

Draft Electric Resource Plan 2009 – 2018

Electric Resource Plan Overview



Overview of Electric Resource Plan

June 15, 2009

LIPA Electric Resource Plan

Contents of Electric Resource Plan

Electric Resource Plan

3. Vision, Mission and Strategic Objectives
5. Efficiency Plan
8. The Electric Resource Plan

Appendix A – Technical Report

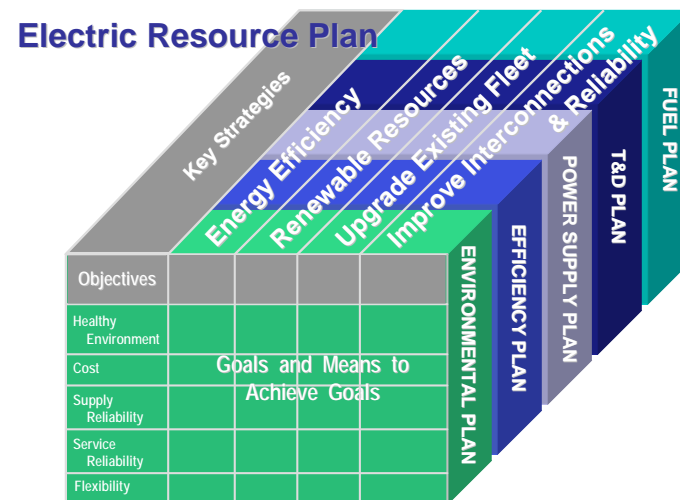
1. Overview
2. Action and Policy Plans
3. Description of Plan Elements
4. Energy Efficiency Planning Analysis
5. Fuel Management Plan
6. Resource Planning Assumptions
7. Resource Needs Analysis
8. Alternative Technology Assessment
9. Development of Electric Resource Plan

Appendix B – Energy Primer

Appendix C – Response to Comments

Appendix D - Technical Appendices

- D-5 Energy Planning Process



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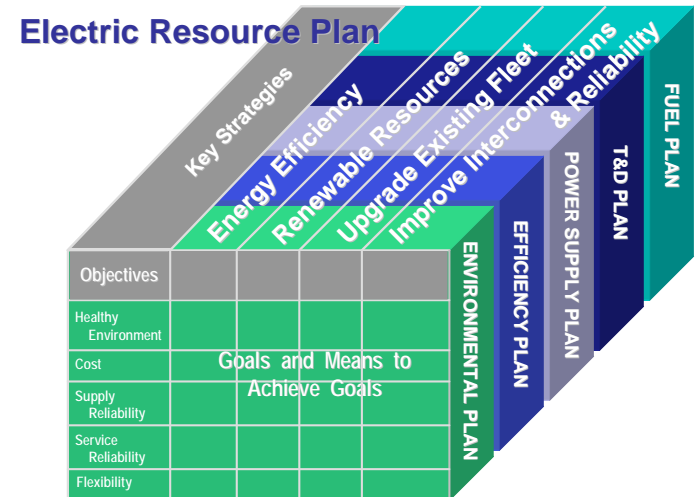
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LIPA Electric Resource Plan

Strategic Objectives

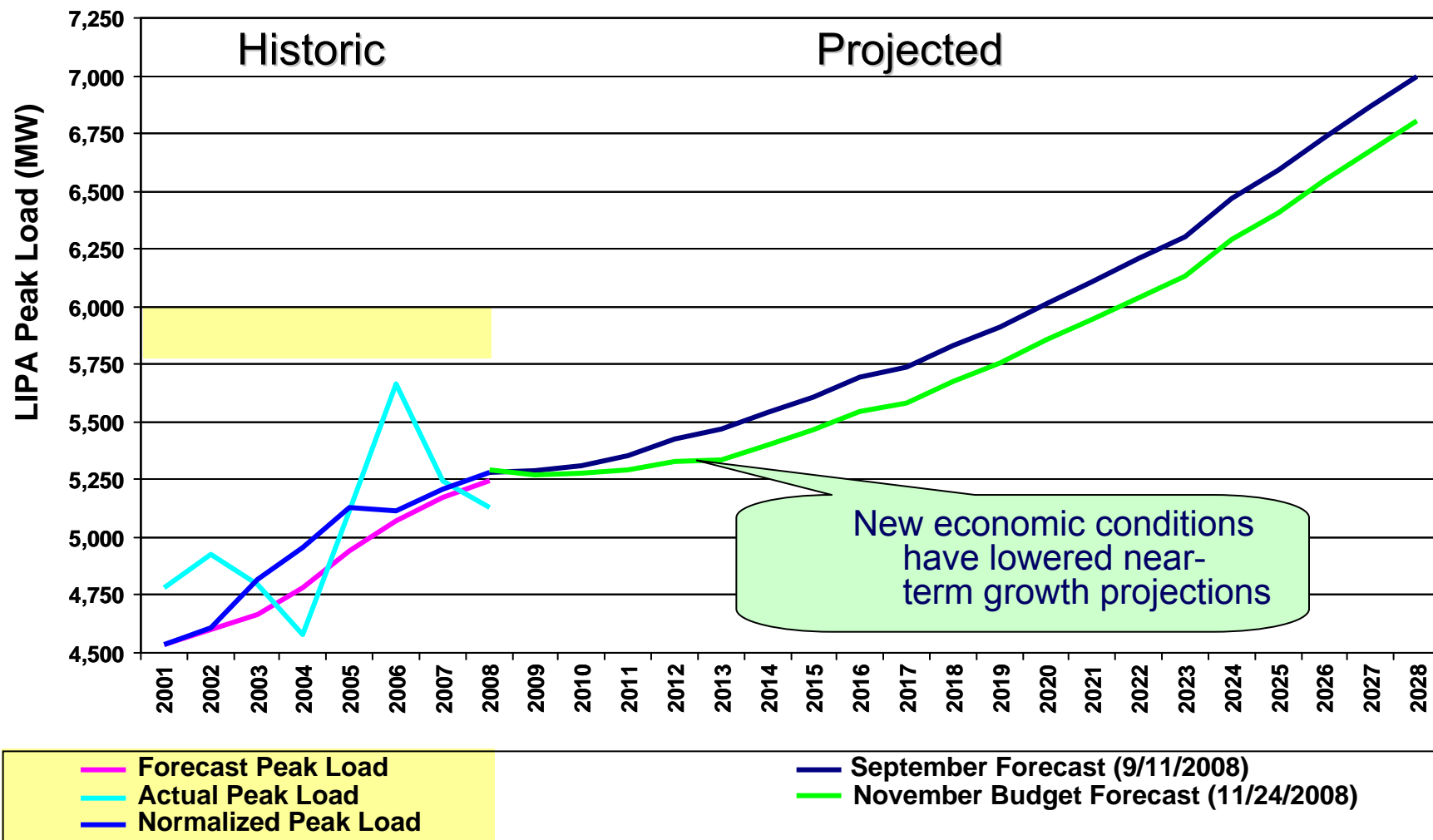
- Promote a healthy environment through leadership in efficiency and renewables
- Balance the objectives of the Electric Resource Plan against impacts on customer electric bills
- Maintain high reliability of the bulk power system
- Maintain high reliability of the distribution system
- Position LIPA with the ability to respond rapidly to change as a way of managing risk

The key is to balance the interrelationships among the Strategic Objectives to satisfy each area of concern to come as close as possible to the Ideal Plan.



