Madison Community Operations 2014 Carbon Emissions Inventory

Debaki Ale, Emily Howell

Xiaomeng Jin, Alexandra Karambelas

Outline

- 2014 Inventory
- BAU and CPP Forecasts
  - *Where will Madison be in 2050?*
- Planning Scenarios:
  1. *Extreme Renewable Portfolio*
  2. *Transit Oriented Development*
  3. *Residential Benchmarking*

Present-Day Inventory

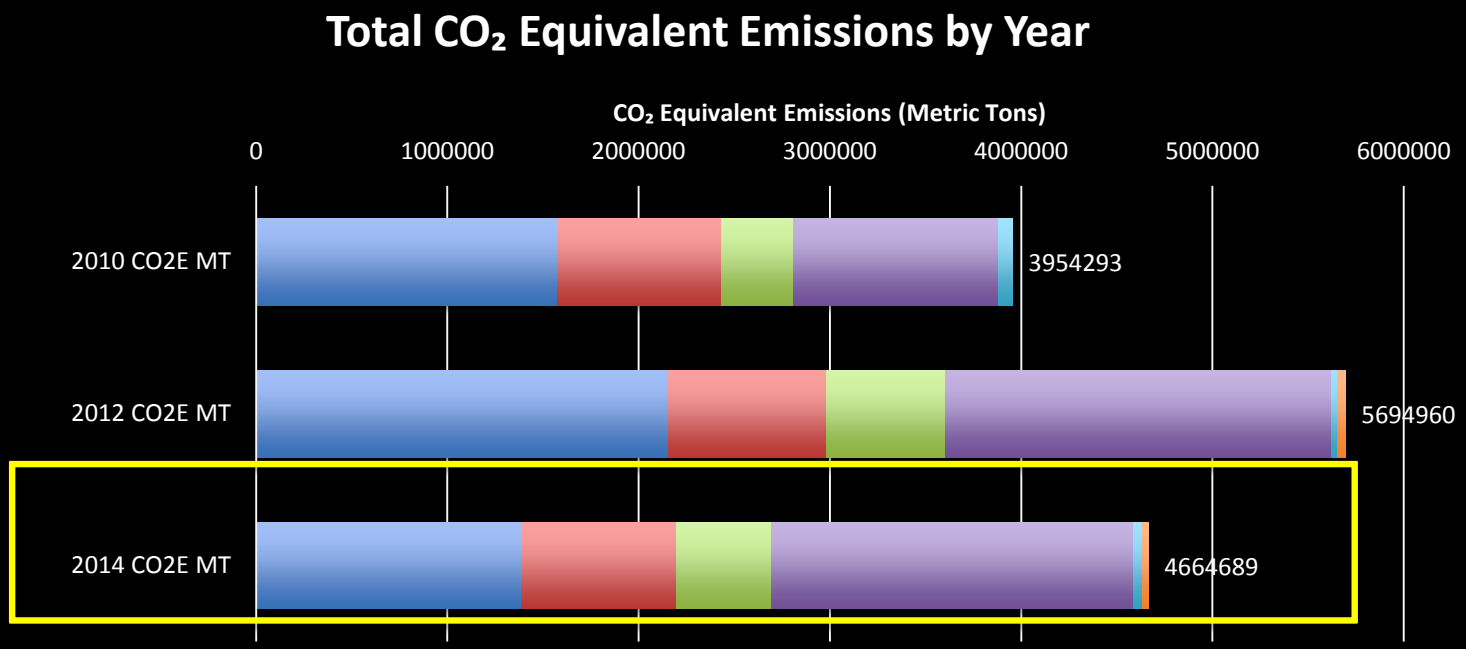
- Data from:
  - *MG&E*
  - *Alliant*
  - *Madison Transportation Planning Board*
  - *MMSD*
  - *DOT*
  - *DCRA*
  - *Dane County Public Works*
  - *DNR*
  - *Madison Water Utility*
  - *City of Madison Engineering Division*

Present-Day Inventory

- Data from:
  - *MG&E*
  - *Alliant*
  - *Madison*
  - *MMSD*
  - *DOT*
  - *DCRA*
  - *Dane County Public Works*
  - *DNR*
  - *Madison Water Utility*
  - *City of Madison Engineering Division*

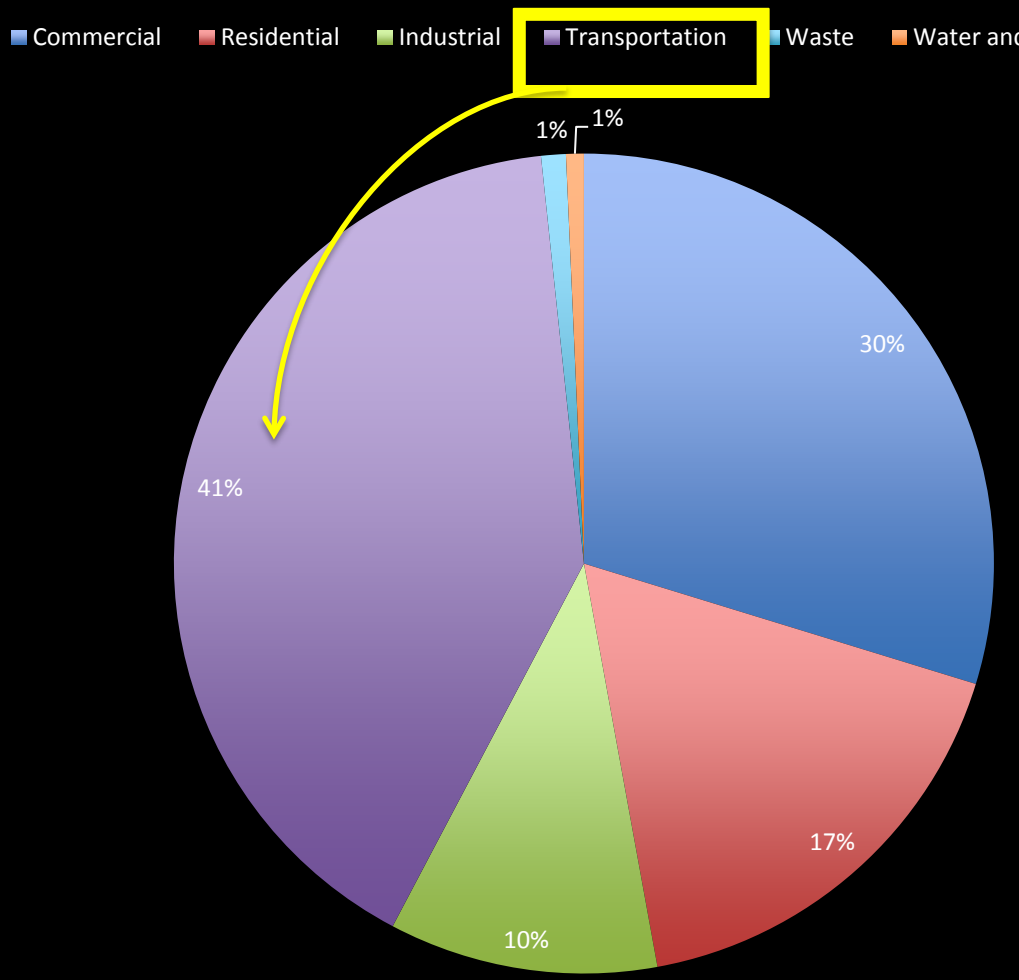
THANK YOU!

