Los Angeles Department of Water & Power

The Statewide Once-Through-Cooling (OTC) Policy

Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS)

Annual Meeting
May 4, 2017

LADWP Update
Grid Reliability Study 2016

LADWP Update
2016 Grid Reliability Report Summary

- Los Angeles Basin Generation
  - *Every* in-basin unit is needed to meet the minimum Reliability Must-Run requirement.
  - Basin generation is critical in order to meet customer demand particularly in the summer.
  - Scattergood Units 1&2 are next units in our repowering schedule.
  - Some basin units are dual fuel capable in the event of an emergency.

- Transmission Reinforcements
  - Install 230kV Scattergood-Olympic Cable A.
  - Add reactive support in-basin and external to basin.
  - Upgrade equipment: wires, transformers, circuit breakers, etc.

- Resources
  - Reserve margin requirement is increasing due to more Variable Energy Resources (VERs)
  - RPS targets of 33% by 2020 and 50% by 2025, 55% by 2030, and 65% by 2036.

- Every WECC audit since 2008 has determined that the LADWP Power System is reliable.

LADWP Update
2016 Grid Reliability Report Summary

- 2016 Transmission Assessment
  - conforms to new TPL-001-4 by adding near-term short circuit analysis to the near and long term steady state flow studies in addition to the transient and post-transient voltage stability required in previous studies. Findings show LADWP's Power System will perform reliably over the next ten years.
- 2016 Transmission Assessment
  - Identified minimum Reliability Must Run (RMR) generators is unchanged,
- 2016 Long-Term Transmission Assessment
  - Key segments of LADWP's transmission system must be reinforced, to the extent possible, in order to ensure continued reliable operations.
  - Transmission upgrades are in addition to maintaining current RMR generation requirements.

LADWP Update
2016 Grid Reliability Report Summary

- Findings in 2016 Grid Reliability Report mirror those reported in previous reports and continue to underscore that LADWP's OTC compliance schedule, shown on the next slide, is the most aggressive that is also feasible.

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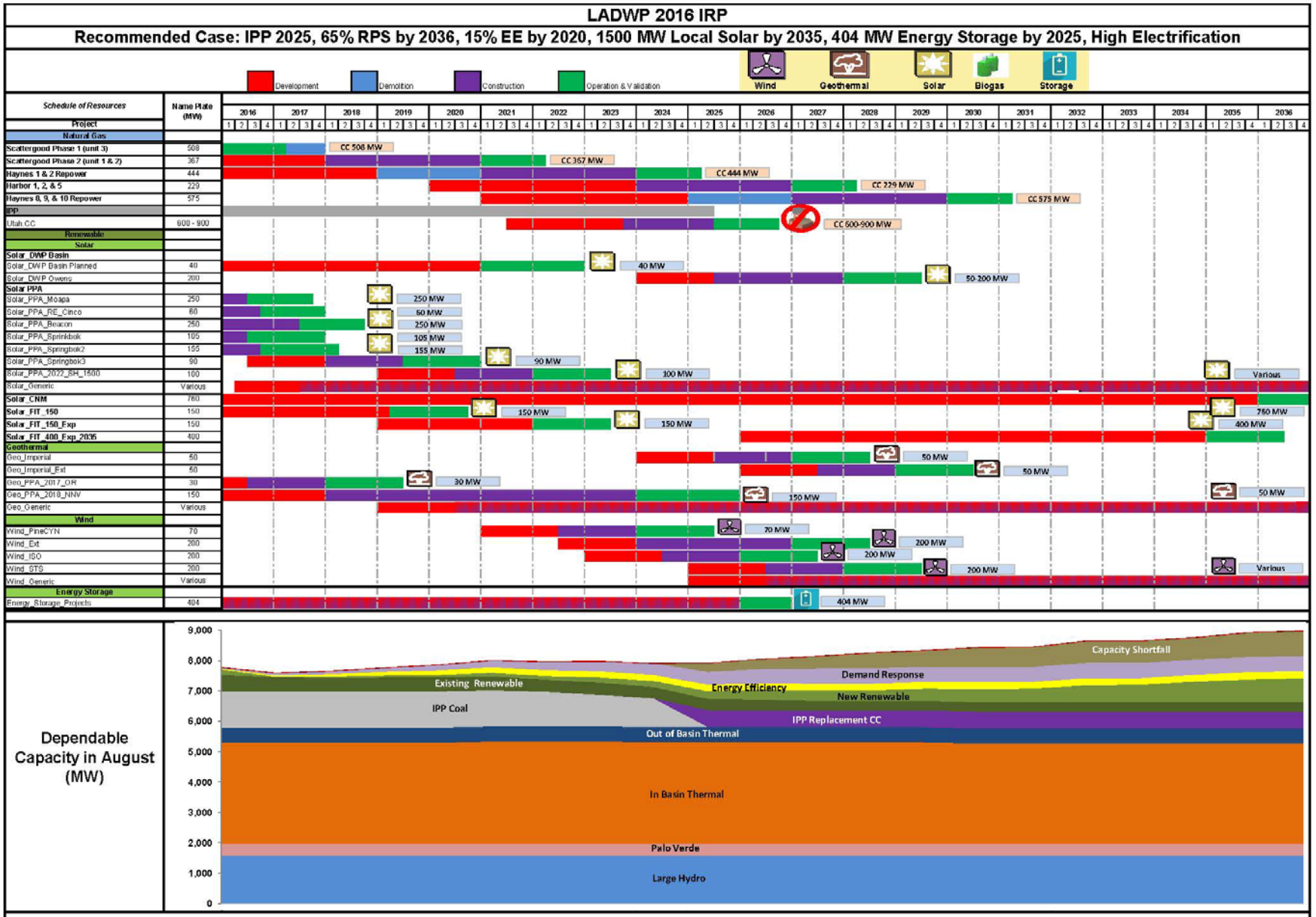
LADWP Update
2016 Grid Reliability Report Summary