LIPA Need for Capacity

Load Forecast History and Comparison



Agenda

Opening Remarks
Overview of Workshop Format
Overview of Electric Resource Plan

Break

Review of Modeling System and Assumptions

Energy Efficiency

Need Analysis

Lunch

Technology Screening

Alternative Plan Analysis

Break

Action Plan

Policy Input

Input on Workshop Approach

Major Sources of Uncertainty

- Load growth
- Long Island Choice program
- Success of energy efficiency programs
- Success of new resources coming on line
- Changing NYSRC and NYISO IRM and LI LCR requirements
- Reliability fluctuations of existing generating fleet

Methodology

- Use estimated probability distributions for each source of uncertainty
- Use a statistical model of supply, demand, markets and resources to develop a probability distribution of need for capacity
- Plan to a specified uncertainty

LIPA Planning Approach to Uncertainty

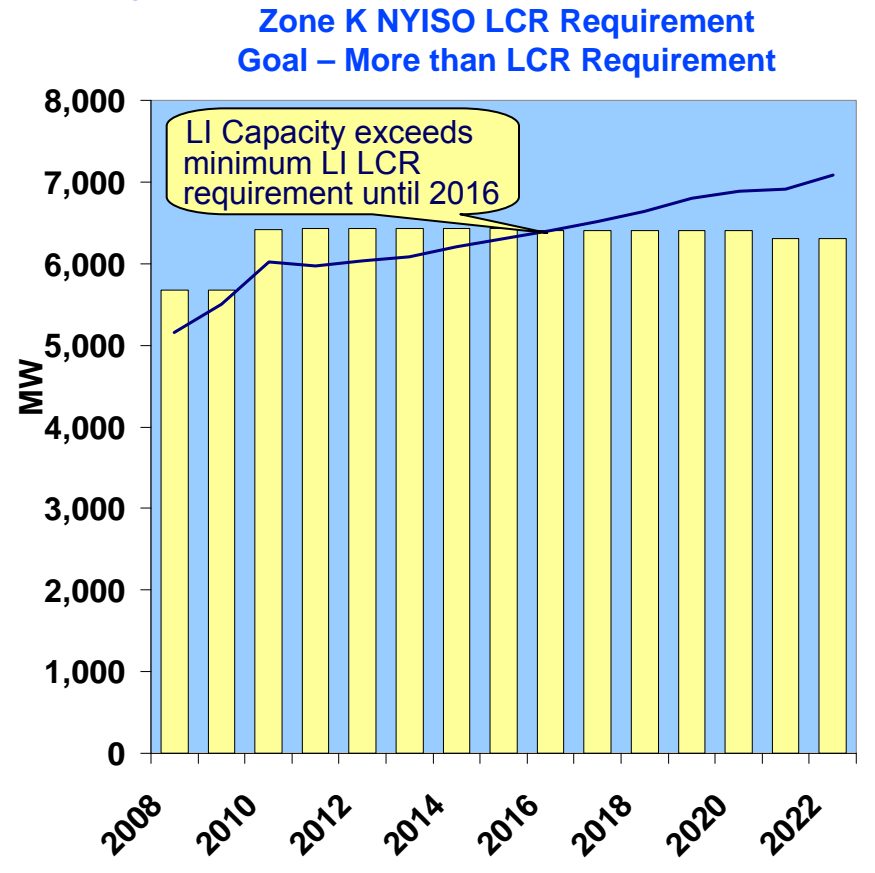
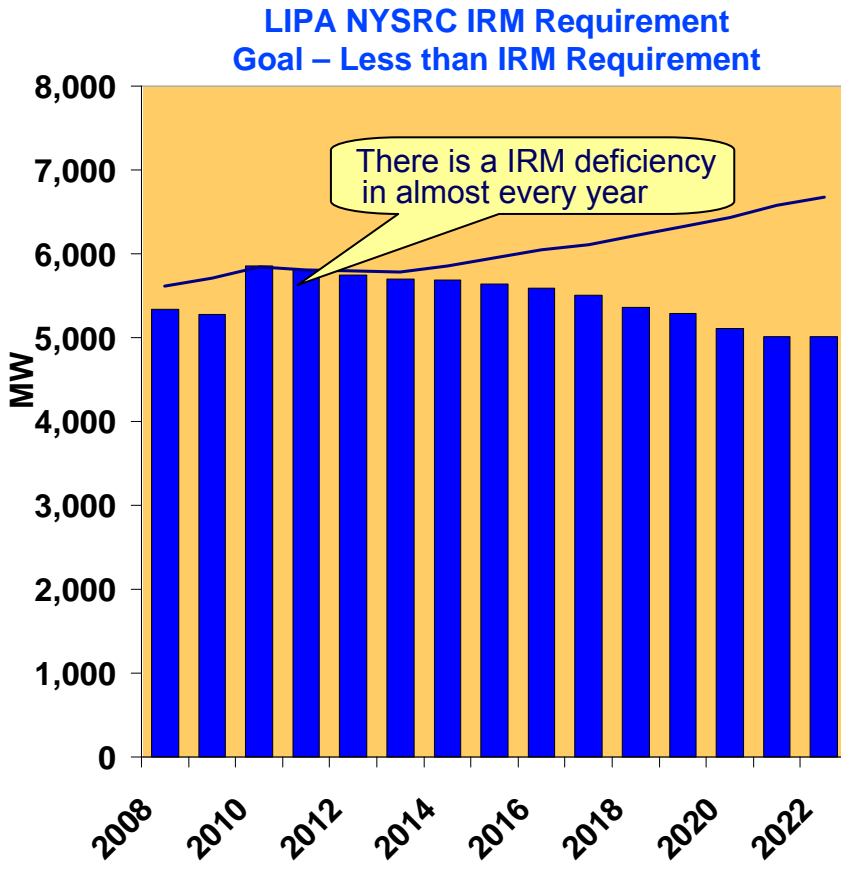
- LIPA NYSRC IRM Standard
 - ▶ Plan to meet standard expected value of need
 - ▶ If a shortfall is projected, evaluate projected condition of spot and bi-lateral capacity markets
 - ▶ Purchase capacity in both markets to minimize LIPA's cost

