
Cambridge Energy Alliance: Implementing Massive Energy Efficiency

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Presentation to
ACEE/CEE Market Transformation Symposium
Washington, DC.

April 1, 2008



CAMBRIDGE
Energy Alliance
Saving Money & the Planet

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- A groundbreaking \$100 million initiative to implement massive energy efficiency and clean energy generation throughout the city
 - Reduce peak demand by 50 MW, electric use by 10% and other fossil fuel use by 5% over 5 years
 - Reduce Cambridge's carbon footprint by at least 150,000 tons over 5 years
 - A collaboration between the City of Cambridge, Cambridge Health Alliance, and the Henry P. Kendall Foundation

About Cambridge, Massachusetts

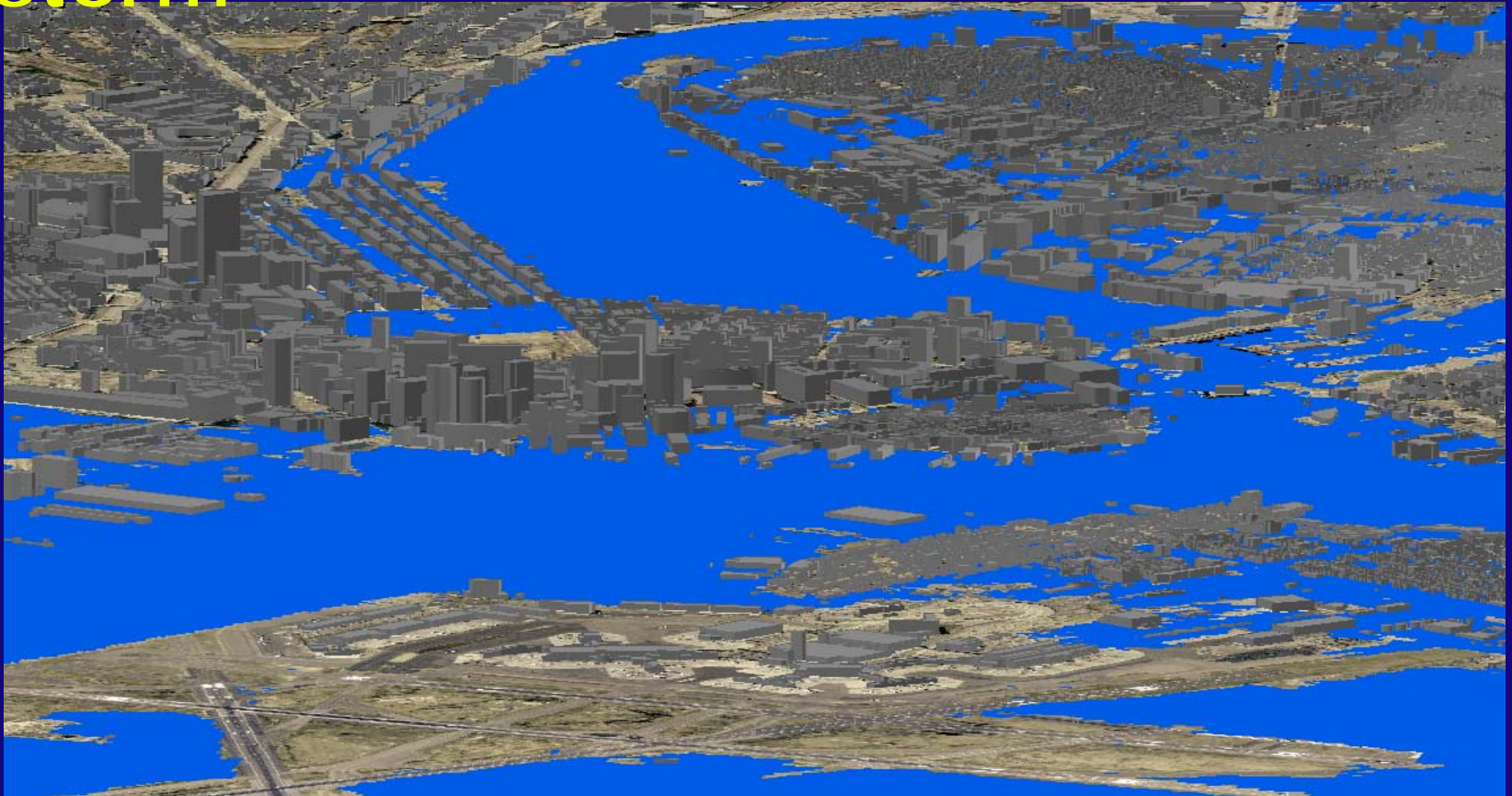
- Population: 101,355 (2000 Census)
- Area: 6.26 square miles
- Home of Harvard University, MIT, Lesley University
- A major biotech center with over 100 companies and a growing cluster of energy innovation and entrepreneurship



