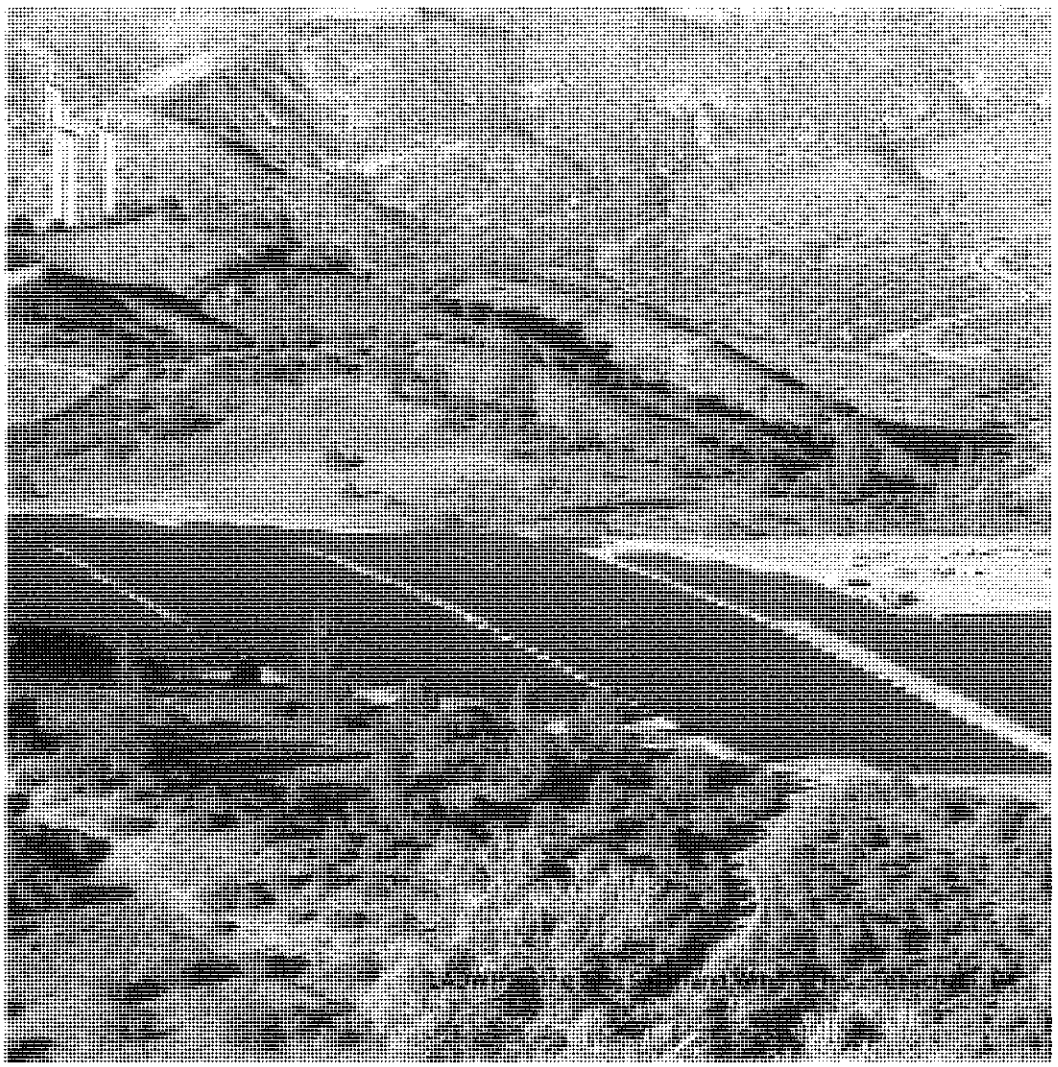
Los Angeles Department of Water & Power

EXECUTIVE SUMMARY

2012 POWER INTEGRATED RESOURCE PLAN

December 2012



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Los Angeles Department of Water & Power

2012 Power Integrated Resource Plan

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POWER SYSTEM

December 3, 2012

Integrated Resource Planning

Power System Planning & Development

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Los Angeles Department of Water and Power

2012 Power Integrated Resource Plan

December 3, 2012

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Preface

This 2012 Integrated Resource Plan (IRP) document revises and builds upon last year's 2011 IRP. Major changes from 2011 include expanded discussion regarding the Power Reliability Program, more detailed information on transmission planning and projects, a new subsection on the impacts of climate change on power system operations, and new case options that analyze higher levels of energy efficiency and solar distributed generation.

The current load forecast used in this IRP is lower than the one used in 2011. Compared to the prior forecast, electricity sales for year 2020 decreased by approximately 5.3 percent mostly due to increasing levels of energy efficiency.

Early coal replacement continues to be a key strategy to reduce greenhouse gas emissions. As with last year's IRP, this 2012 IRP recommends divestiture of the Navajo coal plant by 2015, four years ahead of the scheduled 2019 end date. LADWP will replace the loss of Navajo with energy efficiency, renewable energy, and natural gas generation. LADWP's other coal source – the Intermountain Power Project—is undergoing discussions which could enable a future conversion to lower emitting resources. Because LADWP is one of thirty-six purchasers of IPP energy, any future plans must be agreed to by all project participants. Proposed amendments to the existing contracts are being considered by the purchasers which would require IPP to switch fuel from coal to natural gas no later than July 1, 2025 (two-years before the legal deadline). These amendments require unanimous approval and final purchaser decisions are expected by the end of 2013. Since the results of these discussions are not available for this 2012 IRP, we are hopeful that the plan will be in place for inclusion into next year's IRP process.

This 2012 IRP process included public outreach. Stakeholder meetings were held early in the year to solicit input towards the development of strategic case options. After the case options were analyzed, preliminary results were presented to the public for comment at meetings and through the LADWP website. This 2012 IRP documents the public outreach effort, and addresses the major themes that emerged from that process.

This IRP also includes a general assessment of the revenue requirements and rate effects that support the recommended resource plan through 2032. While this assessment was not as detailed and exhaustive as the financial analysis within the just completed rate case, it does show clearly the general requirements.

The recently concluded rate process confirmed LADWP's revenue requirements, over the next two years, to meet its mandated obligations and responsibilities. As a long-term planning process, the IRP looks at a 20-year horizon to secure adequate supplies of electricity. In that respect, it is our desire that the IRP contribute towards future rate processes by presenting and discussing the programs and projects required to fulfill our City Charter mandate to delivery reliable electric power to the City of Los Angeles.

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1. Introduction and Purpose

This document represents the Los Angeles Department of Water and Power (LADWP) Integrated Resource Plan (IRP) for 2012. The goal of this IRP is to identify a portfolio of generation resources and Power System assets that meets the city's future energy needs at the lowest cost and risk consistent with LADWP's environmental priorities and reliability standards. The IRP is an important planning document for electric utilities, and many states and regulatory agencies require development of an IRP prior to approval of procurement programs or electric rate increases.

This document goes beyond traditional integrated resource planning and incorporates additional Power System planning elements to form a comprehensive Power System plan. It is intended that this Power System plan will drive the priorities, financial planning, and budgeting effort for the Power System.

This IRP considers a 20-year planning horizon to guide LADWP as it executes major new and replacement projects and programs. The overriding purpose is to provide a framework to assure the future energy needs of LADWP customers are met in a manner that balances the following key objectives:

- Superior reliability and supply of electric service
- Competitive electric rates consistent with sound business principles
- Responsible environmental stewardship exceeding all regulatory obligations

In balancing these objectives, LADWP's strategic planning efforts must ensure a high level of system reliability, consider impacts to the local and regional economy, mitigate the volatility in fuel and other cost factors, comply with federal, state, and local regulations, and guarantee fiscal responsibility.

LADWP is the largest municipal utility in the nation, and the third largest utility in California. While numerous recent accomplishments have been made – including achieving 20% of renewable energy sales in 2010 – significant challenges lie ahead. Increasing renewable energy to 33% by 2020, the continued rebuilding of coastal generation units, replacement of coal, infrastructure reliability investments, and ramping up energy efficiency and other demand side programs are all critical and concurrent strategic actions that LADWP will have to carry out over the coming decade.

The 2012 integrated resource planning process developed alternative strategic cases that assess different replacement options for coal-fired generation, as well as different projected levels of energy efficiency and distributed generation. The cases are modeled to determine their respective operational and fiscal impacts, as well as their effects on greenhouse gas emission levels. This document presents the results of this analysis, recommended near-term actions, and a recommended strategy to best meet the future electrical needs of Los Angeles.

LADWP Power System Vision

The transformation that this utility will undergo in the next 20 years will be unprecedented as the use of electricity broadens to new applications and as customer expectations of clean affordable energy continues to take root. Increases in electric vehicle use, expanded electrification of processes to reduce emissions and greenhouse gases, and growing wide-spread use of information technology equipment will require a stable, resilient power grid that delivers affordable power. By adopting energy efficiency, promoting solar rooftop and supporting other clean technologies that mitigate the need to build new fossil-fueled power plants, our customers are embracing the vision of a greener resource portfolio that sustains the environment for future generations.

LADWP and its City Leaders have traditionally taken a leadership position, particularly among public power utilities, to ensure a sustainable, diverse supply of generation and transmission resources to provide electricity to our customers. This utility has also been very progressive in adopting aggressive clean energy goals and programs well before many of today's laws and regulations were in place, and participated in the development of many of the laws and regulations that we see today. In 2000, this utility set out to reduce load growth by 50 percent through the use of renewables, energy efficiency, and distributed generation. Today we have the same electricity consumption as we had in 2000 largely due to these earlier efforts. In 2005, we adopted a renewable target of 20 percent renewable by 2010, and we succeeded to be the largest California utility to achieve 20 percent renewable generation in 2010. Since 1990, we have divested of 2 coal plants and repowered several natural gas in-basin generating stations using cleaner and more efficient new combustion technology, resulting in 21 percent lower greenhouse gas emissions and over 80 percent lower NOx emissions. Reducing ocean water use and reducing the impact on marine life has also been an on-going effort and by next year we will use 42% less ocean water from 1990 levels, with total elimination targeted by 2029.

The world today is not the same as it was 20 years ago, and the world 20 years from now will not be the same as it is today. And while LADWP's mission of providing reliable, affordable electricity in an environmentally responsible manner remains the same, the planning and execution of that mission requires continued diligence to account for, adopt, and even influence, the changing public concerns and priorities related to electricity generation and use.

1.1 Major Changes from Last Year's IRP

Major changes from last year's 2011 IRP include expanded discussion on the Power Reliability Program, more detailed information on transmission planning and projects, a new sub-section on the future impacts of climate change on power generation and operations, and new case options that analyze higher levels of Energy Efficiency (EE) and Distributed Solar Generation (Solar DG).

This 2012 IRP incorporates updates to reflect the latest load forecast, fuel price and projected renewable price forecasts, and other numerous modeling assumptions. Compared to the prior forecast, projected electricity sales in calendar year 2020 decreased by 5.3 percent, mostly due to increased levels of energy efficiency. The new forecast reduces the overall need for renewable energy (assuming 33% RPS) by approximately 461 GWh in 2020 and 745 GWh in 2030.

Long term natural gas price forecasts have been revised downwards from last year with recent prices reaching very low levels over the last year. Compared to last year's 2011 IRP, Opal and SoCal expected gas prices are 16% lower on average in the short term (2011-2020) and 8-9% lower on average in the long term (2021-2030). Coal price forecasts are also lower; with IPP coal at 4% lower for the period 2012-2027, and Navajo coal at 14% lower for the period 2012-2019.

Other changes include lower cost assumptions for solar and geothermal, reflecting price competition for both resources, and updates regarding legislative and regulatory issues. See Section 3 and Appendix N for more details.

2. Recent Accomplishments

A summary of recent LADWP accomplishments consistent with the objectives of this IRP are presented below in Table ES-1. These accomplishments promote the goals of maintaining high reliability and exercising environmental stewardship, while keeping rates competitive. See Section 1.5 for more details.