Present-Day Inventory Comparison



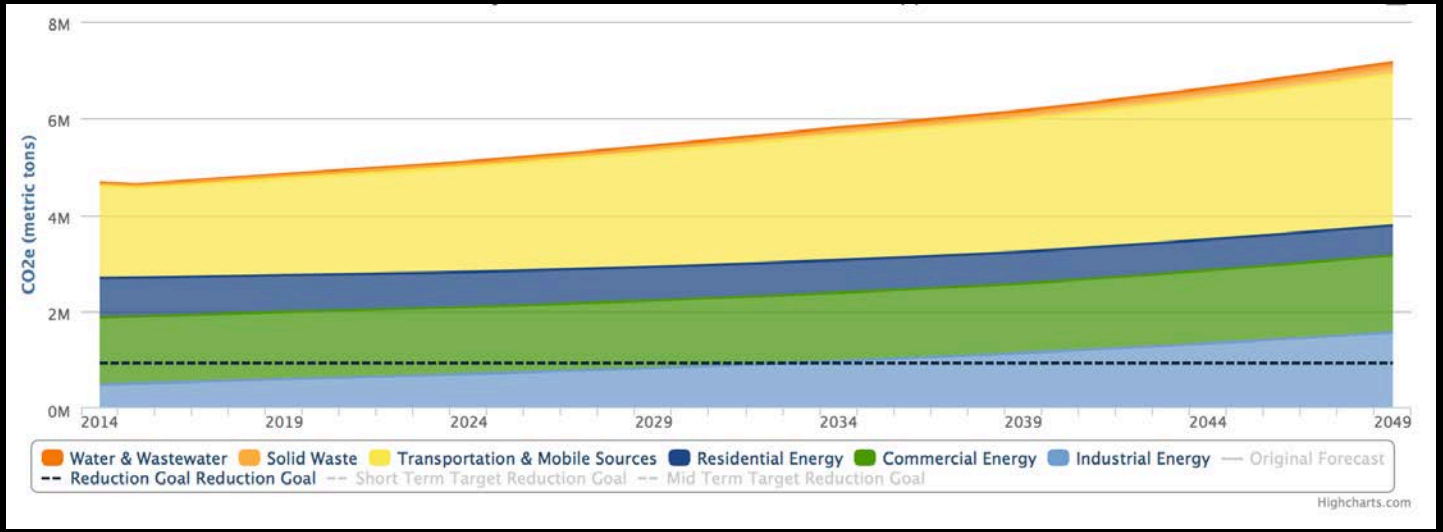
	2014 CO2E MT	2012 CO2E MT	2010 CO2E MT
Commercial	1387486	2157848	1574096
Residential	810907	823390	859582
Industrial	494290	622563	373254
Transportation	1893958	2018727	1073720
Waste	45372	30951	73641
Water and Wastewater	32676	41481	0
Total Emissions	4664689	5694960	3954293