Why Cambridge is Taking Action

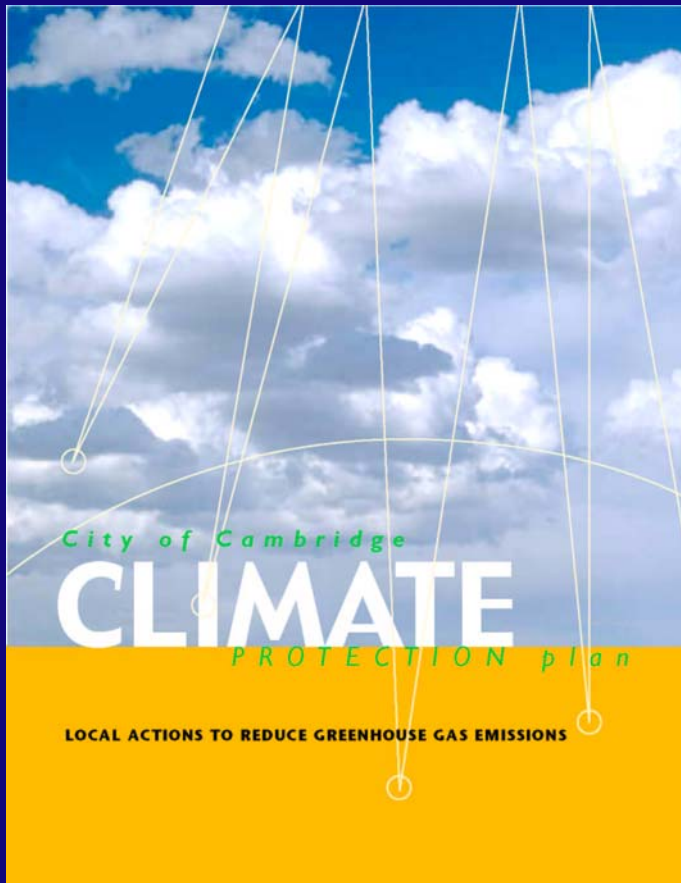
- Local governments will be on the front lines in responding to global warming impacts
- Federal and state action limited
- City Council is committed to reducing carbon emissions, energy efficiency, and clean energy
- Benefits to the community in terms of new jobs, economic development, stabilized energy costs, reduced pressure on grid
- Create a model for action elsewhere

Boston & Cambridge in 2100 with 2-foot sea level rise & 100-year storm



Source: Paul Kirshen, Tufts University; Kelly Knee, Applied Science Associates; National Environmental Trust; Tufts University/University of Maryland/ Boston University CLIMB Study

