



Los Angeles
Department of
Water & Power



The Statewide Once-Through-Cooling (OTC) Amendment





LADWP is:

- A Vertically-Integrated Municipal Utility governed by City Charter
- Mandated obligation to serve
- Owns and Operates its own generation, transmission, and distribution systems
- Own Balancing Authority
- Not part of the CAISO grid system or territory
- Does not rely on energy market or other transmission system operators as a primary means to meet its power needs



- To date, LADWP has reduced the number of OTC units from 14 to 9
- 9 OTC units, located at LADWP three coastal plants:
 - Haynes Generating Station
 - Units 5&6 – repower project with dry cooling towers currently in construction
 - Units 1&2
 - Unit 8 – recently repowered and in service 2005
 - Scattergood Generating Station
 - Units 1&2
 - Unit 3 – repower project with dry cooling towers currently underway (planning / permitting / design)
 - Harbor Generating Station
 - Unit 5 – repowered and in service 1995



- LADWP is eliminating OTC from the largest units first in order to achieve the greatest reductions of impacts to marine life
- Scattergood Unit 3, which is the largest unit, will have OTC eliminated by 2015
- The last units to have OTC eliminated are the combined cycle units (Harbor Unit 5 and Haynes Unit 8)





The 3 coastal stations:

Natural-gas fueled (Assist with SB 1368 compliance)

Necessary to power southern and western portions of LADWP service territory

Provide in-basin power critical for reliability & security & meeting demand during emergencies/natural disasters



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LADWP's Coastal Plants: Overview

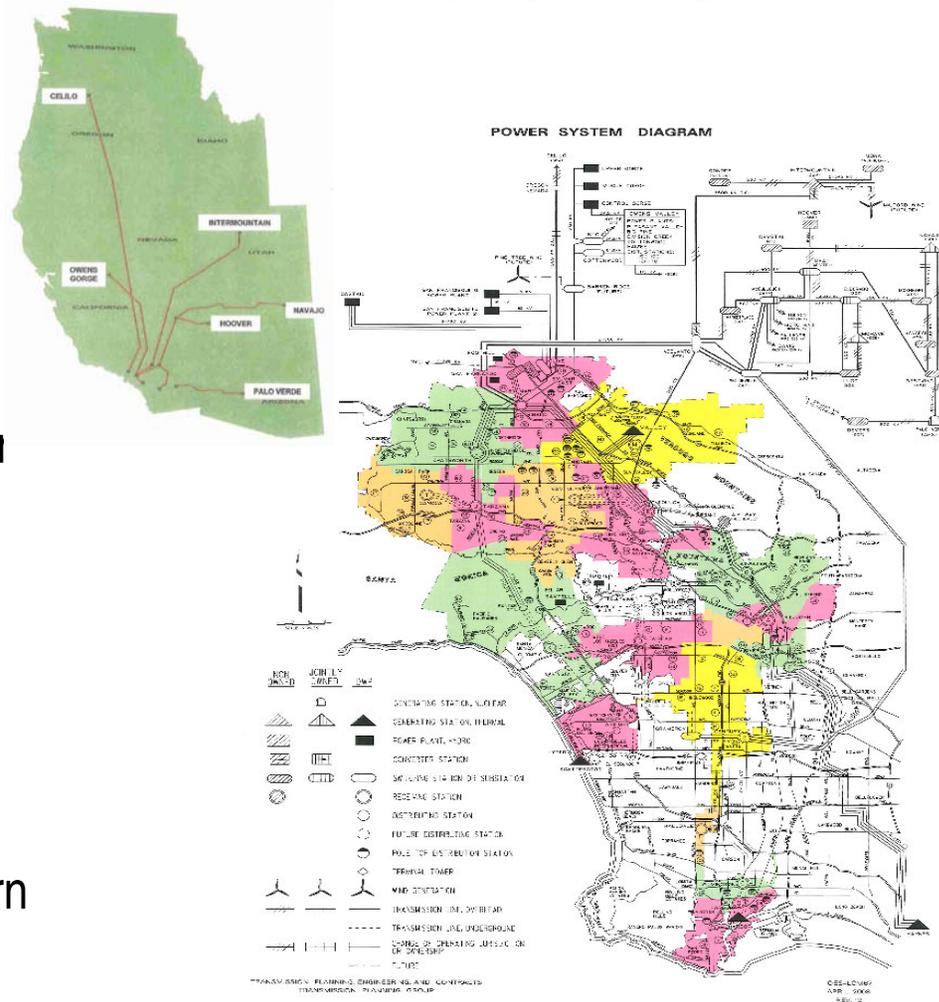
- Provide 39% of LADWP's Total Generating Capacity
- Represent 85% of Total In-Basin Generation
- Provide voltage balance to LADWP's entire system
- Provide local area system inertia
- Provide reliable energy during forced and scheduled transmission and generation outages.
- Provide critical in-basin power for meeting demand during emergencies & natural disasters



