

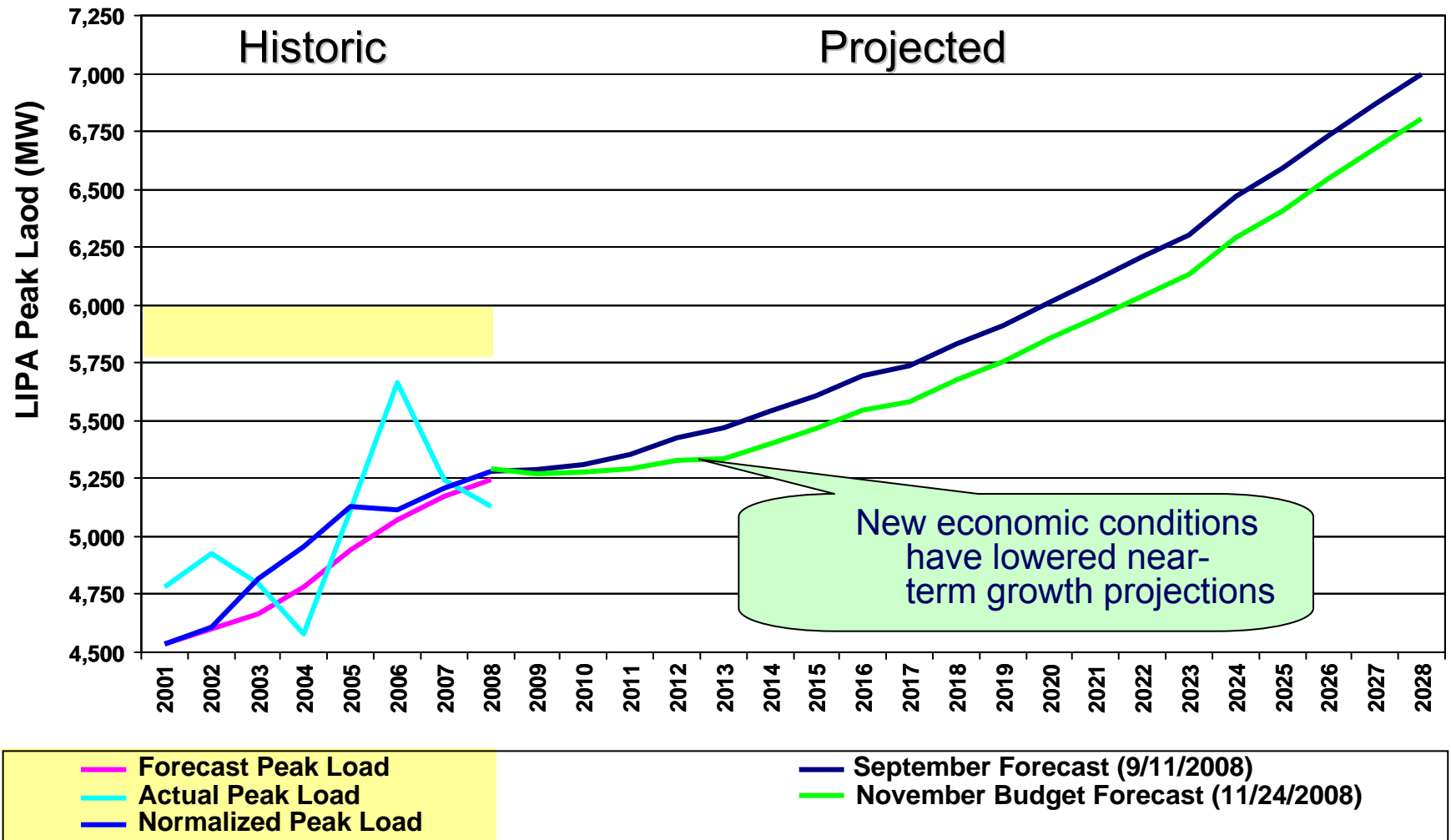
Draft LIPA Electric Resource Plan 2009 - 2018