- Zone K NYISO LI LCR Standard
 - ▶ Plan to exceed NYISO standard with a 80% probability of success
 - ▶ Use LIPA and other Long Island market resources to meet requirements
 - ▶ Take corrective action by contracting for long term and short term shortfalls

LIPA Need for Capacity

Annual Resources and Requirements

Probabilistic Projection



■ LIPA Resources — LIPA IRM Requirement

■ Zone K Resources — Zone K LCR Requirement

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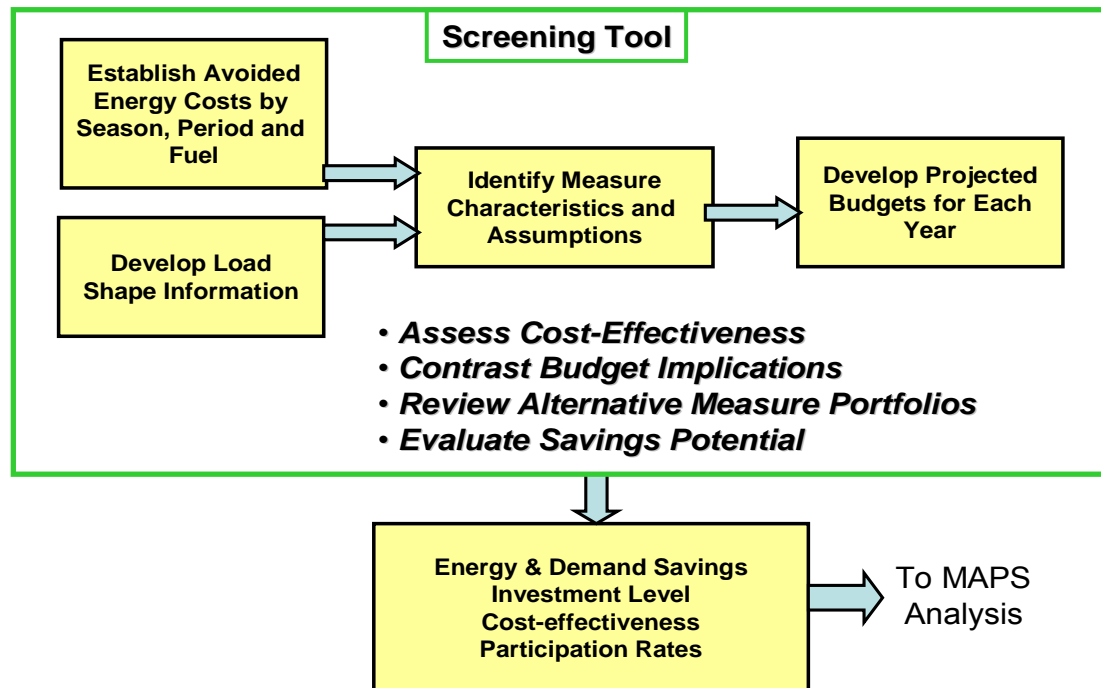
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- LIPA's energy efficiency plan was developed to provide lower cost resources to serve customer needs. The efficiency plan has been developed through a review of LIPA's load shape to identify appropriate preferred solutions.

Energy Efficiency Planning Framework



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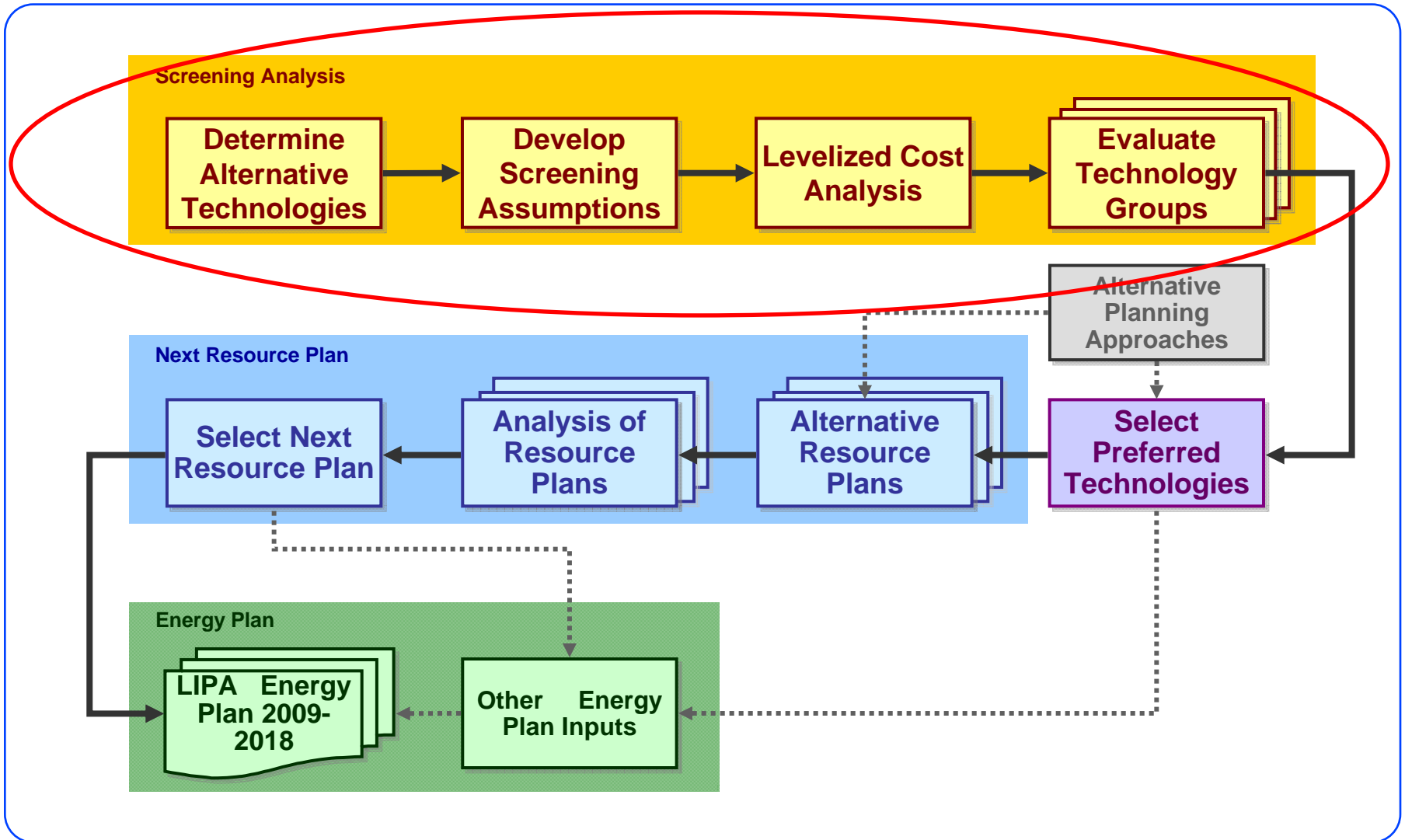
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Action Plan
Policy Input
Input on Workshop Approach

