Harvard's Path to Energy Efficiency & Sustainability

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Harvard Energy Advisory Committee (HEAC)

Agenda Overview

- Community Sponsored Efforts Bear Fruit
  - Volunteers and local activists evolve into Cttee
- Green Community Program in Harvard
  - Evolutionary steps
  - Results and Lessons Learned so far
- Continuing Benefits
  - Outgrowths of Initiatives
- Future Directions

Roots of Energy Advisory Committee

- Harvard Local:
  - People gathering together to discuss environment, energy, sustainability – built awareness and knowledge through workshops and local efforts
  - Climate-related (350.org) events
- Led to local sustainability initiatives:
  - Community garden
  - Applied to DOER for energy audits of town buildings
  - Low Carbon Diet Workshop
  - Energy Audits and home energy savings ideas
  - Wind Bylaw Task Force

Harvard: background

- Small residential community (mostly prop. tax)
  - 1500 homes, 6000 residents
  - Own school district – serves some Devens residents
  - Town Manager, Board of Selectment, ATM
  - Volunteer Govt.
- Energy Use Characteristics:
  - Aging municipal building stock
  - Schools are well over 50% of energy budget
  - mBTU
    - 2007: 25,255 - 2008: 25,610 (before HEAC)
    - 2009: 24,639 - 2010: 20,112 (after HEAC)
    - 2011: 22,093 (???)

Genesis of HEAC

- Annual Town Meeting in 2008
  - Spending review revealed savings opportunities
  - Citizen recollection of 1970's town energy committee, BOS decided to convene
- HEAC Formed with energy-savings agenda
- DOER building audit application submitted
  - Members were already involved in writing proposal
- Green Communities program was announced within our first year (2009)
  - HEAC had been reviewing expenditures and efficiency issues, managing building audits

Green Communities Timeline

- HEAC advises pursuit of GC to BOS in Aug 2009
- Application accepted, consultant hired: Jan 2010
- Developed Strategy around 5 Requirements:
  - 20% Reduction, As-of-Right Siting for RE, Expedited Permitting, Enhanced Building Code (Stretch), Efficient Vehicle Policy
- Initial meeting with Town Officials: March 2010
  - Areas of concern: AOR Siting, Stretch Energy Code
- Forums – panel discussion, focus on Stretch
- Special Town Meeting: Oct. 2010 - voted approval
- Application Accepted: Dec. 2010
- Grant Application: Jan 2011 - approved April 2011

Green Community: Our Approach

- Build on the work of others!!
  - e.g. web site from Lexington, slides from Acton
- Answer questions w/information, not opinion
  - Stretch is complicated: good or bad for the town?
  - Identify and Discuss pros & cons
- Identify, Involve stakeholders & constituencies
  - Realtors, Building Inspector, Builders, DOER et. al.
- Forums & Town meeting: staying on message in the midst of hoopla: "*just the facts ma'am*"

Initial Benefits of GC Program

- 5 Year Plan: Reduce Municipal Energy by 20%
  - New view of dept. budgets – energy as line-item
  - Building Usage Policies (thermostats, power-saving)
  - Halfway to %20 reduction goal, about $100K savings
  - Next 10% will be harder (next 3 years)
- $141K for energy efficiency *projects*:
  - Boiler Replacements (2)
  - HVAC & Building Automation System Upgrades
  - Energy Modeling for Town Hall Retrofit
- Mass Energy Insight Database

Initial Lessons of GC Program

- Savings Aren't Always What They Seem
  - One year reduction of almost 20% was anomaly
  - Systems require balancing and maintenance
- Entrenched Behaviors may be hard to change
  - Need buy-in from everyone playing a role
- Not a snap to acquire and spend $ (grants)
  - Administration, coordination, vendor tracking, etc.
  - Legislation proposed to fund town Energy Managers
- Utility Incentives – Gas & Electric, Lighting
  - Vanish, change, 3rd party negotiation

Other Lessons Learned

- Energy Projects for every town's list:
  - DOER Building Audits – create ECMs for each bldg
  - Maximize Utility Incentive programs
    - Lighting Upgrades (incentives ~ 40%)
    - Consider Oil->Gas Conversion (many suppliers)
  - Get (your data) into MassEnergyInsight!
  - MSBA Green Schools (new/retrofit) & Green Repair
  - Get quotes for Energy Service Co's (ESCO) & PPAs
- Then the real work begins (unless ESCO contract)
  - Measurement & control
  - Thermal Envelope Work: the next big payoff…

Cascading Benefits of GC effort

- Cost Savings: should be ongoing
  - As should new procedures
- Solarize Mass pilot – Harvard one of 4 selected
  - GC-related program of direct benefit to residents
  - Required significant involvement from community
- Federal grant to aid in community solar efforts
  - Due to Solarize, Harvard is now a study site
  - Will help update permitting & interconnection stds
- Discussion on Community Solar “Garden”

Solarize Program & its Challenges

- Solarize Mass
  - 3 way partnership (state, installer, community)
  - Town-wide “market” for installed pricing
  - Limited time period (May – Sept)
- Challenges
  - Outreach, education to residents (during summer)
  - Coordination with town, installer and DOER
  - Not everyone can qualify (80% threshold)
  - Large commitment for volunteers and Installer (NEB)

SOLARIZE MASS HARVARD

Solarize – Aspects of the Campaign

- Communication – regular flows of targeted info
  - Surveys, Meetings
  - Traditional (print, email) and social media (FB, etc.)
  - Web sites, Local Paper, eNewsletters
  - Engaging with townspeople at gathering places
- Teamwork and Cooperation
  - Enthusiastic and dedicated volunteers
  - Installer: local, visible, involved, and aligned
  - State and local government participation
  - Reassessment when necessary

SOLARIZE MASS HARVARD

Solarize – What Was Accomplished

- Stats
  - 429 contacts directly by installer, 1000+ by vols
  - 234 site visits, 151 sites qualified
  - 402 kW contracted, 75 sites
- Notables
  - National finalist RE World Innovative Policy category
  - kW per capita of 0.088 (res) and 0.16 (all)
  - $4 per watt – lowest price for residential solar ever?
  - New England Breeze of Hudson – Worcester Bus. Journal – Small Businessperson of the Year

Community Solar Garden Model

- Alternative for disqualifying sites
  - Still qualify for Comm Solar II grants & Net Metering
- 200 kW in size (or more)
  - allows for in-neighborhood siting (vs. industrial zone)
- Maximum benefits to residential & municipal
  - Homeowners see SREC income after any loan paid
  - Municipalities benefit
- Financing
  - LLC: allows for tax liability and section 1603 credits
  - Local banks interested

Community Solar Garden Challenges

- Organizational and legal costs
- Upfront design and construction costs
  - Usually require financing
- Siting must be carefully done
  - 3-phase power
  - ByLaws - MGL 40A: “reasonable restrictions”
- Tax credits vs Section 1603 grant (gone)
- Utility
  - Interconnection timeline can be 6 – 12 months

What's next?

- Continued focus on energy efficiency
  - Monitoring (eMonitor pilot)
  - Modeling (boiler replacements kick-started)
  - Envelope Audits & Retrofits
- Municipal Solar PV: PPA or Owned?
  - Town land (As-Of-Right Siting)
- CSG
- "Weatherize Harvard"?
- Long Term Investigation: Wind Power

Questions