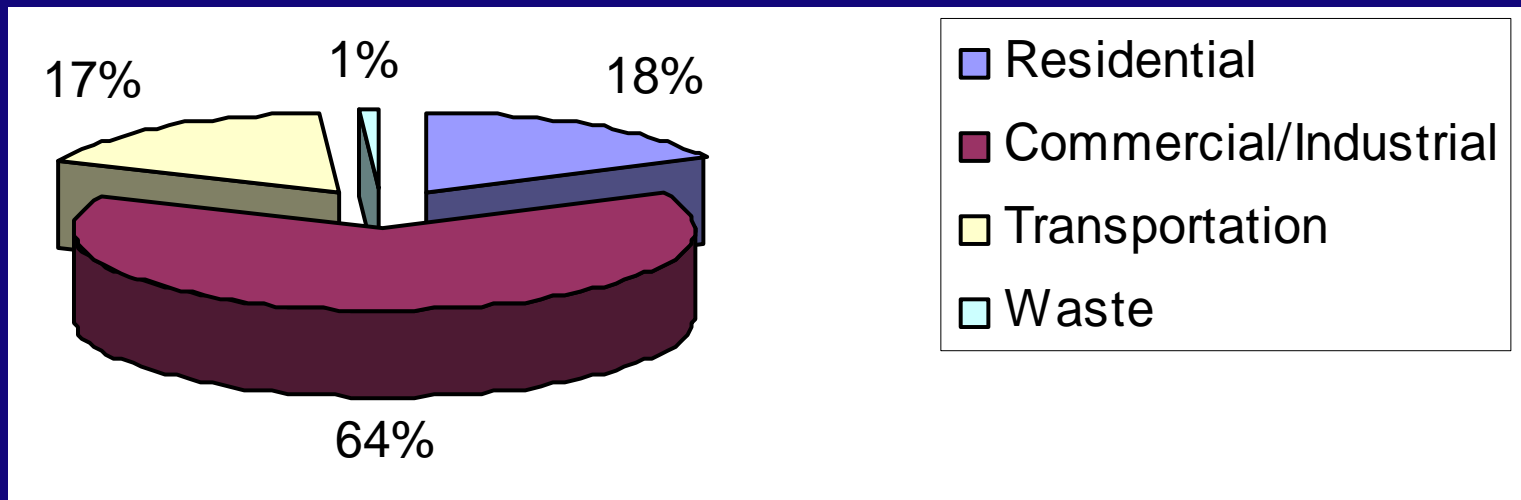
Basis for Action: Cambridge Climate Protection Plan



- Member of Cities for Climate Protection program sponsored by ICLEI-Local Governments for Sustainability since 1999
- Goal to reduce greenhouse gas emissions in Cambridge by 20% below 1990 levels by 2010
- Goal to acquire 20% of municipal power from renewable sources by 2010

Building Energy Use is the Problem

2003 Greenhouse Gas Emissions in Cambridge



- Over 80% of GHG emissions are from building energy use, and about 2/3 is from the commercial, institutional, and industrial sectors; existing building stock is key
- City programs did not match emissions

