Presentation to

Water Supply CAC

MWRA Energy Efforts & Savings
FY02 to FY11 Ten Year Summary Report

February 14, 2012
• Energy Savings and revenue total approximately $177M during FY02 – FY11

• Increase annual energy savings and revenue from $6M in FY02 to $24M in FY11

• Aggressive pursuit of rebates and grants – over $12M awarded to date

• About 45% of MWRA’s total energy cost profile derived from renewable sources

• Process optimization and implementation of energy audit recommendations projected to save almost $2M annually

• Recognition for energy program leadership and projection completion – MWRA awarded 8 regional and national awards (2005 – 2011)
MWRA Drivers for Energy Efficiency Focus

• Cost Savings

• Operations
  – Equipment replacement

• Environmental agency
  – MWRA has been successfully meeting the goals established in Governor Patrick’s Executive Order 484 (April 2007)

  – Goals include:
    - Overall Reduction of Energy Consumption
    - Increase Renewable On-site Energy Production
    - Purchase of Renewable Energy
• MWRA’s total demand - 210,800,000 kWh and 493,250 therms (electricity and natural gas only). Equivalent to 18,500 homes, similar to MWRA service area town the size of Arlington.

• MWRA’s costs for natural gas, electricity and diesel fuel
  – $15 M (8.4% of total direct expenses) in FY02
  – $20 million (9.9% of budget) in FY11
- Price impacts in diesel fuel and electricity prices during FY06 due to Hurricane Katrina and CWTP start-up
- Increases in electricity prices in FY08-FY10 due to market
- Diesel fuel purchases increased in FY10 due to CTG use during spring storms
## MWRA’s Energy Initiatives – 10 Year CEB Impact

### Source ($'s in Millions)

<table>
<thead>
<tr>
<th>FY02-FY11</th>
<th><strong>MWRA’s Energy Initiatives</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>Savings and Avoided Costs:</strong></td>
<td></td>
</tr>
<tr>
<td>Avoided Fuel (DI Digas)</td>
<td>$ 82 million</td>
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<tr>
<td>Competitive Bidding vs Basic Service</td>
<td>$ 34</td>
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<tr>
<td>DI Steam Turbine Generator</td>
<td>$ 24</td>
</tr>
<tr>
<td>Audits/Efficiency</td>
<td>$ 6.5</td>
</tr>
<tr>
<td>Hydropower</td>
<td>$ 4.4</td>
</tr>
<tr>
<td>Wind</td>
<td>$ 0.4</td>
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<tr>
<td>Solar</td>
<td>$ 0.1</td>
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<tr>
<td>Avoided Capacity Charges</td>
<td>$ 2.5</td>
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<tr>
<td><strong>Total Savings/Avoided Costs</strong></td>
<td><strong>$ 154 million</strong></td>
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<tr>
<td><strong>Revenue:</strong></td>
<td></td>
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<tr>
<td>RPS Credits</td>
<td>$ 8.0 million</td>
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<tr>
<td>Load Reduction</td>
<td>$ 6.8</td>
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<tr>
<td>Generation Sales to Grid</td>
<td>$ 7.8</td>
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<tr>
<td>Utility Rebates/Other</td>
<td>$ 0.7</td>
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<tr>
<td><strong>Total Revenue</strong></td>
<td><strong>$ 23 million</strong></td>
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<tr>
<td><strong>TOTAL CEB IMPACT</strong></td>
<td><strong>$ 177 million</strong></td>
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</table>
• Of MWRA’s total energy profile (in $), over 45% is derived from renewable sources
Methane Utilization At Deer Island

- Deer Island utilizes 98% of the methane generated to power a steam turbine generator and backpressure turbine for plant heat and hot water
- Avoid purchase of about 5MG in fuel oil annually
- Approximately 33 MkWh/yr electricity production (projected FY13)
- Over $3.6M/yr electricity savings and revenue (projected FY13)
Hydroelectric Power

- Cosgrove, Oakdale, Loring Rd, Deer Island
- Over 8MW Capacity
- Approximately 23 MkWh/yr electricity production
- Over $1.8M/yr savings and revenue
Wind Power

- Deer Island, Charlestown (DeLauri Pump Station)
- 2.8 MW Capacity
- Over 5 MWh/yr electricity production
- Approximately $575,000/yr savings and revenue
Solar Power

- Deer Island, CWTP
- Over 1200 kW Capacity
- Over 1.4 MkWh/yr electricity production
- Approximately $242,000/yr savings and revenue
MWRA Renewable Electricity Portfolio

![Graph showing the percentage of electricity from renewables over fiscal years (FY) from FY02 to FY11. The graph includes two lines: one for renewables including exported electricity (green line) and another for renewables including exported electricity and purchased green power (red line). There is a note indicating that FY08 includes an additional purchase of National Green-e Power.](image-url)
Maximizing Grants and Rebates

- When the American Reinvestment and Recovery Act was announced, MWRA had a number projects “shovel ready”

- MWRA received $33M in ARRA funds for water and sewer projects of which nearly $10M for renewable energy projects

- Over $2.5M various state grants

- Approximately $680,000 energy efficiency project rebates to date
Hydro – Continue to explore hydropower development potential

Wind – Conducting feasibility study for 4th wind turbine at Deer Island

Solar – Comprehensive solar assessment ongoing

Demand Side Management – Continue energy audits, process control optimization, demand response, EMS installation

Grants/Rebates – Seek funding assistance opportunities

Other Sustainable Efforts – alternative fuel vehicles, green power purchase, energy efficient computing, recycling