE GAS EMISSIONS FORECAST



CITY COUNCIL MOTION 16-0243

March 02, 2016

1st Council motion – Directed LADWP to develop a partnership with DOE renewable lab to conduct 100% Renewable Energy Study

September 16, 2016

2nd Council motion - Directed LADWP to examine potential for high quality careers and equitable local economic development

August 01, 2017

3rd Council motion – ECCEJ

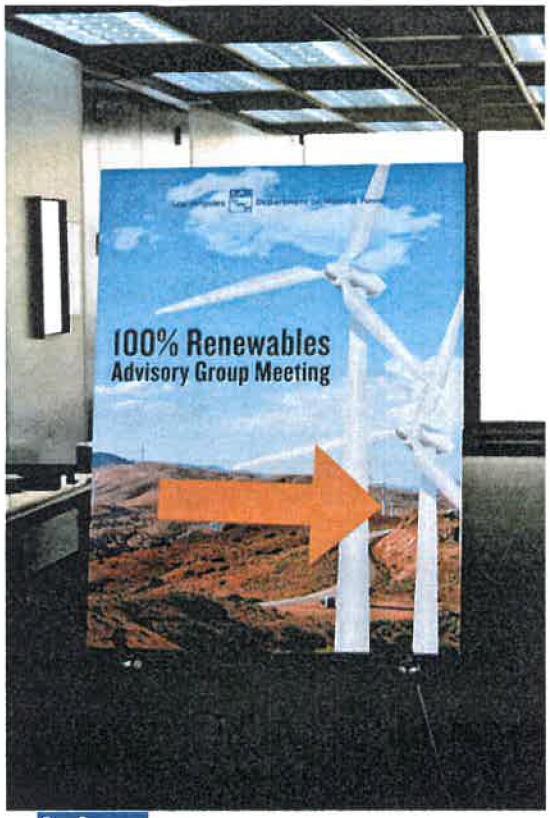
- Analysis by the RPA on how the 100% renewable scenarios fit within the current rate structure
- Incorporation of CalEnviro screen into each research area
- Prioritization of environmental justice neighborhoods as the immediate beneficiaries of localized air quality improvement and GHG reduction

KEY STUDY FACTORS

- Maintaining system reliability
- Necessary infrastructure upgrades
  - Critical transmission investments
  - Role of LADWP's existing natural gas generating units
  - Once-Through Cooling (OTC) Study
- Types/availability of clean energy resources/developing technologies
- Role of energy storage, energy efficiency, demand response, and Energy Imbalance Market (EIM)
- Optimization of costs
- Impact to rate payers and local economy
- Prioritization of environmental justice neighborhoods

100% Renewable Advisory Group

Provides input and guidance with a one primary member and one alternate member. The Advisory Group meets at least quarterly.



