Getting towards Net Zero
Big Ideas for Reducing Carbon Emissions from Buildings

Tuesday, September 23, 2014
6:00 PM - 8:30 PM

City of Cambridge Community Development Department
This program will air on CCTV

In case you missed tonight, this program will air on:

Channel 9:

• -Friday, Oct 17 - Fri, Nov 7, 2014 @ 7 PM
• -Saturday, Oct 18 - Sat, Nov 8 @ 4 PM
• -Sunday, Oct 19 - Sun, Nov 9 @ 1 PM
• -Tuesday, Oct 21 - Tue, Nov 11 @ 10 AM

Thanks CCTV!

10/2/2014  
Getting towards Net Zero
Tonight’s Agenda

6:00 PM Welcome & Purpose

6:15 PM Audience Poll

6:30 PM Panel Introduction
   Net Zero Task Force Background & Preliminary Ideas

6:55 PM Questions to Panelists

7:40 PM Public Comment

8:10 PM Audience Poll & Final Comments by panelists

8:25 PM Closing remarks

8:30 PM END
Audience Poll: Poll Everywhere

About this polling tool...

– This is just a standard rate text message, so it may be free for you

– The polling tool we are using is serious about privacy. We cannot see your phone numbers and you’ll never receive follow-up text messages outside this presentation

– All answers are anonymous

.....Let’s try it!
Audience Poll

There are two ways to participate in the poll:

1. Sending a standard rate text message to 22333

OR

2. Visiting the voting webpage: www.pollev.com/netzero

Please only select one response. If your neighbor doesn’t have a mobile device, please help them out by inputting their vote!
Audience Poll

To participate by voting on the webpage:

• **STEP 1** – Go to: [www.pollev.com/netzero](http://www.pollev.com/netzero)
  
  – You may have to connect your smart phone or mobile device to the Public Library’s Wi-fi (if it hasn’t already done it) – go to “Settings”, then “Wi-fi”, and then select “Cambridge Public Internet”
  
  – If you participate by voting on the website, simply “click” or select your response and it will automatically be counted
  
  – Just vote once please! (unless you are helping your neighbor to vote)
Audience Poll

To participate by text

• STEP 1 - You must first join the polling session by typing the message *netzero* and sending it to *22333*

  – *netzero* is all one word

  – Lower or uppercase – it doesn’t matter!
Audience Poll

To participate by text

• STEP 2 - Once you have joined the session you can submit poll responses by texting the corresponding letter (A,B,C,D, etc.) to 22333

– You just text a letter! That’s it
Your poll will show here

1. Install the app from pollev.com/app
2. Make sure you are in Slide Show mode

Still not working? Get help at pollev.com/app/help or Open poll in your web browser
Your poll will show here

1. Install the app from pollev.com/app
2. Make sure you are in Slide Show mode

Still not working? Get help at pollev.com/app/help
or
Open poll in your web browser
Your poll will show here

1. Install the app from pollev.com/app
2. Make sure you are in Slide Show mode

Still not working? Get help at pollev.com/app/help
or
Open poll in your web browser
Your poll will show here

1. Install the app from pollev.com/app
2. Make sure you are in Slide Show mode

Still not working? Get help at pollev.com/app/help
or
Open poll in your web browser

10/2/2014
Guest Panelists

• Ralph DiNola, Executive Director, New Buildings Institute
• Luke Falk, Sustainability Manager, Related Companies
• Christina Halfpenny, Director, Energy Efficiency Division, Massachusetts Department of Energy Resources
Net Zero Task Force: Background

• In December 2013, the City of Cambridge created the “Getting to Net Zero Task Force”.
• The Task Force is charged developing actions that will set Cambridge on the trajectory towards becoming a “net zero community”, with focus on carbon emissions from building operations.
• The Task Force was created in response to a proposal made by residents that would have required new, large buildings to be Net Zero or pay an annual fee.
Thank you to our Task Force

**Community Advocates/Residents**
Henrietta Davis, former Mayor of Cambridge  
Andrea Love, Resident, Payette Architects  
Barun Singh, Resident, Founder & CTO, Wegowise  
Quinton Zondervan, Executive Director, Climate Action Liaison Coalition

**University/Climate Compact Representatives**
Heather Henriksen, Director of the Office for Sustainability, Harvard University  
Julie Newman, Director of Sustainability, Massachusetts Institute of Technology

**Planning Board**
Tom Sieniewicz, Planning Board member, Partner, NBBJ

**Business/Property Owner/Developer Representatives**
Bill Kane, Vice President, Leasing & Development, BioMed Realty  
Joseph Maguire, Vice President at Alexandria Real Estate Equities, Inc.