Summary of Electric Resource Plan
Public Hearing – William H. Rogers Legislature Building
April 2, 2009

LIPA Need for Capacity

Load Forecast History and Comparison



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 market.
 - ▶ If market looks favorable, purchase any shortfall from the NYISO spot market
 - ▶ Otherwise take corrective action by contracting for capacity
- 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

History

- Historic LIPA Peaks
 - ▶ Record LIPA peak load
 - 5,294 MW (8/2/06)
 - ▶ Record LIPA weather normalized peak
 - 4,840 MW (2008)
- 2008 LIPA Statewide IRM

Projected weather normalized peak load	4,880 MW
Actual peak load	4,777 MW
Weather normalized peak load	4,840 MW
LIPA IRM requirement	5,612 MW
LIPA total capacity resources	5,336 MW
LIPA minimum purchase requirement	276 MW

Probabilistic Projection

- 2010 Assumptions
 - ▶ Caithness contract effective
 - ▶ Marcus Hook contract effective
 - ▶ ELI program implemented
 - ▶ A portion of Solar RFP 50 MW installed
- 2010 LIPA Projected Statewide IRM

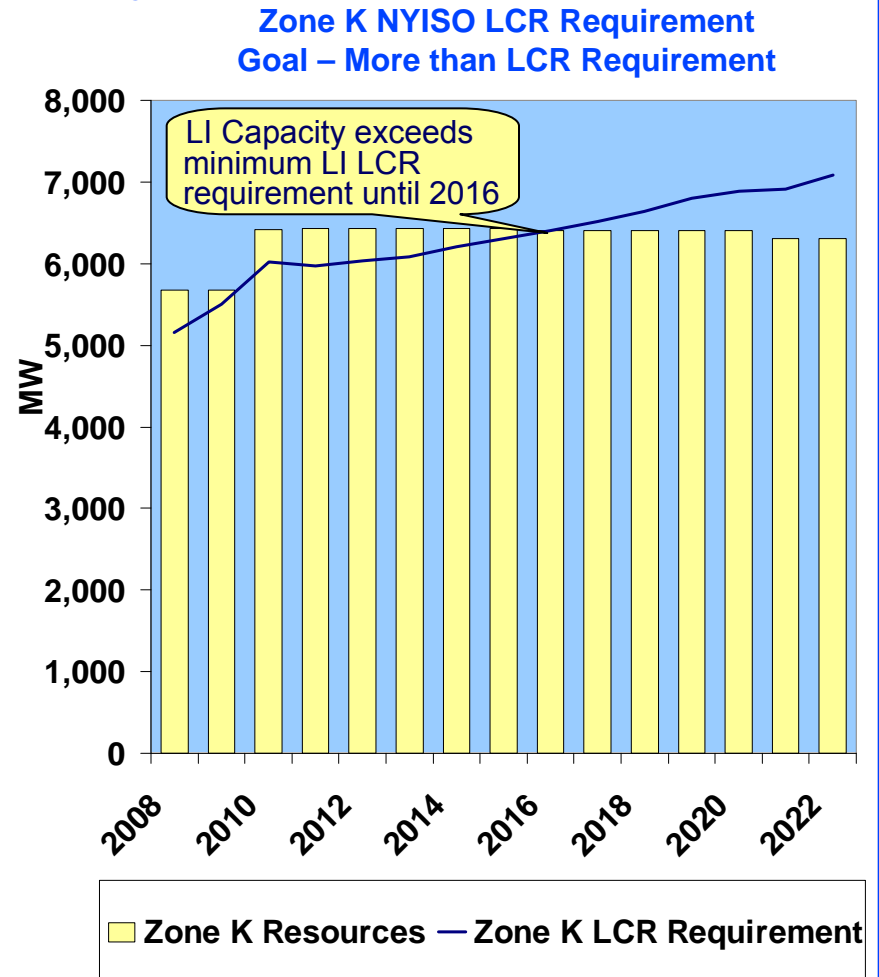
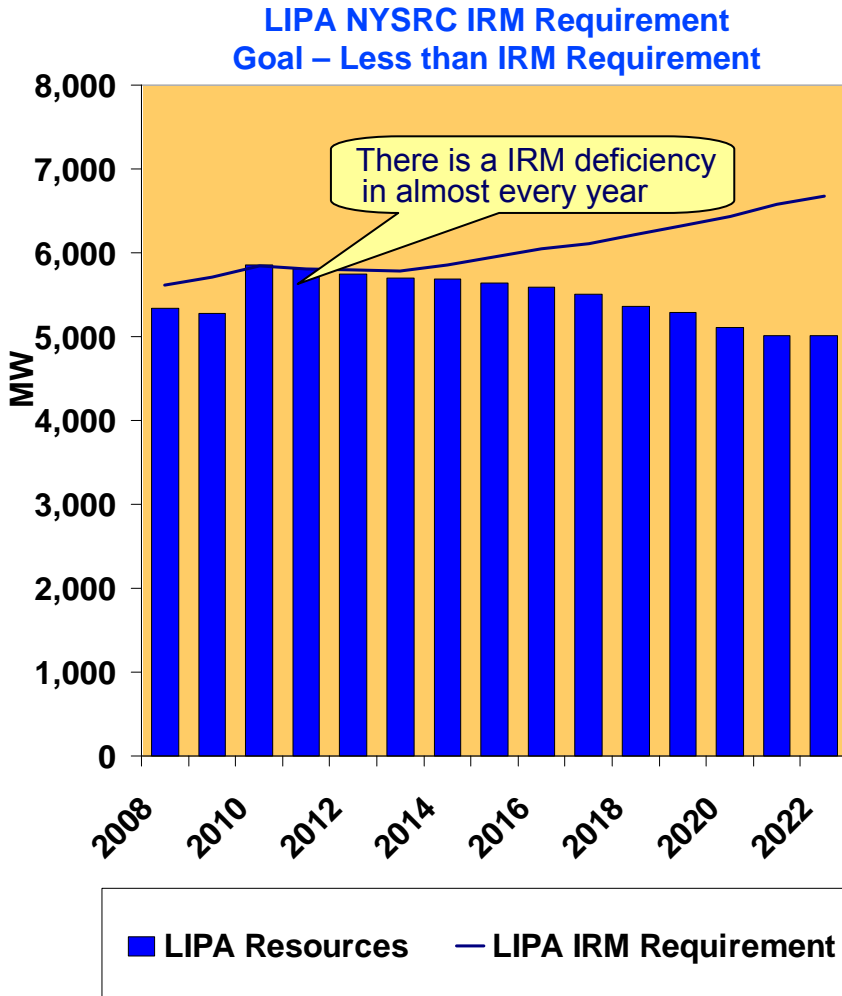
LIPA forecast peak load	5,019 MW
LIPA IRM requirement	5,847 MW
LIPA total capacity resources	5,851 MW
LIPA margin over requirement.	4 MW

Includes only loads supplied by LIPA. All loads are stated coincident with NYISO and include bulk transmission losses

