Carbon Neutral Seattle

City Council Briefing
May 23, 2011
Carbon Neutral Seattle Project

- Define City’s carbon neutral goal
  Zero net emissions by 2050 (in road transportation, buildings and waste sectors)

- Develop carbon neutral emission reduction scenario
  Proof of concept demonstrating one pathway to becoming a climate-friendly community.

- Goal and scenario inform Seattle Climate Action Plan update
  Action Plan update process to begin in September 2011, with Plan complete by summer 2012.
Carbon Neutral Scenario

- “What if” analysis that outlines one of many possible pathways to achieve deep emission reductions
- Proof of concept that asked what is possible.
  - It is not an action roadmap or an economic or political feasibility analysis.
- Will inform City’s action planning.
  - Financial and political feasibility and community support will be considered during the action planning process.
Seattle’s GHG Measurement Framework

Core Emissions are the focus of Seattle Climate Action Plan

Supplemental Emissions are measured but not significant focus of City action

Consumption Emissions are the focus of outreach to residents and businesses

**KEY**
- = Core
- = Consumption
- = Supplemental
- = Emissions released to support consumption outside Seattle (approx.)
* = Not to Scale (No Data)
## CN Scenario Strategies

<table>
<thead>
<tr>
<th>Emission Sector</th>
<th>Less of GHG Producing Activity</th>
<th>Cleaner GHG Producing Activity</th>
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</thead>
</table>
| ROAD TRANSPORTATION (Passenger & Freight) | Reduce vehicle travel  
Increase vehicle efficiency                                                     | Mode & Fuel switching                                  |
| BUILDINGS (Residential & Commercial) | Increase building efficiency                                                                 | Fuel switching                                        |
| WASTE                            | Increase waste diversion                                                                   | Reduce landfill gas emissions                           |
CN Scenario Results

Change from 2008 in total emissions:
2020 – 30% reduction
2030 – 58% reduction
2050 – 87% reduction
CN Scenario - Transportation

- **Strategies**
  - Transit/bike/pedestrian infrastructure
  - Pricing (road, parking, VMT)
  - Transportation demand management
  - Land use/compact development
  - Fuel efficiency & switching—electrification & biofuels

- **Assumptions**
  - Rapid & extensive increase in transit
  - 80% of passenger vehicles are electric by 2050
  - Next generation biofuels replace most freight diesel use
Transportation GHG Emissions (left) and Energy Use (right) by fuel, Carbon Neutral Scenario, 2008-2050

Passenger VMT reductions per capita:
- 20% by 2020
- 31% by 2030
- 53% by 2050
CN Scenario - Buildings

○ Strategies
  ● Green building design
  ● Energy efficiency retrofits
  ● Distributed energy production
  ● District energy systems

○ Assumptions
  ● 90% of existing residential buildings are retrofit by 2050
  ● All new residential buildings are built to deep passive design levels by 2030
  ● 95% of commercial gas & oil space and water heating switched to district energy or heat pumps by 2050
Buildings

Residential and Commercial Building GHG Emissions (left) and Energy Use (right) by fuel, Carbon Neutral Scenario, 2008-2050
CN Scenario - Waste

○ Strategies
  ● Increase diversion rate
  ● Reduce waste generation

○ Assumptions
  ● 70% of waste is diverted to recycling or composting by 2025
  ● Landfill gas emissions are reduced 50% by 2050
Waste
## 2020 Outcomes Based on Carbon Neutral Scenario Assumptions

<table>
<thead>
<tr>
<th></th>
<th>Reduction in GHG Emissions-Producing Activity</th>
<th>Reduction in GHG Emission Intensity of Activity</th>
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</thead>
<tbody>
<tr>
<td><strong>Transportation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger</td>
<td>Reduction in vehicle miles travelled (VMT)</td>
<td>Decrease in GHG per mile of Seattle vehicles</td>
</tr>
<tr>
<td></td>
<td>20% reduction in light duty VMT/capita</td>
<td>35% reduction</td>
</tr>
<tr>
<td>Freight</td>
<td>7% increase in total VMT</td>
<td>25% reduction</td>
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<tr>
<td><strong>Buildings</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>Decrease in energy use</td>
<td>Decrease in GHG intensity of energy mix</td>
</tr>
<tr>
<td></td>
<td>15% reduction in residential energy use/capita</td>
<td>15% reduction in tonnes CO2e/billion BTU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>residential and commercial buildings combined</td>
</tr>
<tr>
<td>Commercial</td>
<td>15% reduction in commercial energy use/employee</td>
<td></td>
</tr>
<tr>
<td><strong>Waste</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increase in recycling and composting rate</td>
<td>Reduction in GHG intensity of waste commitment</td>
</tr>
<tr>
<td></td>
<td>Increase diversion rate from 49% to 69%</td>
<td>per ton waste disposed</td>
</tr>
<tr>
<td><strong>TOTAL GHG Emissions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction</td>
<td>30% reduction in per capita emissions by 2020</td>
<td></td>
</tr>
<tr>
<td></td>
<td>90% reduction in per capita emissions by 2050</td>
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</tbody>
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Goods & Services

- Production and transport of goods, food, and services *consumed* in Seattle
- Different methodology, not additive with core emissions
- Sketch analysis derived from economic data
- Select findings
  - Emissions from producing goods and services are significantly greater than the emissions associated with transporting them, even over long distances
  - Emissions associated with producing goods and services represent over 40% of total consumption emissions
### Goods & Services

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<tr>
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<tbody>
<tr>
<td>Construction</td>
<td>2.3</td>
<td>21.8</td>
<td>55.2</td>
</tr>
<tr>
<td>Air travel</td>
<td>1.0</td>
<td>5.3</td>
<td>11.4</td>
</tr>
<tr>
<td>Services</td>
<td>4.6</td>
<td>12.8</td>
<td>22.3</td>
</tr>
<tr>
<td>Freight Travel</td>
<td>0.7</td>
<td>1.2</td>
<td>1.5</td>
</tr>
<tr>
<td>Food</td>
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<td>0.7</td>
<td>0.9</td>
</tr>
<tr>
<td>Goods</td>
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<td>1.8</td>
<td>4.7</td>
</tr>
<tr>
<td>Home Energy</td>
<td>1.3</td>
<td>8.1</td>
<td>15.7</td>
</tr>
<tr>
<td>Personal Vehicles</td>
<td>0.1</td>
<td>0.1</td>
<td>0.2</td>
</tr>
</tbody>
</table>

**Consumption-based Emissions**
(Million tonnes CO2e)

- **Seattle (2008)**
- **U.S. (2001)**
- **World (2008)**
Climate Action Plan Process

- **Summer 2011**
  - Hold focus groups to inform community engagement and action planning
  - Soft launch of CAP community engagement

- **Fall 2011 – Spring 2012**
  - Technical Advisory Groups develop emission sector action plans
  - Hard launch of CAP community engagement

- **Spring 2012 – Summer 2012**
  - Develop CAP funding strategy
  - Green Ribbon Commission finalizes action plan