



# Building Sustainability Through Community Engagement

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# Background & Scope

- **Presentation focuses on Energy Efficiency**
  - **Broadest scope and impact**
  - The approach applies across other areas of sustainability – renewable energy, community planning
- **Needham snapshot**
  - Population ~29,000
  - AAA-rated
  - FY 2012 Operating Budget \$112 million
  - Town Manager government
  - 5-member Board of Selectmen
  - Town Meeting
  - Strong sense of community



# Energy Efficiency: The First Fuel

- **Energy Efficiency versus Energy Conservation**
  - Energy efficiency – the same energy services for lower cost
  - Energy conservation – a different level of energy service
- **The least expensive energy source**
  - From global studies of GHG emission reductions to corporate finance, EE projects consistently show strongest financial case (NPV)
- **MA national leader in energy efficiency policy**
  - Strong legislative frameworks and implementation
  - #1 ranking from ACEEE
- **It works for Massachusetts**
  - Last 20 years - estimated 10% of electricity demand
  - Current 3-year plan - \$3.7 billion NPV benefit
- **Statewide 3-year plan funds EE investments**
  - Total funding \$1.5 billion (\$1.2b electric, \$322m gas)
  - Residential Direct Incentives \$474m (\$313 electric, \$161m gas)
  - Government direct incentives – Electric \$11.2m, gas (est.) \$1.2m



# Creating the Local Context

- **Saving energy = saving money**
  - Municipal energy reductions save taxpayer dollars and promote confidence in municipal government - WYSIATI\*
  - Residents save money and reduce life cycle costs of owning homes
  - Businesses save money and reduce facility costs
- **Savings benefit the local economy**
  - Massachusetts has no local energy production
  - The dollars spent on energy leave the community and the region
    - Oil used by Needham residents represents a transfer of wealth to OPEC of **\$14.6 million each year**
    - Statewide, \$5,000 per household for energy leaves MA
  - Money not spent on energy by the municipality, residents and businesses can be spent to benefit the local economy
    - 10% of the FY 2011 energy budget = 4 teachers + 2 firefighters

\* What you see is all there is



# Why is local important?

What works in driving demand for energy efficiency?

...in retrospect many of these lessons seem obvious: Forge strong local partnerships. Find out what people care about. Speak their language. Sell something people want. Be trustworthy.

- from a 2010 Lawrence Berkeley Labs report on US residential energy efficiency programs



# Green Needham Collaborative

- Volunteer group
- Bring together people and organizations to build a much more sustainable community through collaborative efforts on energy and the environment
- Founded in 2006
- Foster, support and partner with related organizations
- Municipal & school staff involvement from the beginning
- Increase mutual understanding and facilitate productive collaboration across the citizen/government boundary
- **We leverage relationships and networks**



# Projects

- **Needham Community Solar Challenge**
  - Community donations to NE Wind Fund → \$21,000 for municipal projects & 2kW Solar PV array for school building
- **Home Energy Efficiency Improvement Seminars**
  - Education on overcoming barriers; partnered with domain experts
- **Wind Power Feasibility Study**
  - Raised funds funds & developed collaborative project with schools; advocacy and support for zoning changes and DEP approval
- **Solar PV**
  - Feasibility research and advocacy
- **Outreach & Education**
  - Meetings, seminars, web site, blog, newsletters, cable TV



# Green Needham Projects

(continued)

- **10% Challenge – Needham 1,000**
  - Easy-to-use online tool to identify ways to save 10% on energy use
- **Green Community**
  - Ongoing effort
- **Needham 2011 Summit on Energy and the Environment**
  - Community conversation on Needham in 2020 in the context of the Massachusetts 2020 Clean Energy & Climate Plan
- **NStar Community Pilot**
  - Promoting home energy assessments & follow-up actions
  - Already overachieved kWh reduction targets but much opportunity remains

See our projects page, web site and blog for more information  
<http://www.greenneedham.org>



# Benefits of Community-wide collaboration

- **More resources & complementary capabilities**
  - Residents, community organizations, businesses, schools, municipality
- **Break through communications clutter**
  - Similar messages from multiple sources more effective
  - Community organizations better positioned for outreach
- **Creating a virtuous circle**
  - Savings impact of municipal projects can encourage residents to participate
  - Residential programs and investments drive understanding of and support for municipal efforts
- **Creating new social norms**
  - Social norms are the most powerful behavioral change agent
  - Strengthen community identity



# Challenges of Community-wide collaboration

- Working with volunteers and community groups can be a source of tension
  - Every “constituent-based” organization has this challenge
  - There is a lot of relevant expertise in your community
  - Leverage those strengths
- Managing Expectations, not diminishing them
  - Balancing deliberation and process with the passion for change
- Communications
  - You can never do enough
  - Too many channels, too much distraction



# Energy Efficiency: Focus on buildings

- Buildings consume 40% of the energy used in the US
  - 22% Residential, 18% Commercial
- 2/3 of that energy is attributable to the building and its systems
  - HVAC, lighting and water
- Buildings have long lives
- Turnover of US building stock is slow (~1%/year)
  - Importance of work on existing facilities
- Projects are well-understood - fundamental building technology and operations
  - Residential and municipal



# Municipal buildings - the fundamentals

- **Lighting – retrofits and energy efficient bulbs**
  - Lighting control trial – outdoor lighting at High School
- **Motion/occupancy sensors**
  - Installed in all unoccupied spaces in 3 older schools
- **Energy control systems**
  - Upgraded older school with EECBG funding
  - All schools – staggered starts, nightly setbacks, remote controls, slow startups
- **Variable-speed drive (VSD) motors**
- **Incremental improvements to existing systems**
  - Fuel catalyst reduced oil consumption 10%
  - Longer-life filters – reduce energy use and staff costs
  - Preventative maintenance program



# Municipal buildings

(continued)

- **Equipment upgrades – leverage incentives**
  - Chiller replacement in Public Safety building – rebate for EE model
  - Energy-star refrigerators for schools with older equipment
  - Conversion to natural gas
- **Tightening building envelopes**
  - Major envelope improvements usually tied to renovation/construction
  - Smaller projects do make a difference



# Beyond the core projects

- **You need data**
  - Not just for management, but for communication with the public
  - MassEnergyInsight- available to all cities & towns at no cost
- **Don't ignore newer buildings**
  - Olin College Campus buildings completed ~2004/5
  - 2010 - Energy Management Program reduced energy consumption 45% over 4 years - \$2 million in avoided costs
  - Projects included daylight harvesting, kitchen ventilation control,, occupancy sensors, VSD motors, building community-wide involvement
- **Building Commissioning**
  - Then and now – overlap, not turnover
  - Facilities involvement during design & value engineering
  - Continuous Commissioning



# Beyond the core projects

(continued)

- **Behavior change – share the benefit**
  - Under discussion: % of persistent energy savings to a building Principal
- **Facilities Master Plan**
  - Facilitates prioritization & focus because identifying, scoping, planning and procuring EE projects is time consuming
- **Facilities maintenance and upgrade plans should be well-communicated and widely-understood**
  - Promotes confidence and smooth approval process
  - Community can respond to opportunities – saved \$1 million on energy-efficient roof replacement with stimulus-funded MSBA program



## Summary

There are significant financial and quality-of-life benefits to community-wide investments in energy efficiency

Leveraging all the resources in your community is a powerful force for change, but it requires patience and persistence

Presentation slides available at <http://bit.ly/mma2012>