Screening Analysis



Resource Planning Process Overview

Determine Alternative Technologies

► Exhibit 8-1 Alternative Technologies Considered

Supply Options	Transmission Options
Generic On-Island Combined–Cycle	Loss Reduction
Generic LMS 100 CC	NUSCO Upgrade 1
Caithness Combined-Cycle	NUSCO Upgrade 2
Generic Off-Island Combined–Cycle	Neptune Cable (RB)
Combined -Cycle CT LM6000	Neptune Cable (UDR)
Simple-Cycle CT LM6000	PJM Cable II (RB)
Generic Off-Island Coal	PJM Cable II (UDR)
Mobile Generating Units	Neptune Cable w/Marcus Hook
Fuel Cell Stack	Cross-Sound Cable
Pratt & Whitney (Twin Pac)	Hydro Inter-tie Reinforcements
Generic Off-Island Nuclear	
Efficiency Options	Renewable Options
Clean Energy Initiative	Landfill Waste-to-Energy**
ELI Base Program	Barrett 1,2, Convert to B20 Diesel
ELI Advanced & Accelerated Program	East , Convert to B20 Diesel
AMI	Resource Recovery
Time-based Pricing	Shoreham, Convert to Biodiesel
	Bio-Diesel
	Photovoltaic Roof
	On-Shore Wind
	Off-Shore Wind
	Off-Island Renewables
	Solar Pioneer

Repowering Options	Retirement Options
Barrett Repowering	Barrett Retirement
Northport Repowering	Northport Retirement
Port Repowering	Port Jefferson Retirement
Shoreham Repowering	Shoreham Retirement
Wading River Repowering	Far Rockaway Retirement
	Glenwood Retirement
	Wading River Retirement
	Peaking CTs and Diesels

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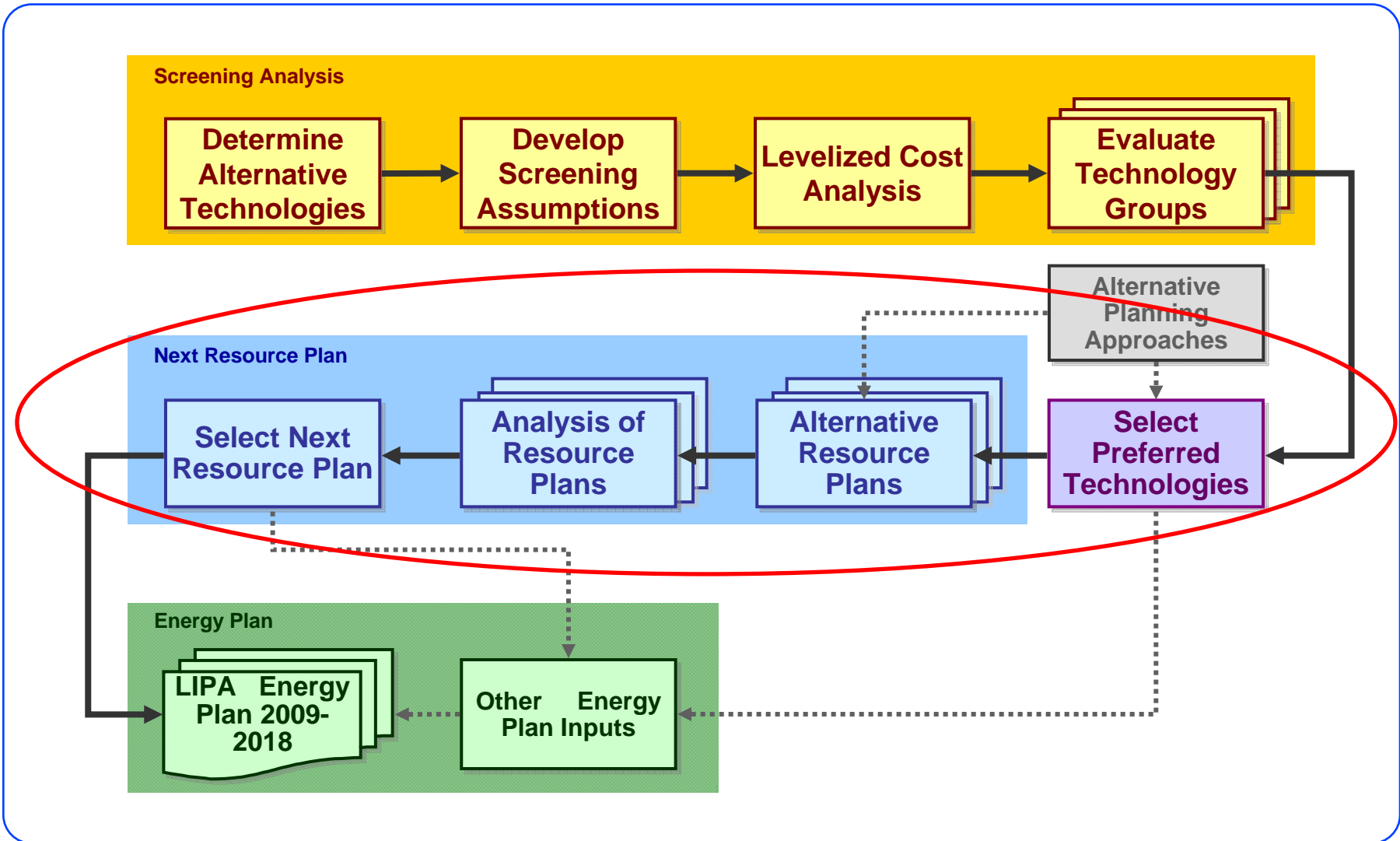
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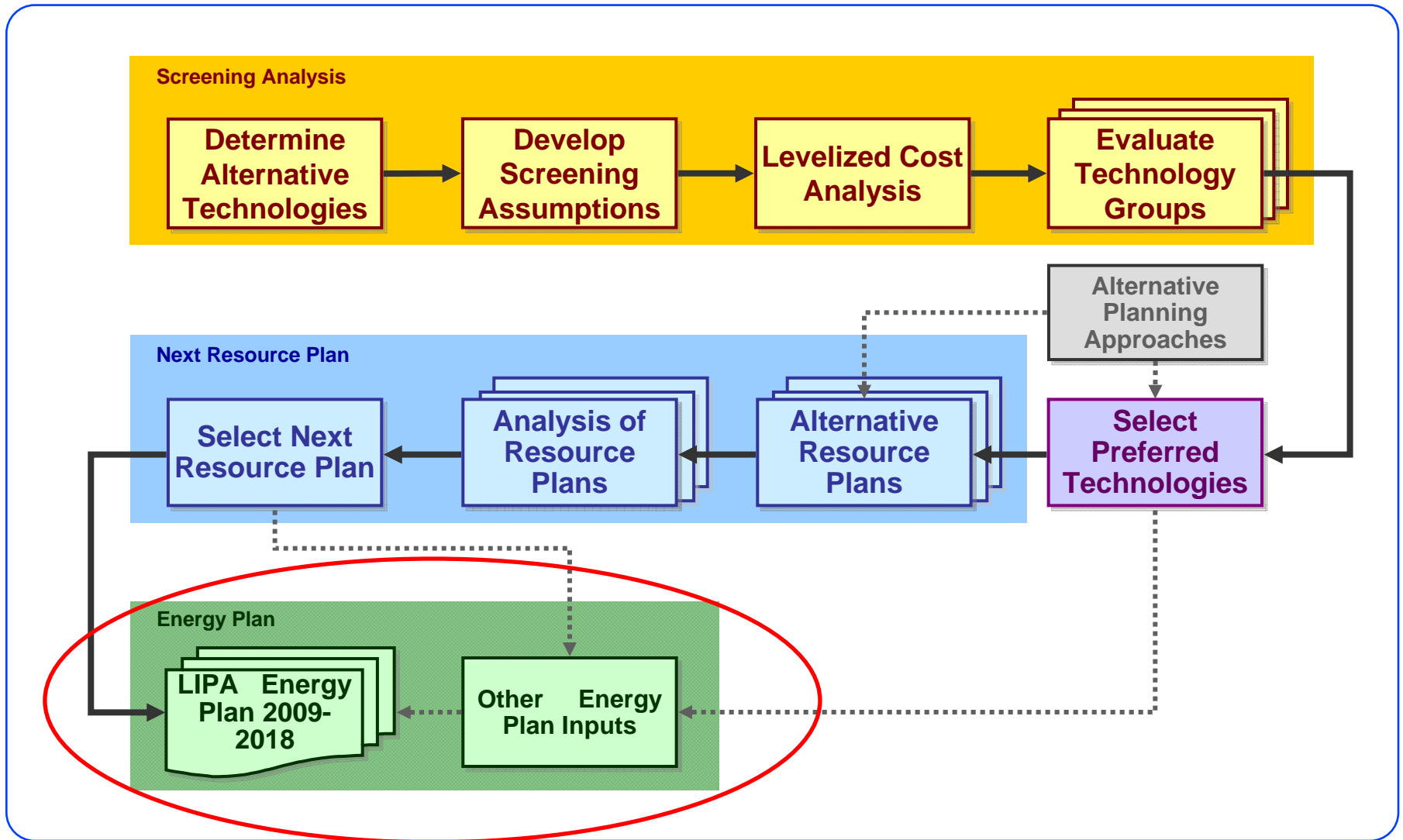
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Resource Planning Process Overview