Table ES-1. LADWP RECENT ACCOMPLISHED PROJECTS/PROGRAMS

Project/Program	Time Period	Accomplishment
Renewable Portfolio Standard	2003 to 2010	Increased renewable energy percentage from 3% to 20%
Adelanto Solar	2012	10 MW solar project built, put in-service
Energy Efficiency Program	2012	Recommitment goals adopted: 10% by 2020, with target of 15%
Solar Incentive Program	1999 to Present	Provided funding that has enabled the installation of 55 MW of solar to date
Solar Feed-in-Tariff	2012	Pilot program conducted, followed by full scale re-launch for up to 150 MW
Milford II Wind Project	2011	Supply over 100 MW of wind energy
CO_2 Emissions Reduction	1990 to 2010	CO_2 emission 22% lower than 1990 level
Once-through Cooling	1990 to Present	OTC reduced by 17% from 1990 level
Haynes 5&6	2011-12	Repowering project initiated, new turbines installed. In-service scheduled for 2013
Castaic Upgrade	2004 to 2014	Project adds up to 80 MW of renewable capacity
Power Reliability Program	Ongoing	In 2011-12, replaced 1,813 poles, 2,054 transformers, and 51 miles of UG cable
Navajo Generation Station Replacement	Ongoing	Process to divest initiated. RFP for replacement capacity issued.
Southern Transmission System Upgrade	2011	Increased capacity of 480 MW was added to the existing transmission line
Green Power Program	1999 to 2011	Participants receive 104 GWh of renewable energy annually
Electric Vehicles Incentive	2011	Provide a $2000 rebate for home EV charging systems
Demand Response Program	1999 to Present	Signed up 60 MW of load shifting and interruptible load
Alternative Marine Power Program	Through 2012	Signed up 13.8 MW of load to offset diesel motor emissions at the Port of LA

3. 2012 IRP Development Process

The IRP is prepared by a group of engineers dedicated to LADWP resource planning and preparation of the IRP document. While this group performs the production model and report preparation for the IRP, the bulk of the work is collaborative across the numerous work groups and functional areas of the Power System, including wholesale marketing, grid operations, renewable procurement, environmental and legislative affairs, and financial services.

The following general sequence represents the process to develop this IRP document:

1. Gather stakeholder input
2. Establish clear goals and objectives
3. Identify and approve key assumptions
4. Establish strategic case alternatives
5. Conduct computer modeling of Power System operations
6. Present preliminary findings and gather internal and public comments
7. Recommend and approve a preferred resource case

Stakeholder input was considered in the establishment of the goals and objectives for the IRP analysis. Modeling assumptions and case alternatives were identified and approved by an internal IRP Steering Committee consisting of Power System Division and Section heads. Preliminary results were analyzed and presented to the public for review and input. Final recommendations incorporating public feedback were then forwarded to the General Manager and Board of Water and Power Commissioners.

The IRP development process includes coordination among multiple LADWP organizations responsible for different aspects of Power System operations. Recommended positions at the various stages were presented to LADWP's leadership team, including Division and Section Heads. The approval process for recommendations was based on consensus from the managers of each area of responsibility.

4. Public Outreach

The 2012 IRP process includes a public outreach effort to provide information and gather public input.

Public outreach began with two stakeholder meetings held in early 2012. LADWP staff met with key major customers and business representatives in February; and in March with key environmental organization representatives. Comments received during these stakeholder meetings were considered in the development of the preliminary cases that were analyzed.

The preliminary results were documented in the 2012 Draft IRP that was made available at www.ladwp.com/lapowerplan on October 5, 2012. The draft IRP was presented at three stakeholder meetings and one public workshop held on October 11, 2012. Comments were accepted through November 5, 2012.

Comments received were synthesized into the following major themes. Each theme is considered of equal importance. The following list is not presented in any order of importance

Eliminate Coal from LADWP's Energy Portfolio

Incorporate More Renewables

Incorporate More Local Solar

Incorporate More Distributed Generation

Incorporate More Energy Efficiency

Reduce Greenhouse Gas Emissions

Look at New Case Scenarios

Financial and Rate Concerns

Maintain Power Reliability

LADWP Should Take a Leadership Role

Public comment and input received was considered prior to finalizing this 2012 IRP.

A summary of the public comments received is included in Section 5 and Appendix O.

5. Challenges and Critical Issues

LADWP faces a number of concurrent issues and challenges that require careful assessment. Long term strategies must focus on these issues so they can be addressed in the most cost effective manner without compromising reliability compliance and environmental stewardship. The major issues around which the strategies of this IRP are centered include: adequate funding to support programs; ensuring reliability; greenhouse gas emissions reduction; increasing the amounts of renewable generation resources; and addressing once-through cooling.

5.1 Adequate Funding to Support Programs

To support the recommended projects and programs, adequate funding is necessary. Due to the delay of the rate action that was previously anticipated in 2011, many of the programs were scaled down, delayed or deferred. The rate process that concluded on October 5, 2012 is a positive step towards LADWP's fulfillment of its responsibilities and regulatory obligations that are discussed throughout this 2012 IRP.

Properly funded programs will enable LADWP to achieve the following objectives:

- Modernize its coastal generation units to replace aging equipment and to satisfy once-through cooling and local emissions regulatory requirements.
- Implement early coal divestiture and replacement to accelerate the reduction of greenhouse gas emissions and to enhance integration of renewable energy and energy efficiency measures.
- Secure the state-mandated amounts of renewable energy.
- Increase use of local distributed solar generation and combined heat and power to support State goals.
- Through the Power Reliability Program, reduce the number and duration of distribution outages and improve system reliability.
- Implement necessary transmission improvements to maintain reliability and support new resources, including renewables.
- Provide energy efficiency and customer solar programs for participation by our customers through the Customer Opportunities Program.
- Achieve energy efficiency and other demand-side-resource target levels.
- Implement Smart Grid initiatives.
- Comply with FERC-approved reliability and Cyber-security standards.

Securing adequate multi-year funding is crucial to ensure LADWP's ability to stay on track towards meeting its future long term goals and obligations.

5.2 Ensuring Reliability

Challenges to ensuring continued reliable electric service include the replacement of aging generation facilities, maintaining grid reliability, the integration of intermittent renewable energy resources, and the replacement of poles, power cables, transformers and other elements of the local distribution system.

LADWP's Repowering Program, which began in 1994, is a long term program to upgrade LADWP's in-basin generating units. The program is a sequence of projects that extends to 2029 that will eliminate the use of once through cooling and provide modern units that are more reliable, efficient, and community-friendly than the units they are replacing.

To maintain grid reliability, LADWP's Ten-Year Transmission Assessment Plan has identified a number of necessary improvements that are needed to avoid potential overloads on key segments of the Basin transmission system. These overload conditions, if encountered, could lead to load shedding events (intentional power outages) to minimize the overall impact on the Power System.

The integration of renewable energy into the grid poses major reliability challenges. Because renewable resources like wind and solar produce electricity variably and intermittently (i.e., only when the wind is blowing or when the sun is shining), integration of these resources requires additional supplemental generator units to compensate for significant and often rapid swings in energy production. These swings present operational challenges and must be leveled by controllable generation capable of equally rapid changes of generation in the opposite direction.

Between 2003 and 2005, LADWP experienced a growing number of distribution outages due to, among other things, aging infrastructure (poles, lines, transformers, etc.), deferred maintenance and asset replacement.[1] In response, LADWP established a comprehensive Power Reliability Program (PRP) in 2006 which provided increased funding to address the growing maintenance and replacement backlog. The PRP experienced initial success as the number of outages decreased from 6,323 in 2006 to 4,523 in 2009. Since then, however, funding constraints have prevented any measurable improvement.

5.3 Greenhouse Gas Emissions Reduction

While LADWP has multiple and concurrent GHG emissions reduction strategies, the primary focus is early replacement of coal-fired generation. Because coal-fired energy production emits relatively high levels of CO_2, switching to energy efficiency, renewables and other cleaner fuels will significantly lower the overall emission levels. Early coal replacement facilitates LADWP's compliance with AB 32's upcoming cap and trade program.

During calendar year 2011, 41 percent of the energy delivered to LADWP customers was

[1] To illustrate the age of the distribution system, over 25 percent of the City's 321,780 distribution poles have already exceeded their 60-year life expectancy.

generated from two coal-fired generating stations: the Intermountain Power Project (IPP), located in Utah, and the Navajo Generating Station (NGS), located in Arizona. The NGS's operating agreement and land lease expires in December 2019 and IPP's Power Purchase Agreement (PPA) contract is in effect until June 2027. Although these stations provide dependable, low cost base load generation to Los Angeles, they emit about twice as much CO_2 as energy generated with natural gas. Accordingly, this 2012 IRP focuses on early coal replacement options as a means to lower LADWP's CO_2 emission levels. Sections 3 and 4 discuss the coal replacement options in detail.

LADWP's CO_2 emissions reduction strategy must comply with state regulations:

- SB 1368, the California Greenhouse Gas Emissions Performance Standard Act, enacted in 2006, prohibits LADWP and other California utilities from entering into long-term financial commitments for base load generation unless it complies with the CO_2 emissions performance standard. The CO_2 emissions level must be equal, or below the emissions performance standard of 1,100 lbs. per MWh that can be achieved by gas-fired combined cycle units. This standard also applies to existing power plants for any long-term investments or contractual extensions, effectively prohibiting LADWP from continued acceptance of coal-fired generation beyond the current contractual expiration dates for NGS (2019) and IPP (2027).
- Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, calls for reducing the state's CO_2 emissions to 1990 levels by 2020. The regulations for implementing a greenhouse gas emissions Cap and Trade program under AB 32 were finalized and adopted on October 20, 2011 by the California Air Resources Board (ARB). Enforcement and compliance with the trading program will begin January 1, 2013. LADWP has been granted an administrative allocation of emission allowances that reflects its resource projections through 2020. At this time, it is uncertain if the program will extend beyond 2020.

5.4 Increasing Renewable Resources

LADWP's policy for renewables was initiated in the early 2000's, and has guided the adoption of increasing levels of renewable energy, including the milestone achievement of 20 percent of energy sales in 2010. Major legislation affecting LADWP's renewable policy are SB 1, SB 32, and SB 2 (1X).

Senate Bill 1 (SB 1)

Former Governor Schwarzenegger signed the California Solar Initiative (CSI), outlined in SB 1, on August 21, 2006. The CSI mandated that all California electric utilities, including municipals, implement a solar incentive program by January 1, 2008. The goal of the CSI is 3,000 MW of net-metered solar energy systems over 10 years with expenditures not to exceed $3.35 Billion. Expenditures for local publicly owned electric utilities shall not exceed $784 Million. The LADWP cap amount is $313 Million, based on its serving 39.9% of the municipal load in the state.

SB 32

SB 32, signed into law on October 11, 2009, requires LADWP to make a tariff available to eligible renewable electric generation facilities within its service territory until LADWP meets its 75 MW share of the statewide target. Through this program, owners or operators of eligible renewable energy systems may sell their energy directly to LADWP. The purchase of SB 32 qualifying energy includes all environmental attributes, capacity rights, and renewable energy credits. This energy is just one of the many renewable energy sources that will apply towards LADWP's 33 percent renewable requirement.

SB 2 (1X)

Following the passage of SB 2 (1X) in 2011, LADWP's renewable energy policy is now largely driven by those requirements of SB 2 (1X).

SB 2 (1X) – which was passed in April 2011 and became effective on December 10, 2011, subjects all utilities to procurement of eligible renewable energy resources of 33 percent by 2020, including the following interim targets:

- Maintain at least an average of 20 percent renewables between 2011 and 2013
- Achieve 25 percent renewables by 2016

In December 2011, LADWP amended its Renewable Portfolio Standard Policy and Enforcement Program to comply with the requirements of SB 2 (1X). However, LADWP's policy continues to include some requirements that are not a part of SB 2 (1X) but were in place prior to enactment of the State legislation. These additional requirements include the provision for LADWP to own at least 50 percent of its renewable energy resources, and to give preference to projects located within the City.