2014 Emissions by Sector

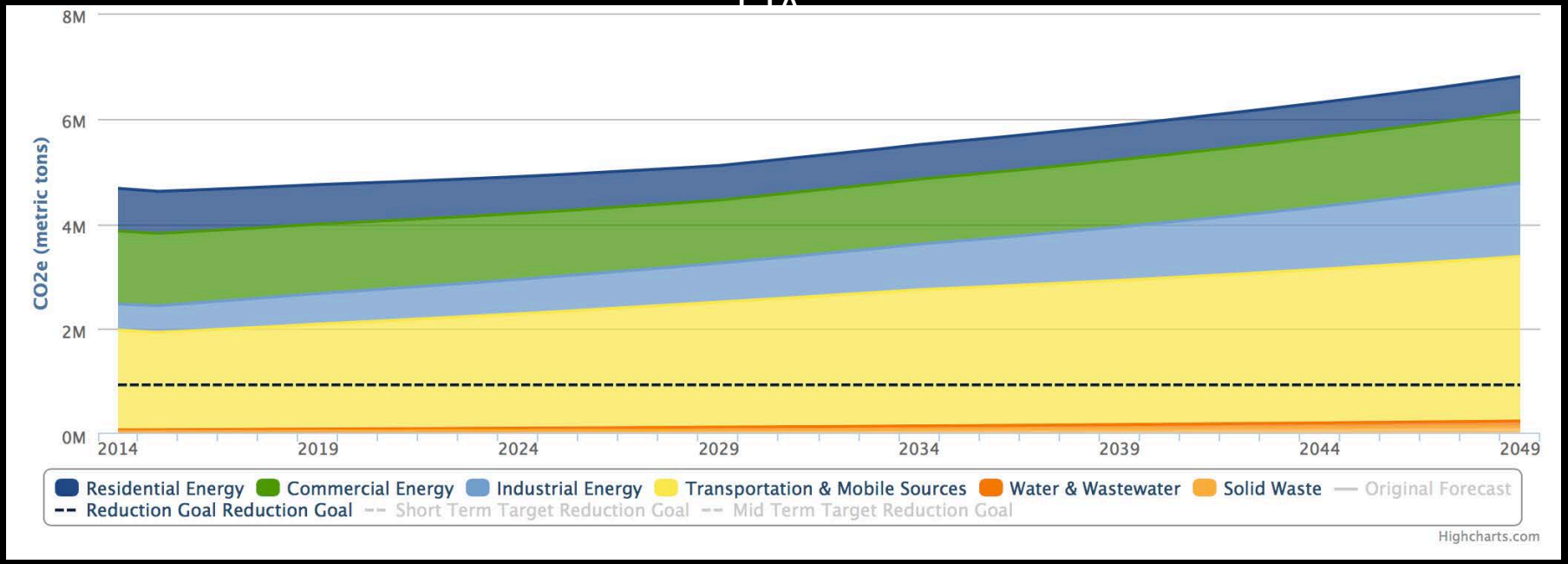


Total GHG emissions = 4664689 MT CO2e

Business as Usual with EIA

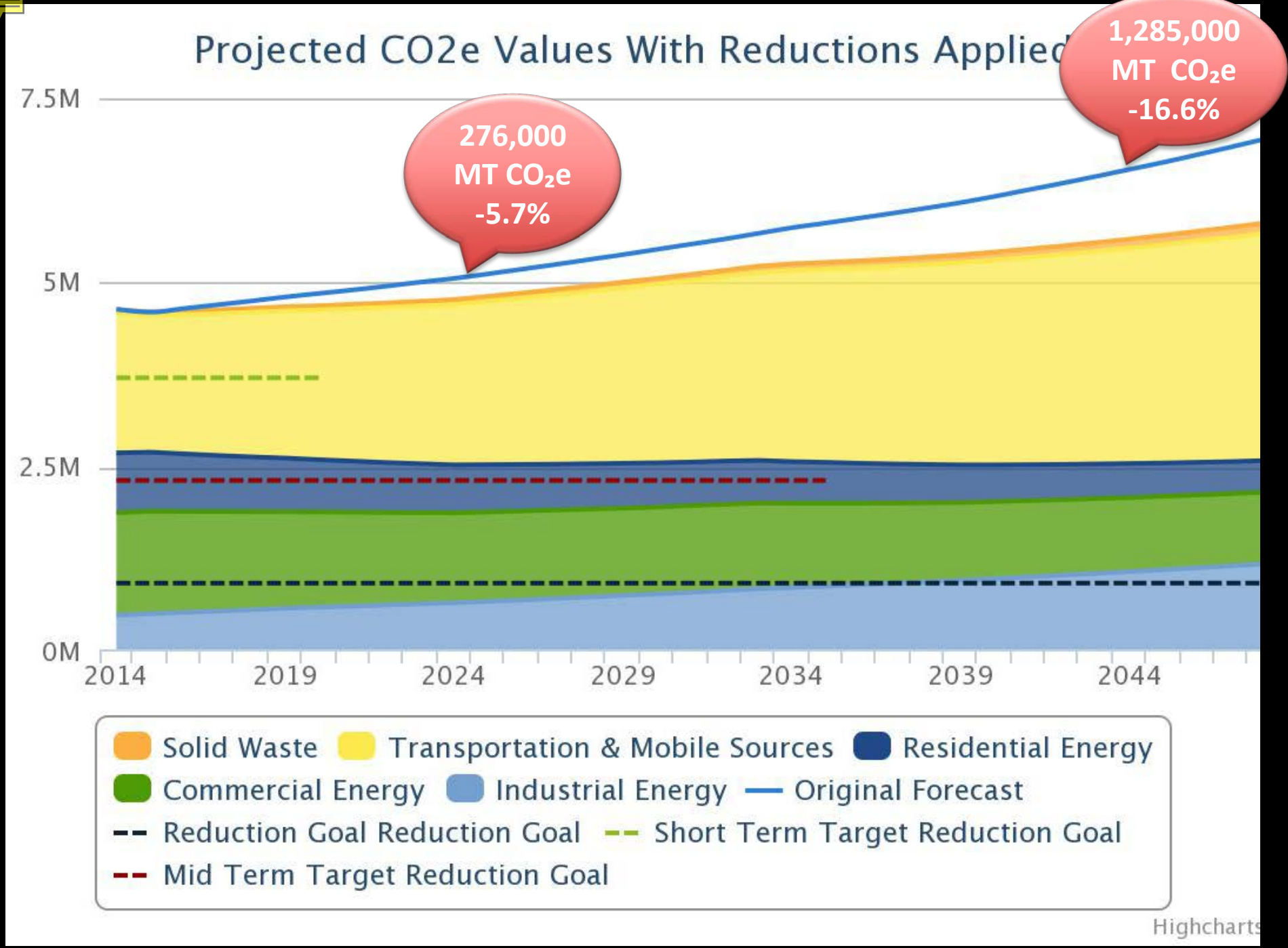


Forecast Using Clean Power Plan with EIA

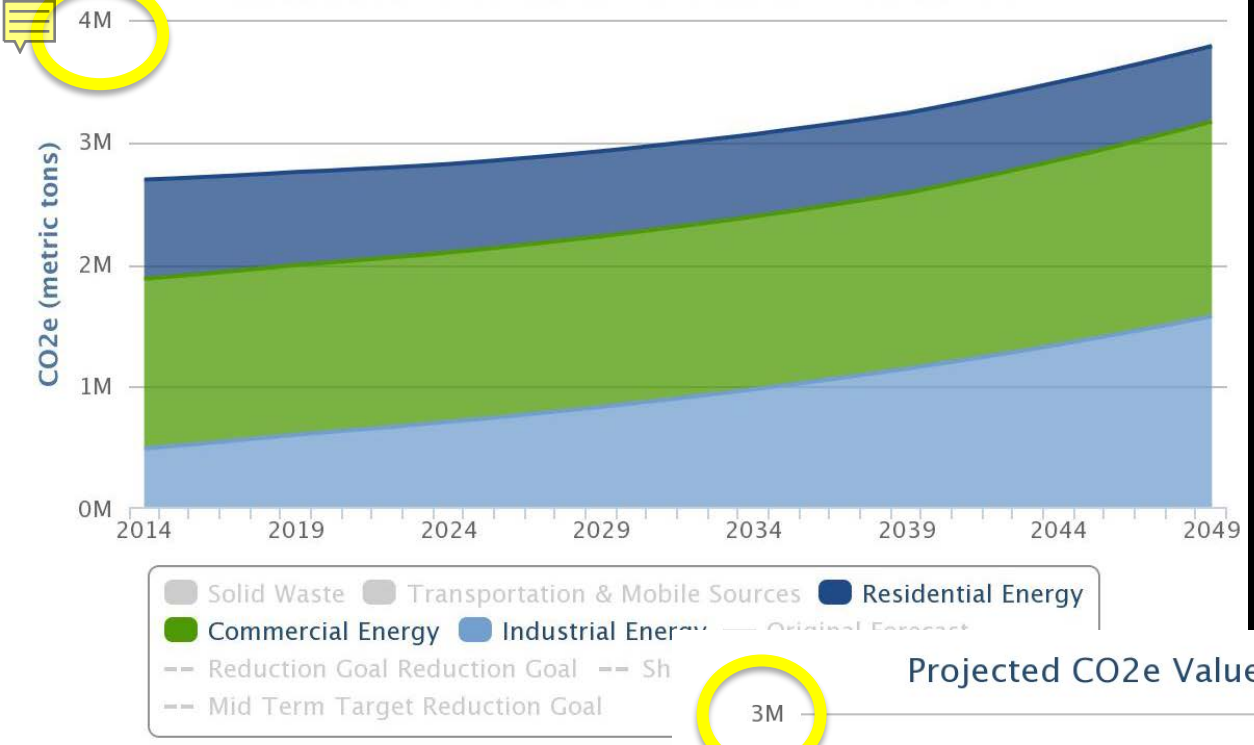