Electric Resource Plan



1. Energy Efficiency

- ▶ Endorse adoption of a LIPA 15 x 15 plan
 - End-use efficiency
 - **ELI**
 - **Additional DSM to close remaining gap**
 - Generation efficiency
 - T&D efficiency
 - **Smart Meters**
 - **Efficient Electro-Technologies**

2. Renewable Resources

- ▶ Endorse adoption of a LIPA RPS program that supports statewide goal of 30% renewables by 2015
- ▶ Off-Island Renewable RFP
- ▶ On-Island Resources
 - **Wind (regional and backyard)**
 - **PV 50 MW RFP and successors**
 - **Net Metering Program**
 - **Expansion of Solar Rebate**
- ▶ **Utilize renewables to enhance fuel diversity**

3. Upgrade Existing Fleet

- ▶ Repower older plants to address environmental and efficiency issues
- ▶ Competitive procurement of green field plants and repowering/retirement
- ▶ Retire some of older steam plants
- ▶ **Study best site for Peaking Unit retirements**
 - **Issue RFP for new 10-minute reserve**
 - **Retire targeted units**

4. Improve Interconnections & Reliability

- ▶ Proceed with NUSCO Upgrade
- ▶ **Study to examine membership in NYISO, PJM, or ISO-NE**
- ▶ **Target new interconnections with best ISO System**
- ▶ **SmartGrid System**

Legend:



Committed



Planned



Under Study

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Performance of Electric Resource Plan Reference Plan and Representative Plan

Reference Plan

- A benchmark for comparison purposes
 - ▶ Not intended to represent a real plan
- Features of Plan
 - ▶ No Energy Efficiency
 - ▶ No Renewable Portfolio Standard
 - ▶ Expand system when capacity is needed using new power plants gas fired combined cycle units scattered throughout Long Island
 - Similar to Caithness power plants but bigger

Representative Plan

- One of many possible ways to implement the Resource Plan Strategy
 - ▶ Each component of plan to receive LIPA Trustee review and approval
- Features of Plan
 - ▶ Meets Governor's 45 x 15 targets
 - Energy Efficiency 15 x 15 program
 - 30% Renewable Portfolio Standard
 - ▶ On-Island renewables
 - Solar
 - Wind
 - ▶ Repowering of larger steam units
 - ▶ Retirement of oldest power plant
 - ▶ Improved interconnections with neighboring systems

