Agenda

• Context and Importance
• Past GHG inventories
• Inventory methodology
• 2016 GHG inventory results
• GHG reduction strategies
• Goals
Importance – Stable Climate & Climate Adaptation Cost Assessment

The Impact of Climate Change: Projected Adaptation Costs for Boulder County, Colorado

April 2018

Paul S. Chinowsky, PhD

Resilient Analytics
Past GHG inventories

- 2005: Keeping as baseline year
- 2011
- 2016
2016 Inventory Methodology

• “Global Protocol for Community-Scale Greenhouse Gas Emission Inventories”
• Added: Airline travel, grid distribution & transmission losses, fugitive gas emissions
• Removed: RECs / offsets
Emissions Timeline

- 2005, 5,021,237
- 2011, 4,890,832
- 2016, 4,887,441
- 2020 Goal, 3,012,742
- 2050, 5,218,422
- 2050, 977,488

- Red: Business-as-usual increase in GHG emissions
- Green: Reduction needed to meet an 80% reduction in GHG emission by 2050 (2016 baseline)
2016 Boulder County Countywide GHG Emissions by Sector

- Residential & Commercial Buildings Combined: 60%
- Commercial & Industrial: 38%
- Transportation: 31%
- Industrial Process & Product Use: 5%
- Oil Wells: 2%
- Agriculture: 1%
- Waste: 1%
2016 Emissions by Source

Other includes: diesel generators, railways, agricultural sources, landfill gas, compost, wastewater, and refrigerants.
2016 Emissions by Municipality

Emissions by Muni

- City of Boulder: 33%
- Unincorporated: 30%
- Longmont: 22%
- Lafayette: 7%
- Superior: 2%
- Nederland: 0.3%
- Lyons: 0.4%
- Louisville: 5%
Comparison: 2005 and 2016

3% decrease
(with different methodologies)

18% decrease
(with only the same sources)

13% decrease
Population

45% increase
Sales & Use Tax

15% increase
Jobs
GHG Emission Reduction Strategies

- 3rd party expertise with Lotus
- Additional local experts consulted
- Includes local programs and local & state policy
- County, city, and collaborative efforts
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<tr>
<th>Sector</th>
<th>Specific Strategy</th>
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<td>Building Energy</td>
<td>- Adopt and Enforce Current Building Code</td>
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<td>- Implement Beyond Code Requirements</td>
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<td>- Accelerate Fuel Switching</td>
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<td>- Mandatory Commercial Benchmarking</td>
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<td>- Increase the State’s Energy Efficiency Resource Standard</td>
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<td>- Continue Boulder County’s Suite of Energy Efficiency Programs</td>
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<td>Renewable Energy</td>
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<td>- Expand Rooftop Solar</td>
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<td>- Expand Community Solar</td>
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<td>- Additional Efforts</td>
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<td>Transportation</td>
<td>- Accelerate Electric Vehicles: All-of-the-Above Strategy</td>
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<td>- Support Federal and/or State Clean Car Policies</td>
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<td>- Expand Public Transit</td>
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<td>Oil and Gas</td>
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<td>Waste</td>
<td>- Reduce Food Waste</td>
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<td>- C&amp;D and Composting Waste to Local Transfer Facility</td>
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<td>- Promote Zero Waste Education</td>
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<td>- Strive for County Operations Zero Waste</td>
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<td>- Additional Efforts</td>
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<td>Other Carbon Reduction</td>
<td>- Pursue Carbon Sequestration</td>
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<td>Reduction Efforts</td>
<td>- Implement Carbon Tax</td>
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<td>- Carbon Intensive Industries Carbon Impact Offset Fund</td>
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New Countywide Goals

Reduce greenhouse gas emissions 45% by 2030 relative to the 2005 baseline.
New County-wide Goals

2016

15 mtCO$_2$e
Emissions per person per year, average countywide

2030

WE MUST CUT OUR EMISSIONS IN HALF BY 2030

7 mtCO$_2$e
Emissions per person per year, average countywide
Greenhouse Gas Emission Trends

Boulder County has calculated and reported community-wide GHG emissions since 2005 and focused its GHG reduction efforts on the largest emissions sources: electricity, natural gas, ground travel, and solid waste (see opposite page). According to the latest inventory, emissions from commercial and residential building energy use account for 60% of emissions and transportation accounts for 31% of emissions countywide. Emissions from industrial processes, oil wells, solid waste, and agriculture account for the remaining 9% of emissions. Between 2005 and 2016, countywide GHG emissions decreased by 3%. It is significant that emissions have remained relatively steady over a period of sizeable growth in population (13%) and economic prosperity (45% increase in sales and use tax).

In 2012, Boulder County laid out a bold goal of reducing community GHG emissions 40% below 2005 levels by 2020. Our recent 2016 inventory suggests that reaching this goal remains a significant challenge and will require all of us to take action. While no single step can reverse climate change effects, Boulder County, municipalities, and all community members can pursue more reduction strategies, take advantage of leading edge technologies, and engage more citizens across our community in this effort to reduce carbon pollution. Boulder County residents emit an average of 15 metric tons of carbon dioxide equivalent (mtCO$_2$e) annually in Boulder County (see page 40). We have the challenge of getting our emissions per person per year to a countywide average of 7 mtCO$_2$e (to meet our 2030 goal).

reducing waste

Waste reduction efforts play a large role in helping Boulder County work toward our climate goals. Boulder County completed a 2016 GHG inventory using a standardized methodology. A global emissions perspective is missing from the inventory methodology, which can only account for the methane released from landfills, while most of the products we purchase also have emissions associated with their collection and manufacture outside of our county. Zero waste efforts contribute to significant emissions reductions by avoiding "upstream" GHG emitted in the extraction, manufacturing, and transportation of raw materials, food, and goods.
Conclusions

✓ Buildings and Transportation are 90% or more of all emissions

✓ Waste reduction important too

✓ Countywide emissions have decreased at the same time population grew

✓ Emissions reductions due to a cleaner grid had the greatest impact on emission reductions
  - Policy is therefore important
Conclusions cont’d

✓ With all strategies, estimate reductions over 45% by 2030 relative to 2005 baseline
  ▪ Emissions reductions due to renewable energy, electric vehicles, and cross-cutting strategies have the potential for greatest impact on emission reductions

✓ Collaboration and leveraging resources

✓ We have our work cut out for us - all hands on deck!
Thank You!