



**Massachusetts Bay
Transportation Authority**

MBTA Utility Management

Presentation to the MBTA Fiscal Management Control Board

April 25, 2016



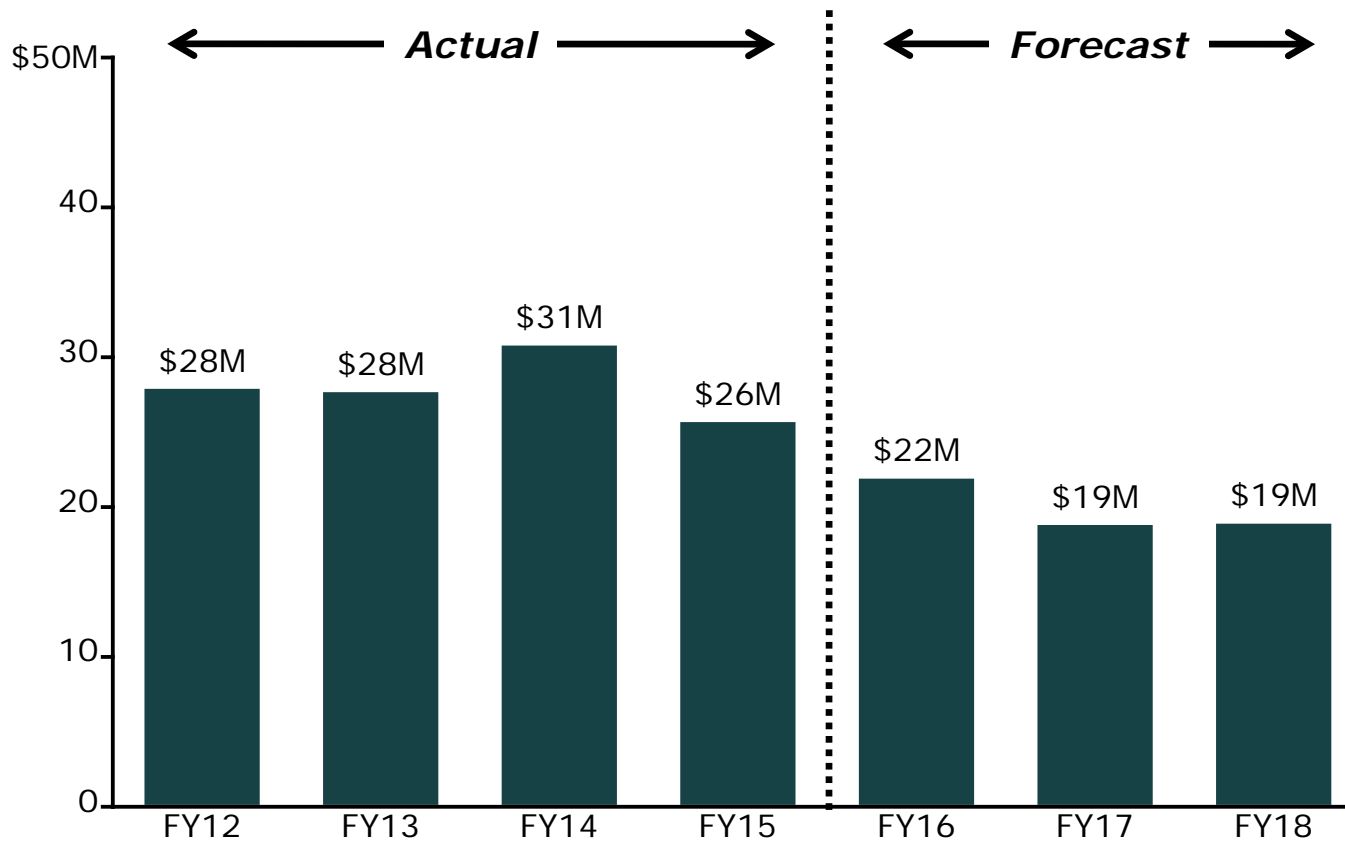
Utility Budget Overview

- **FY16 Budget for Utilities is \$48.4 Million**
 - › 6 Types of Utilities:
 - » Electricity
 - » Natural Gas
 - » Heating Oil
 - » Steam
 - » Jet Fuel
 - » Water
 - › **\$42.5M of this budget is electricity**
- **FY17 budget projects 12.8% reduction in costs**