As LADWP expands its renewable resource portfolio, it is important that it do so in a cost effective manner to minimize the impact on ratepayers. Some of the considerations in selecting these resources are as follows:

- Cost differences for different renewable technologies
- Cost trends that reflect decreasing prices
- Variable integration costs and operational impacts
- Technologies that deliver more energy during peak hours
- Preference for local projects
- Proximity of projects to transmission
- For PPA resources, tax credits that can be passed along as cost savings
- PPA proposals that provide future ownership opportunities
- Overall diversity of resource mix and geography
- Qualification as "Bucket 1" energy according to CEC RPS regulation and guidelines
- Assessing projects on the basis of value to maximize benefits and minimize risks

In this 2012 IRP, the overall base renewable portfolio levelized cost is $98/MWh, which represents an $11/MWh decrease from last year. This cost reduction was achieved by selecting a more optimized and diverse portfolio that accounts for changing price trends and market developments. By maintaining flexibility in the selection of cost-effective renewable resources, LADWP is able to secure the best pricing as market conditions evolve.

5.5 Once Through Cooling

Once-through cooling (OTC) is the process of drawing water from a river, lake, or ocean, pumping it through a generating station's cooling system, and discharging it back to the original body of water. OTC is a utility regulatory issue, stemming from the Federal Clean Water Act Section 316(b) and administered locally by the State Water Resources Control Board (SWRCB).

OTC regulations affect LADWP's three coastal generating stations – Scattergood, Haynes, and Harbor. To comply with OTC regulations, generation units at those stations that utilize ocean water for cooling will be repowered with new units that do not use ocean water. The amount of generation capacity affected by OTC is significant – approximately 2,600 MW of LADWP's total in-basin plant capacity of 3415 MW. The total expenditures required are also significant, on the order of $2.2 billion. Because of the size and scope of the effort required, the work to comply with OTC regulation is a long term program, extending to 2029. Figure ES-1 is a timeline of the program target dates. More information regarding OTC is provided in Section 1.6.6.

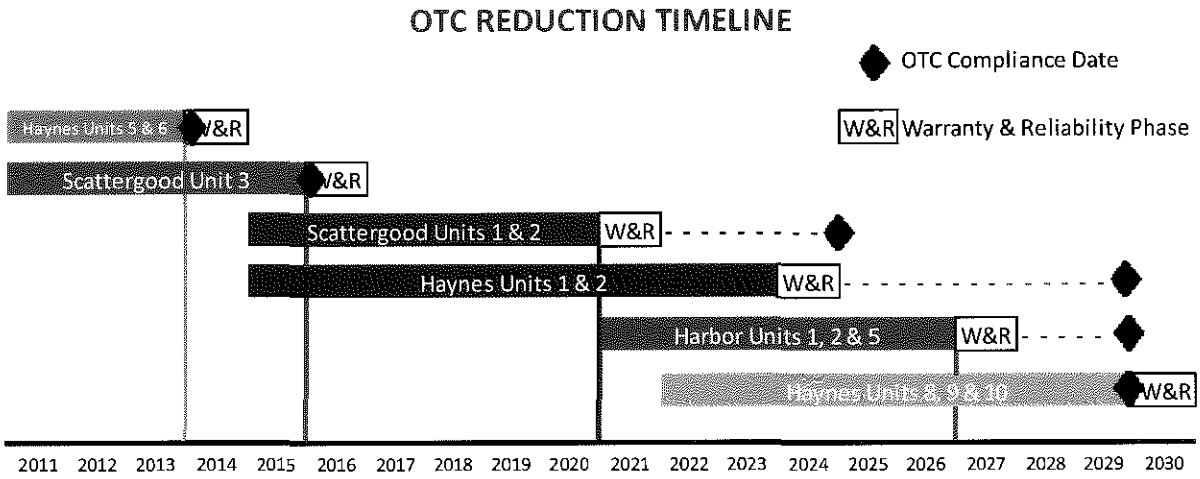

Figure ES-1. Timeline for OTC compliance.

5.6 Workforce Development

To effectively implement the programs and projects recommended in this IRP, an effective human resources strategy is required. The Power System is challenged to develop a sustainable workforce development plan that addresses the following human resource elements:

Staffing
Adequate staffing is needed to meet mandated deadlines and regulatory obligations, to execute new and expanded work functions, and to manage the volume of retirements expected over the next 3-5 years.

Proper Skill Sets
New work areas such as renewable energy facility operations, solar distributed generation, and smart grid deployment will require analysis to identify the skills, knowledge and abilities required to perform these functions in a safe, effective and efficient manner.

Training/Professional Development and New Technologies
LADWP supports employee development by providing various computer-based training programs, and offers tuition reimbursement for those who return to school to enroll in work-related courses and advanced degree programs. Across the Power System, different work groups are encouraged to develop training specific to their particular functions and needs. This is especially important as new and emerging technologies become applicable to various work functions. Applied correctly, technology increases employee productivity, enhances safety, and enables new and expanded customer services.

Recruitment
Recruiting the best qualified employees assures an effective workforce capable of meeting the near term and long term challenges identified in this IRP. Continued use of LADWP's website and social media to promote career opportunities will help ensure that the best qualified individuals consider joining the LADWP workforce.

5.7 Other Challenges

Additional challenges that LADWP must address in the coming years include:

- Managing potential natural gas price volatility
- Incorporating higher levels of Distributed Generation (DG) that advance renewable resource and local solar objectives, and support the State's promotion for more DG
- A heightened demand for transmission planning to support new and intermittent resources that has introduced greater complexity
- Cyber security regulations
- The relicensing of the Castaic Pumped Storage facility with the Federal Energy Regulatory Commission
- Accounting for the effects of climate change on power generation, operations, and markets
- Load factor improvement
- Acquisition of replacement resources for coal-fired generation

6. Strategic Case Alternatives

The 2012 IRP strategic cases incorporate the latest developments in legislation and regulation, and tactical plans developed by the Power System. This 2012 IRP also includes updated assumptions that have influenced the composition of potential resource portfolios that can fulfill LADWP's goals of reliability, competitive rates, and environmental stewardship.

The coal cases analyzed in this 2012 IRP consider different replacement dates for LADWP's two coal resources – the Navajo Generating Station (NGS), and the Intermountain Power Project (IPP). The coal replacement dates for Cases 1, 2 and 3 are similar to the cases analyzed in last year's 2011 IRP. The replacement date of December 2023 for IPP (Case 4) is new for this year.

In addition to the coal cases, this 2012 IRP also analyzes four additional cases to consider higher levels of energy efficiency and solar distributed generation.

The assumptions used in the development of all cases have been updated to reflect recent changes in fuel pricing, renewable project cost estimates and renewable resource mix, and updated energy efficiency goals including 10 percent by 2020.

Section 3 of this IRP provides more information surrounding the development of the cases, including resource adequacy and net-short considerations. Table ES-2 provides a detailed description of each strategic case. For comparison purposes, the recommended case from last year's IRP is included in the table.

More detailed description of the assumptions used in developing these cases can be found in Appendix N.

Table ES-2. CANDIDATE RESOURCE PORTFOLIOS FOR 2012 IRP

COAL CASES

		GHG or SB1368 Compliance Date		2020	2010 thru 2020	2010 thru 2032	New Renewables Installed Capacity (MW) 2012 - 2020					New Renewables Installed Capacity (MW) 2012-2032				
Case ID	Resource Strategy	Navajo Replacement	IPP Replacement	RPS Target	EE (GWh)	EE (GWh)	Geo / Biomass	Wind	Non-DG Solar	Dist. Solar	Generic	Geo / Biomass	Wind	Non-DG Solar	Dist Solar	Generic
1 (Base Case)	No Early Coal Divestiture	12/1/2019	6/15/2027	33%	2300	3500	242	0	887	337	39	283	54	915	496	114
2	Navajo Early Replacement	12/31/2015	6/15/2027	33%	2300	3500	242	0	887	337	39	283	54	915	496	114
3	Navajo and IPP Early	12/31/2015	12/31/2020	33%	2300	3500	242	0	887	337	39	283	54	915	496	114
4	Navajo and IPP Early (Alt)	12/31/2015	12/31/2023	33%	2300	3500	242	0	887	337	39	283	54	915	496	114
2011 Recommended	Navajo Early Replacement	12/31/2015	6/15/2027	33%	1443	2183	243	492	401	325	0	308	492	451	466	162

ENERGY EFFICIENCY AND DISTRIBUTED GENERATION CASES

		2020	2010 thru 2020	2010 thru 2032	New Renewables Installed Capacity (MW) 2012 - 2020					New Renewables Installed Capacity (MW) 2012-2032				
Case ID	Resource Strategy[1]	RPS Target	EE (Net GWh)	EE (Net GWh)	Geo / Biomass	Wind	Non-DG Solar	Dist Solar	Generic	Geo / Biomass	Wind	Non-DG Solar	Dist Solar	Generic
5 (Base Case)	Base EE , Base Solar DG	33%	2300	3500	242	0	887	337	39	283	54	915	496	114
6	Advanced EE, Base Solar DG	33%	2300	4000	242	0	887	337	39	283	0	915	496	114
7	Base EE, High Solar DG	33%	2300	3500	242	0	847	485	39	258	0	876	852	95
8	Advanced EE, High Solar DG	33%	2300	4000	242	0	847	485	39	258	0	876	852	0

[1]EE percentages are as follows:

	By 2020	By 2032
Base EE	10%	15.2%
Advanced EE	10%	17.4%

The feasibility of attaining EE levels greater than 10% are uncertain at this time, but will be addressed in the upcoming EE Potential Study to be completed in 2013.

7. Evaluation of Strategic Case Options

Key results for each model run were tabulated and compared against each other. Each strategy was compared on average incremental dollars per megawatt hour generation cost and the total million metric tons of CO_2 emissions. The selection of the best case for LADWP ratepayers hinges mainly upon the load forecast, price of fuel, and CO_2 emission levels. All cases meet the mandated RPS percentage targets and reliability standards. The analytics performed for this IRP examined the associated costs of each strategic case.

The key modeling results are summarized below:

7.1 CO_2 Emissions Considerations

Current GHG emissions levels are approximately 14.1 MMT which is 21 percent below 1990 levels due to the prior elimination of power from the Mojave and Colstrip coal plants, completed repowering of units at Haynes and Valley generating stations with cleaner gas-fired replacements, and increased renewable generation from 3% in 2003 to 20% of overall sales in 2010. Using Case 1 (Navajo divestiture in 2019, IPP replacement in 2027) as a baseline, early divestiture of Navajo in Cases 2, 3 and 4 results in approximately 7.2 MMT less GHG emissions between 2016 and 2019. For Case 3 (IPP replaced in 2020) there is an additional post-2020 cumulative reduction of 19.5 MMT. For Case 4, the post-2020 reduction is 9.3 MMT. These GHG emission reductions are shown below in Table ES-3 and Figure ES-2.