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LADWP's Coastal Plants: Local Role

- Are critical to Local Area
- Are situated in a Transmission cul-de-sac
- Due to lack of transmission capacity, the ability to import power from the northern portion of LADWP's service territory or from external connections - also in the north – is limited
- These plants provide 100% of reliability generation for the Western & Southern portions of LADWP's service territory





NERC Reliability Requirements

- 1100 MegaWatt (MW) Replacement Reserve Requirement
 - For reliability and security purposes,
 - Based on loss of “Most Severe Single Contingency” (MSSC)
 - Haynes Combined Cycle 575 (MW)
 - Intermountain 1 or 2 541 (MW)
 - Valley Combined Cycle 515 (MW)
 - Any two of the above scenarios add up to approximately 1100 MW



- Forecast 1 in 10 Demand 6262 MW
- Resources ~ 7200 MW

- LADWP does not have excess reserve capacity

- Transformation and uncertainty of new technologies and policies will place additional power demands on LADWP system: such as,



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LADWP's Coastal Plants & Power Transformation

Electrification adds Power Demand in Southern and Western Regions of the City

- Shore-to-ship power to reduce ships' use of auxiliary diesel engines
- Electric forklift, trucks, tugs & rail at Port of Los Angeles and Airports

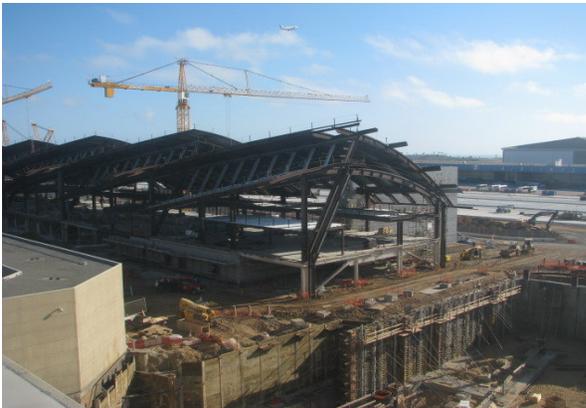




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Load Growth Through Modernization & Policies

- Planned expansion of Los Angeles International Airport
 - May add 160 MW of demand load on LADWP's system
- City of Los Angeles & LADWP Planning Support
 - PHEVs: Plug-in Hybrid Electric Vehicles
 - Electrification of Railway – California High Speed Rail





Present and Future Requirements

- Transmission forced outages may increase the amount of reliability generation required
 - Local area and import transmission is vulnerable to seasonal fires and other failures
- Sufficient local area generation must be available to compensate for forced outage of other local and remote generation
- Sufficient dispatchable generation must be available to regulate and back-up intermittent generation resources (wind and solar)
- Planned repowering projects may change the operation of coastal generation but will not have significant impact on capacity and energy requirements during the peak times of the day
- Most Renewables can meet general energy needs but do not, on their own, reliably meet capacity requirements, regulation, and locational needs.