MBTA Annual Wholesale Energy costs forecast to decline by about a quarter from FY15-FY18

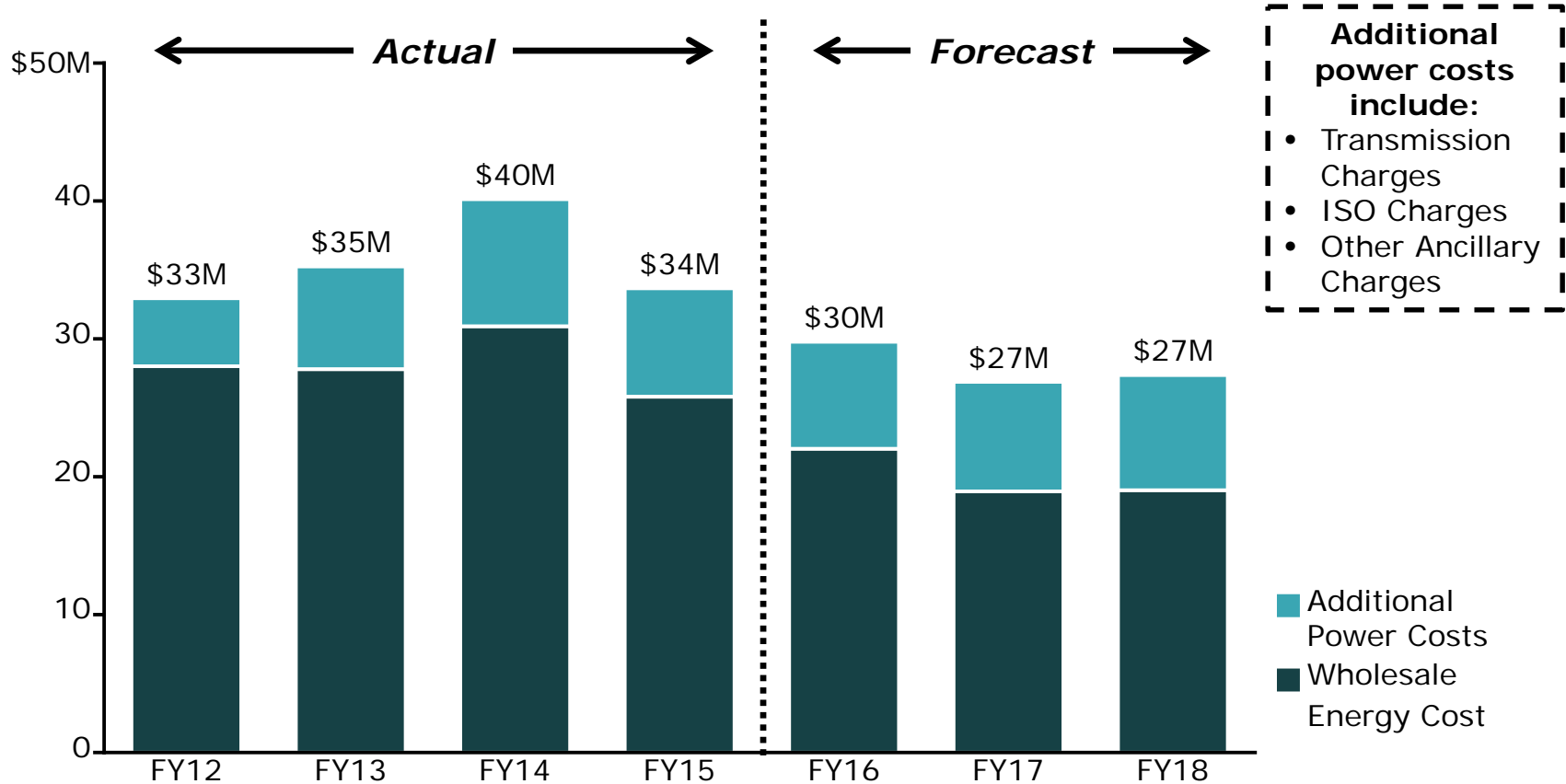
Annual Wholesale Energy Costs, FY12-FY18





