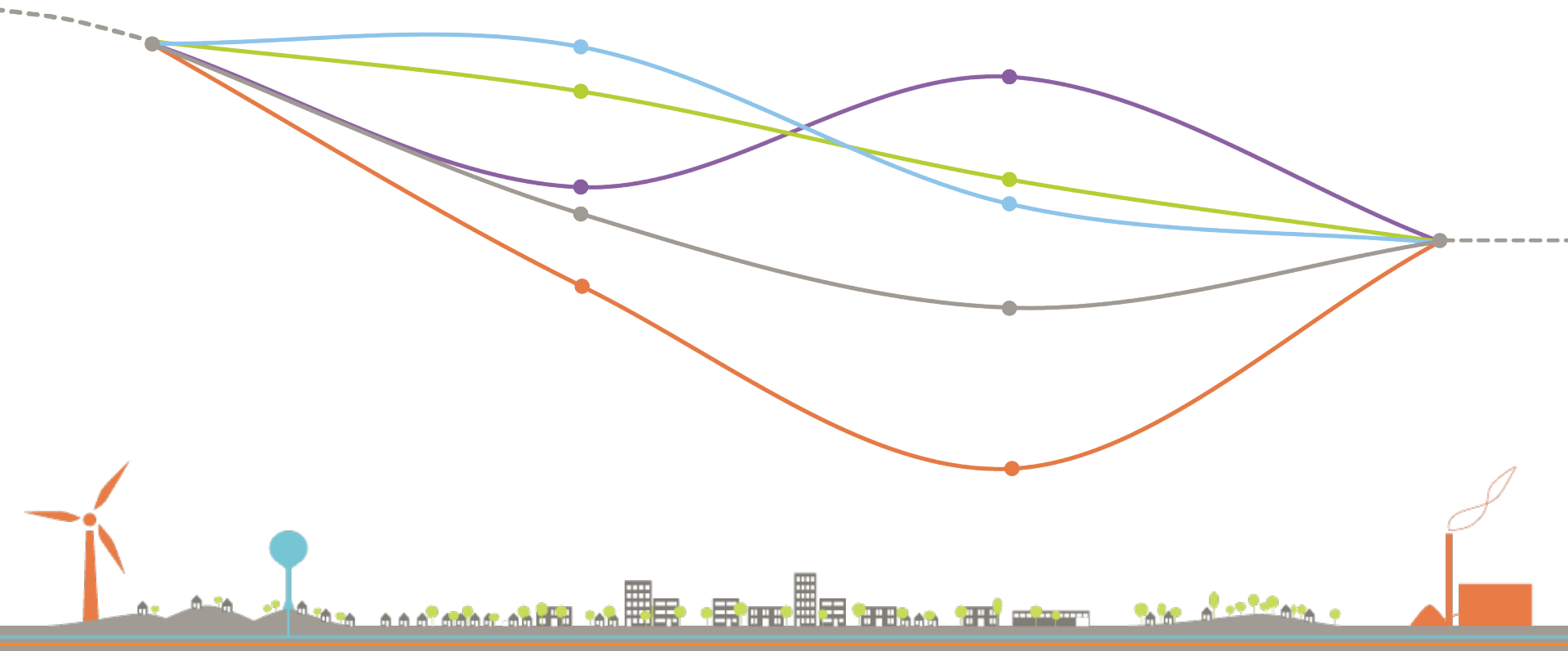
REGIONAL INDICATORS INITIATIVE AND CLIMATE REALITY

Energy Design Conference

Rick Carter, LHB Inc. and DyAnn Andybur, Energy Coordinator – City of Duluth

An Inventory of Energy, Potable Water, Travel, Waste, and Greenhouse Gas Emissions for Twenty one Minnesota Cities from 2008 to 2012.



February 26, 2014

BACKGROUND

Minnesota Pollution Control Agency's GreenStep Cities Program:

- Choose from 28 best management practices (BMPs)
- GreenStep Cities tracks which BMPs cities have adopted, but does not currently have a method of tracking the effectiveness of these strategies
- GreenStep Cities Pilot