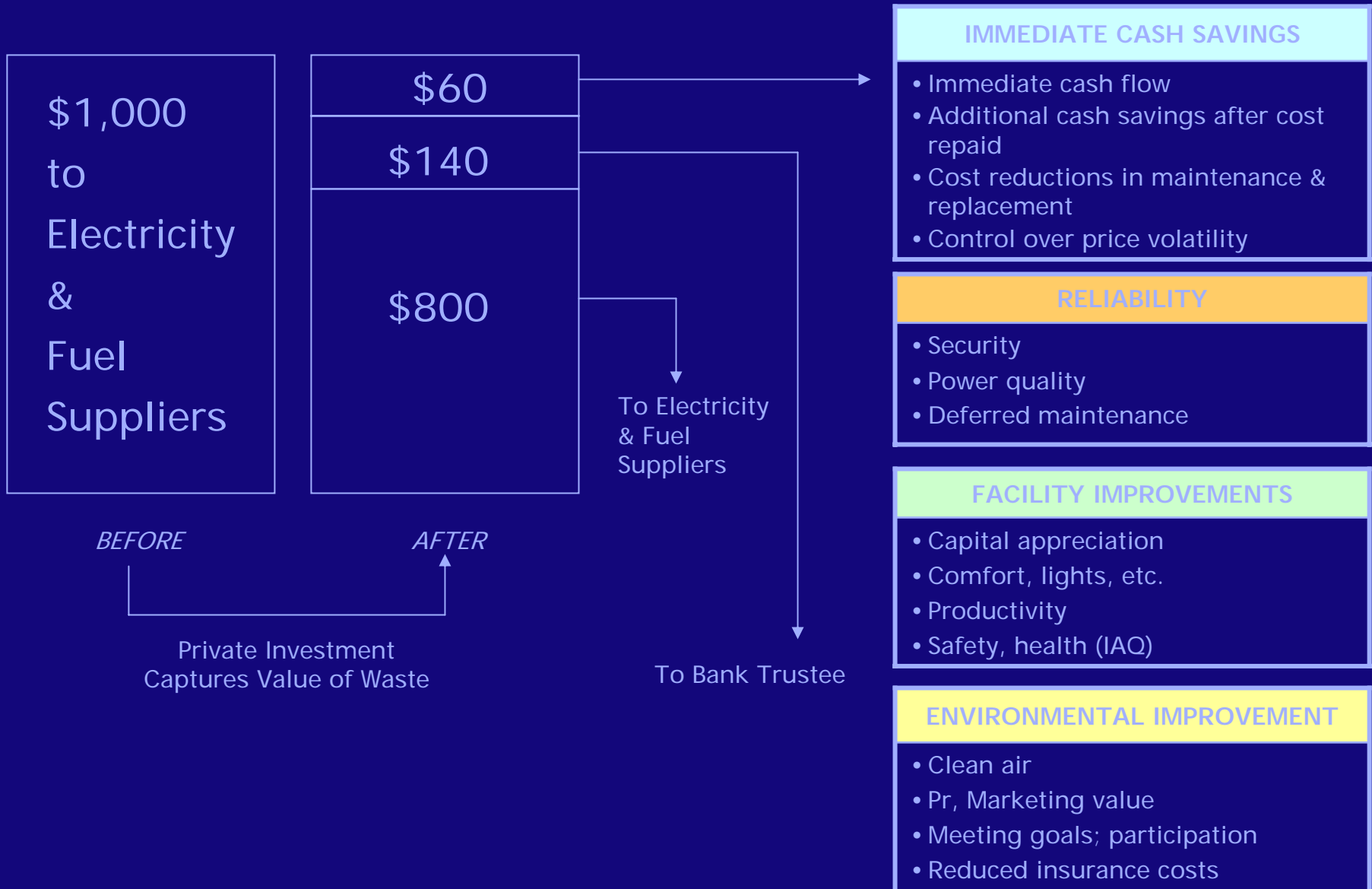
Partnership Between the Henry P. Kendall Foundation and the City

- Developed the concept for the Alliance
- The Kendall Foundation and the Barr Foundation each committed \$250,000 for technical and financial expertise
- Formed core team of city staff and Kendall Foundation staff as well as consultants to develop detailed program design
- Established an organizing committee with representation from local institutions, businesses, & organizations; since replaced by Board of Directors

Two Key Concepts

- Together We can Make a Difference
 - Pride
 - Peer Pressure
 - Guilt
 - Economies of Scale
 - Visibility
- “No Cost” Debt to Invest in Efficiency