Objective, Integrated, Scientific Analysis

Renewable Generation

Buildings

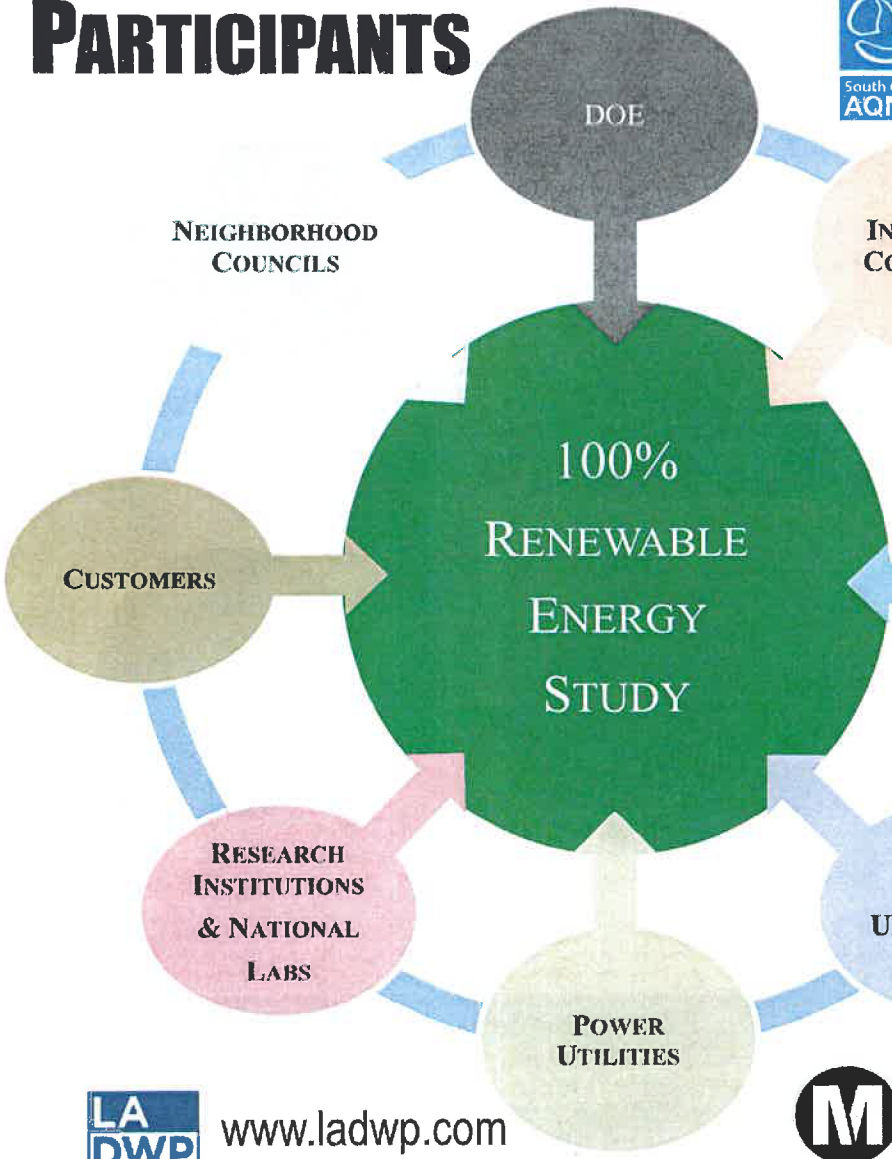
Vehicles

Data

People