Transmission Upgrades?

- Local area transmission was initially constructed to move power from south to north at a time when Los Angeles was growing
- The early transmission was comprised of 138-kV lines and cables. Later additions were at higher capacity 230-kV
- Additional utility interconnections in the local area not possible
 - Lack of available transmission corridors
 - Power flow determined by system characteristics – may not flow as desired



Transmission Upgrades?

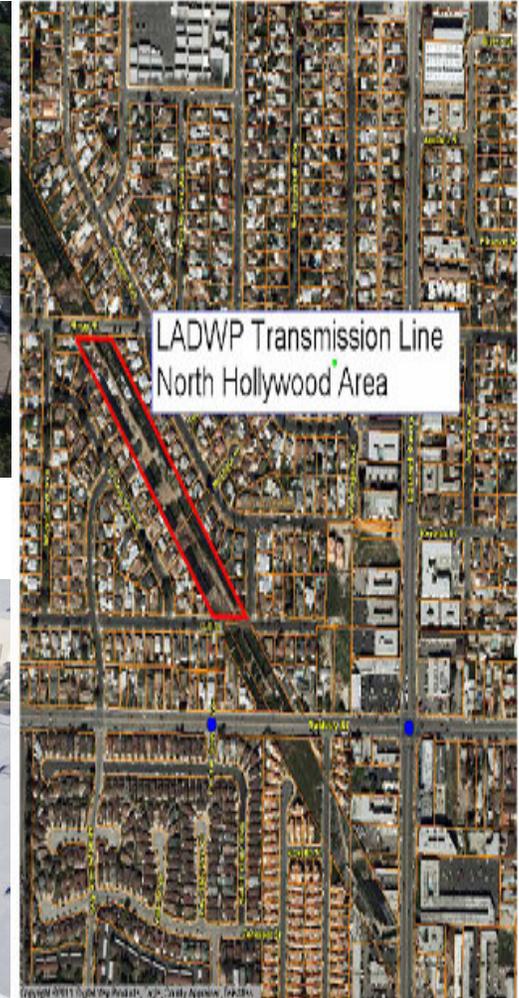
- Los Angeles is now a largely metropolitan area. Opportunities to add or upgrade local area transmission is limited
- Plans to upgrade the old 138-kV system was found to be impractical due to impact to infrastructure and high cost
- Right of way for overhead transmission is no longer available
- Underground circuits are difficult and costly to install, have generally lower transmission capability and require additional support equipment



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Transmission Upgrades?

- There is limited ability to upgrade the internal transmission due to the density of the service territory.
- 10-year transmission plan is primarily focused on load growth and renewable integration





Repowering Projects and Air Permits

- The Haynes Generating Station (HnGS) Repowering Project will replace two steam boiler units with six advanced simple-cycle gas turbines.
- The 600 MW of gas turbines will increase the capacity of the facility by 12 MW gross with no net increase in capacity
- The DWP has been granted the SCAQMD Rule 1304 exemption from the Emission Reduction Credit (ERC) requirement
- Rule 1304 provides an exemption from the offset requirements on a MW-for-MW basis for replacements of steam boilers with advanced gas turbines.
- The DWP is in the preliminary stages of designing the Scattergood Generating Station Repowering Project which will replace the largest steam boiler unit with gas turbine technology
- The SCAQMD has held a number of workshops regarding streamlining its New Source Review regulations. One proposal is to calculate the ERC requirement in an annual rather than a monthly basis.