Customer Value Proposition



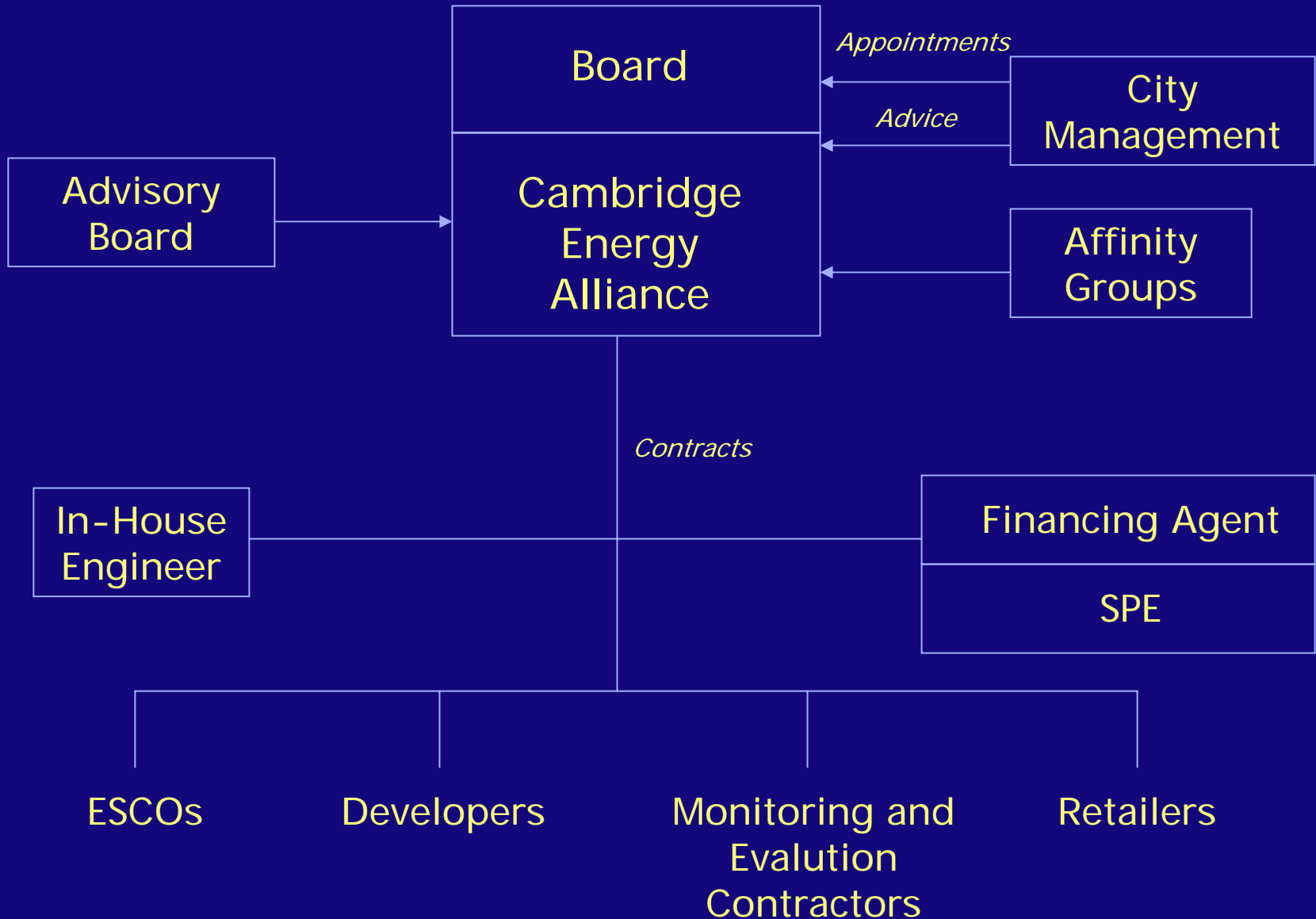
Using the City as an Aggregator

- City is a natural aggregator of energy demand, public incentives, and private investment
- City uses its “brand” to rally businesses, institutions and residents to reduce energy use, carbon emissions, and reliance on foreign energy sources
 - Stakeholders have a trusted relationship with the City
 - The City has authority to deal with all sectors

Key Elements of Energy Efficiency Initiative

- High penetration rates
- Critical mass needed for financing and lower marketing and transaction costs
- Include all energy efficiency and water measures as well as renewables/CHP
- High profile campaign to create “buzz”
- Will address 3 key obstacles for building owners:
 - ✓ knowing what to do
 - ✓ identifying competent contractors
 - ✓ paying for improvements