**Subject Matter Experts**
Jane Carbone, Director of Development, Homeowner's Rehab  
Caitriona Cooke, Program Director, Conservation Services Group  
Emily Grandstaff-Rice, President, Boston Society of Architects, Associate, Cambridge Sevens Associates  
Shawn Hesse, Architect, Sustainability Expert, Emersion Design  
Marc Hoffman, Energy Efficiency Advisor  
Paul Lyons, President, Zapotec Energy

10/2/2014
What is NetZero?

<table>
<thead>
<tr>
<th>It includes:</th>
<th>Its does NOT include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHG emissions from new buildings</td>
<td>Transportation emissions</td>
</tr>
<tr>
<td>GHG emissions from existing buildings</td>
<td>Emissions from waste or garbage</td>
</tr>
<tr>
<td>Net zero emissions on a citywide scale, not building by building</td>
<td>Every building having to be net zero on its own</td>
</tr>
<tr>
<td>Energy used to heat, cool, light and “plug loads”</td>
<td>“Embodied” energy or carbon</td>
</tr>
<tr>
<td>Water use</td>
<td></td>
</tr>
</tbody>
</table>
Energy Use & Emissions

Energy Use (MMBTU) by Fuel 2012

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>MMBTU (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Gas</td>
<td>54%</td>
</tr>
<tr>
<td>Grid Electricity</td>
<td>40%</td>
</tr>
<tr>
<td>Fuel Oil</td>
<td>4%</td>
</tr>
<tr>
<td>District Steam</td>
<td>2%</td>
</tr>
</tbody>
</table>

CO2 Emissions by Fuel 2012

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>CO2 (tonnes) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid Electricity</td>
<td>54%</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>40%</td>
</tr>
<tr>
<td>Fuel Oil</td>
<td>4%</td>
</tr>
<tr>
<td>District Steam</td>
<td>2%</td>
</tr>
</tbody>
</table>
## Estimated Energy Use by Space type:

<table>
<thead>
<tr>
<th>Space Type</th>
<th>Commercial Lab</th>
<th>Commercial Office</th>
<th>Hotel</th>
<th>Warehouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Lab</td>
<td>21%</td>
<td>12%</td>
<td>4%</td>
<td>&gt;8 Unit</td>
</tr>
<tr>
<td>Retail</td>
<td></td>
<td></td>
<td></td>
<td>Residential</td>
</tr>
<tr>
<td>University Lab</td>
<td>13%</td>
<td>6%</td>
<td>4%</td>
<td>2-3 Family</td>
</tr>
<tr>
<td>Academic / Administration</td>
<td></td>
<td></td>
<td></td>
<td>4-8 Unit</td>
</tr>
<tr>
<td>University Residential</td>
<td></td>
<td></td>
<td></td>
<td>Residential</td>
</tr>
<tr>
<td>Athletics Museums Support</td>
<td></td>
<td></td>
<td></td>
<td>1-Family</td>
</tr>
<tr>
<td>Support</td>
<td></td>
<td></td>
<td></td>
<td>Gov't</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td>Other</td>
</tr>
</tbody>
</table>
2014 Work Plan

- **Research**
- **Working Groups formed**
- **Public Events**
- **Public & Stakeholder Input**

**Early Actions**
- **Series of Short Primers:**
  - NZ Best Practices
  - Building Energy
  - Renewable Energy

**Working Groups set up:**
- Initial workshops
- Consultant support for analysis
- Bi-monthly meetings

**Long list of ideas generated**

**Alignment & Analysis of Options**

**Prioritization**

**Testing of options**

**Recommendations**

**1st Meeting**

Winter 10/2/2014

Spring

Summer

Fall
Working Groups

- Education & Engagement
- Energy Supply & Offsets
- Getting to Net-Zero Task Force
- Incentives & Financing Tools
- Regulation & Planning Approaches
Endorsed Early Action Items