The Amendment would allow a carefully sequenced, yet aggressive repowering plan allowing for transformation and uncertainty

- Principles of LADWP's proposed repowering schedule:
 - Ensure that local area demand can be met
 - Ensure overall system reliability through voltage balance
 - Eliminate Coal generated power (40%) from resource mix
 - Add enough intermittent renewable generation to achieve 33% RPS by 2020
 - Provide adequate power to meet demand resulting from modernization & policy-driven demand



Principles of LADWP's repowering schedule continued:

- Recognizes Limitations
 - Limited space requires the demolishing of old units prior to construction/repowering of new units
- Must also interface and reach consensus with the communities that will be affected by construction impacts: traffic, noise, dust
- Sequencing other known regulatory mandates
- Based on past repowering experience

The Amendment = fastest, “as soon as” schedule



LADWP Repowering With Closed Cycle Cooling Tasks

Chart 1 – Description of Repowering with Closed Cycle Cooling Tasks

Task	Description	Time (months)	Comments
1	Conceptual Engineering & Emissions Modeling	10	A total of ten (10) months is allocated for these tasks. Should the EPA or SCAQMD request additional information or emissions modeling, a longer period of time will be required. For example, during the planning phase for the repowering of HnGS Units 5 and 6, this task took a full two years, because new regulations were promulgated and the EPA requested changes to the emissions modeling. For SGS Unit 3, there have also been delays due to modeling that has already extended the duration of this task.
2	Engineering & Permitting	12	These inter-related tasks will take approximately 12 months; please note that the SCAQMD will not issue an air permit until the CEQA process is complete.
3	CEQA	18	CEQA and permitting task can begin at the same time.
4	Prepare Request for Proposal (RFP)	7	Preparation of the RFP can commence two months prior to completion of the emissions modeling.
5	Prepare City Council Ordinance	1	An ordinance is required for design/build contracts. One month is allocated to obtain necessary approvals from LADWP manager, General Manager, and the LADWP Board of Commissioners. Can begin this task at the same time as start of CEQA.
6	City Council Approval of Ordinance	1	The ordinance must be submitted for assignment to a specific City Council meeting agenda; upon City Council approval the RFP can be issued. Approval of the ordinance is dependent upon approval of CEQA. It cannot be approved until CEQA is approved.
7	Advertise RFP, Review Proposals, Select Vendor and Board of Water and Power approval	9	An RFP cannot be advertised until both CEQA and the ordinance have been approved.
8	Award of Contract – City Council Approval	2	The design/build contract (agreement) must next be approved by the City Council; upon City Council approval, equipment procurement, demolition and/or construction can begin.
9	Procure Equipment	20	Equipment orders are placed. Cannot start until after City Council approval.
10	Demolition	18	Demolition will occur simultaneously with equipment procurement. Cannot start until after City Council approval
11	Construction	24	Construction will commence after demolition and will overlap with final stage of equipment procurement.
12	Commission New Units	13	If more than one unit is being commissioned, it is not necessary to commission them serially; there can be some overlap.
13	Total Time for Project Completion	94 months	



- Amendment cannot be considered in isolation
- There is an overlay of other regulatory mandates & initiatives
- 2020 will be a watershed year on several fronts
 - Represents a transformation for LADWP