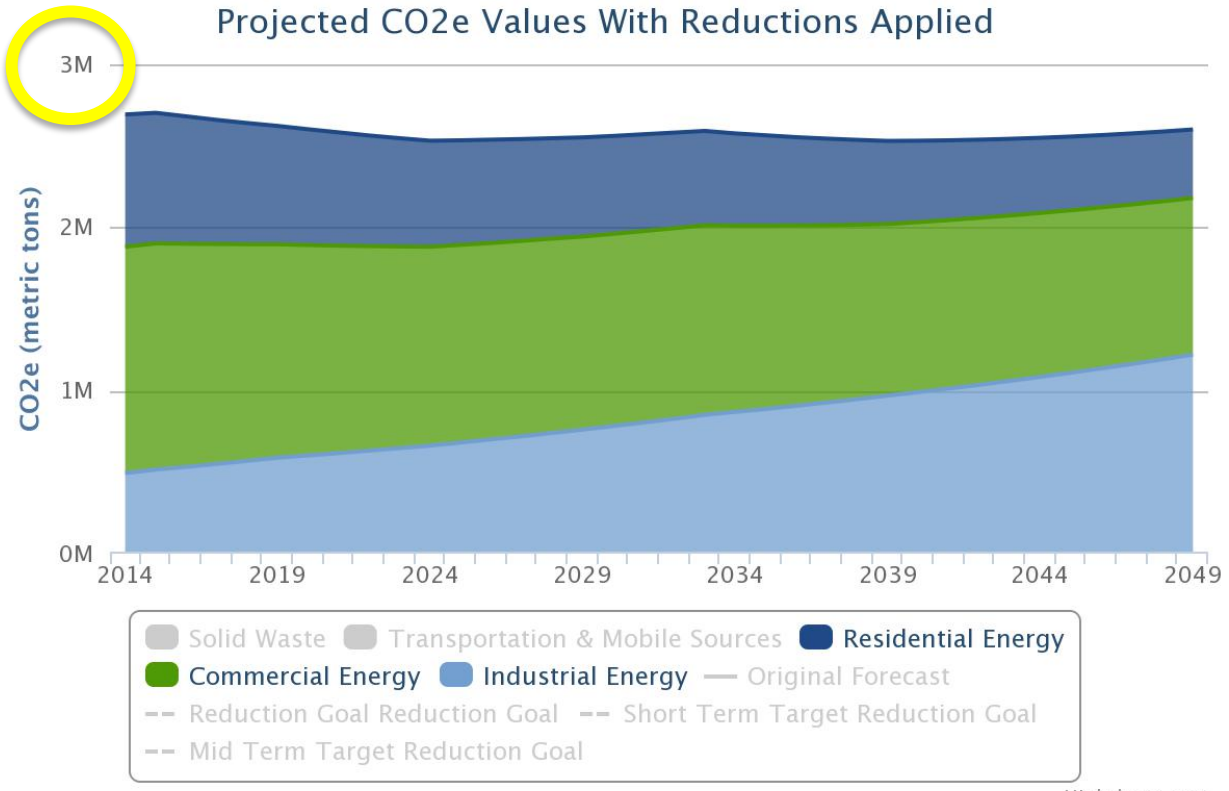
25% to 100% Renewable Electricity

- End of statewide RPS
- Utility agreement to increase renewables
- Example of:
  - Minneapolis, MN – Memorandum
  - Boulder, CO – Municipalization
  - Austin, TX – 100% by 2050