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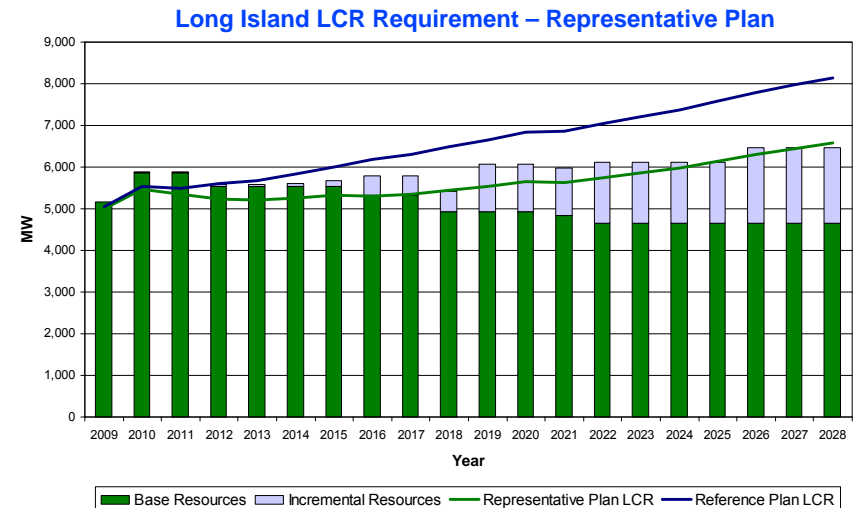
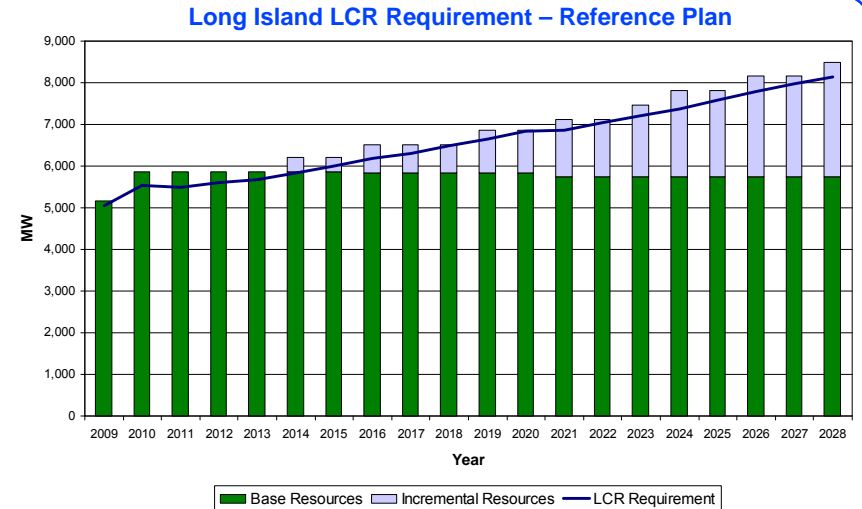
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Performance of Electric Resource Plan Resource Expansion – Long Island Requirement



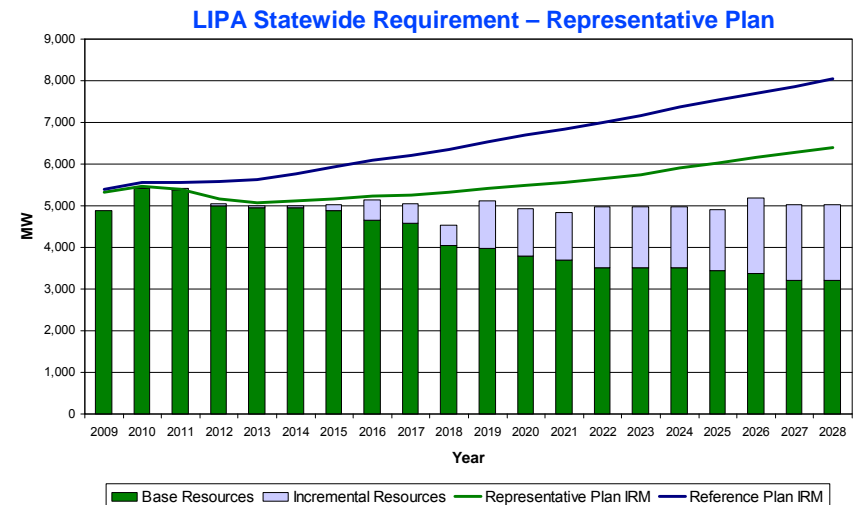
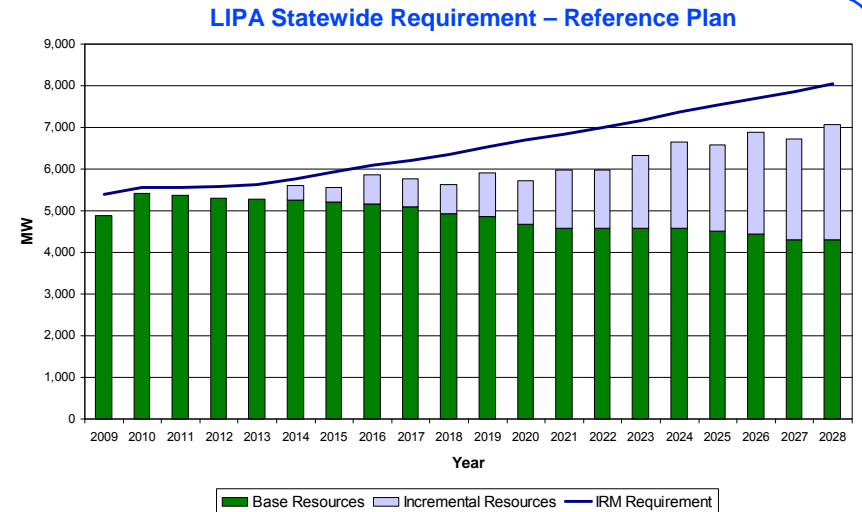
- LIPA's Long Island Requirement Goal
 - ▶ Long Island resources remain at or above minimum resource levels in all years
- Representative Plans energy efficiency investment reduces need for capacity allowing:
 - ▶ Retirement of older existing plant
 - ▶ Repowering of older existing plant
 - ▶ Still build fewer new resources than Reference Plan
- Savings from energy efficiency and smaller need for new resources provides more money for investment in more expensive renewable resources
- Long Island Requirement Goal is met in every year



Performance of Electric Resource Plan

Resource Expansion – Statewide Requirement

- **Statewide Planning Goal**
 - ▶ LIPA contracted resources remain below IRM requirements
- **Statewide resources driven primarily by locational resource investments.**
 - ▶ Current projections of statewide market allow LIPA to rely upon spot market for purchases to make up the remaining need for resources.
- **Statewide Planning Goal met in almost every year**