Regional Indicators Initiative Pilot

- Edina
- Falcon Heights
- Saint Louis Park

REGIONAL INDICATORS INITIATIVE

PARTICIPATING CITIES

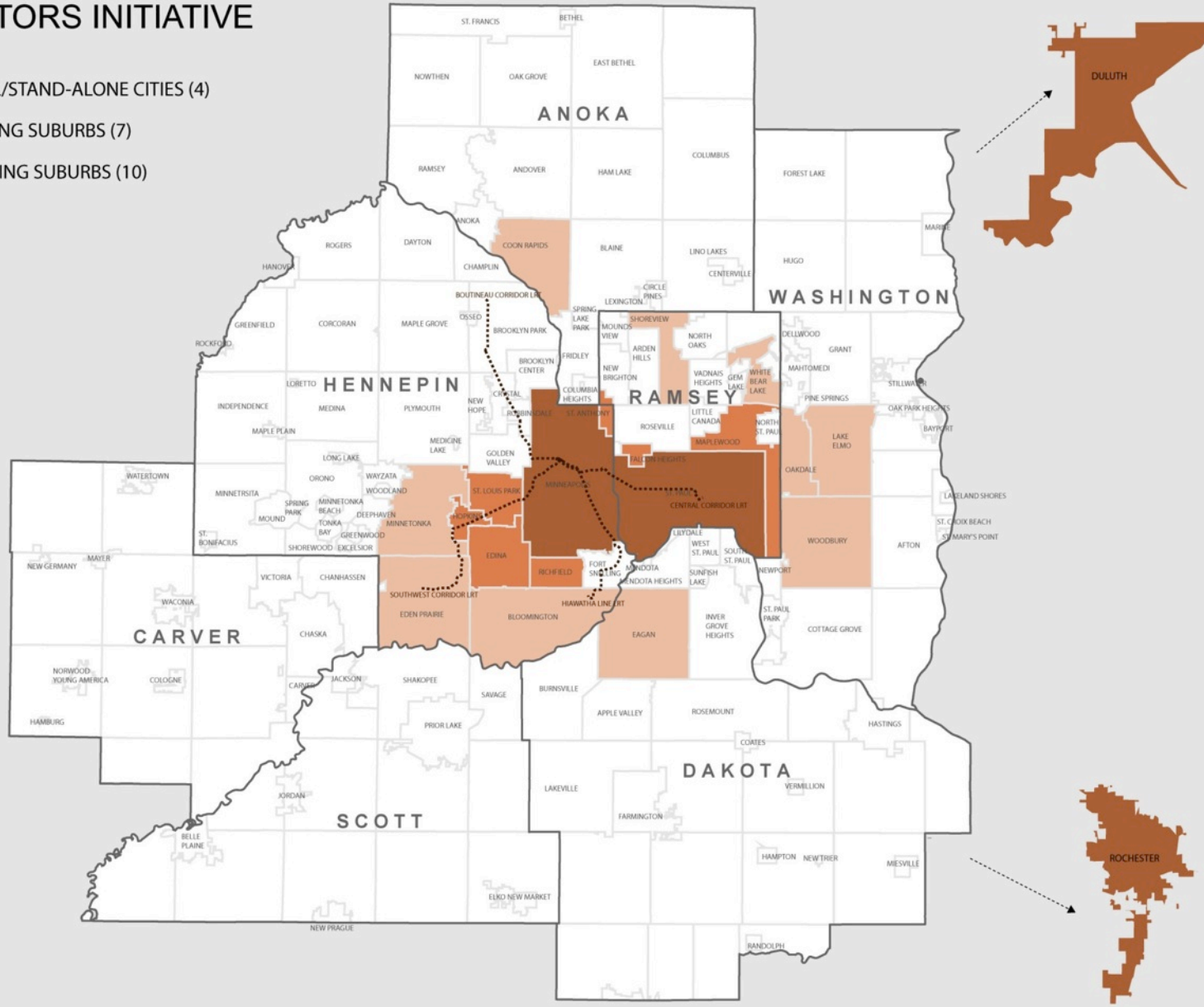
- RII PARTICIPANTS - CENTRAL/STAND-ALONE CITIES (4)
- RII PARTICIPANTS - INNER-RING SUBURBS (7)
- RII PARTICIPANTS - OUTER-RING SUBURBS (10)

The Regional Indicators Initiative participants include:

of the seven county metropolitan area population,
1,330,326 PEOPLE

and:

of total MN population
1,525,529 PEOPLE



METRICS

ENERGY (IN BTUS): electricity, natural gas, and district energy consumed citywide (subdivided into residential and commercial/industrial)

WATER (IN GALLONS): potable water consumed citywide (subdivided into residential and commercial/industrial)

TRAVEL (IN VEHICLE MILES TRAVELED): on-road distance traveled within city limits

WASTE (IN POUNDS): citywide municipal solid waste managed via recycling, composting, combustion, and landfilling (prorated from countywide data)

COMMON METRICS

GREENHOUSE GAS EMISSIONS (IN TONNES CO_2E): citywide greenhouse gas emissions associated with each of the four indicators