LIPA Need for Capacity

Annual Resources and Requirements

Probabilistic Projection

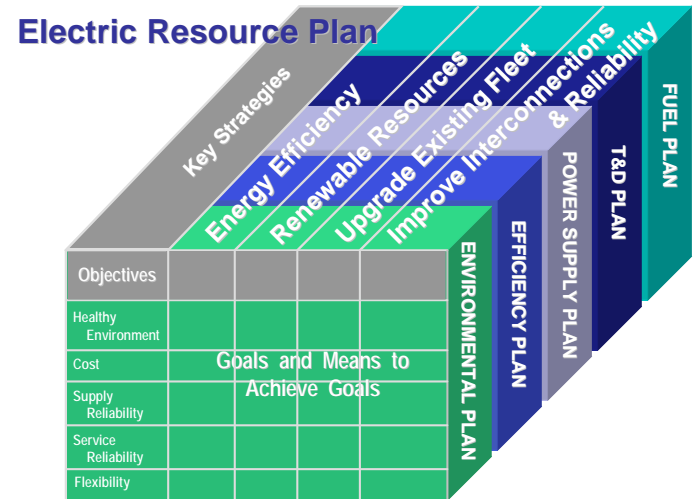


LIPA Electric Resource Plan

Contents of Electric Resource Plan

Electric Resource Plan

1. Executive Summary
2. Overview
3. Vision Mission and Strategic Objective
4. Environmental Action Plan
5. Efficiency Plan
6. Transmission and Distribution Plan
7. Fuel Management Plan
8. Electric Resource Plan



Appendix A – Technical Report

Appendix B – Energy Primer

Appendix C – Response to Comments

Appendix D - Technical Appendices

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.



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**

Performance of Electric Resource Plan Reference Plan and Representative Plan

Reference Plan

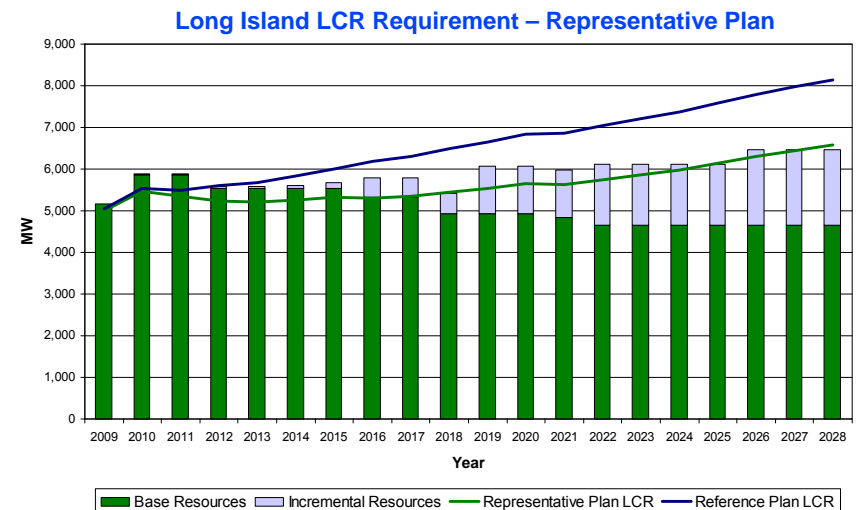
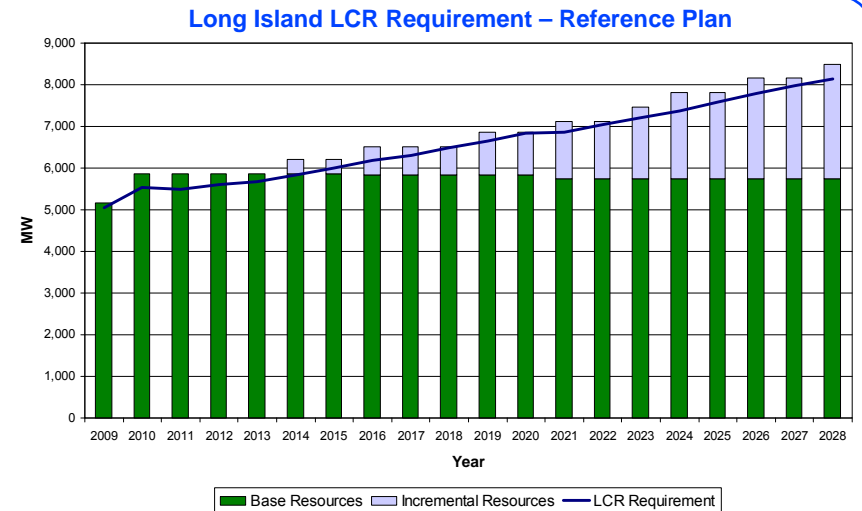
- A benchmark for comparison purposes
 - ▶ Not intended to represent a real plan
- Features of Plan
 - ▶ No Energy Efficiency
 - ▶ No Renewable Portfolio Standard
 - ▶ Expand system when capacity is needed using new power plants gas fired combined cycle units scattered throughout Long Island
 - Similar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