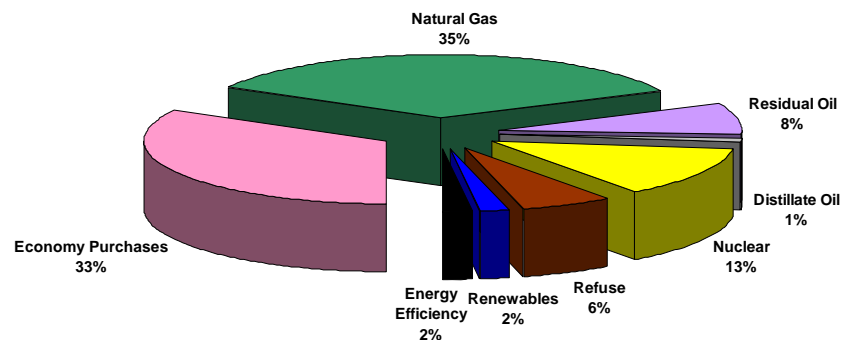


Performance of Electric Resource Plan

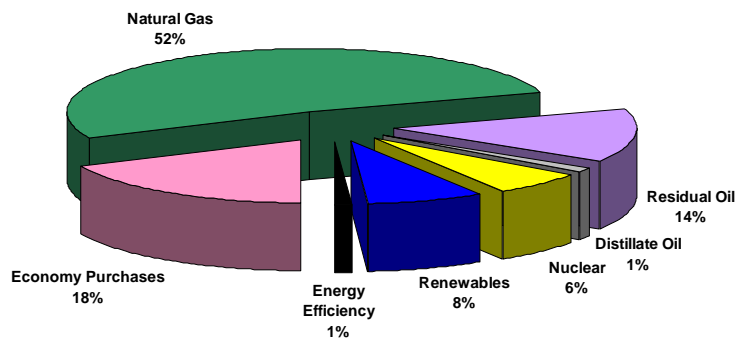
Energy Mix

- 2008 Fuel mix reasonably diverse
 - ▶ Greatest dependence on Natural Gas at 35%
- Reference Plan
 - ▶ Less diverse with 52% dependence on Natural Gas
- Representative Plan
 - ▶ More diverse with 28 % dependence on Natural Gas

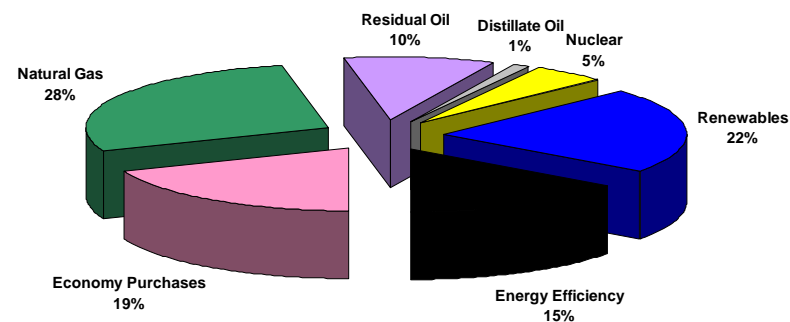
Actual Fuel Consumption in 2008



Fuel Consumption for the Reference Plan in 2018



Fuel Consumption for the Representative Plan in 2018



Performance of Electric Resource Plan Environmental Emissions of CO₂

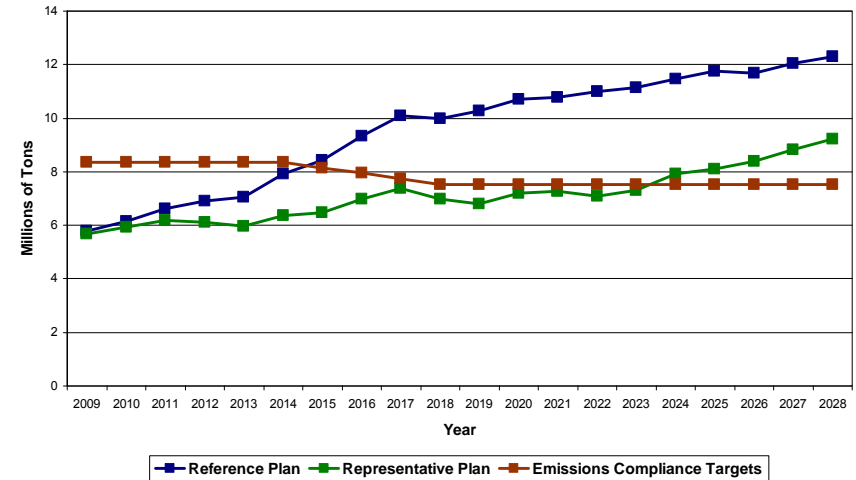
Regional Greenhouse Gas Initiative (RGGI) Target

- ▶ Assumes LIPA target is to use no more than proportionate share of statewide allowances
- ▶ Reference Plan exceeds target in 2015
- ▶ Representative Plan exceeds target in 2024
- ▶ Caused by addition of new on-island repowering and new plants

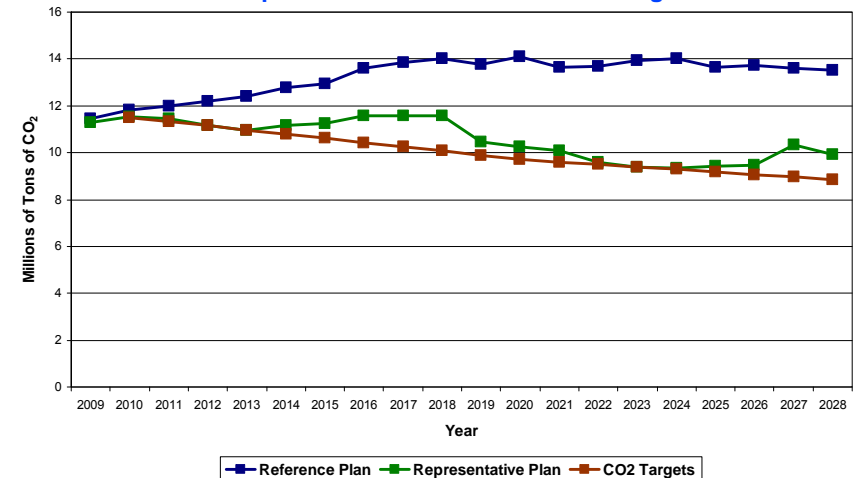
LIPA CO₂ Footprint Target

- ▶ Goal is to reduce CO₂ footprint to:
 - 9,720 tons (millions) by 2020; and
 - 8,856 tons (millions) by 2028
- ▶ Reference Plan fails this target in all years
- ▶ Representative Plan comes close to target in many years
 - Need to refine plan to meet targets