Additional Energy projected to remain constant over FY15-18 timeline

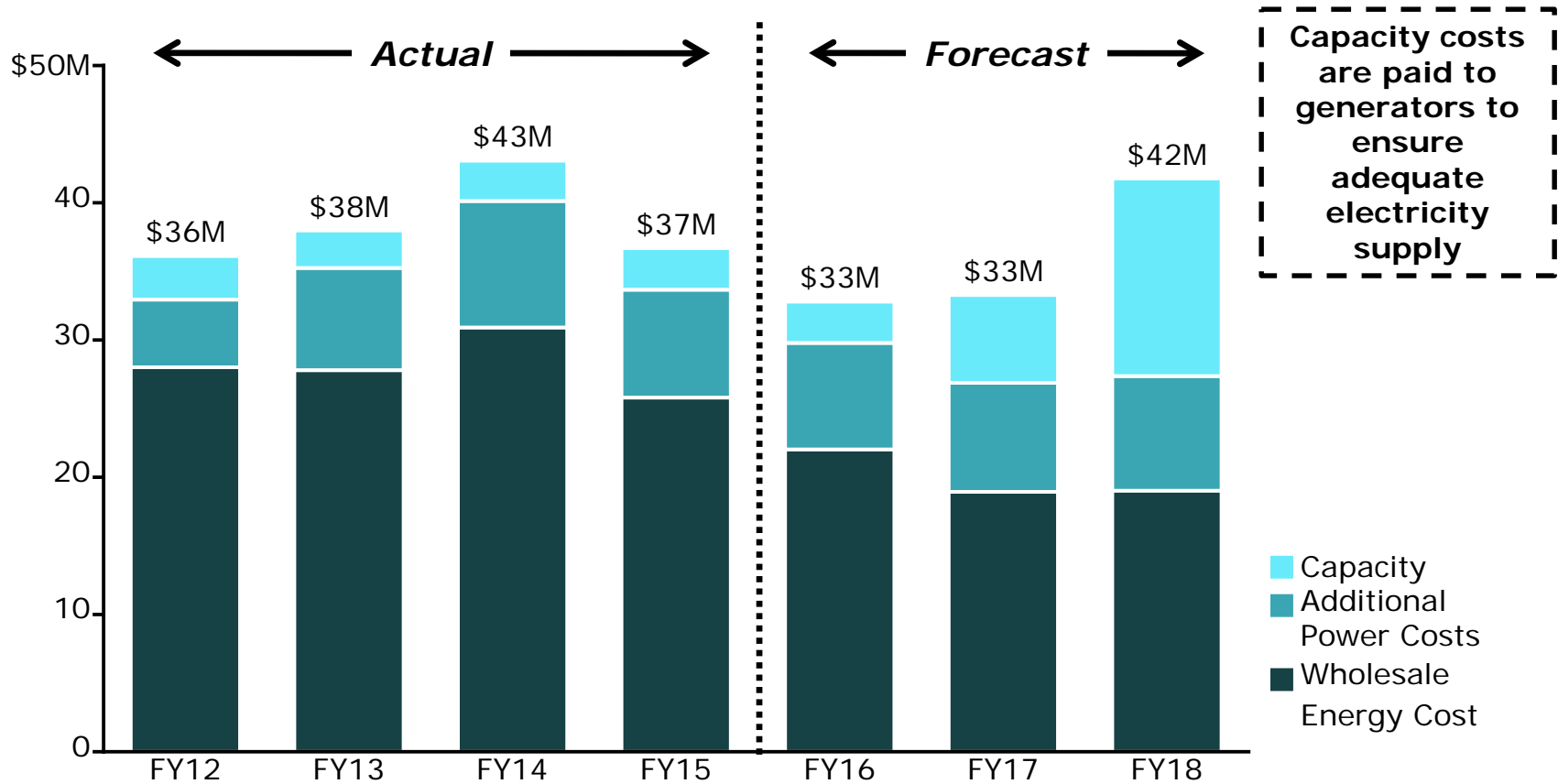
Annual Wholesale Energy and Additional Energy costs, FY12-FY18