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

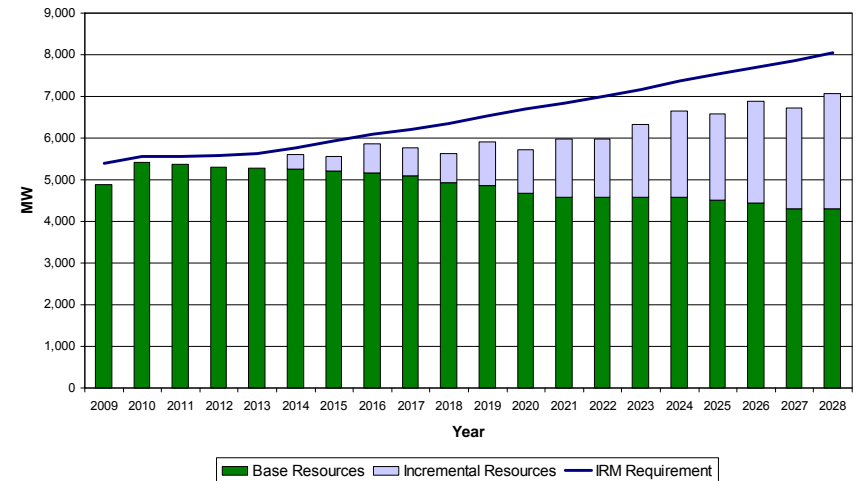


Performance of Electric Resource Plan

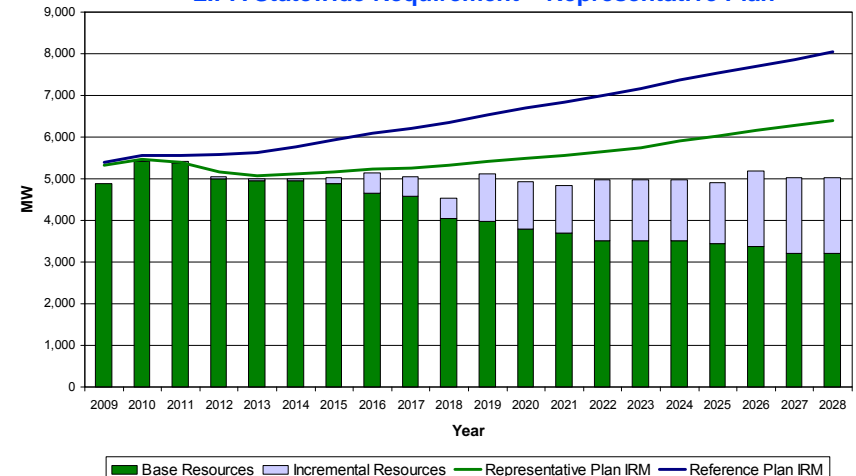
Resource Expansion – Statewide Requirement