Comparison of Plans – RGGI Allowances



Comparison of Plans – LIPA's CO₂ Targets

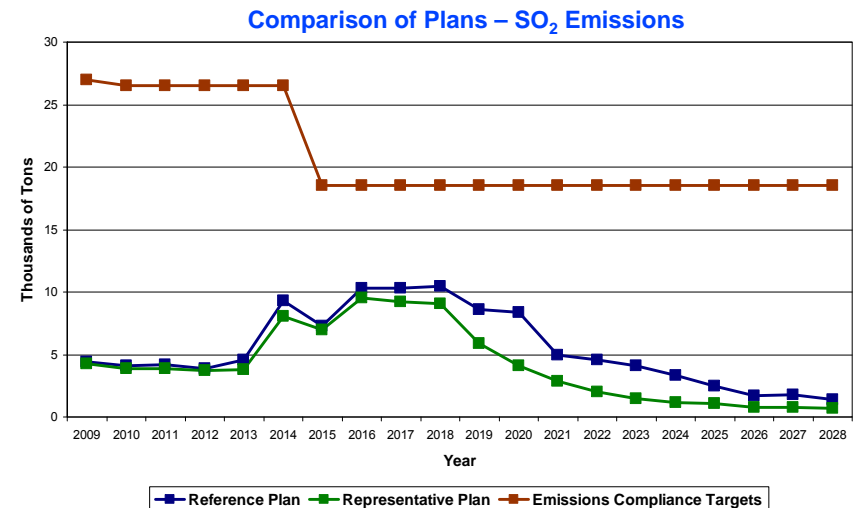
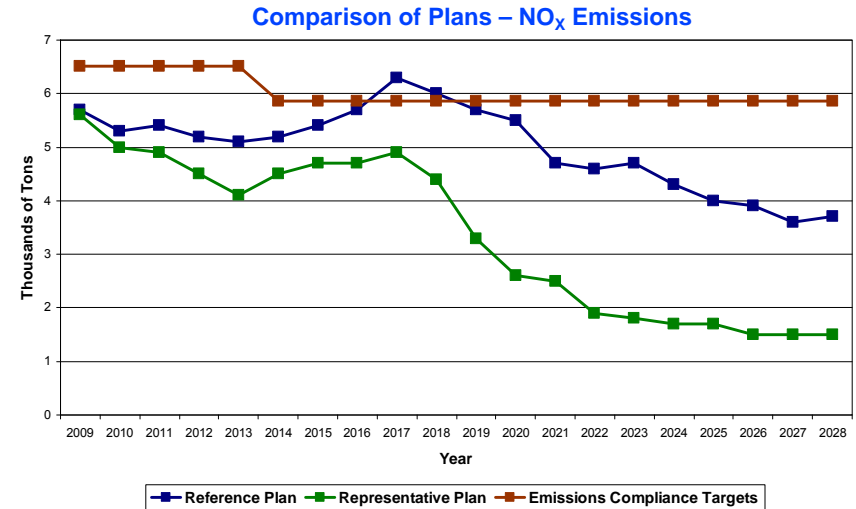


Performance of Electric Resource Plan

Environmental Emissions of NO_x and SO₂

- NO_x emission target based on current allocated allowances and projected reduction in allowances from more stringent regulation
 - ▶ Reference Plan exceeds allowances in 2 years
 - ▶ Representative Plan is below allowance target in all years

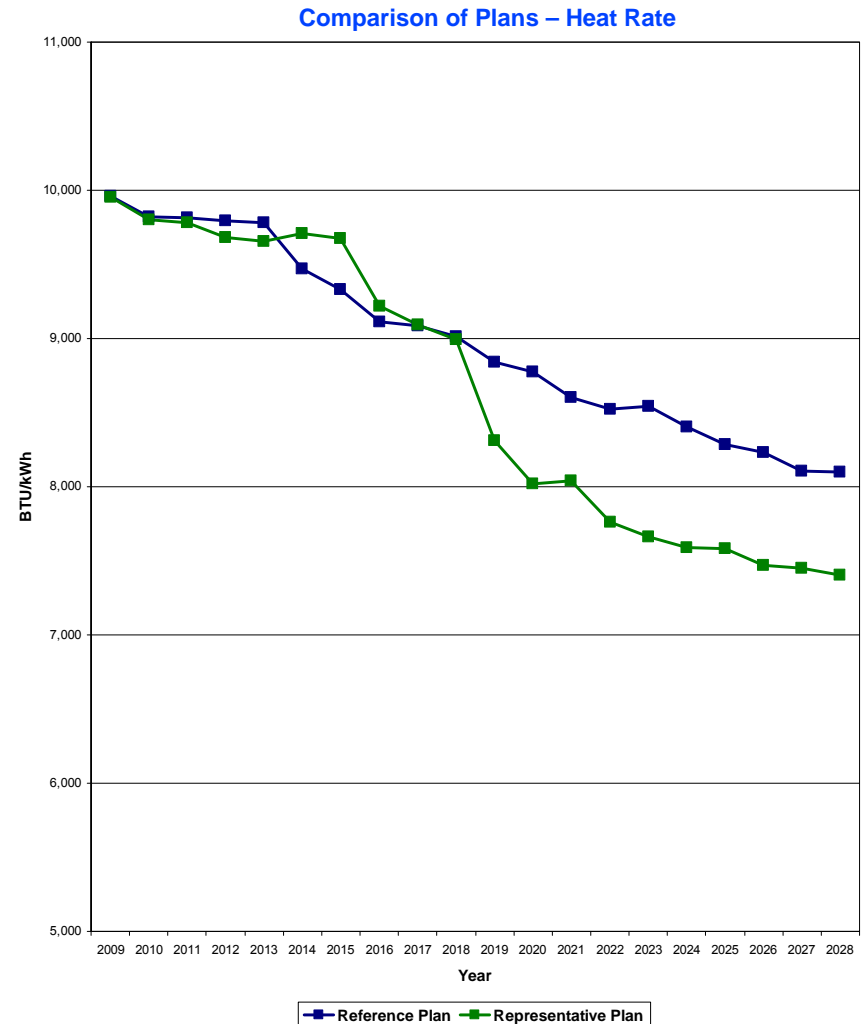
- SO₂ emission target based on current allocated allowances and projected requirement for more allowances per ton from more stringent regulation
 - ▶ Both plans are below allowance target in all years
 - ▶ Representative Plan has lower allowances than Reference Plan



Performance of Electric Resource Plan

Production Efficiency

- Heat rate measures the efficiency of producing electricity in power plants. The lower the heat rate, the more efficiency energy production is.
- LIPA is projected to reduce heat rate by 10% compared with 1999 levels
 - ▶ Reference Plan reduces heat rate by additional 9% by 2028
 - ▶ Representative Plan reduces heat rate by an additional 16% by 2028



Benefits of Representative Plan

- More diverse energy sources
- Meets 45 by 15 goals
 - ▶ 15 x 15 energy efficiency goal met
 - ▶ 30% RPS target is met
- Lower CO₂ emissions
- Meets NO_x and SO₂ targets
- Electricity production efficiency improves
- Customer bills are lower over the planning period compared to Reference Plan

Challenges with Representative Plan

- Need to refine plan to meet CO₂ footprint targets
- Need to secure funding to keep customer bills under control while investing for the future
- Need to assure that efficiency programs are effective so all customers can benefit

End of Presentation

Discussion

Target Completion Time **10:30 am**

- Discussion on Overview of Electric Resource Plan
- Process Check

Next Up

- Opening Remarks
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- *Break*
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