Table ES-3 GHG EMISSIONS REDUCTION LEVELS IN MMT

Case	Reduction 2016-19	Reduction 2020-27	Total Reduction 2016-27
1	Baseline	Baseline	Baseline
2	7.2	0.0	7.2
3	7.2	19.5	26.7
4	7.2	9.3	16.3

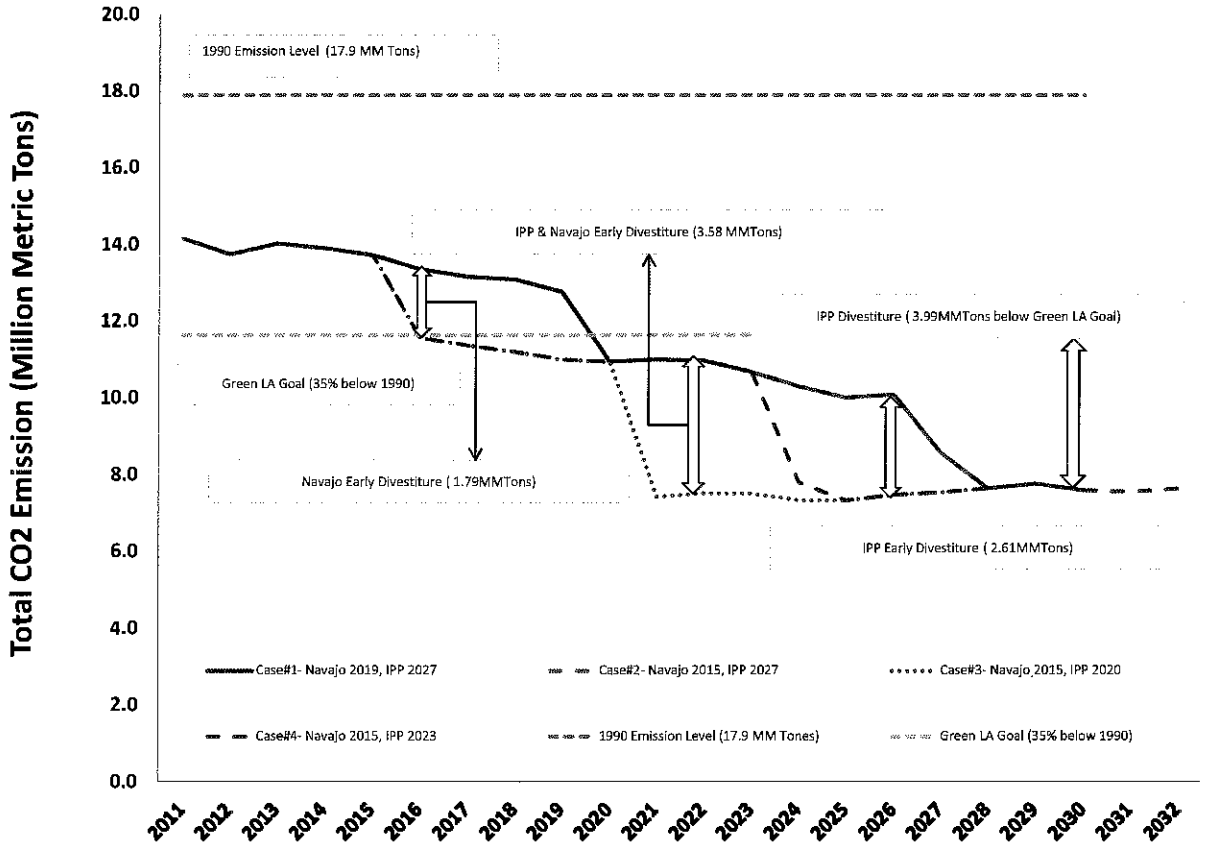

Figure ES-2. GHG emissions comparison by calendar year.

Emissions levels for energy efficiency and solar distributed generation, Cases 5 thru 8, were also evaluated and are shown in Figure ES-3. Advanced levels of EE were found to result in slightly lower emissions of CO_2 as compared to the Base EE cases. Higher levels of Solar DG were found to have little effect on reducing CO_2 emissions since Solar DG would have been replaced with other zero emissions resources. Although these higher levels of EE and distributed generation have a small impact on emissions compared to the base EE, it is important to note that the base level of energy efficiency in itself has a very significant impact on reducing overall CO_2 levels as shown by the "No More EE" curve illustrated in Figure ES-3. If no additional EE were implemented, annual GHG emissions levels would be approximately 2.0 MMT higher by 2032. This is equivalent to removing 385,000 cars from the road. For reference purposes, the CARB emissions allocation for LADWP as part of the AB 32 Cap and Trade program being implemented in 2013 and ending in 2020 is included in Figure ES-3.

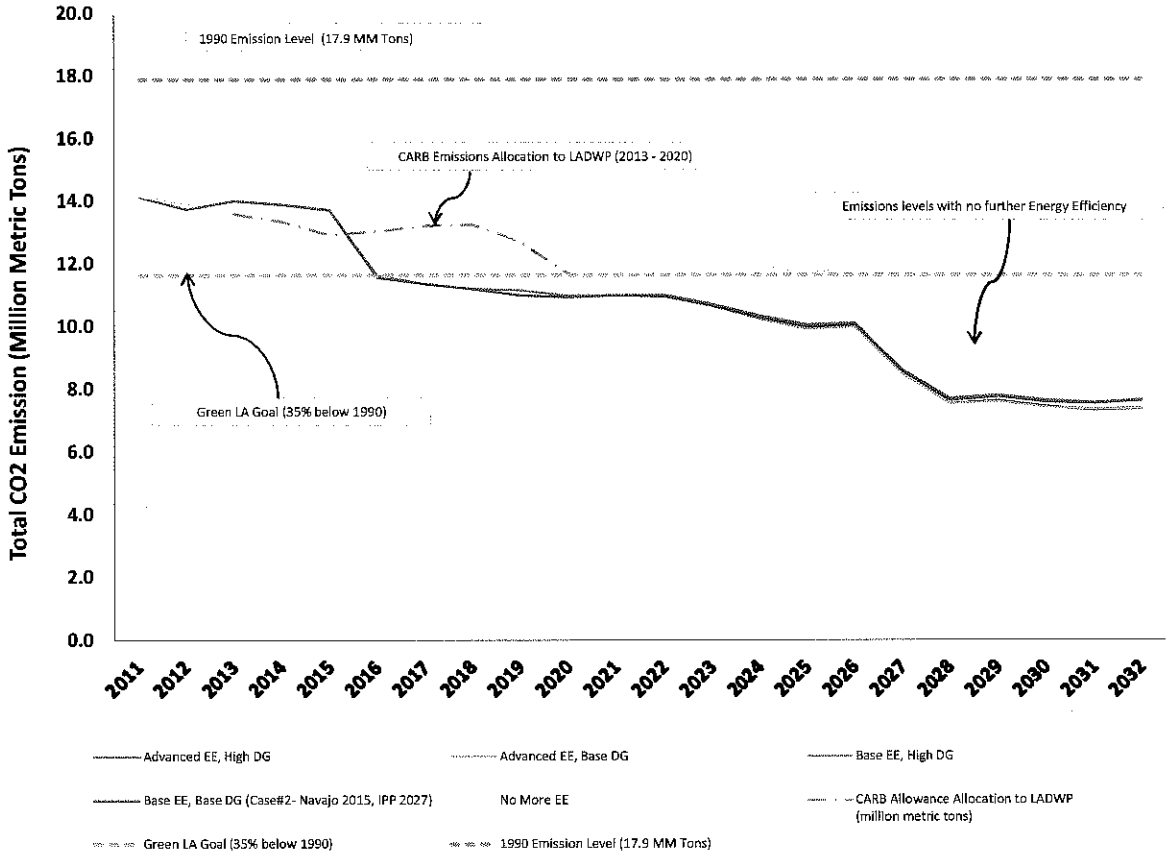

Figure ES-3. GHG emissions comparison for Energy Efficiency and Solar Distributed Generation cases by calendar year.

7.2 Total Power System Cost Comparisons

The total Power System cost for each case includes bulk power costs, depreciation costs related to transmission, distribution, and generation, bond debt-service, and city transfer costs[2]. These costs assume full funding of the Power System programs including the Power Reliability Program and Energy Efficiency programs among others. Total annual Power System costs are shown in Figure ES-4 and reflect short-term spending reductions through 2011-12 fiscal year with subsequent years reflecting a restoration of funding levels to ensure that the longer term IRP recommendations can be implemented. To the extent that energy efficiency costs are lower than the costs of generation it is replacing, its effect is to lower total costs. The costs shown in Figure ES-4 do not attempt to represent a thorough analysis of Power System finances, but they do illustrate the general trend of Power System costs relative to the 4 coal and 4 EE/DG cases analyzed.

[2] The city transfer payment is 8% of the previous year's operating revenue.

Note:
Unless otherwise stated, forecasted costs in all charts in this IRP are "nominal".

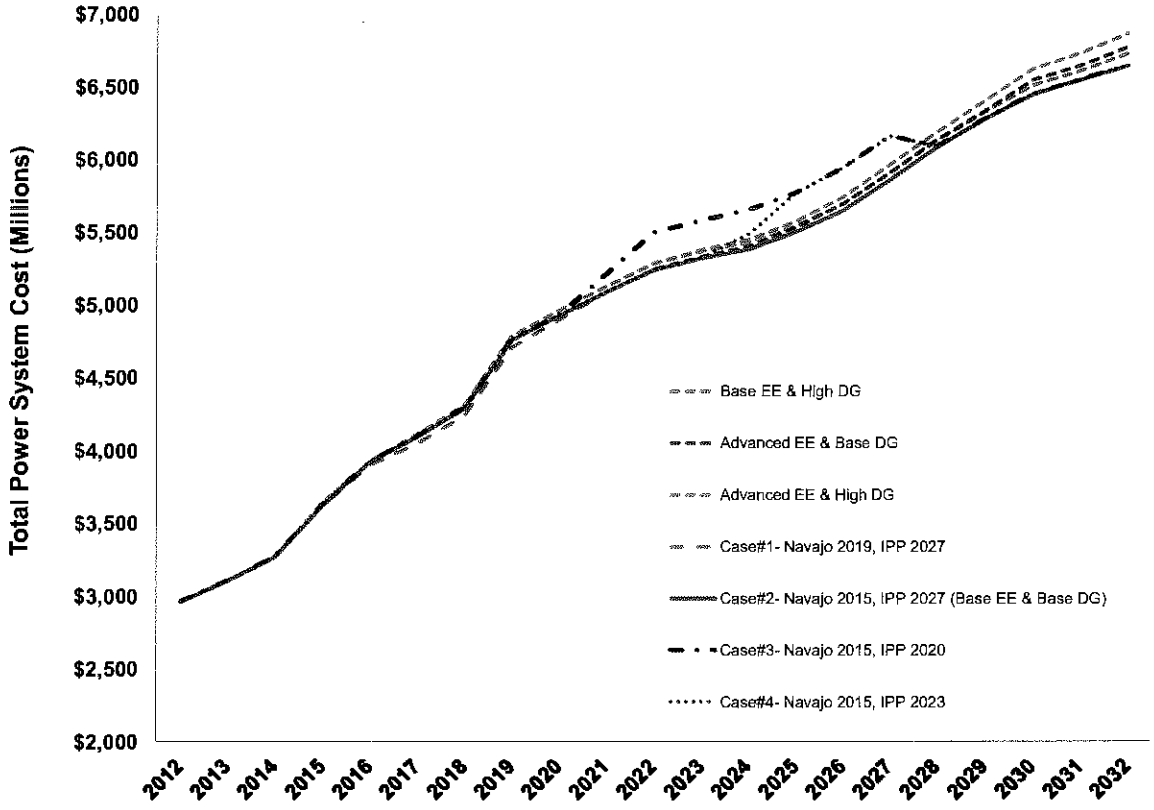

Figure ES-4. Comparison of annual Power System costs over the next 20 fiscal years.

The cost differences between the cases are highlighted in Table ES-4, which presents the incremental costs of the 4 coal cases and the 4 EE/DG cases. For the coal cases, the values listed under the Case 2 column represent the incremental costs between Cases 1 and 2 – i.e., the cost of early divestment of Navajo. The values listed under Case 3 and Case 4 represent the additional incremental costs of early IPP replacement in 2020 and 2023, respectively.

All EE & DG cases assume Navajo divestment in 2015 and IPP replaced in 2027. The values shown for Cases 6, 7, and 8 represent each case's incremental costs when compared to Case 5.

TABLE ES-4 INCREMENTAL COST COMPARISONS BETWEEN CASES

Coal Case Summary

	Case 1	Case 2	Case 3	Case 4
Case Description	Navajo 2019, IPP 2027	Navajo 2015	IPP 2020	IPP 2023
Total Incremental Revenue $M	$0	$205	$1,790	$980
Average Incremental Revenue ($M/yr)	$0	$51	$275	$280

EE & DG Case Summary

	Case 5 (Baseline) *	Case 6	Case 7	Case 8
Case Description	Base EE & Base DG	Base EE & High DG	Advanced EE & Base DG	Advanced EE & High DG
Total Incremental Revenue $M	$0	$669	$494	$1,247
Average Incremental Revenue ($M/yr)	$0	$32	$24	$59

7.3 Sensitivity Analyses

An analysis of the effects of fuel price volatility was performed for the four coal cases and is shown in Figure ES-5. With the early divestiture of Navajo in 2015 and the IPP coal contract ending in June 2027, increased bulk power costs are expected with the replacement of each of these resources.

Elimination of coal involves the switch to more natural gas generation, which has higher fuel price volatility compared to coal. The resulting decrease in fuel diversity, along with the higher volatility of natural gas, will increase the risk of fuel cost changes in the future and so warrants careful evaluation when comparing the different case scenarios.