- **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**

LIPA Statewide Requirement – Reference Plan



LIPA Statewide Requirement – Representative Plan

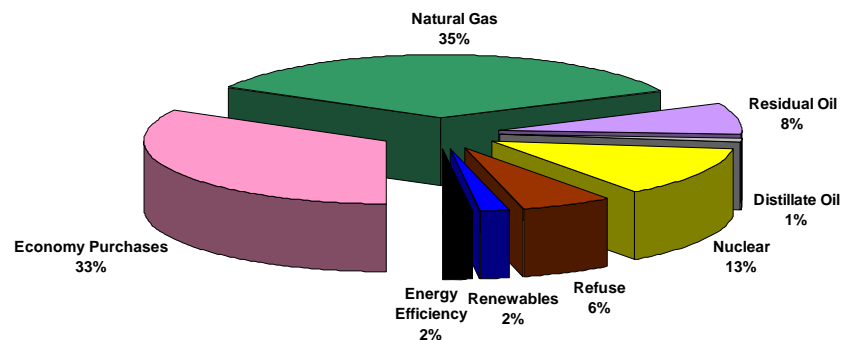


Performance of Electric Resource Plan

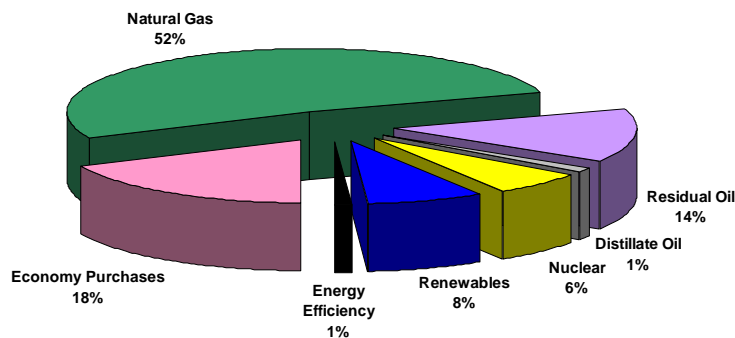
Energy Mix

- 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

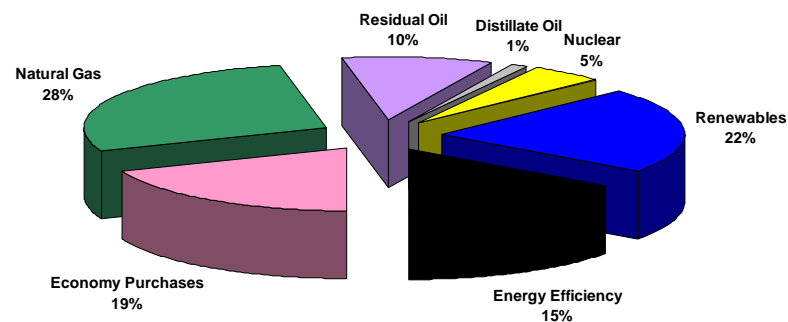
Actual Fuel Consumption in 2008



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



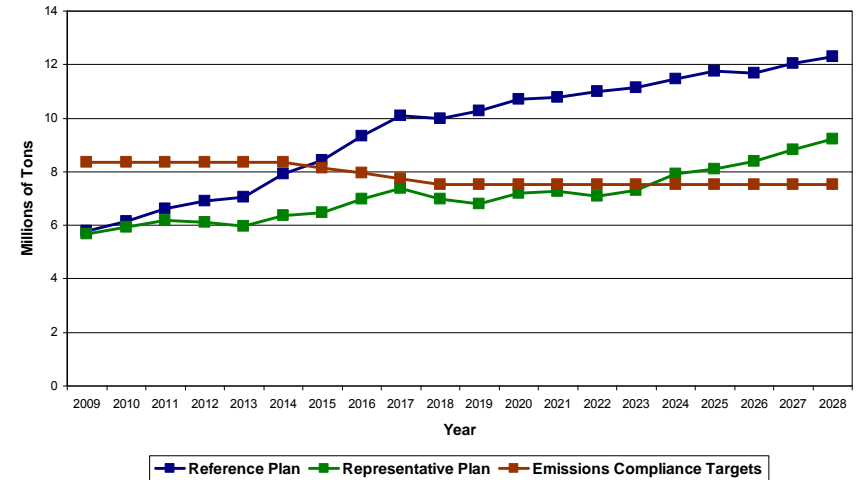
■ Regional Greenhouse Gas Initiative (RGGI) Target