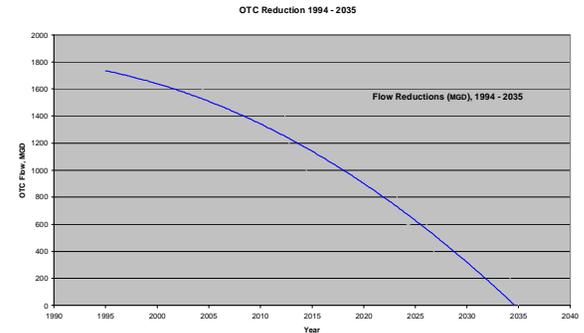
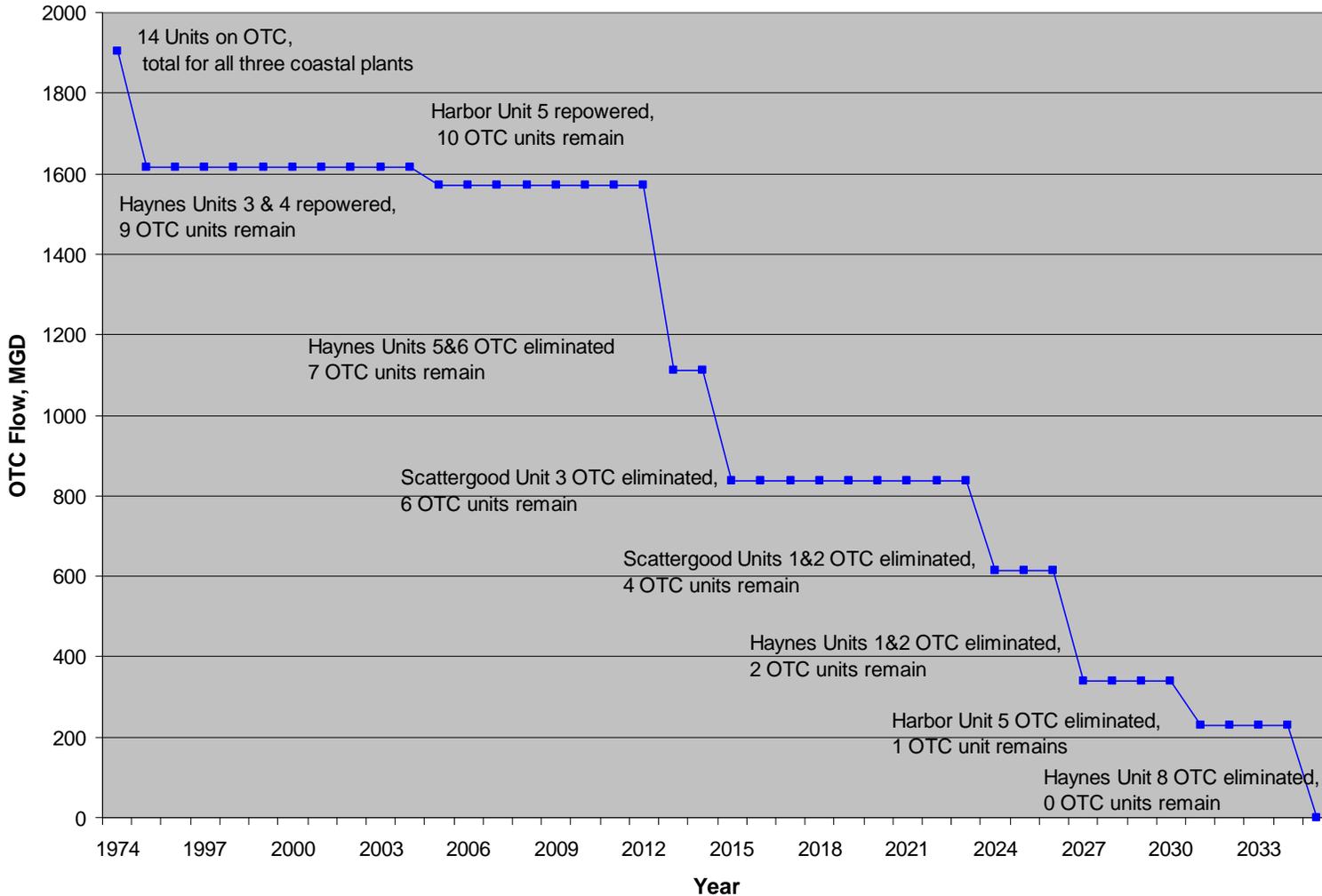


Chart 2 – Schedule and OTC Reductions

Year Unit/s Repowered Start and in Service	Unit/s No.	OTC Reduction			Total LADWP
		Scattergood	Haynes	Harbor	
2007 - 2013	5 & 6		50%		42%
2009 - 2015	3	55%			56%
2014 - 2020	Achieve 33 percent renewable portfolio standard (RPS) Integrate renewable energy (Variable Energy Resources [VERs]) Comply with SB 1368 (divest Navajo Generating Station's coal-fired generation) Transmission system upgrades to deliver renewable energy to the LADWP system				
2016 - 2024	1 & 2	100%			68%
2020 - 2027	1 & 2		77%		82%
2025 - 2031	5			100%	87%
2028 - 2035	8		100%		100%