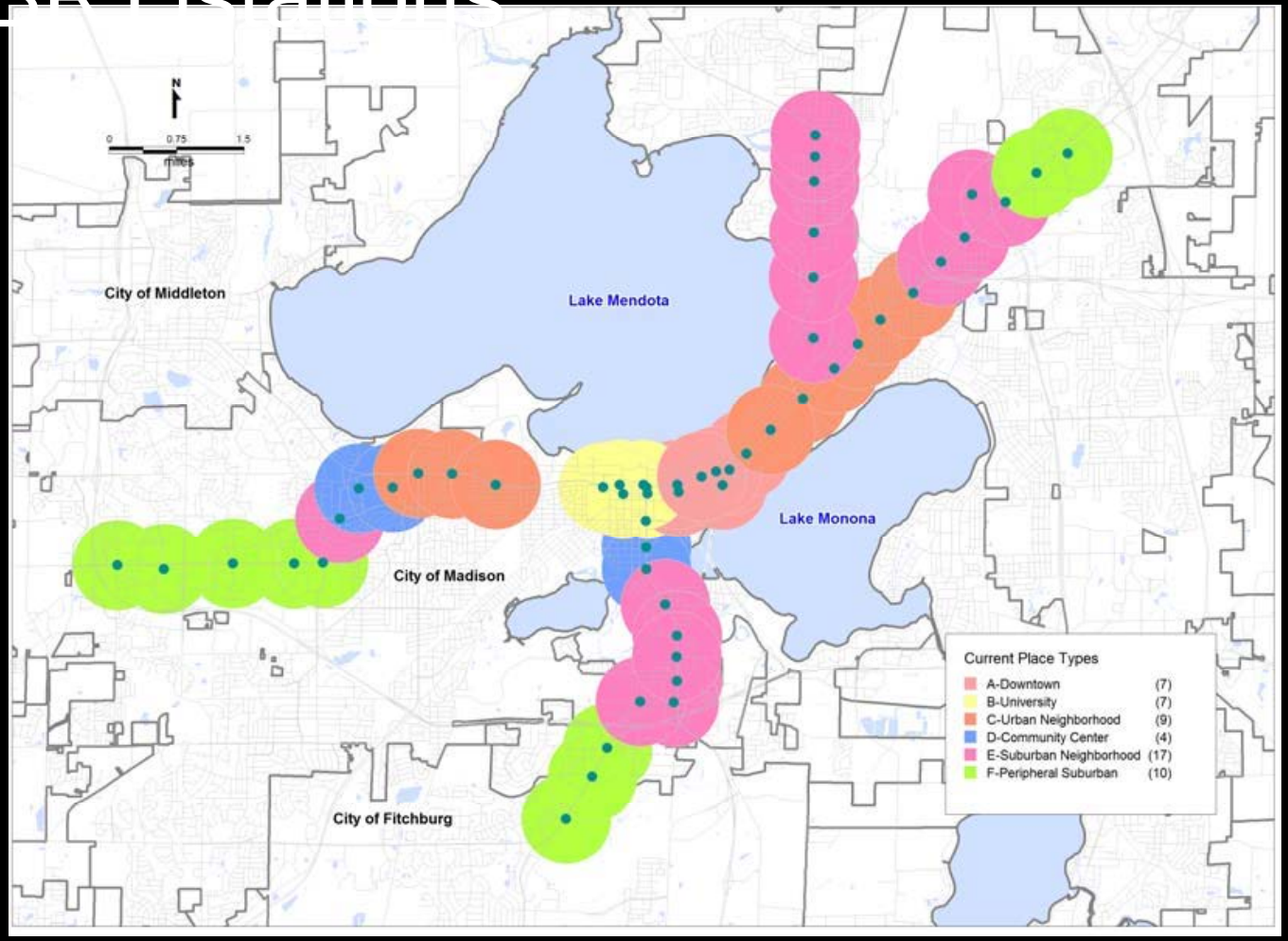

Projected CO2e Values With Reductions Applied
1,285,000
MT CO₂e
-16.6%
276,000
MT CO₂e
-5.7%
7.5M
5M
2.5M
0M
2014
2019
2024
2029
2034
2039
2044
Solid Waste
Transportation & Mobile Sources
Residential Energy
Commercial Energy
Industrial Energy
Original Forecast
Reduction Goal Reduction Goal
Short Term Target Reduction Goal
Mid Term Target Reduction Goal
Highcharts