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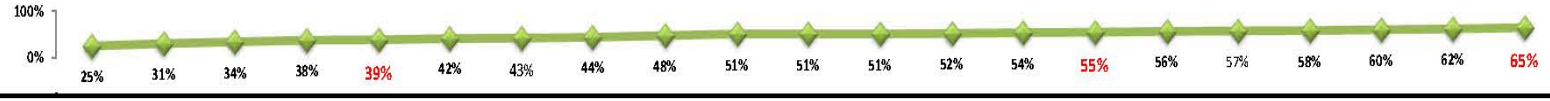
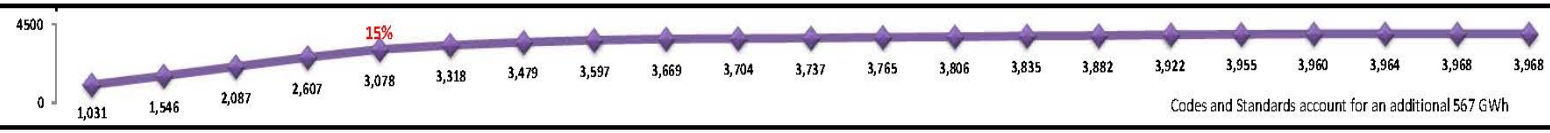
LADWP Update
2016 Grid Reliability Report Summary