100% Renewable Advisory Group

Participants



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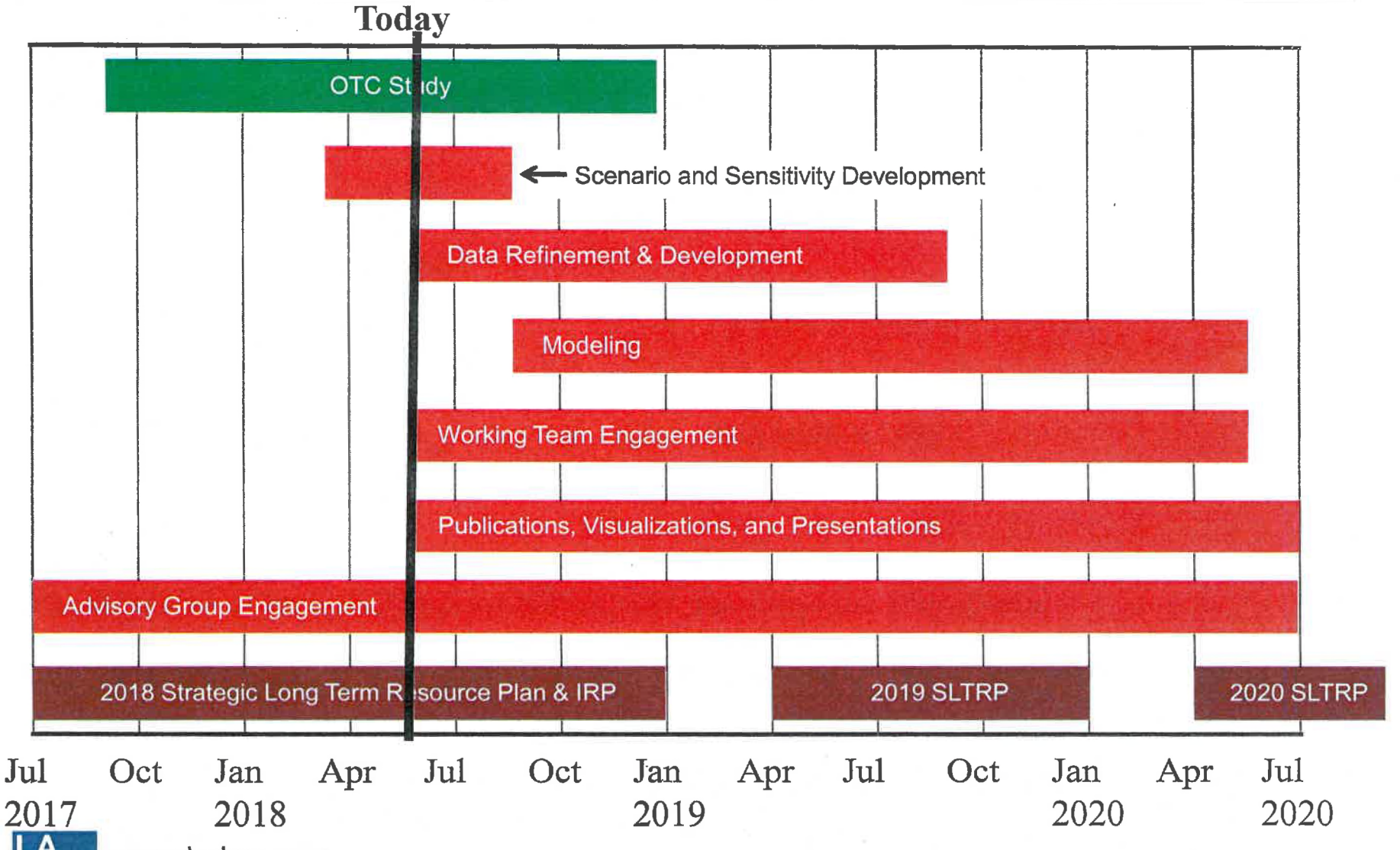
STUDY PROCESS