Renewable Energy Reduction strategy



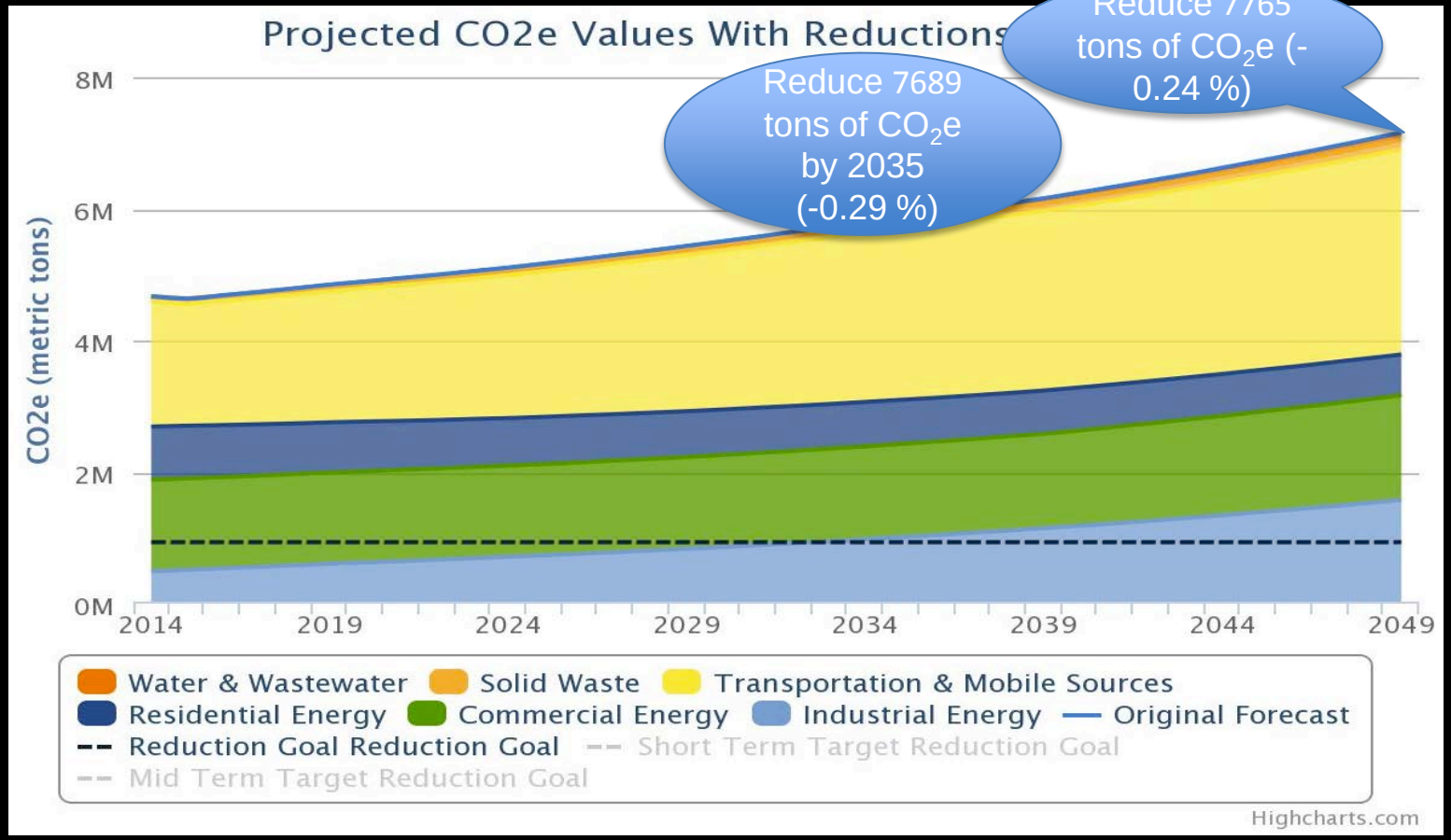


Transit-Oriented Development (TOD) along Bus Rapid Transit (BRT)stations



Source: Lagro et.al., 2013, CRSCC

GHG reduction by TOD



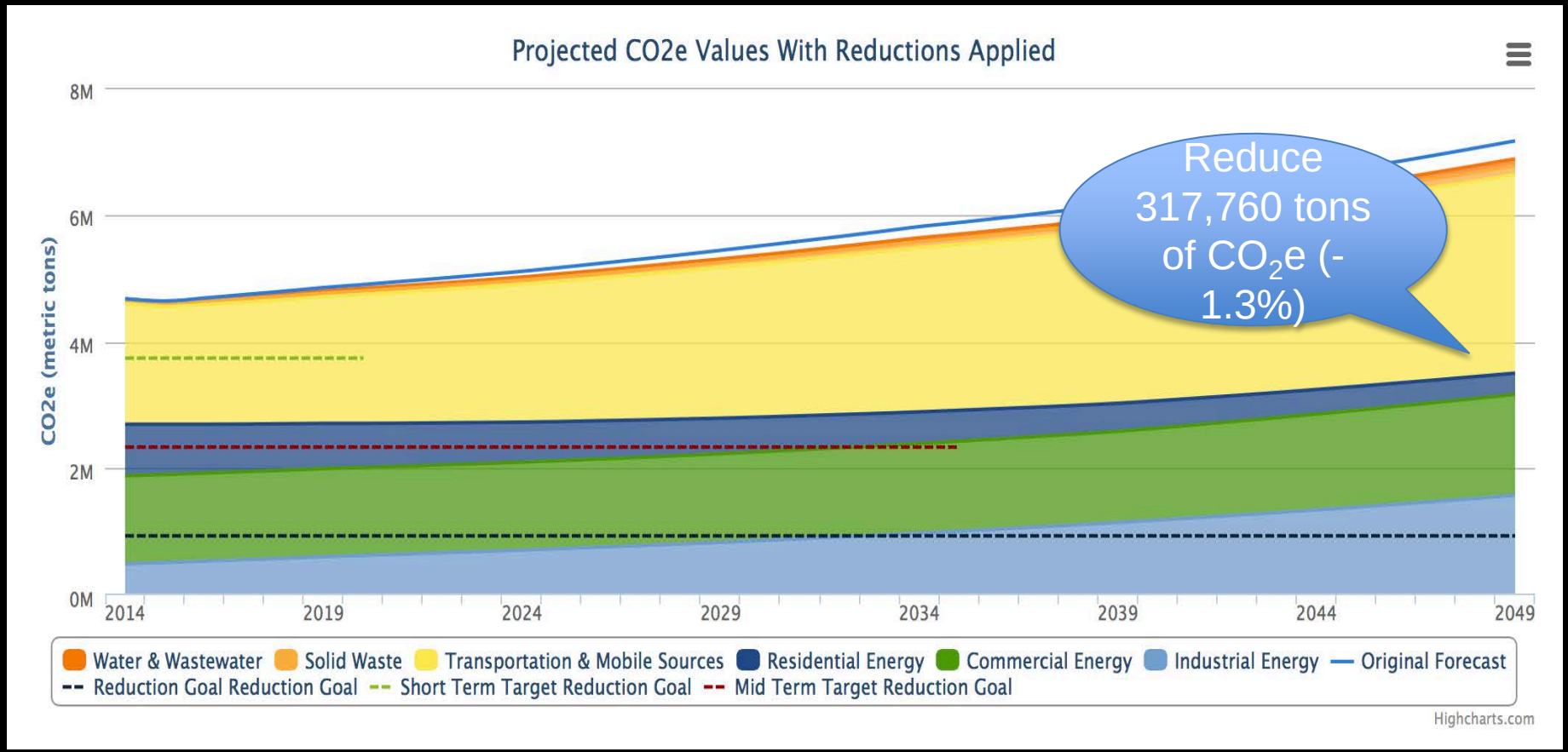
Reduction of 14.2 millions VMT by 2035

CO2-e reduction of 348 MT each year with the total of 6960 MT by 2035

Residential Benchmarking

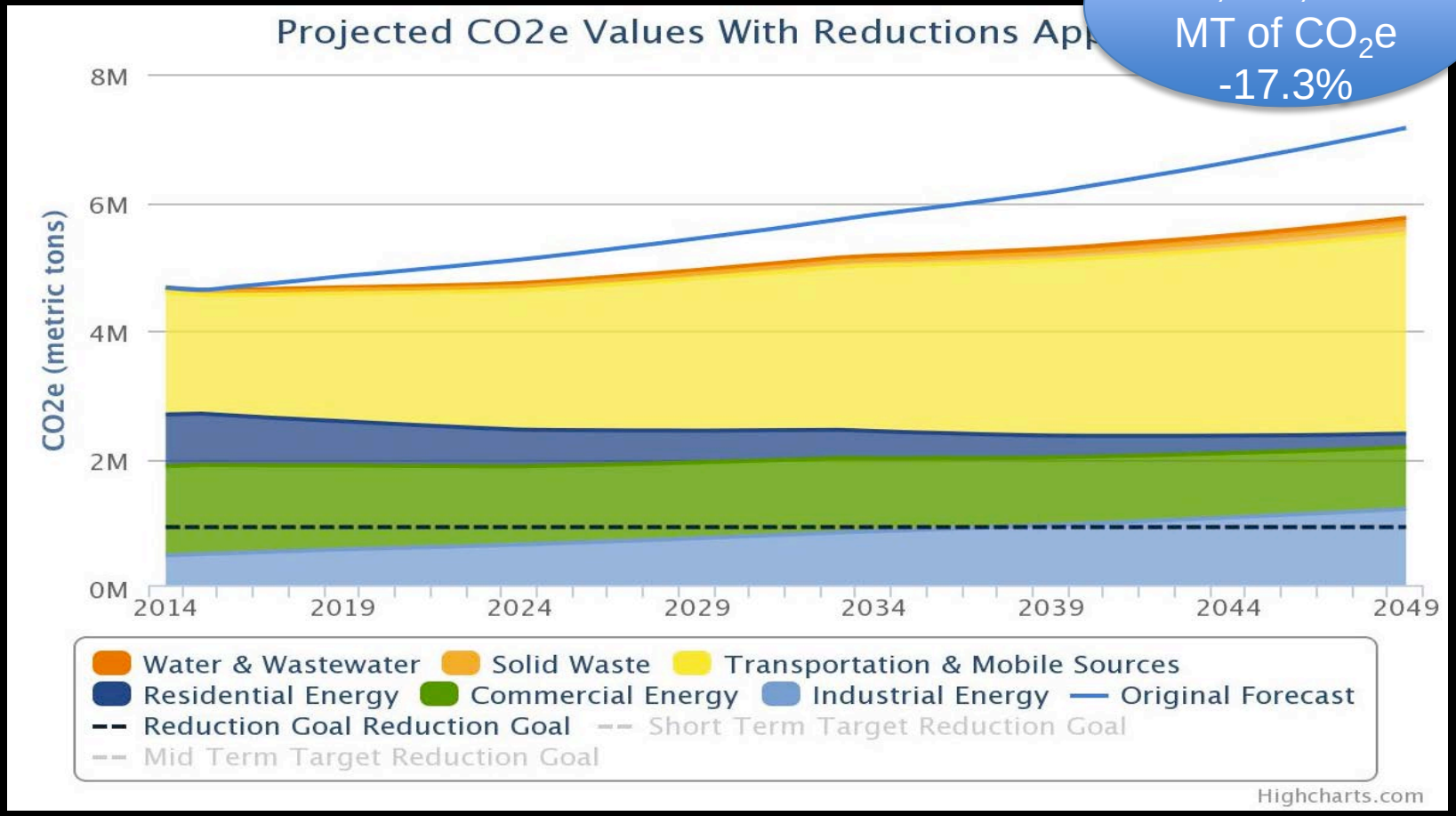
- Plan for Georgetown University Energy Prize competition in November 2014
- The City of Madison proposed to build a full-service retrofit program to reduce residential energy consumption.
- Total energy savings from residential benchmarking is about 114,840 MBtu per year.
- Annual energy cost savings: $2,423,156
- Accumulative impacts: energy savings will continue after the competition.
- Long-term approach to engage more residential building owners over time.