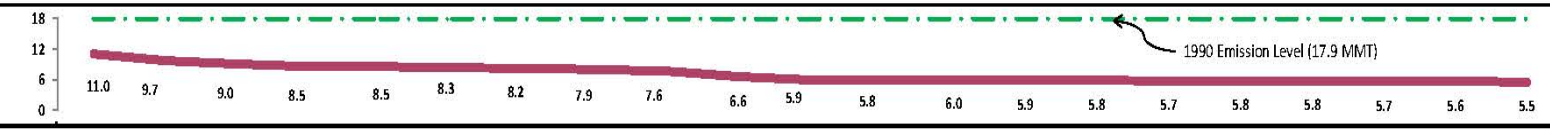
RPS %



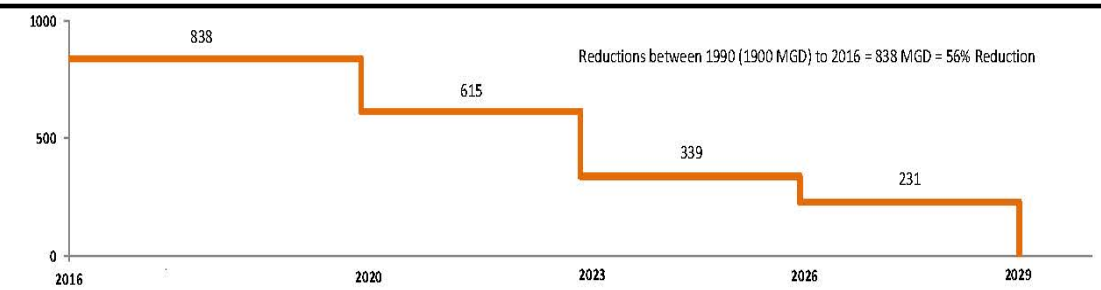
Energy Efficiency (GWh)



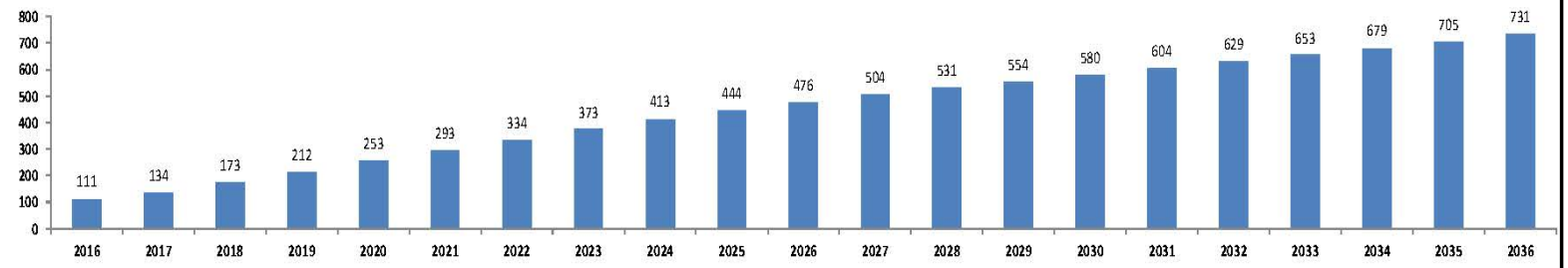
CO2 Emission (Million Metric Tons)



OTC Water Reduction Intake (Million Gallons/Day)



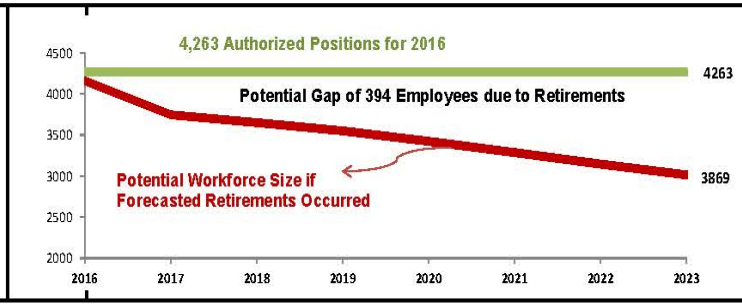
Cumulative Number of Electric Vehicles in Los Angeles (Thousands)



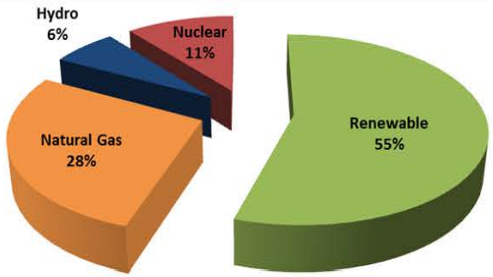
LADWP Update
2016 Grid Reliability Report Summary