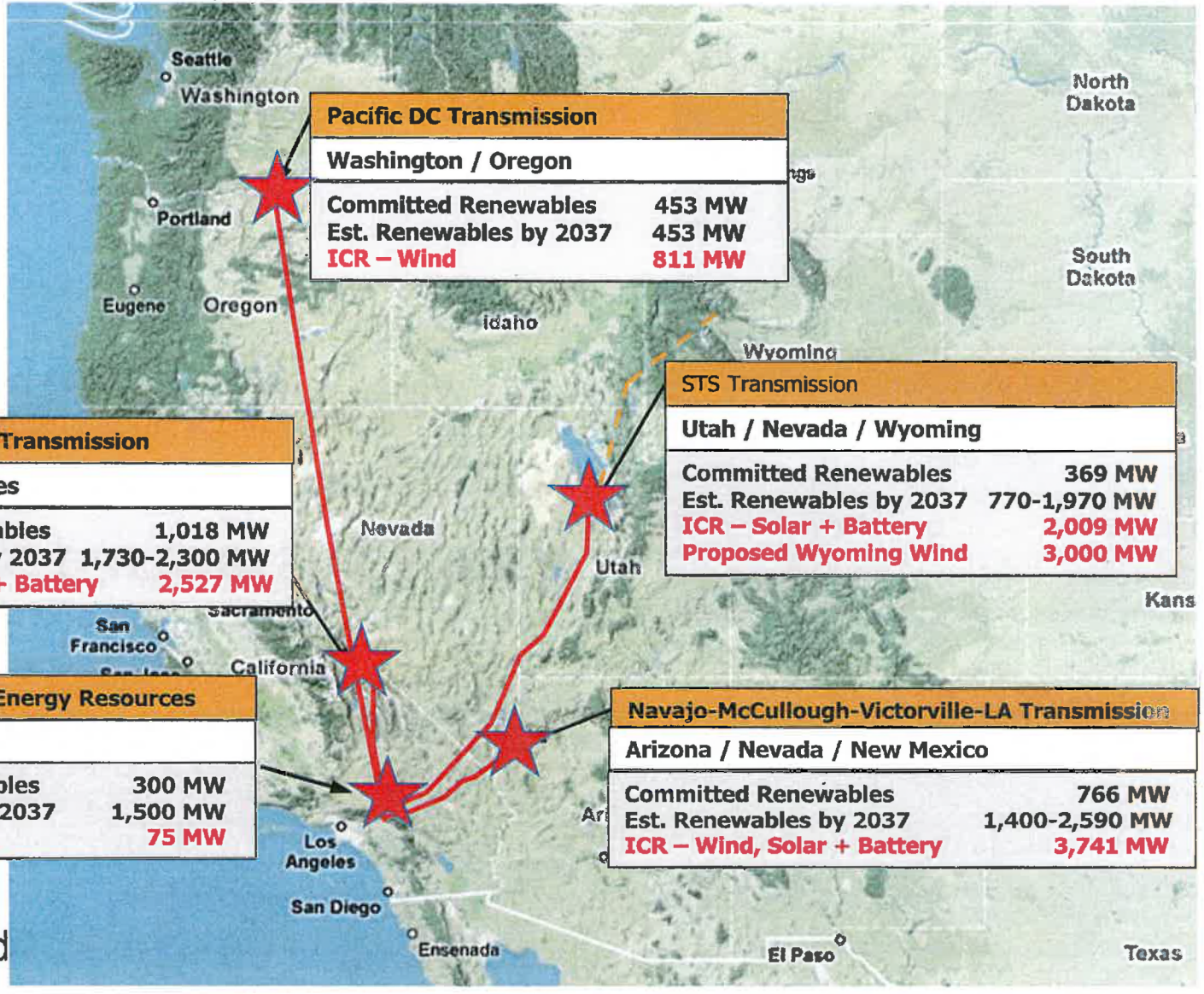


What might it take to make LA 100% possible?

Reaching 100% renewable electricity, affordably, unlocks potential for decarbonization in other sectors

- Transmission and storage will need to be built
- Seasonal and interannual variability is a significant challenge
- Comprehensive planning is critical to reliability
- Many renewable technologies will play a role
- Flexibility will be crucial
- Demand is part of the solution