Total Power Costs expected to remain stable in FY16-17 but increase rapidly in FY18 due to capacity costs

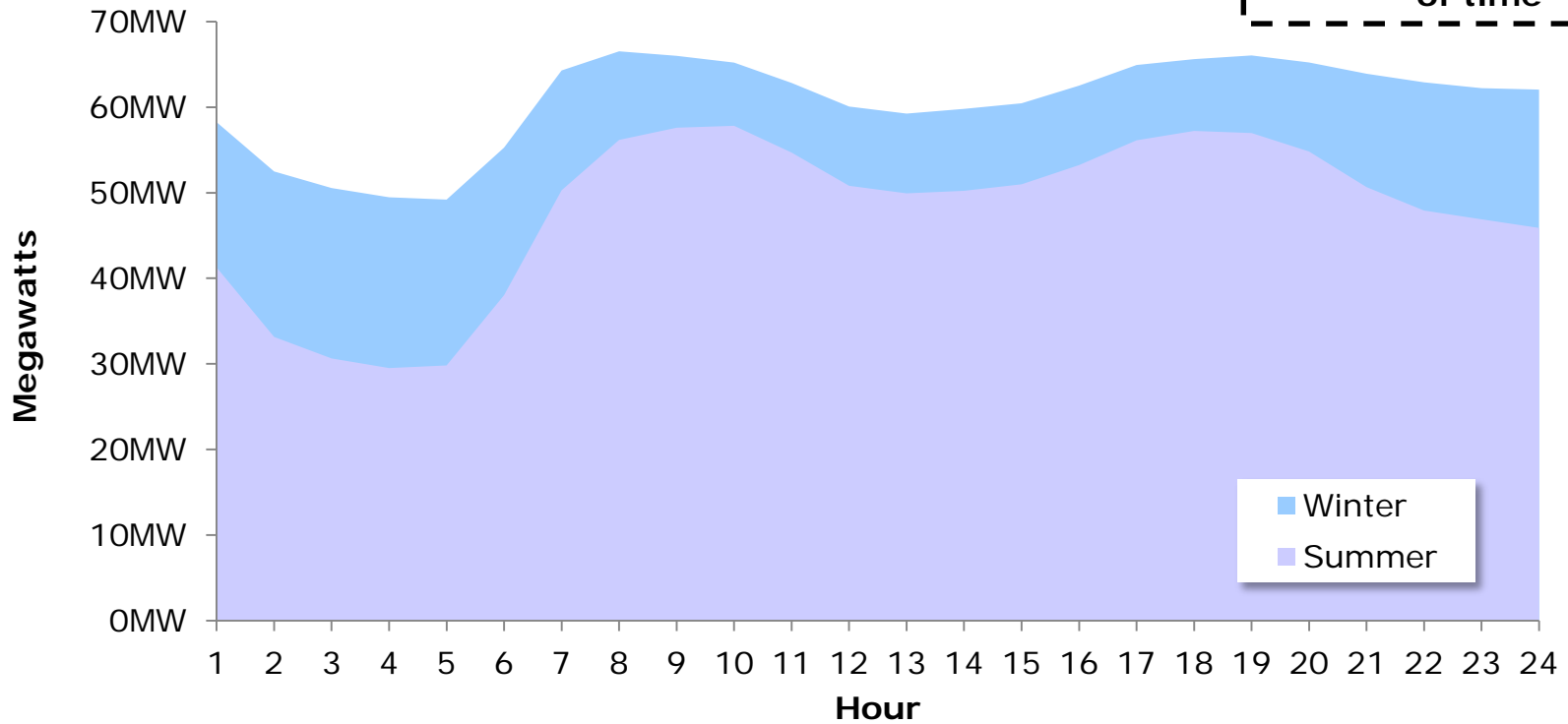
Total Power Costs, FY12-FY18





MBTA power payload peaks at rush hours; typically ~15% higher in winter than in summer

MBTA Average Weekday Load Profile 2015





Energy Management Strategy

ELEMENTS	• OPTIMIZE	BUY IT AND USE IT MORE EFFICIENTLY
	• CONSERVE	USE LESS
	• REGENERATE	PRODUCE IT FROM RENEWABLE SOURCES OR RECAPTURE SPENT ENERGY

TARGETS	• RELIABILITY	MAINTAIN OR IMPROVE SERVICE DELIVERY (OPERATIONS)
	• ENVIRONMENTAL	CREATE THE LOWEST POSSIBLE ENVIRONMENTAL IMPACT
	• SAFETY	MAINTAIN OR IMPROVE SAFETY AT ALL MBTA LOCATIONS
	• RISK MANAGEMENT	MITIGATE PRICE AND SUPPLY VOLATILITY
	• SUSTAINABLE DESIGN	INCORPORATE ENERGY & ENVIRONMENTAL FUNDAMENTALS IN CAPITAL PLANNING



Optimize: Utility Contract Management

Mitigating Price Risk

Wholesale Electricity Contract

- \$25 Million in Savings over 5 years
 - › \$65.72/MW down to \$46.35/MW

Managing contract delivery

- Retail to Wholesale
- Regulatory Changes
 - › Resulting in \$880K in annual costs avoided

Monetizing the Benefit of Power Station

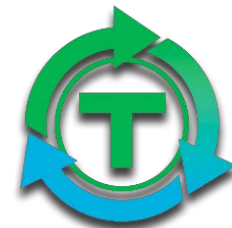
- \$574K in payments to the MBTA over the last five years
- \$5.01 million projected for FY '17