- ▶ 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

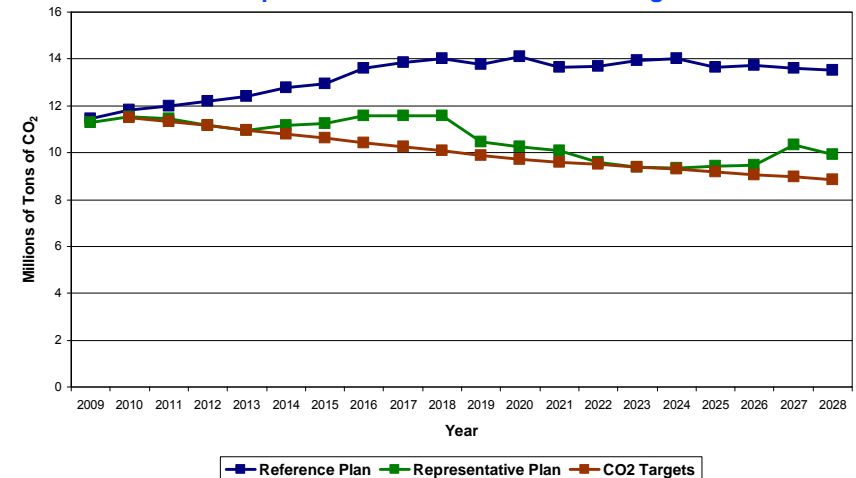
■ LIPA CO₂ Footprint Target

- ▶ 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

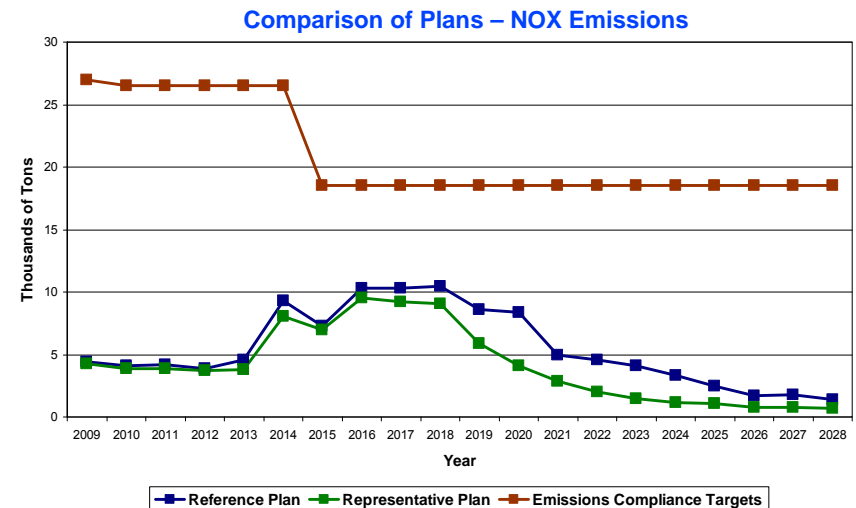
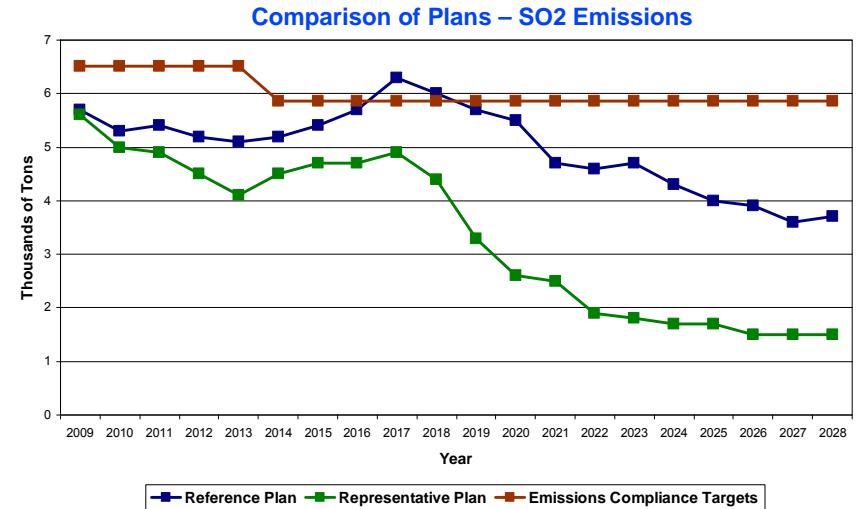