Renewable Interconnection Requests 2017-2037: 12,163 MW



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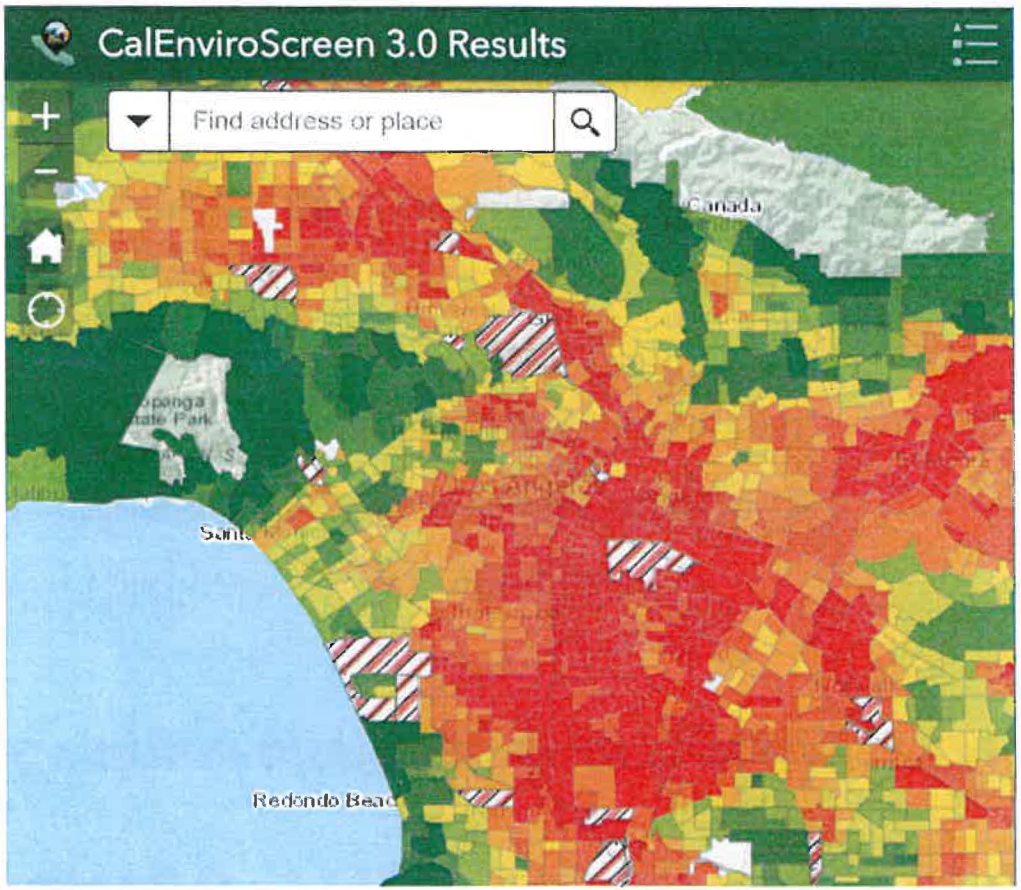
Economy Wide Impact Economy Wide Analysis