Optimize: Energy Management

Enterprise Energy Management System (EEMS)

- **Utility Management & Cost Savings**
 - › Verification of Charges by Utility Companies
 - › Allocation of Energy Costs to Departments and Facilities
 - › Benchmarking of Consumption to Track Progress
 - › Assist in Project Management
- **Environmental Tracking**
- **Impacts Behavior**
- **Outreach – Set the Example**



Conserve: Energy Efficiency Program

Total Project Cost to Date

\$6.17M

81 Projects Completed over the past 4 years

Utility & DOER Contribution

\$3.87M (37%)

MBTA Contribution

\$2.28M (63%)

Average MBTA Payback Period

1.31 years

Project Achievements

Annual Savings

\$1.74M

Demand Reduction

2.98 MW

Consumption Reduction

15.3M kWh



Projects in pipeline projected to add \$5-6M in annual savings



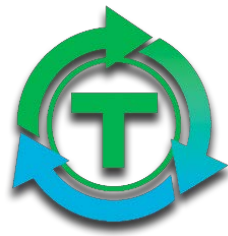
Conserve: Energy Management



Before



After

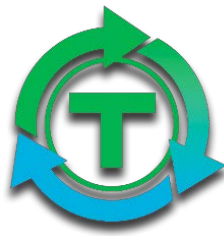


Generate/Recapture: Energy Management

Renewable Energy

- **Wind turbines**
 - › Kingston & Bridgewater
- **Solar Power Purchase Agreements**
 - › 20 year Fixed Price
 - › Slight Cost Savings
 - › Mitigates Future Cost Increases
- **Energy Storage & Regenerative Breaking**
 - › Airport Station Project
 - › Upcoming Opportunities





Questions?