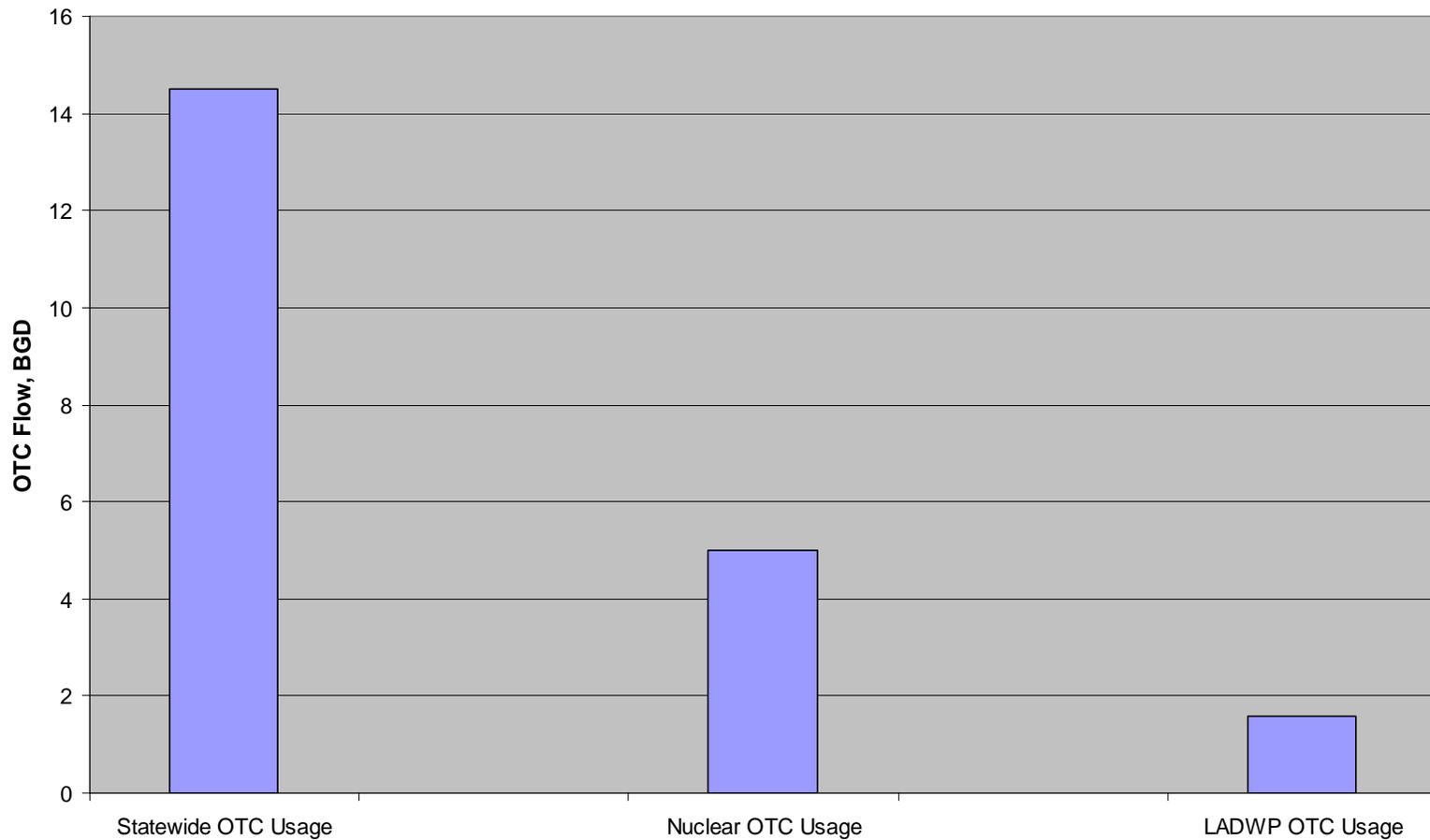


LADWP OTC Reduction 1974 - 2035





2011 Statewide Comparative OTC Flows



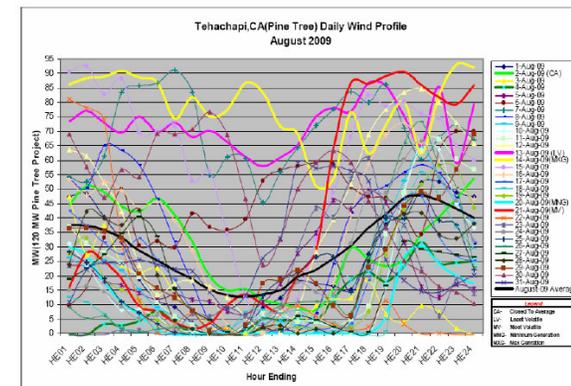
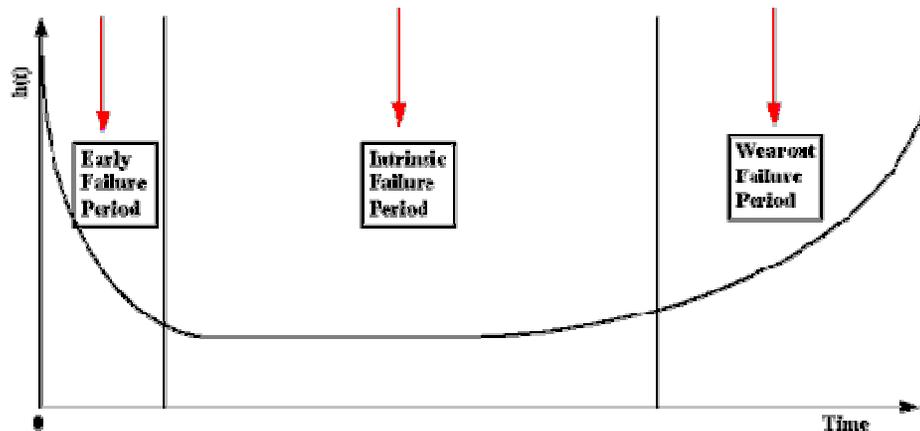


Timeframe 2014- 2020:

- SB 1368 – LADWP will be replacing some coal-generated power, or **30%** of coal capacity, by 2018
- SBx1-2 – LADWP will be integrating up to **33%** renewables by 2020
- SB 1 – LADWP plans to incorporate up to **225 MWs** new solar roof top
- Power Reliability Program / Smart Grid
- Commissioning New Units and Trial Operation



The Bathtub Curve



Variable Power Output from Pine Tree Wind Farm



- For long-term planning and budgeting, LADWP needs a firm OTC implementation (repowering) schedule
- LADWP is embarking on a major transformation of its Power System
- Postponement of a decision on the Amendment leaves LADWP unable to move forward with planning
- The Amendment ensures system and local area reliability; a shorter schedule would not
- Amendment also offers complete elimination of OTC at all LADWP coastal plants
- Includes immediate mitigation measures to protect marine life in interim



- LADWP needs certainty for planning and the financial markets
- The schedule set by the OTC Policy is infeasible
 - LADWP would have to continually request schedule revisions
 - This is not feasible from a planning and/or an operational standpoint
- LADWP's budgeting, planning and operational needs require a set schedule & thus a decision, not a postponement
- LADWP's implementation plan is strategic, aggressive, and is structured to take into consideration its transformation while ensuring local area and grid reliability.