Projected GHG emission with residential benchmarking applied

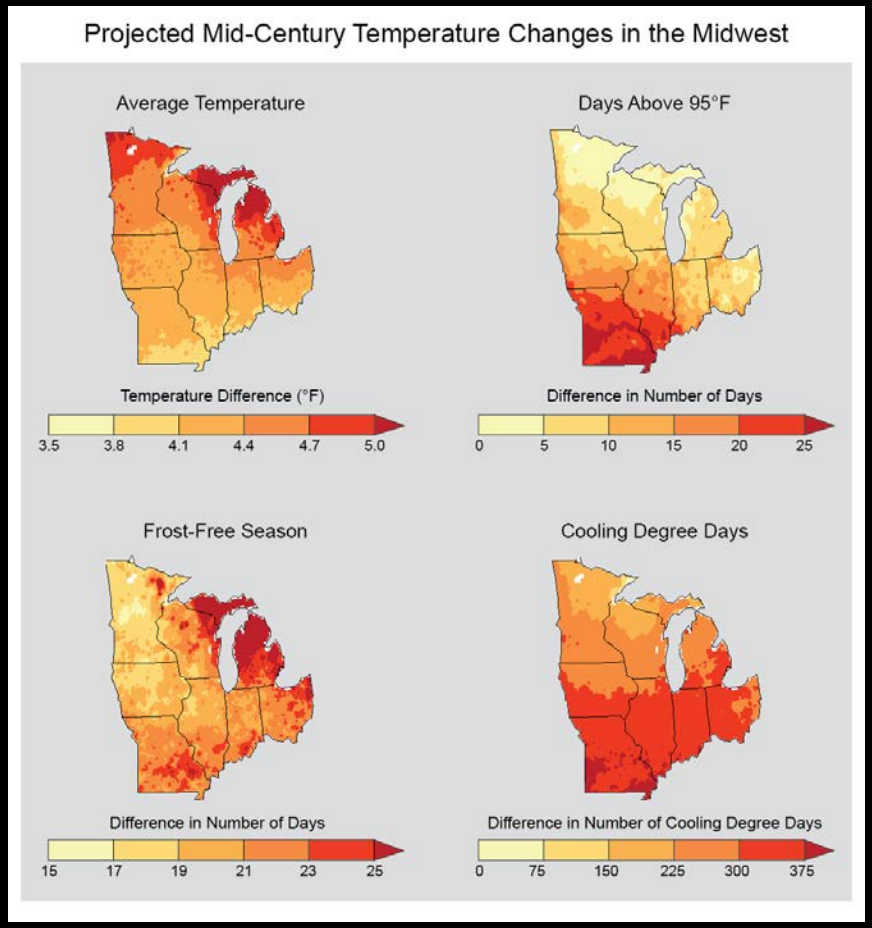


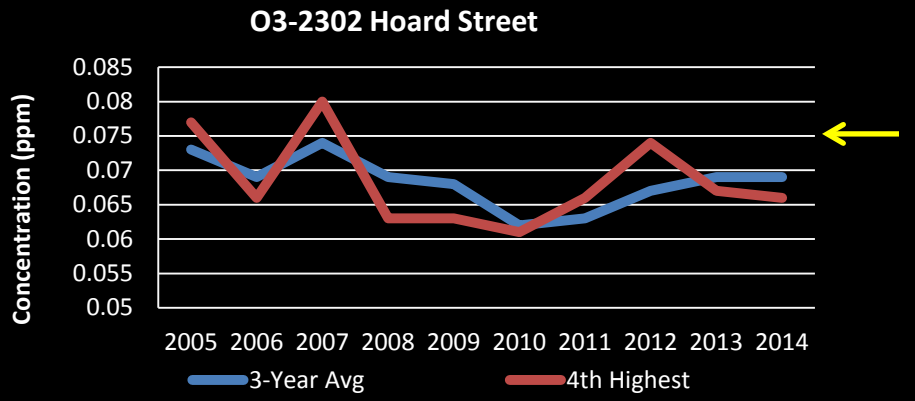
Total Reductions from Combined Strategies

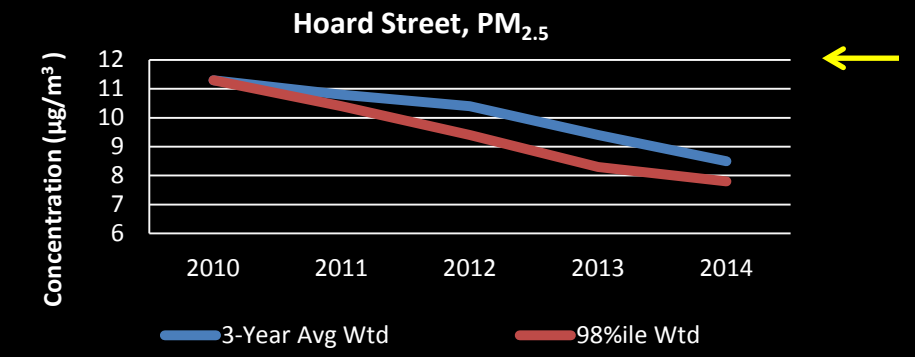
Reduce 1,241,435 MT of CO_2e -17.3%

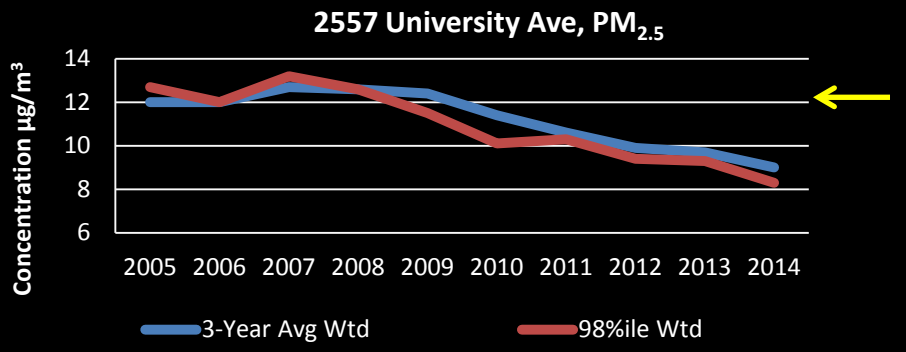


Community Implications









Source: National Climate Assessment 2014

Conclusions and Recommendations

- Madison has a lot of work to do to meet 80% reductions by 2050
- Heavy renewable investment works best
- Making residences energy efficient helps
- Transportation is the largest contributing sector in Madison and requires more R&D to find best suitable solutions for our community

Thank you!

Jeanne Hoffman (City of Madison)

J.R. Killigrew (ICLEI)

Paul Wilson (UW-Madison)