Los Angeles Department of Water & Power

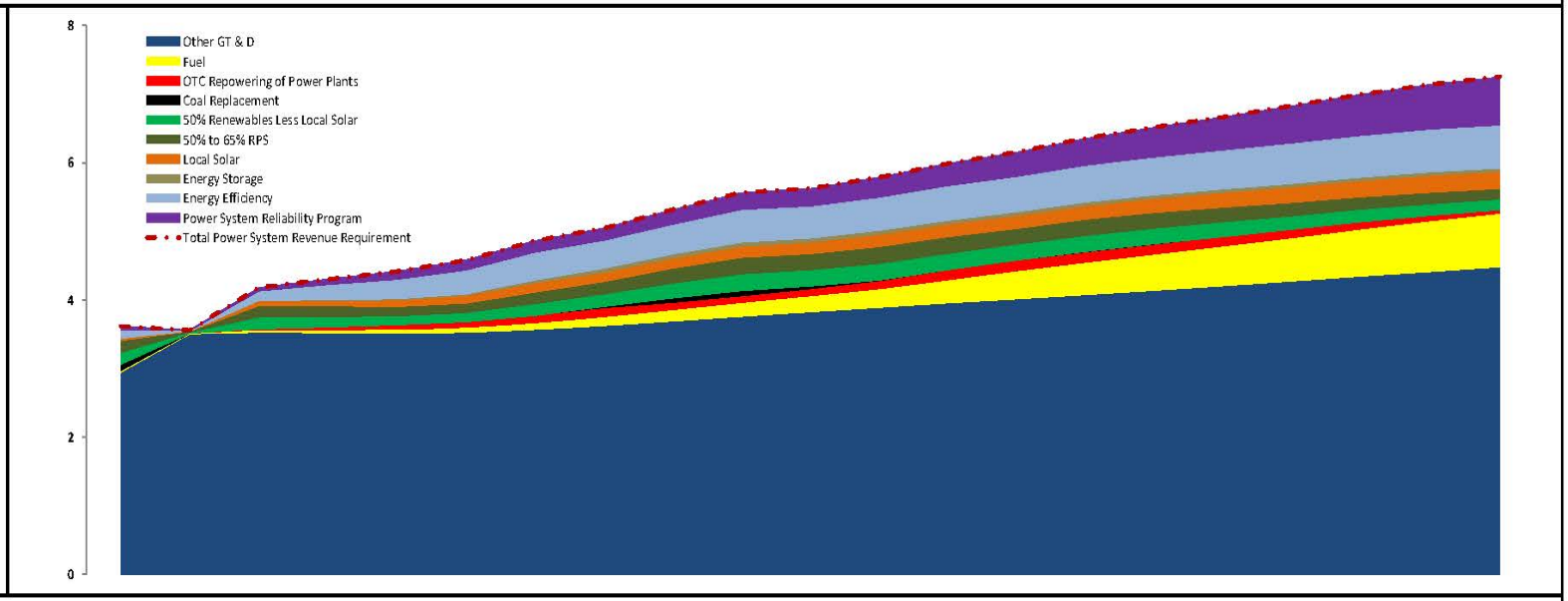
Power System Workforce Integrated Human Resource Plan (IHRP)



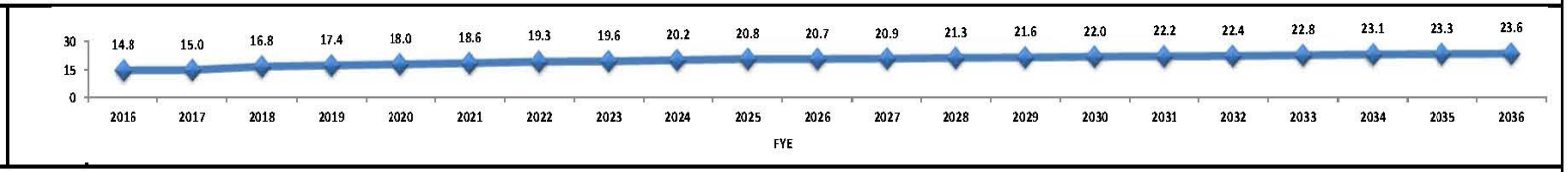
Generation Resource Percentages for 2030



Power System Revenue ($ Billion)