It is important to note that bulk power costs shown in Figure ES-5 include fuel, renewable and other purchase power costs in addition to coal replacement costs. After applying high and low fuel prices to these bulk power costs, the replacement of these resources could result in large cost increases should fuel prices remain at higher than expected levels. Conversely, lower than expected fuel prices could have the opposite effect on bulk power costs.

To help manage natural gas fuel price volatility, LADWP employs financial hedges for up to ten years, and physical hedges for up to five years. LADWP is in the process of developing a revised hedging strategy based on the newly approved rate ordinance.

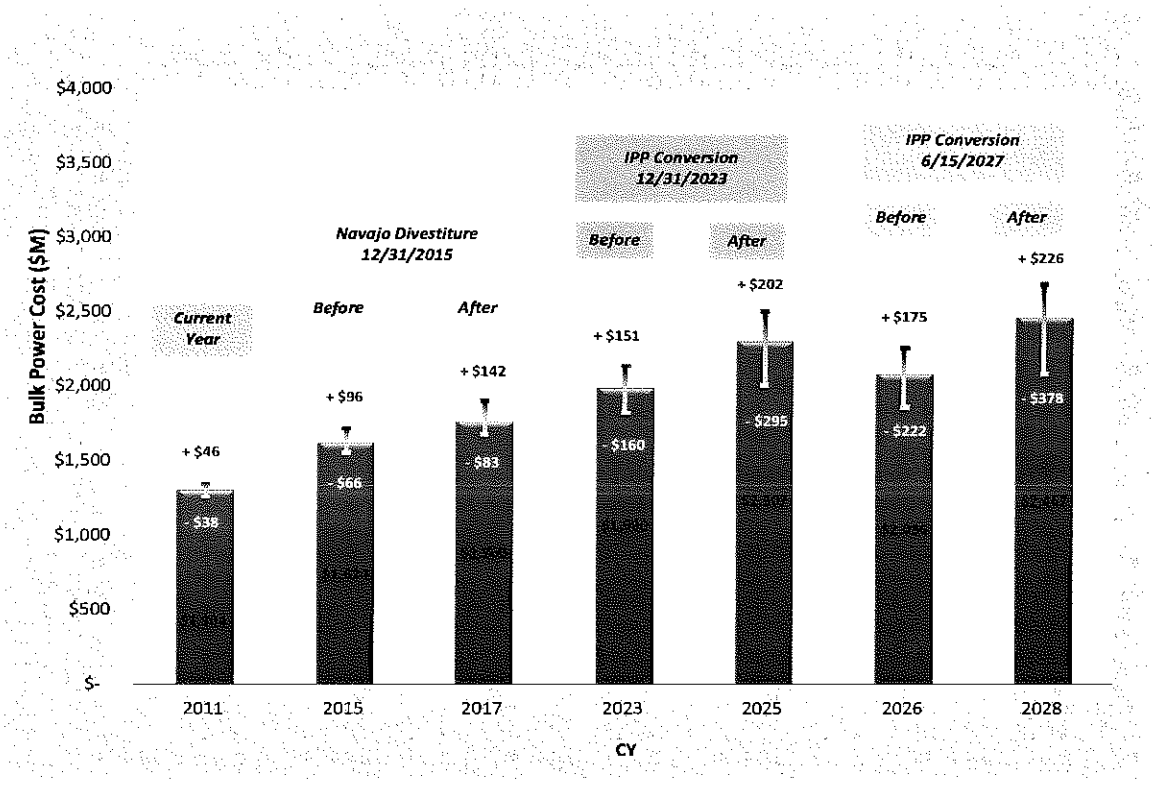

Figure ES-5. Bulk power cost before and after coal replacement with potential cost impacts from high (+$) and low (-$) fuel prices.

Increased risk exposure from high fuel costs may translate into higher customer electric rates. Figure ES-6 shows the potential rates that could be experienced under the 4 coal cases given high, expected, and low fuel ranges for both gas and coal fuel types. Today, overall coal costs represent approximately 65 percent of overall fuel expenditures. Once Navajo coal is replaced in 2015, this percentage will drop to 50 percent of overall fuel expenditures. From 2023 thru 2026, coal expenditures will gradually drop to 30 percent before reaching zero percent in 2027 when IPP coal is replaced, and future fuel price increases will be based solely on natural gas and nuclear.

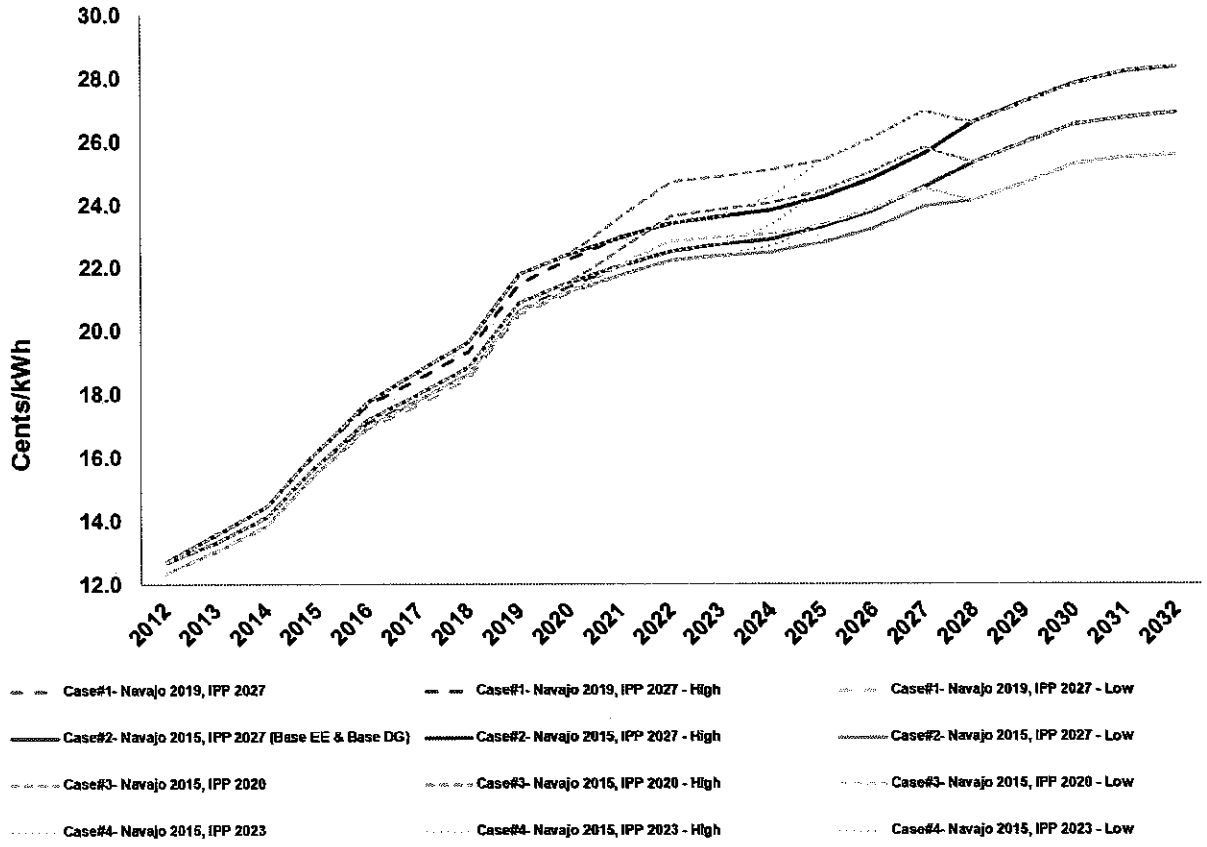

Figure ES-6. Estimated electric rate comparison with fuel price sensitivity over 20 years by fiscal year-ending

7.4 Rate Contributions Breakdown

Figure ES-7 presents the fiscal year breakdown for Case 5 comprising rate contributions from reliability, energy efficiency, renewable energy, reliability, coal replacement, OTC repowering, other Generation, Transmission and Distribution (GT&D), and fuel costs between 2012 and 2032. These individual contributions represent incremental adders to the rates. For analysis purposes, the Reliability Program has been segmented into the basic program and preferred program. The preferred program contribution shown is incremental to the basic program.

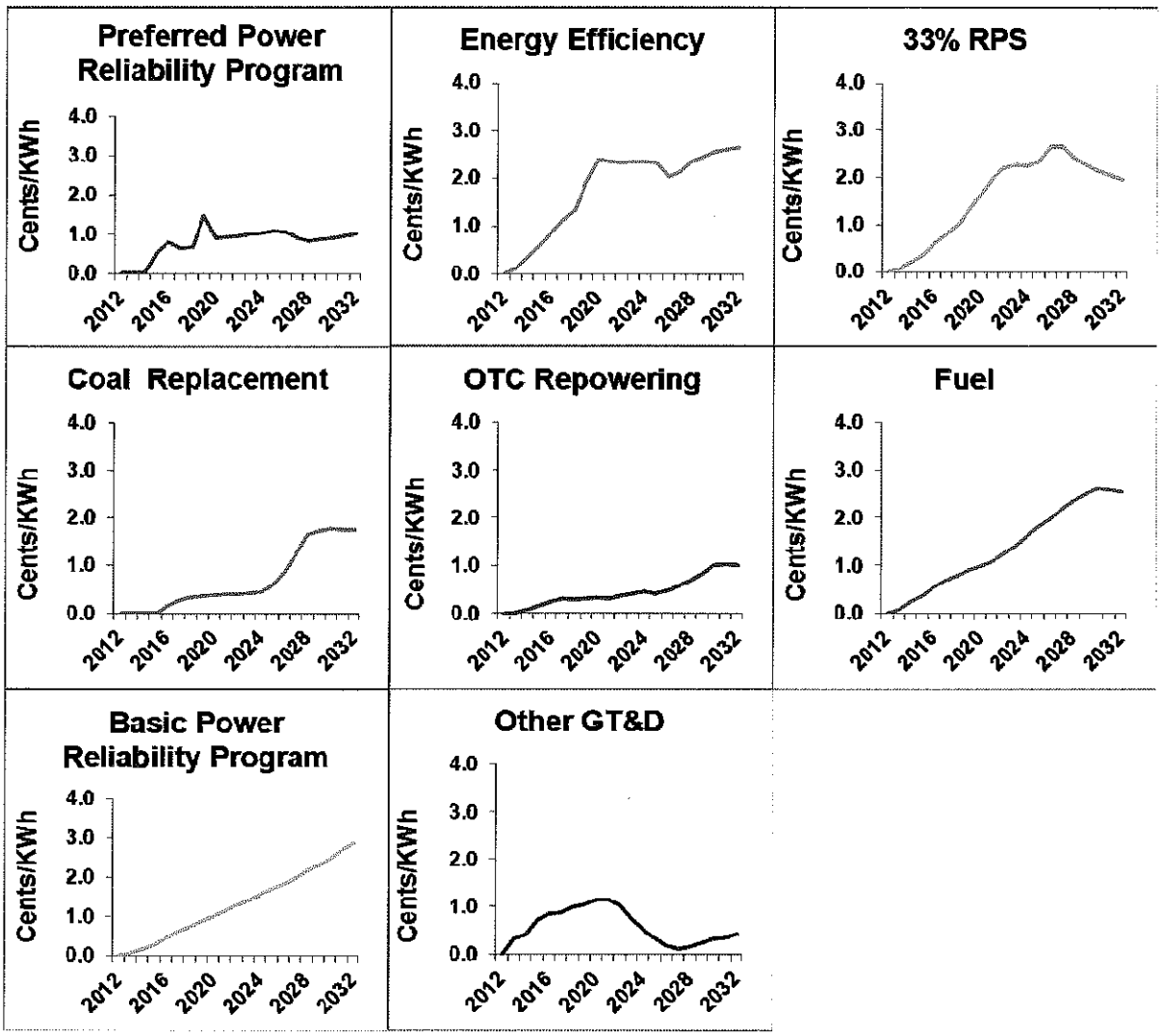

Figure ES-7. Retail electric rate contributions breakdown, based on the 2012-13 budget forecast (Case 5).

Figure ES-8 shows the total retail rate impact after combining all of the program components. One can draw the conclusion that rising fuel costs and complying with various regulatory requirements are the primary drivers of the growth in rates.