Strategic partnerships with academia enable targeted local analysis

Emissions, Air Quality, and Environmental Justice



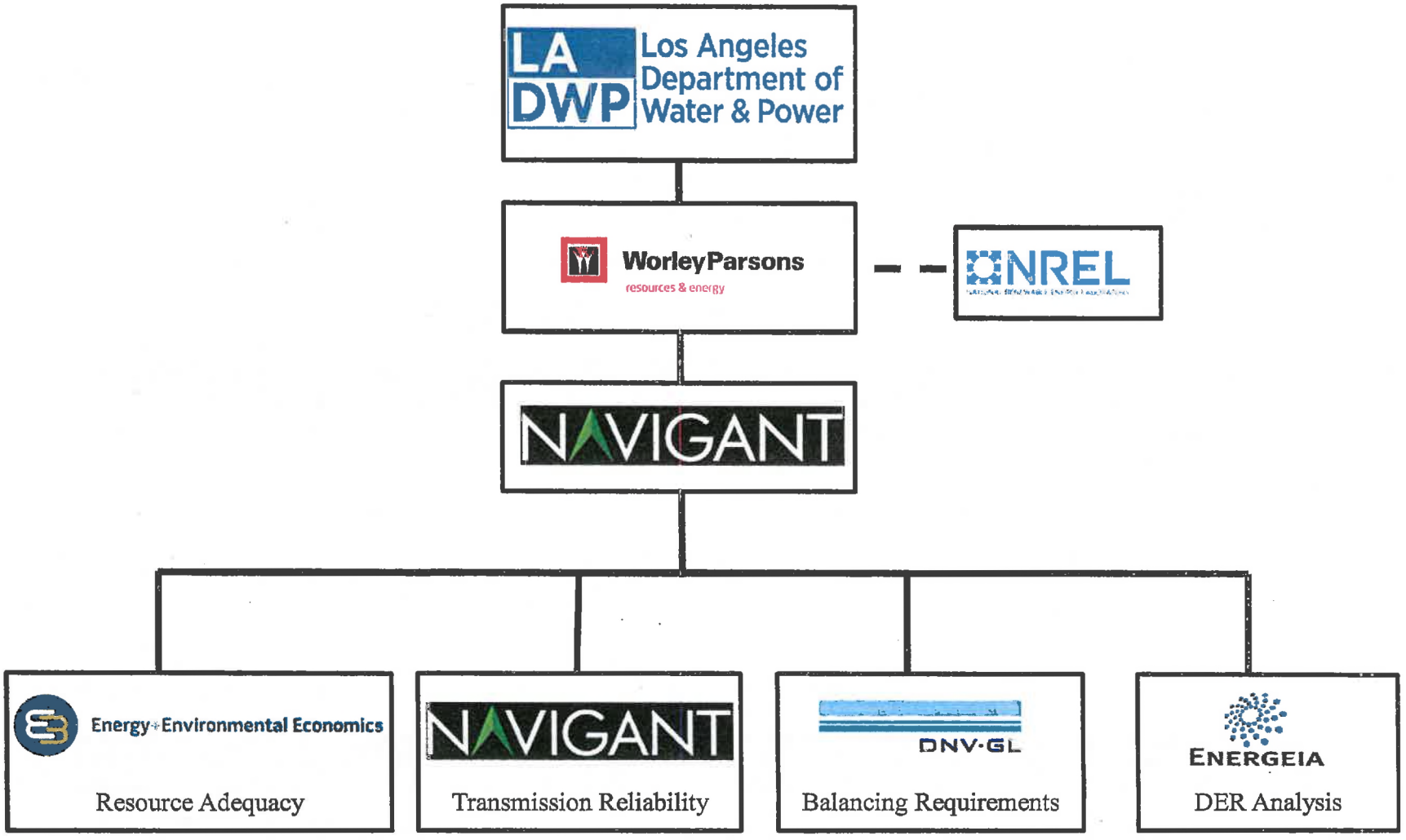
Integrated impacts assessment enables comprehensive insights into the cost of inaction

Once-Thru Cooling (OTC) Study

Evaluate alternatives to LADWP's OTC repowering plan

- Third party, independent study
- Maintains system reliability through 2036
- Evaluates all non-emitting alternatives
- Requires proven technology
- Adopts and expands on 2016 IRP (excludes OTC repowering)
- Considers environmental constraints
- Evaluates the cost associated with various alternatives
- Provides an overall recommendation