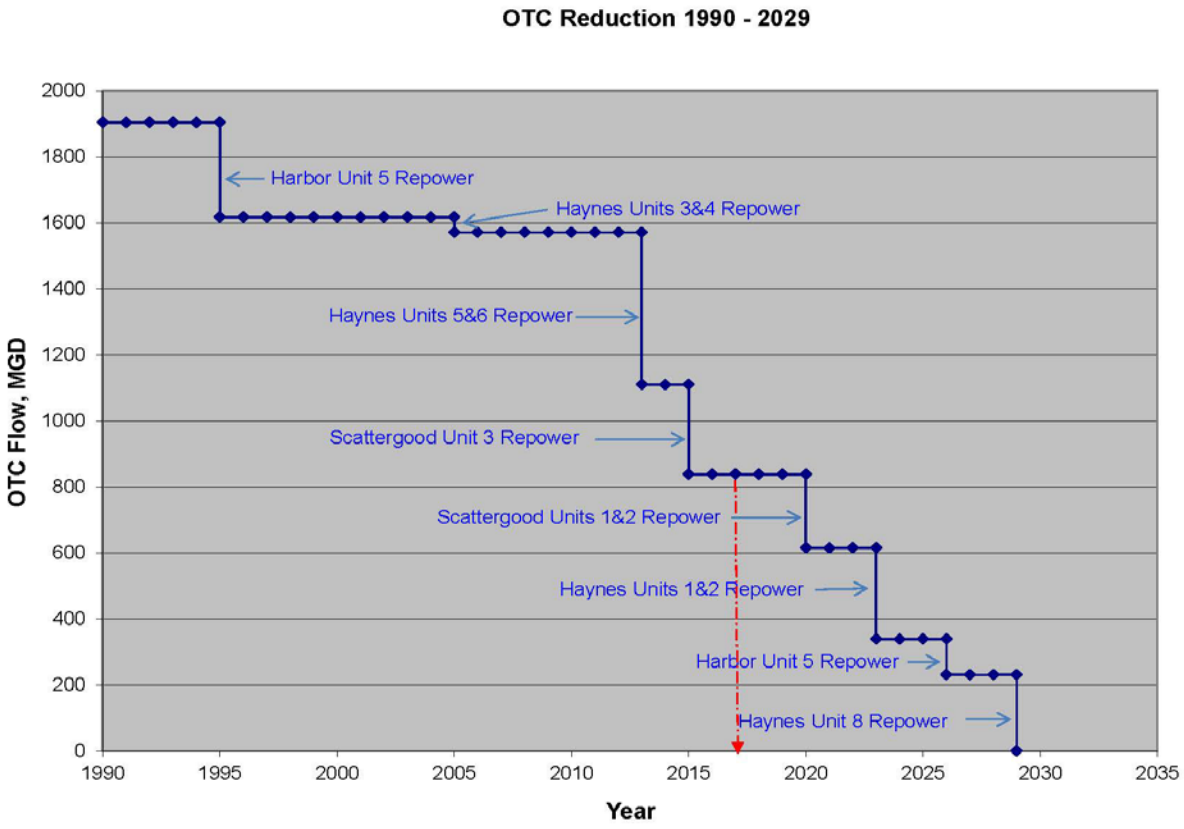


Total Rate Payer Costs (Cents/kWh)



Model Run Date: 12/21/2016

LADWP Update
2016 Grid Reliability Report Summary



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LADWP Update
LADWP Coastal Power Plants Compliance Schedule Status

Station	Unit/ (Vintage)	Max. Flow (MGD)	Compliance Date (Complete conversion to Closed-Cycle Cooling)	Status	Cumulative % Flow Reduction
Haynes	5 (1966) 6 (1967)	230.4 230.4	2013	Complete	42
Scattergood	3 (1974)	270.7	2015	Complete	56
Scattergood	1 (1958) 2 (1959)	112.3 112.3	2024	In Progress	68
Haynes	1 (1962) 2 (1963)	138.2 138.2	2029	Pending completion SGS 1&2	82
Harbor	5 (1995)	108	2029	Pending Completion HnGS 1&2	87
Haynes	8 (2005)	230	2029	Pending completion HGS 5	100

HARBOR GS

HAYNES GS

SCATTERGOOD GS

Units 1&2 Repower Project Status:

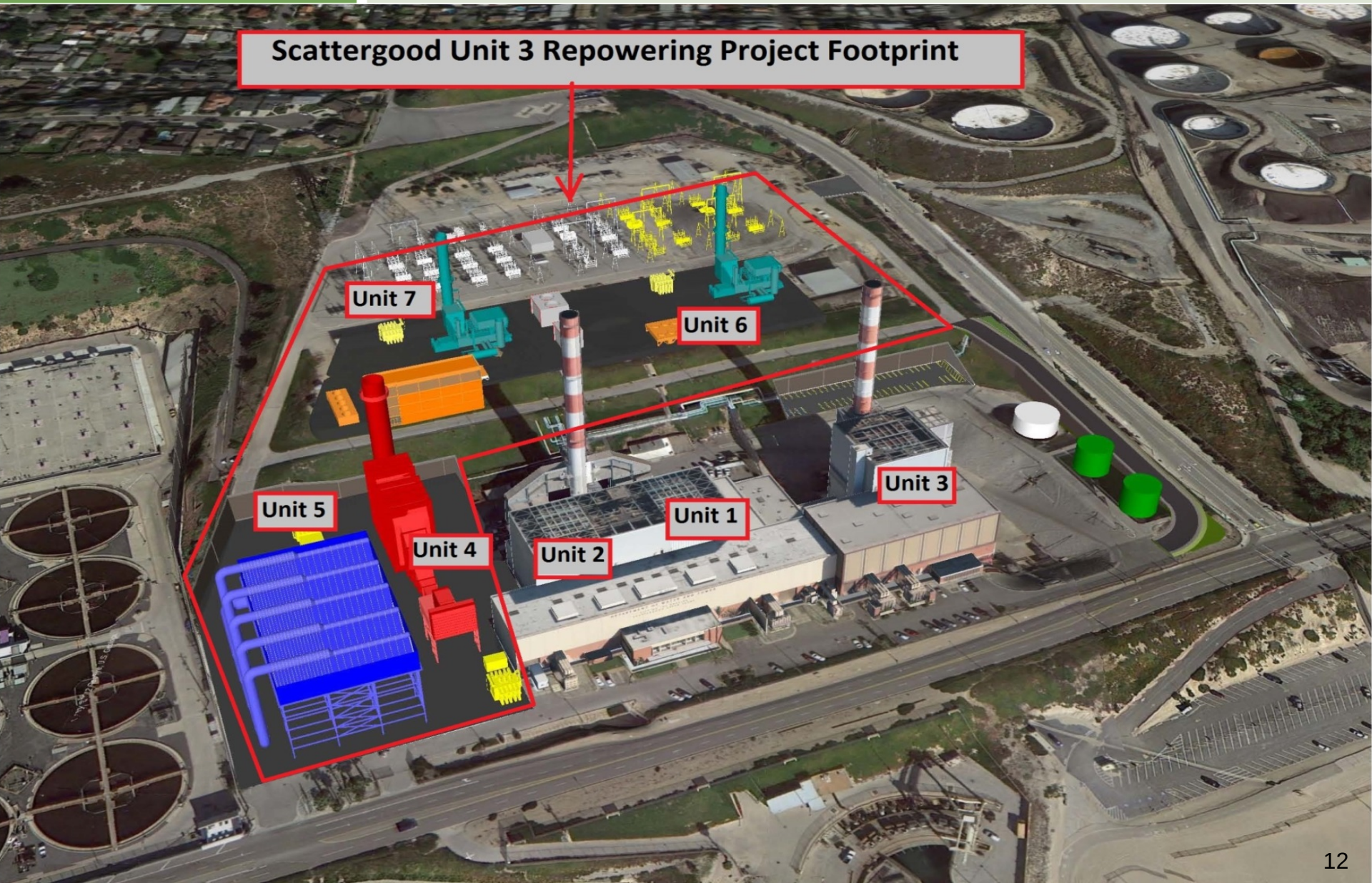
- **Environmental impact analysis is currently underway**.
- Developing technical specifications for contracts.
- Performing air modeling for prospective equipment manufacturers.
- Decoupling decommissioned equipment for demolition is complete.

Units 1&2 Repowering Project Status:

- Demolition of existing Unit 3 equipment is currently underway with expected completion of 2/2018.
- Units 1 & 2 scheduled for decommissioning and shutdown of Once-Through Cooling system by December 31, 2024.