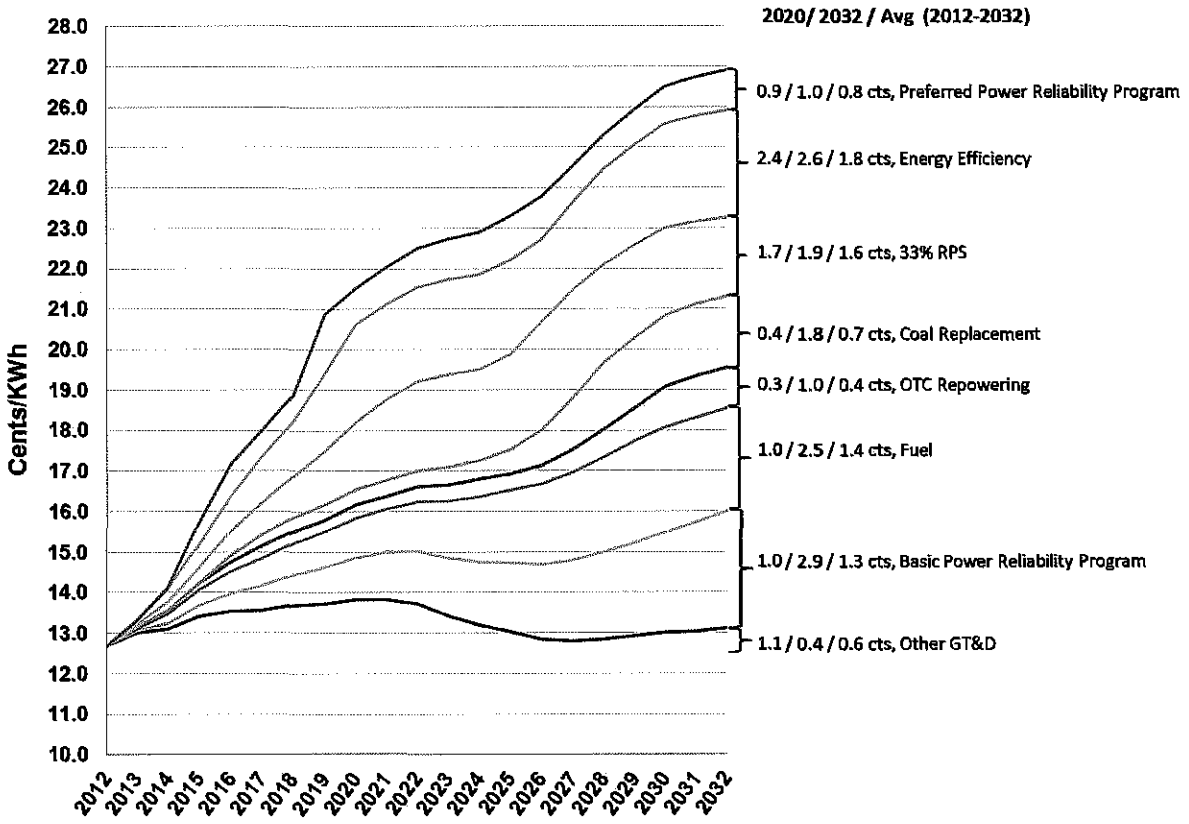

Figure ES-8. Total retail electric rate composite by fiscal year, based on the 2012-13 budget forecast (Case 5).

A few observations from Figures ES-7 and ES-8[3] can be made regarding the RPS and EE programs. Firstly, the influence of the RPS program on rates increases substantially through 2020 after the RPS percentage of sales reaches 33% and the RPS component of rates begins to decline as fuel savings increases over time with escalating fuel prices. In 2027, the RPS component of rates increases as new renewable projects are added to replace expiring PPA agreements and then the RPS component of rates resumes a downward trend due to fuel savings. Secondly, the EE program component of rates increases over time as program incentive payments and net revenue loss attributable to the EE program are recovered. Like RPS, EE has

[3] Figures ES-7 and ES-8 represent forecasted rate increases based on system averages, and do not account for rate structure variations across and within customer classes.

savings beyond 2020 due to fuel savings. Thirdly, general inflation in fuel costs and GT&D costs represents a significant growth in rates.

Preferred levels of funding for the Power Reliability Program (PRP) include capital and O&M expenditures to replace over age distribution and transmission system components that have exceeded their life expectancy, and ensure levels of funding to reduce the backlog of "fix-it" tickets which are temporary repairs that need to be corrected. The spikes in the preferred PRP and EE curve occurs when capital borrowing limits are reached around 2019-20 and cash is needed to fund capital expenses. This quickly subsides as the capacity to borrow resumes shortly thereafter.

The GT&D component of rates rises in the early years because of general inflationary pressure. After 2023 when the IPP debt is fully paid, the GT&D component of rates lowers slightly and goes slightly negative until IPP is replaced with new gas-fired generation and then resumes the familiar inflationary path.

Figures ES-9 and ES-10[4] further illustrate the impact to average residential and commercial/industrial customer monthly bills from these environmental and reliability programs. To show the potential effect of energy efficiency on customer bills, the dashed lines on these figures represents what a total monthly bill would amount to after implementing energy efficiency measures that result in a 14% savings. While LADWP's overall energy efficiency program is evolving and much will depend on the new potential study to be conducted in 2013, these figures illustrate what may reasonably be achievable by customers who have not already implemented significant energy efficiency measures to reduce their electricity consumption.

[4] Figures ES-9 and ES-10 are general representations only, and do not account for rate structure variations across and within customer classes, such as the effect of tiered rates, minimum charges, time-of-use, etc. The figures provide an indication of the relative contributions of the individual program areas toward a typical monthly bill.

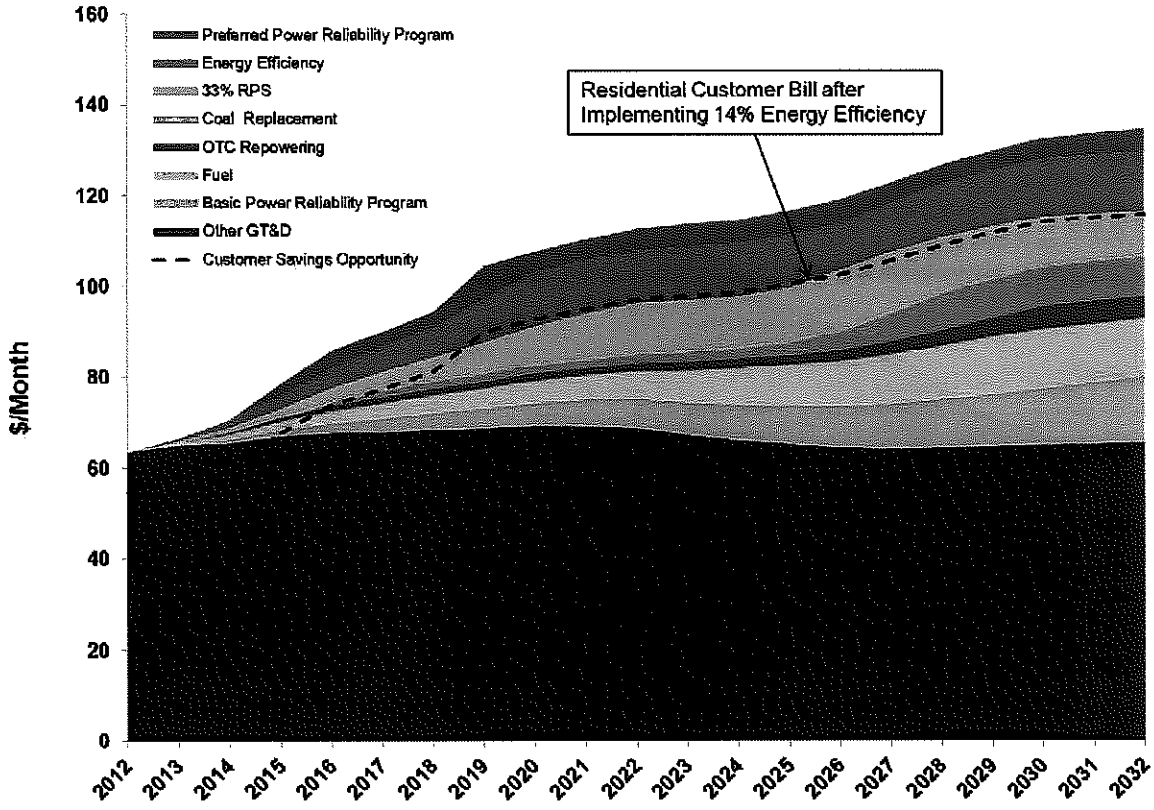

Figure ES-9. Average residential customer bill (500 kWh/month) with environmental and reliability programs by fiscal year based on the 2012-13 budget forecast (Case 5).

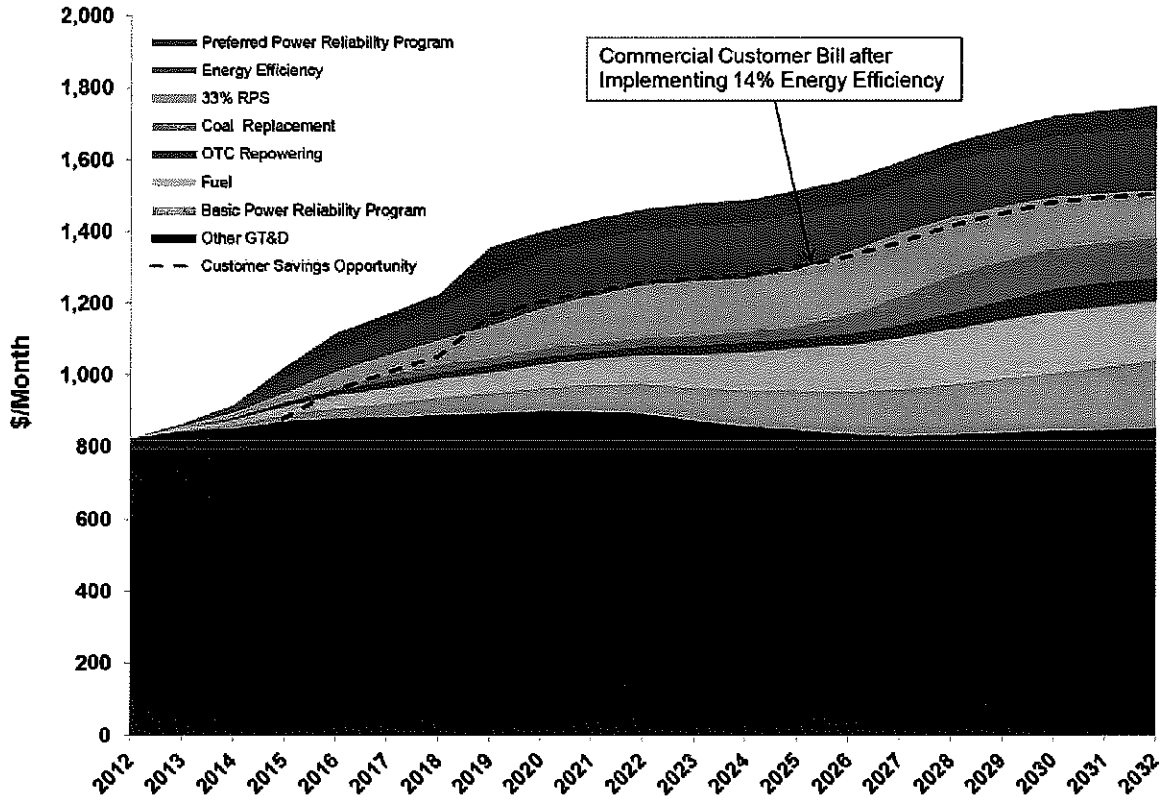

Figure ES-10. Average commercial/industrial customer bill (6,500 kWh/month) with environmental and reliability programs by fiscal year based on the 2012-13 budget forecast (Case 5).