1. An update to Cambridge’s zoning ordinance for design of new buildings from LEED Silver to LEED Gold
2. City advocacy for an update to the State ‘stretch’ building code which mandates better energy performance
3. City adoption of a building energy reporting and disclosure ordinance
4. Support for multi-family energy efficiency pilot program
The Ideas

Energy Sources & Offsets Working Group

• Go beyond rooftop solar; exploit all available renewable resources to the fullest extent
  • Promote fuel switching, city owned solar, district energy projects

• Develop adequate energy storage to support maximum build out of renewables
  • Storage in locations and vehicles,

• Position Cambridge to be a test bed for microgrids and grid modernization
  • Partnerships for grid-modernization

• Provide alternatives for residents to participate in local solar projects
  • Community Solar Projects
The Ideas

Behavior Change Working Group

• Cambridge launches a comprehensive and pervasive communications campaign that touches everyone living, working or studying in Cambridge
  • Communications network & improved engagement

• Cambridge property owners and tenants engage utility programs
  • Promote utility programs

• Building industry professionals (and property owner/management companies)
  • Collaborate with partners

• Competitions, challenges & rewards drive progress towards NZ

• The ‘cool’ factor of technology is exploited to engage people

• Building performance data is leveraged to drive energy efficiency and behavior change.
The Ideas

Incentives & Finance Working Group

- Create a new source of funding for incentives
- Prioritize incentives to reduce energy consumption in all sectors
  - Provide additional incentives to augment utility programs
- Work with private sector property owners to develop internal programs
- Develop nonfinancial incentives for new development projects
- Make carbon tangible
- Develop competition, recognition and awards programs
The Ideas

Regulation & Planning Working Group

• Regulations drive maximum engagement in energy efficiency and renewables across all sectors

• New districts or overlays are created, dedicated for specific clean energy uses

• Tenant guides & Green Leases

• Leverage funding sources to require new elements
The Overarching Ideas

• Adopt a data tracking platform to track progress over time

• Utility Engagement

• Expand capacity within the City

• **Identify any 3rd party resources needed**: to support program development and execution.

• **Develop training/education programs for staff**: so they are best prepared to support new programs.

• Engage in regional advocacy
Getting towards Net Zero

Preliminary Cambridge Emissions Reduction Model

Incentives and retrofit programs

Market saturation of incentives

NZ new construction + Deep Retrofits

10/2/2014
Some Important Facts/Ideas

• A 70% reduction by 2040 sets us on track to meeting the widely adopted goal of 80% by 2050.
• Renewable energy generation in Cambridge will largely depend on solar; current technical and economic potential for solar would cover 5% of our electricity needs.
• But, more energy efficient buildings and more efficient solar technology would increase this percentage.
• State/federal requirements regarding carbon pricing, renewables and utility energy efficiency programs will influence progress.
• Additional actions need to be explored, e.g. impact of increased usage of steam from the Veolia plant.
• There is no silver bullet and planning needs to be on-going.
Questions for Panelists
PlaNYC and Greener Greater Buildings Plan Results

New York City’s Greenhouse Gas Emissions Drivers of Change, 2005-2013

23% of reductions from Newly efficient buildings

Source: New York City Mayor’s Office of Long-Term Planning and Sustainability

Source: “One City, Built to Last” City of New York, September 2014
NYC LL 84 Results

Figure 10: Variation in Source Energy Use Intensity (EUI) Within Five Sectors

Source: NYC Local Law 84 Benchmarking Report 2012
ISO-NE Load Forecast

New England: Annual Energy (GWh)

Your poll will show here

1. Install the app from pollev.com/app
2. Make sure you are in Slide Show mode

Still not working? Get help at pollev.com/app/help

or
Open poll in your web browser
Your poll will show here

1. Install the app from pollev.com/app
2. Make sure you are in Slide Show mode

Still not working? Get help at pollev.com/app/help
or
Open poll in your web browser
Net Zero Task Force

• To view the comprehensive list of ideas or to learn more about the Getting to Net Zero Task Force visit us on the web at:

www.cambridgema.gov/CDD/Projects/Climate/netzerotaskforce.aspx

#netzerocamb

• For more information on the Getting to Net Zero Task Force, please contact Ellen Kokinda in the Community Development Department at

ekokinda@cambridgema.gov or 617/349-4618