COST (IN DOLLARS): cost estimates associated with each of the four indicators

ADDITIONAL DATA

DEMOGRAPHICS

All data is reported both as a total as well as in units/capita. Residential data is reported in units/household, and Commercial/Industrial data is reported in units/job

AREA

City Area (sf)

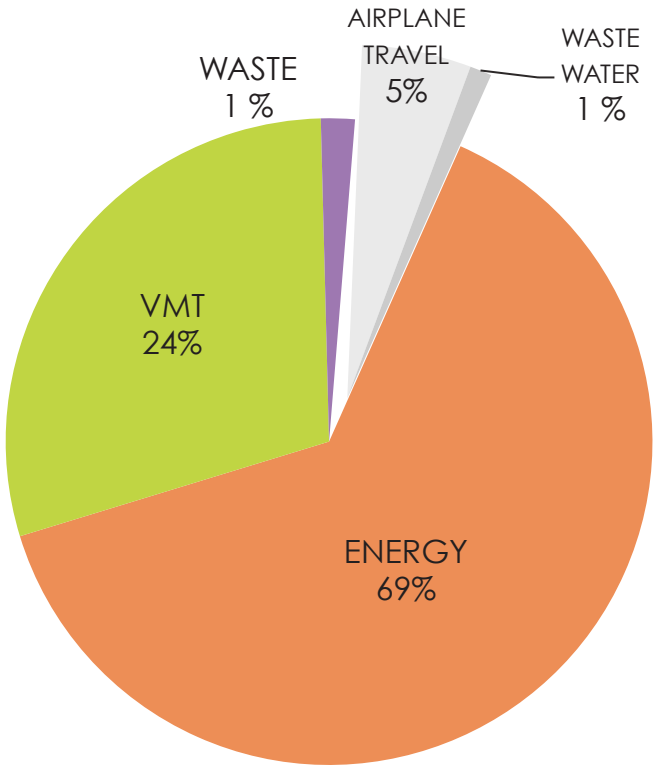
WEATHER

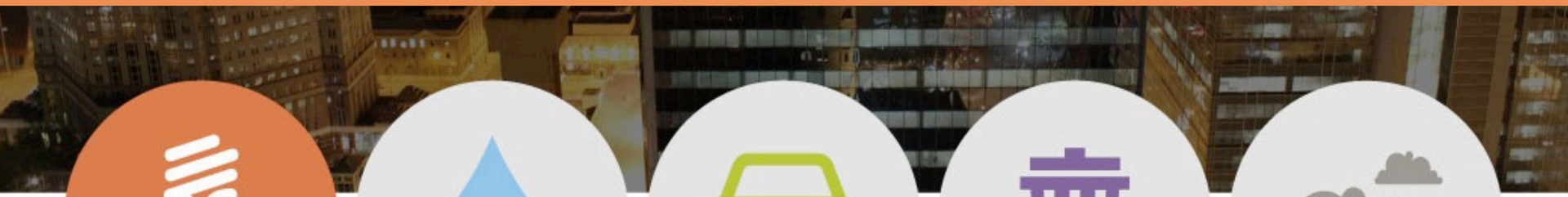
Heating Degree Days
Cooling Degree Days
Precipitation (in)

A COMMON METRIC

BREAKDOWN OF GREENHOUSE GAS EMISSIONS – 2011 (all 20 cities)

- RII follows the method outlined in the ICLEI Community Protocol
- Many cities have done greenhouse gas inventories, but this is the first state-wide effort of this scale
- For RII cities, energy is the largest contributor to emissions
- RII's primary metrics comprise over 90% of all in-boundary emissions
- Other emission sources were also calculated, including air travel and wastewater