8. Recommendations

8.1 Strategic Overview

LADWP's recommended strategy set forth in this IRP for meeting its key objectives can be separated into two areas: (1) Regulatory and Reliability Initiatives, and (2) Strategic Initiatives. Regulatory and Reliability Initiatives are required actions to ensure system reliability and compliance with regulatory and legislative mandates. Strategic Initiatives are policy actions to achieve objectives established by the LADWP Board of Water and Power Commissioners and the Los Angeles City Council, and reflect their vision and leadership. These policies include, for example, energy efficiency targets, social and economic development goals, early compliance with SB 1368, and investing in local solar distributed generation.

Regulatory and Reliability Initiatives

- RPS

  LADWP must increase its percentage of renewable energy per recently enacted state law, from the current 20 percent, to 33 percent by the end of 2020. SB 2 (1X) also establishes interim targets to ensure progress towards the 33 percent goal. In addressing this mandate, it is important that LADWP expand its renewable portfolio in the most cost-effective manner as possible. As two subsets of the RPS program, SB 1 requires $313 Million of expenditures towards solar incentives (Customer Net Metered), and SB 32 mandates a Feed in Tariff program of 75 MW (although LADWP by choice will exceed this mandate and provide 150 MW by 2016).

- Power Reliability Program (PRP) and System Infrastructure Investment

  To ensure system reliability, LADWP must re-establish sustained funding to invest in replacing transmission and distribution infrastructure that are contributing to outages. Recent funding shortfalls have resulted in an increase in the frequency and duration of system outages. Section 1.6.3 of this IRP discusses the importance of fully funding the Power Reliability Program (PRP). As discussed in Section 2.4.6, the PRP will also increase the resiliency of the distribution infrastructure to better withstand the higher future wear-and-tear effects that are expected due to climate change.

- Re-powering for Reliability and to Address OTC

  LADWP will continue to re-power older, gas-fired generating units at its coastal generating station for the reasons discussed in Section 2.4.2. The repowering program is a long-term series of projects through 2029 that will increase generation reliability and efficiency, reduce NO_X emissions, and eliminate the need for once-through ocean water cooling.

- AB 32 – GHG Cap and Trade

  LADWP will participate in the mandated greenhouse cap-and-trade system which is scheduled to start January 1, 2013. LADWP has been granted an administrative allocation of emission allowances that reflects its resource projections through 2020. At this time, it is uncertain if the program will extend beyond 2020, and if so, what LADWP obligations would be.

- Energy Efficiency (EE)

  LADWP will continue to pursue and implement EE programs per AB 2021 standards and as directed by the Board of Water and Power Commissioners, who have adopted a goal of achieving 10 percent EE by 2020, with a target of up to 15% by 2020 pending the results of an upcoming new EE Potential Study. The Base EE cases evaluated in this 2012 IRP have all incorporated 10% EE by year 2020, with higher levels of up to 15% by 2032. Next year's IRP will incorporate the findings and recommendations of the potential study as they are finalized and approved.

- SB 1368 Compliance

  LADWP's two coal-fired generation sources, the Navajo Generating Station (NGS), and the Intermountain Power Project (IPP), must be compliant with the mandates established in SB 1368 by 2019 and 2027, respectively. IRP modeling determined that these units will be replaced earlier with a combination of renewable energy, demand response, EE, short term market purchases, and conventional gas-fired generation.

- Energy Storage

  Per AB 2514, LADWP is investigating Energy Storage (ES) technologies and will establish targets for implementation by October 1, 2014. LADWP will look for programs and projects that support its unique electric grid, resource plan, and projects that will facilitate renewable integration, distributed generation and demand response. As these projects are identified and scoped, they will be incorporated into and analyzed in future IRPs. See Section 2.4.5 for more information.

- Castaic FERC Re-licensing Program

  On January 31, 2022, the Federal Energy Regulatory Commission's (FERC) license to operate Castaic Pumped-storage Hydroelectric Plant will expire. The license is a co-license between LADWP and the Department of Water Resources and includes a number of hydro power plants along the California Aqueduct. Both parties have initiated the joint re-licensing process that, on average, requires ten years to complete. Through 2015, LADWP expects to complete preliminary studies, contract negotiations, and prepare a new application strategy. In 2016, LADWP expects to file a notice-of-intent (NOI) and initiate the formal studies and applications.

- Transmission

  LADWP's Ten-Year Transmission Plan is prepared each year to ensure that LADWP remains compliant with NERC Transmission Planning Standards. The planning process involves complex modeling of the LADWP system, and concludes with findings and recommendations to maintain operational flexibility and avoid potential future overload conditions. LADWP will continue to implement the recommended projects, including construction of a new transmission line between Scattergood Generating Station and Receiving Station K, and upgrades at various other receiving and switching stations.

Strategic Initiatives

- Early Compliance with SB 1368

  Regarding the Navajo Generating Station (NGS), while power imports can legally continue until 2019, LADWP recommends divestiture from NGS four years earlier, in 2015. There are many strategic advantages to early divestiture, including:

  1. Better sales terms and conditions than waiting until the 2019 deadline.
  2. Avoiding the risk of pending federal regulations that could potentially encumber the plant with expensive mitigation requirements.
  3. Better availability and pricing for replacement generation (including existing plants), and lower fuel costs.
  4. Reduced CO_2 emissions, alleviating LADWP from subsequently having to purchase emission credits for native load.
  5. Transmission network for importing additional solar and geothermal resources becomes available.
  6. Low load growth and increased renewable energy place less reliance on the plant for energy.
  7. Provides time to handle contingencies, and to ensure that competition for replacement resources is going to benefit our ratepayers.

  Regarding the Intermountain Power Project (IPP), LADWP recommends modeling and planning to be compliant with SB 1368 by 2027. However, LADWP, the Intermountain Power Agency (IPA), and the other 36 participants are considering the conversion of IPP from coal to natural gas. A new contractual arrangement is in process, which will establish a firm conversion date that will be no later than, and possibly sooner, than 2027. Until a firm conversion date is established and for analysis purposes, Case 4 was developed for this IRP which has IPP coal replacement in 2023. Once a firm date is determined, it will be incorporated into the IRP base case model runs.

  Strategically, it is important for LADWP to remain a participant at IPP to retain geographic diversity in its resource mix, access the regional fuel supply, and retain the project's transmission lines to access renewable energy from the region.

- Local Solar

  Comments received at prior public workshops indicate local solar development should be a priority in LADWP's renewables procurement strategy. LADWP is recommending a policy action to allow 340 MW of its solar resources be sited locally by 2016, through initiatives including the Solar Incentive Program, feed-in tariffs, and installation of solar on City-owned properties.

- Demand Response

  LADWP should accelerate its evaluation and implementation of Demand Response programs that will initially provide 5 MW of new peak demand capacity beginning in 2013 and gradually build to 200 MW by 2020 and 500 MW by 2026. Ramping the program in this manner will promote the development of in-house expertise, and will also allow time to deploy the supporting information systems necessary to implement these systems successfully.

- Advanced Technologies/Research and Development

  LADWP is looking ahead to technologies that will enhance the reliability of its system, including smart grid, energy storage, enhanced information and management systems, automation of system functions, advanced methods of outage management, and weather forecasting. These system enhancements will increase reliability, facilitate the integration of local solar generation and other variable renewable resources into the distribution network, enable smart charging of electric vehicles, and advanced demand-side management technologies. LADWP should continue to pursue grants, cost-sharing opportunities, and joint projects that promote the use and deployment of new technologies that meet its strategic goals.

- Provide Sufficient Generation

  Provide sufficient generation, demand response, and limited short term purchases in peak season Q3 to cover operating and replacement reserves in accordance to applicable federal and regional reliability requirements.

- Control of Transmission Assets

  In addition to the regulatory requirement to remain compliant with NERC Transmission Planning Standards, LADWP will maintain its policy of maintaining control of its transmission assets and continue to augment those assets commensurate with load growth, reliability needs, and renewable energy opportunities.

- Collaborate with Water System

  The LADWP Power System will continue to work with the Water System to develop programs that reduce the usage of electricity and conserve water, as well as optimizing hydroelectric energy production.

- Financial Targets

  To preserve and maintain its credit rating, the following financial targets have been adopted:
  - Maintain debt service coverage at 2.25 times
  - Minimum operating cash target of $300 million
  - Debt-to-capitalization ratio less than 68 percent

8.2 Recommended Strategic Case

Achieving the goals of reliability and environmental stewardship, while maintaining competitive rates, requires that costs be closely managed. Considering these factors, Case 5 with early Navajo coal divestiture in 2015, Base EE and Base DG with additional local solar Feed in Tarrif (FiT) DG becomes the Recommended Case for the 2012 IRP. Whereas Case 5 has 75 MW of local solar FiT by 2016, the new recommendation is to adopt an additional 75 MW for a total of 150 MW by 2016 based on input that was received from the public outreach efforts. The increase in cost for the additional 75 MW of FiT is an average of 0.018 cents/kWh or a 9 cent increase in the typical residential monthly bill (500 kWh/month). Although Case 5 with the added FiT represents additional cost as compared to the 2011 Recommended Case, the additional costs to rate payers appears to be reasonable in light of the benefits of job growth and support of the local economy from adopting higher levels of DG solar. As described in the 2011 IRP, the environmental benefits of reducing GHG emissions by 7.2 MMT are still present with the early Navajo replacement. The cost to implement Navajo divestiture in terms of metric tons of GHG removed is $28/MMT. This represents a reasonable cost in line with the range of expected AB 32 cap and trade allowance prices. Other benefits of early Navajo divestiture include a better sales price than waiting until 2019, and better availability (lower costs) of replacement energy. With Case 5 and the noted addition of FiT and Navajo divestiture in place, LADWP can begin to focus its attention on early replacement of IPP coal generation, prior to 2027, by working with the other power purchasers and the IPP plant owner.

The 2011 IRP included the same recommendation to accelerate divestiture of Navajo and this 2012 IRP further clarifies and supports this prior recommendation. This 2012 IRP recommended case presents a reasonable approach to achieving environmental goals and promoting job growth in the local economy without excessive costs to our ratepayers while limiting potential exposure to possible fuel price volatility to within manageable limits.

Table ES-5. 2012 IRP RECOMMENDED CASE

	2020	SB 1368 Compliance Date		New Renewables Installed (MW) 2012-2020				New Renewables Installed (MW) 2012-2032				
Case ID	RPS Target	Navajo End Date	IPP End Date	Geo/ Biomass	Non-DG Solar	Dist. Solar	Generic	Geo/ Biomass	Wind	Non-DG Solar	Dist. Solar	Generic
Case 5	33%	12/31/2015	6/15/2027	242	842	382	39	283	54	915	496	114

Figure ES-11 illustrates the changing generation resource percentages for 2010, 2020, and 2030 based on the Recommended Case. Because energy efficiency forecasts are forward-looking, the savings of 1,256 GWh or 5.5 percent of sales that was implemented between 2000 and 2010 are embedded into the load forecast and are not included as part of the generation resource mix shown below.