Los Angeles Department of Water & Power

LADWP Update
2016 Grid Reliability Report Summary
Scattergood Repower Project



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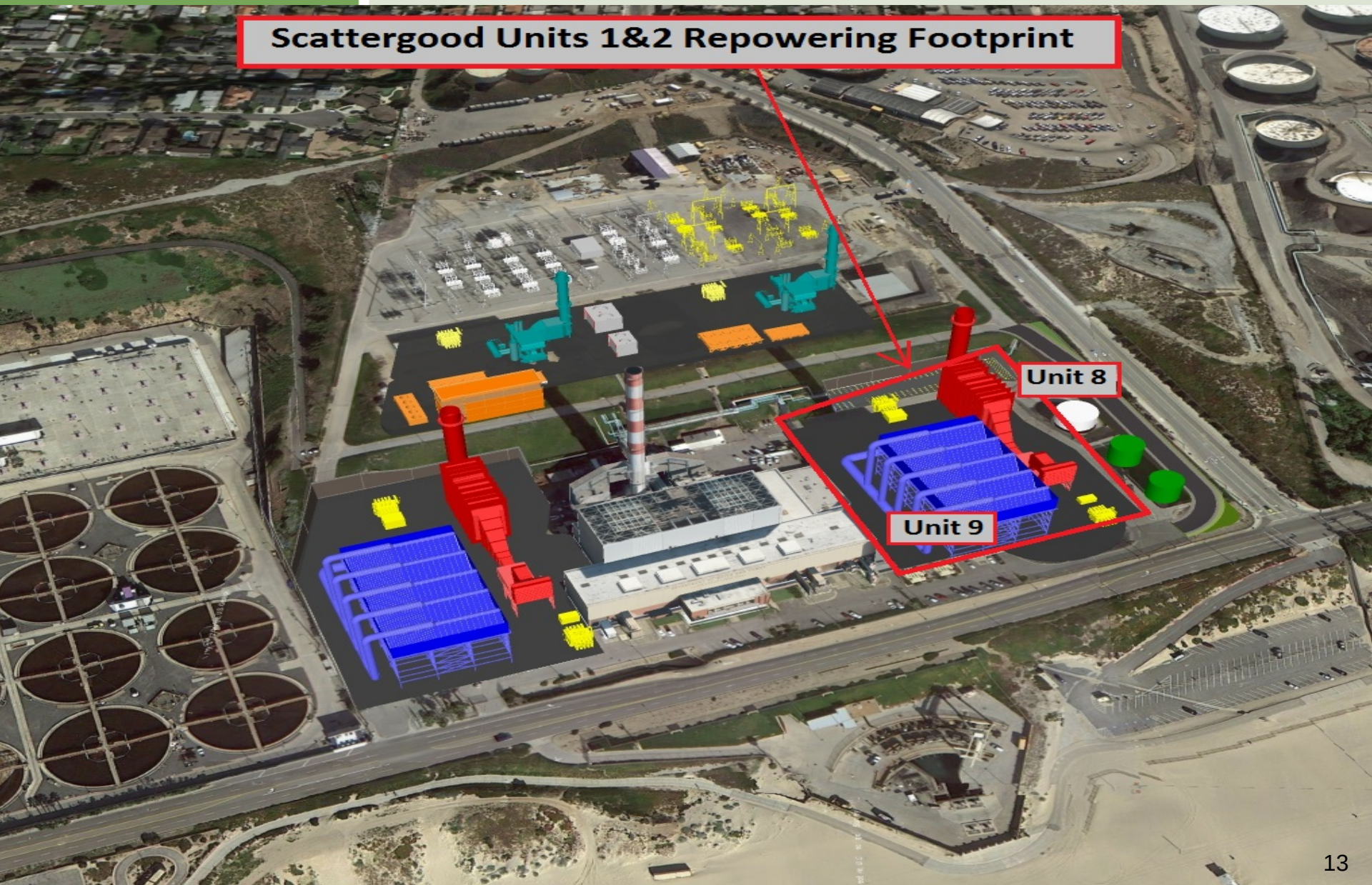
LADWP Update
2016 Grid Reliability Report Summary
Scattergood Repower Project



LADWP Update
2016 Grid Reliability Report Summary