OTC Consultants Organization Chart

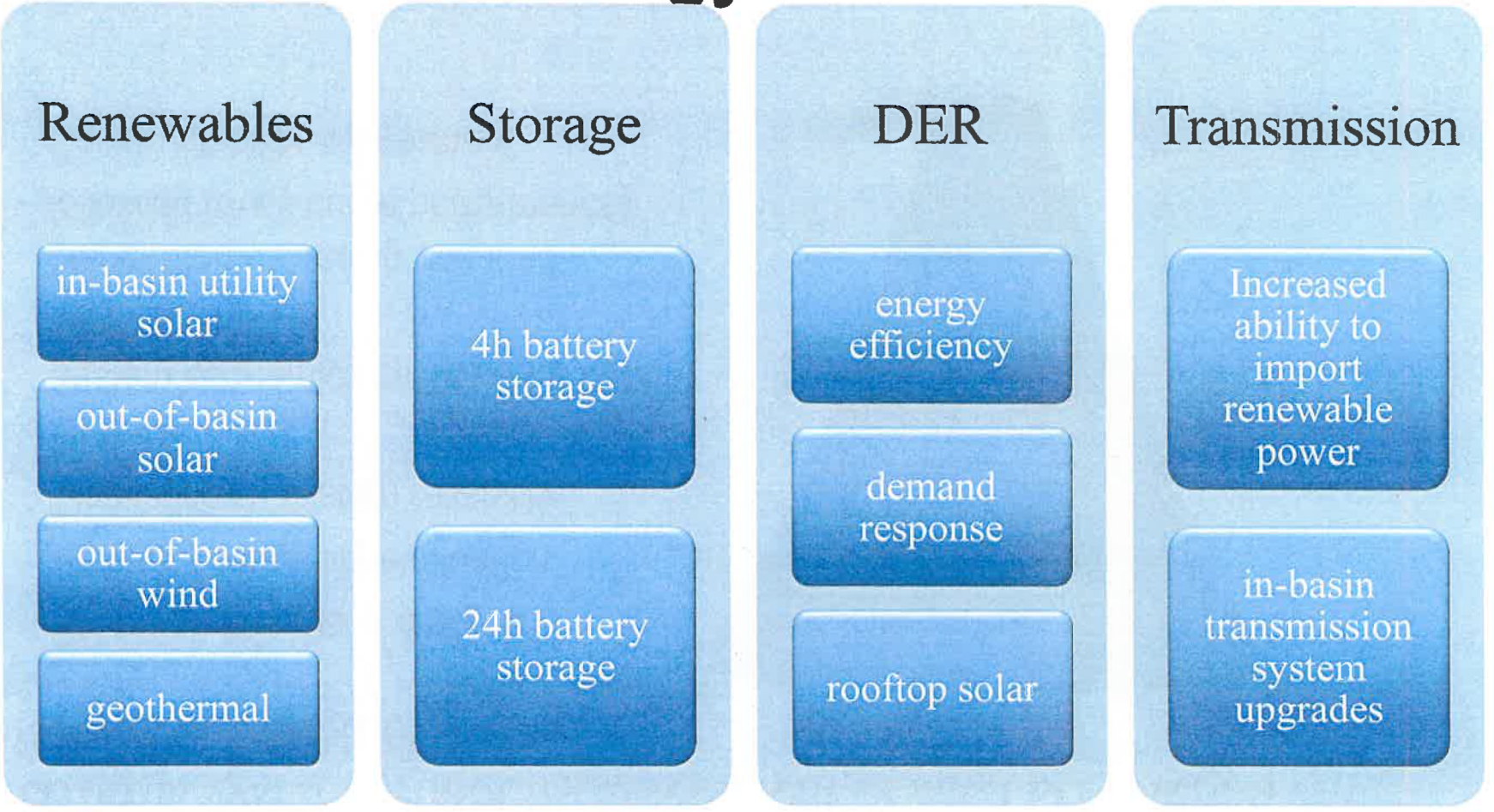


Study Objective – Retirement Scenarios

Existing OTC Capacity		
Unit	**Nameplate Capacity (MW)**	**LADWP Compliance Date**
Scattergood 1	185	12/31/2024
Scattergood 2	185	
Haynes 1	230	12/31/2029
Haynes 2	230	
Haynes 8, 9 & 10	590	12/31/2029
Harbor 1, 2 & 5	246	12/31/2029

Study Scenarios			
Scenario	**OTC Units Retired**	**MW Retired**	**MW Repowered**
A	None	0	1,593
B	All OTC Retired	1,666	0
C	SCAT Retired	370	1,256
D1	All HAY Retired	1,050	582
D2	HAY 8/9/10 Retired	590	919
D3	HAY 1/2 Retired	460	1,256
E	HAR Retired	246	1,348
F	HAY & HAR Retired	1,296	337
G	SCAT & HAY Retired	1,420	245
H	SCAT & HAR Retired	616	1,011

Alternatives Strategy



Other resources were considered but excluded due to technology maturity, construction timing, and GHG emissions

Study Methodology

Performs system reliability assessment of each OTC repowering alternative which includes:

- Resource adequacy analysis
- Technical feasibility evaluation
- Transmission system reliability analysis
- System economics estimate for each alternative
- Generation balancing and load following (duck curve performance)
- Constructability assessment

Questions?