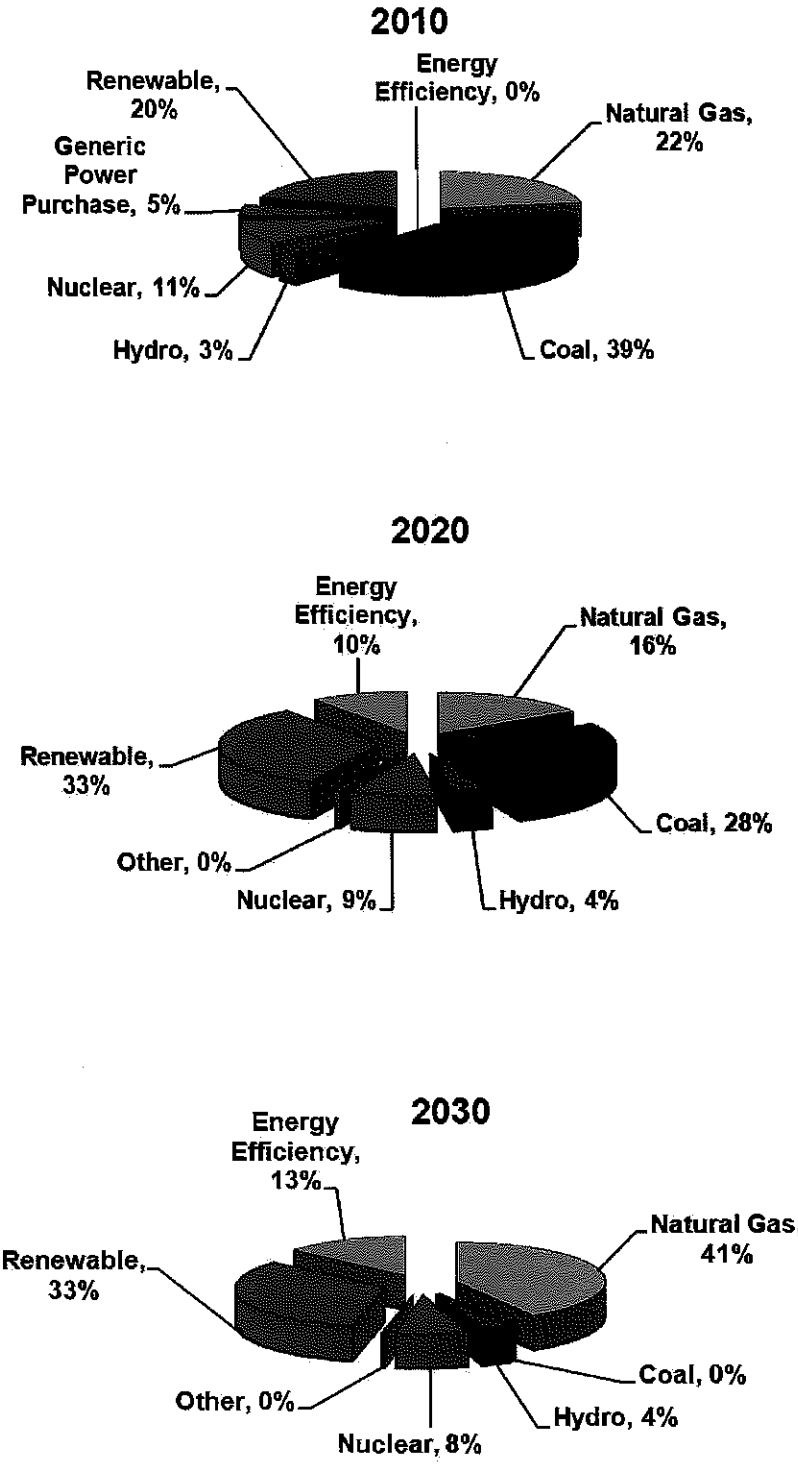

Figure ES-11. Recommended case generation resource percentages for 2010, 2020, and 2030.

Figure ES-12 shows the breakdown of renewable generation by technology, and Figure ES-13 illustrates the dependable capacity mix for the recommended case.

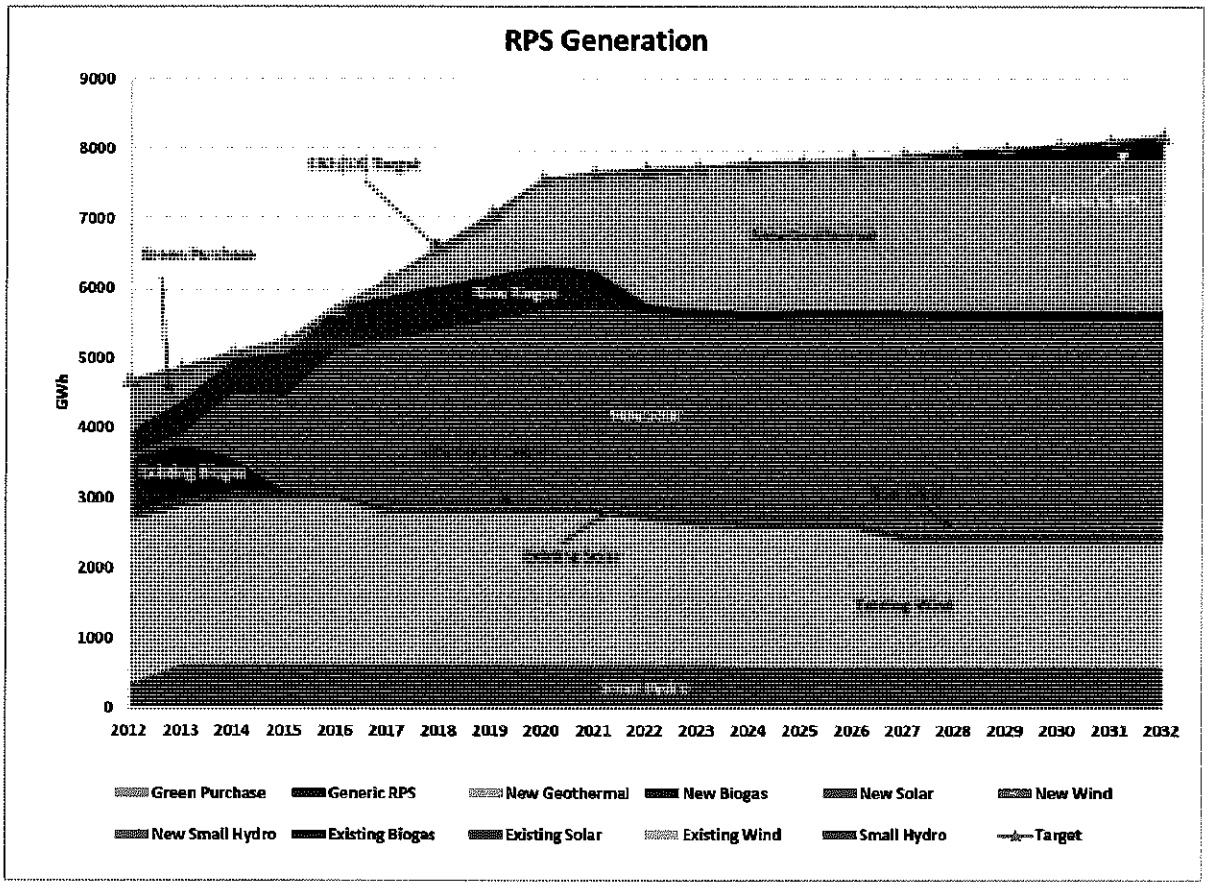

Figure ES-12. Recommended case renewable generation by technology.

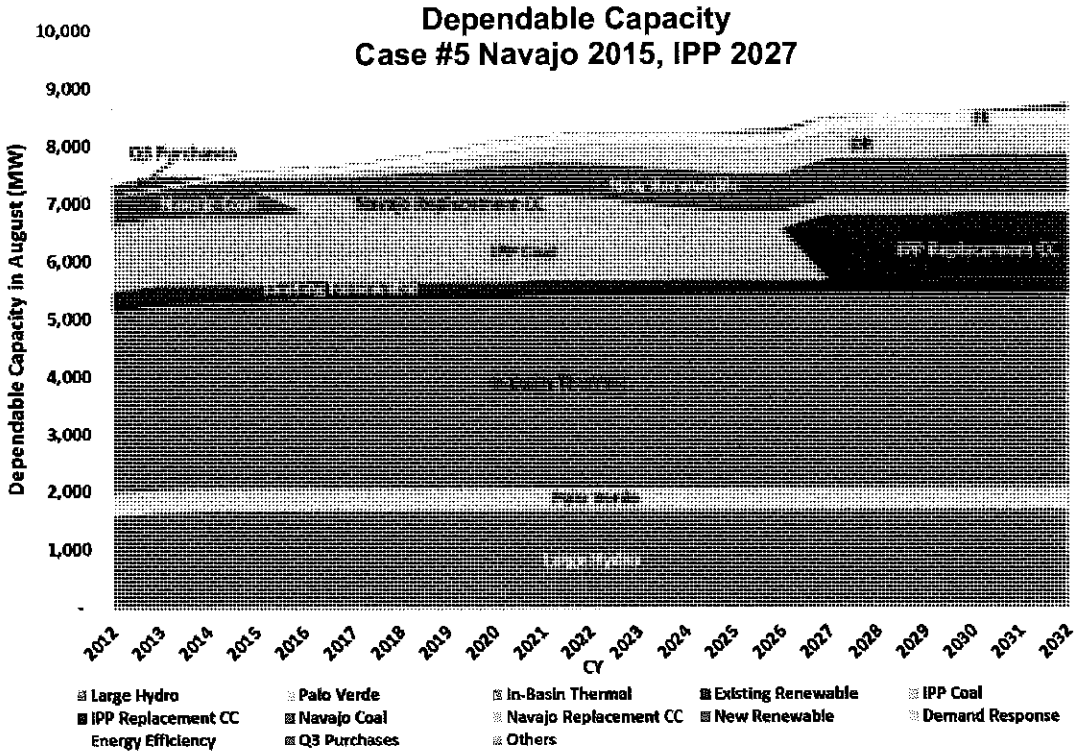

Figure ES-13. Dependable capacity profile, recommended case.

Because the analysis and conclusions are dependent on a number of assumptions, LADWP will constantly refresh its analysis as new IRPs are developed in future years.

8.3 Recommended Near Term Actions

Except for early Navajo divestiture, the actions needed to be taken by LADWP in the next two to four years are very similar no matter what resource strategy is chosen. Based on the strategic requirements presented earlier and projected resource procurement needs, the following actions are recommended to be taken in the near-term:

1. Proceed with re-powering plans for generation units at the Haynes and Scattergood Generating Stations, and pre-development plans for the Harbor Generating Station.
2. Continue to investigate the technical and contractual options for coal-fired generation to be compliant with SB 1368.
3. Divest from the Navajo Coal Plant by 2015.

4. Continue the implementation of existing energy efficiency efforts, in anticipation of an expanded program pending the results of a new energy efficiency potential study to be conducted in 2013.
5. Continue to implement the Power Reliability Program (PRP) to replace aging infrastructure components. Develop electric modeling capability to better define the necessary investments and to prioritize the expenditures.
6. Develop/update a sustainable workforce development plan that addresses staffing needs, skill set identification for new and evolving work areas, training/professional development, application of new technologies, and recruitment strategy.
7. Implement recommendations contained in the Ten-Year Transmission Assessment Plan.
8. Develop a Demand Response Program to initially provide 5 MW of new peak load reduction capability by 2013 which will ramp up incrementally to 200 MW by 2020 and 500 MW by 2026.
9. Implement renewable strategies for geothermal, biogas, solar, and wind resources to ensure increasing levels of renewable procurement in accordance with SB 2 (1X). Sign Power Purchase Agreements for an additional 300-400 MW of cost effective renewable energy projects by 2014
10. Complete a comprehensive study of issues associated with integrating increasing amounts of variable energy resources such as wind and solar to reflect possible megawatt limits for the LADWP electric Power System.
11. Develop and incorporate strategies to:
    a. Fully utilize existing transmission assets;
    b. Locate renewables as close as practical to the load center to reduce transmission losses;
    c. Preserve existing brown field sites to be repurposed for renewable or natural gas generation;
    d. Incorporate the concept of O&M cluster zones[5] to maximize operational efficiencies;
    e. Assess and develop necessary transmission facilities to deliver electricity generated from new facilities.
12. Develop a renewable energy feed-in tariff program to encourage 150 MW of renewable generation resources to be developed by 2016.
13. Encourage the development of an additional 50 MW of customer net-metered solar projects before 2015.
14. Develop up to 30 MW of solar capacity on existing properties under public/private partnership projects before 2015.
15. Investigate the use of term physical gas supply arrangements, either with contracts for physical supplies or futures contracts to limit LADWP's exposure to volatile gas prices. Evaluate and potentially implement any recommendations in the Fuel Hedging Plan.
16. Investigate and develop energy storage targets by October 1, 2014, per AB 2514.

[5] Clustering renewable projects in relative proximity will decrease O&M expenditures due to economies of scales and personnel efficiencies. This would need to be balanced with the need for geographic diversity.

17. Refine and implement a Smart Grid strategy that can assist in the procurement and development of advanced technologies to support areas such as: weather forecasting/ energy scheduling, customer kWh metering, high speed communications and information systems, and energy storage systems. Deployment of these technologies will increase operational efficiency, help reduce system losses, improve outage response times, increase utilization of predictive/proactive maintenance techniques for improved grid reliability, enable better management of the Power System, and lower costs.

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