Governance of the Alliance



How the Alliance Will Operate

- Will provide full range of engineering, installation, project management, monitoring, & financial services
- A stable of private energy service companies and contractors has been selected to perform energy assessments and implement measures
- Independent engineers will monitor and verify the work of the ESCOs and contractors
- In most instances customers loan payments will be equal to or less than their monthly savings
- Will enable consumers to take measures with longer paybacks, e.g., combined heat & power and solar
- Will plan and executive marketing jointly with City

Large Customer Benefits

- > New energy- and water-using equipment at no up-front cost
- > Reduced costs of energy, maintenance, and replacements
- > Increased reliability
- > Improvements in comfort, safety, health, and productivity
- > Assistance with utility relationships
- > Improved community and public relations
- > Benefits of environmental stewardship
- > Expert energy engineering and staff support
- > Instantaneous financing of opportunities as discovered in energy and water efficiency, renewables, and CHP
- > Documentation of energy use, trends, analysis, budgeting
- > As-built documentation
- > Quality assurance
- > Help with internal approvals, City and State relationships

ESCOs: the Services Delivery Agent

- One-stop shopping for customers
- ESCOs pre-qualified for 4 market sectors
- Large customers can choose from 2
- Financing new to small customer ESCOs
- CEA inspections bolster customer confidence
- Marketing Assistance provided by CEA
 - Marketing campaign for small customers
 - Introductions for Large Customers

ESCO Contracts/Responsibilities

- 1) With Customer: Typical ESA
- 2) With CEA: Marketing Division of Responsibilities, CEA Quality Control, Fee Thresholds
- 3) Some of ESCOs also have NStar Contracts
- 4) Financing Between Lender & Customer
- 5) CEA Arbiter on Utility Incentives

Financing the Alliance

- Assembling financing from:
 - pension & annuity providers, life insurance companies for large customers/loans >\$250k
 - banks for residential and small C&I customers
 - public & utility-related sources
- Interest rates for low-income owners will be 0% paid for by demand reduction incentive payments; state funds may be available to reduce overall residential interest rates
- No municipal funds directly involved

Financing the Alliance

- Assembling up to \$70 million revolving line of finance
 - \$50M+ raised from pension & annuity providers, life insurance companies
 - \$3M+ from private equity or subordinated debt
 - \$15M +/- from public & utility-related sources
- No municipal funds directly involved
- Because savings are paid into a revolving fund, \$100 million in energy efficiency implementation will result over 5 years

Other Funding Sources in 2008-2012

- Forward Capacity Market of the Independent System Operator of New England will provide incentive payments for demand reduction
- Regional Greenhouse Gas Initiative, a Northeast United States cap and trade program, will create carbon market
- New federal energy block grant
- Energy efficiency & renewable energy system benefit charges collected by the private utility
- Other carbon offsets, renewable energy credits, pollution credits may become available in future

New rules for everyone...

- ESCOs: Serve smaller customers, work under rules set by CEA, accept outside financing, 3rd party quality control
- Lenders: An aggregated pool of smaller loans, flexible terms, some uncertainty on total demand
- Utilities: Loss of revenue, flexibility with incentives, need for “decoupling” relief
- Customers: Accept ESCOs, take on debt, accept measures not otherwise a priority

Other Departures from Norm

- Green Leases to address Split Incentives
- HUD Regional Office Waivers to allow Assisted Federal Housing to Participate
- Web-based, Internet-driven viral marketing
- Extensive Use of Volunteers
- Extraordinary Interest in Cultivating Green Jobs
- Strengthened Town-Gown Relationships

Status of the Alliance

- The Alliance is incorporated and Board of Directors has been formed
- Pilot engineering assessments carried out
- Coordinating with gas and electric utility company on marketing and incentives
- Partnering with universities, property owners & managers, businesses, & citizens
- PBS NOW devotes March 28 show to CEA
- Four Lenders selected for various markets
- 5 ESCOs selected to serve 4 market segments
- Working Capital Financing in progress
- Full services to be launched in April 2008

What Happens Next?

- 2009: New Construction Initiative
- 2009: Transportation Initiative
- 2010: City Ordinances ?