Performance of Electric Resource Plan

Environmental Emissions of NO_x and SO₂

- NOX 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

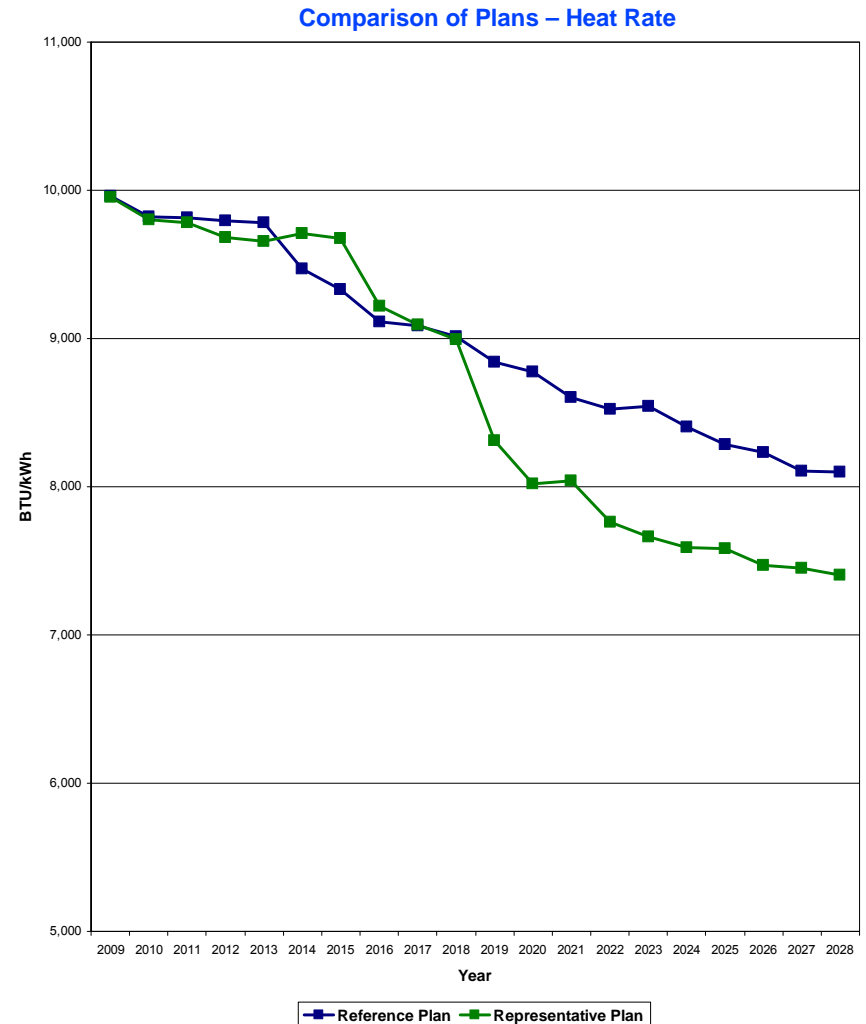
- SO2 emission target based on current allocated allowances and projected requirement for more allowances per ton from more stringent regulation
 - ▶ Both plans are below allowance target in all years
 - ▶ Representative Plan has lower allowances than Reference Plan



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