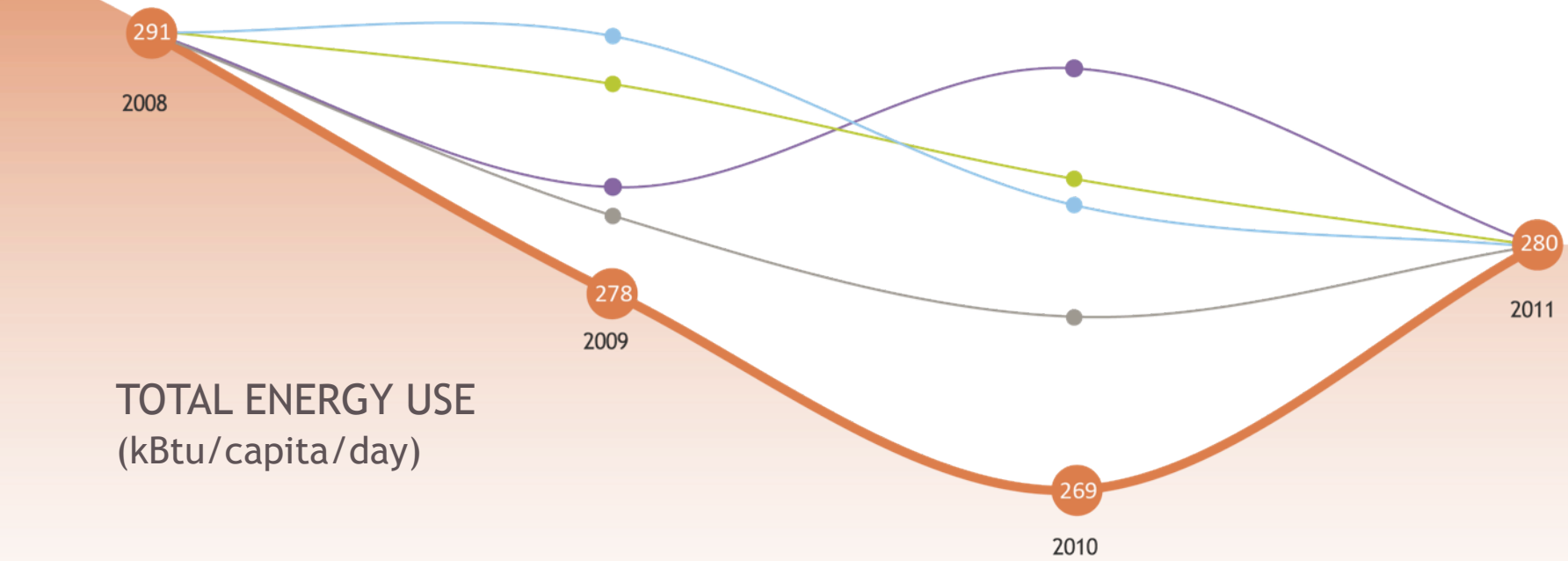
ENERGY
BRITISH THERMAL UNITS

WATER
GALLONS

TRAVEL
VEHICLE MILES TRAVELED

WASTE
POUNDS

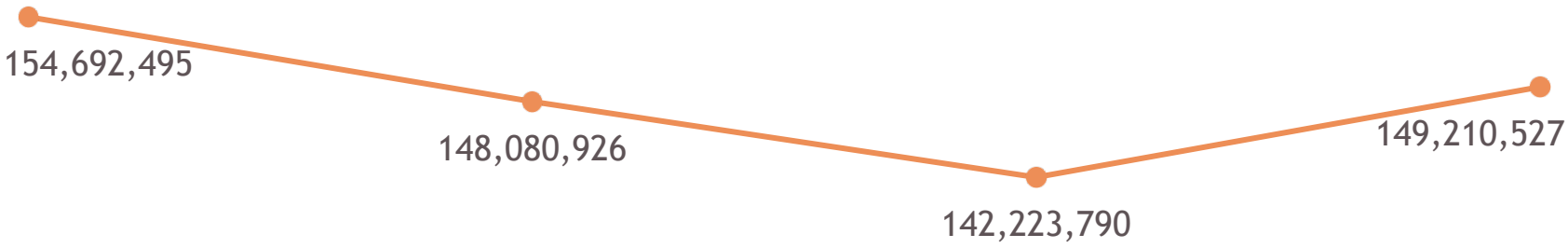
GHG EMISSIONS
CARBON DIOXIDE EQUIVALENTS



TOTAL ENERGY USE
(kBtu/capita/day)

THE ‘CHECK MARK’ TREND

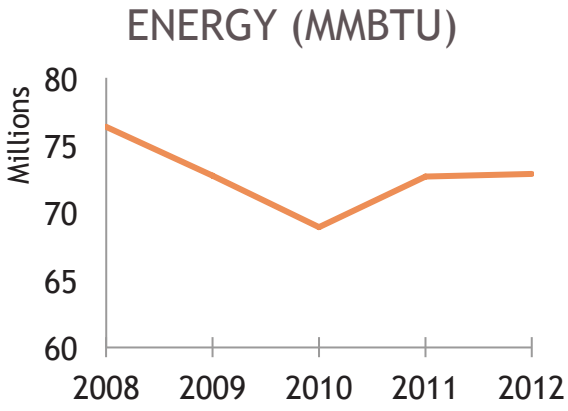
TOTAL ENERGY USE 2008-2011 (MMBtu/year)

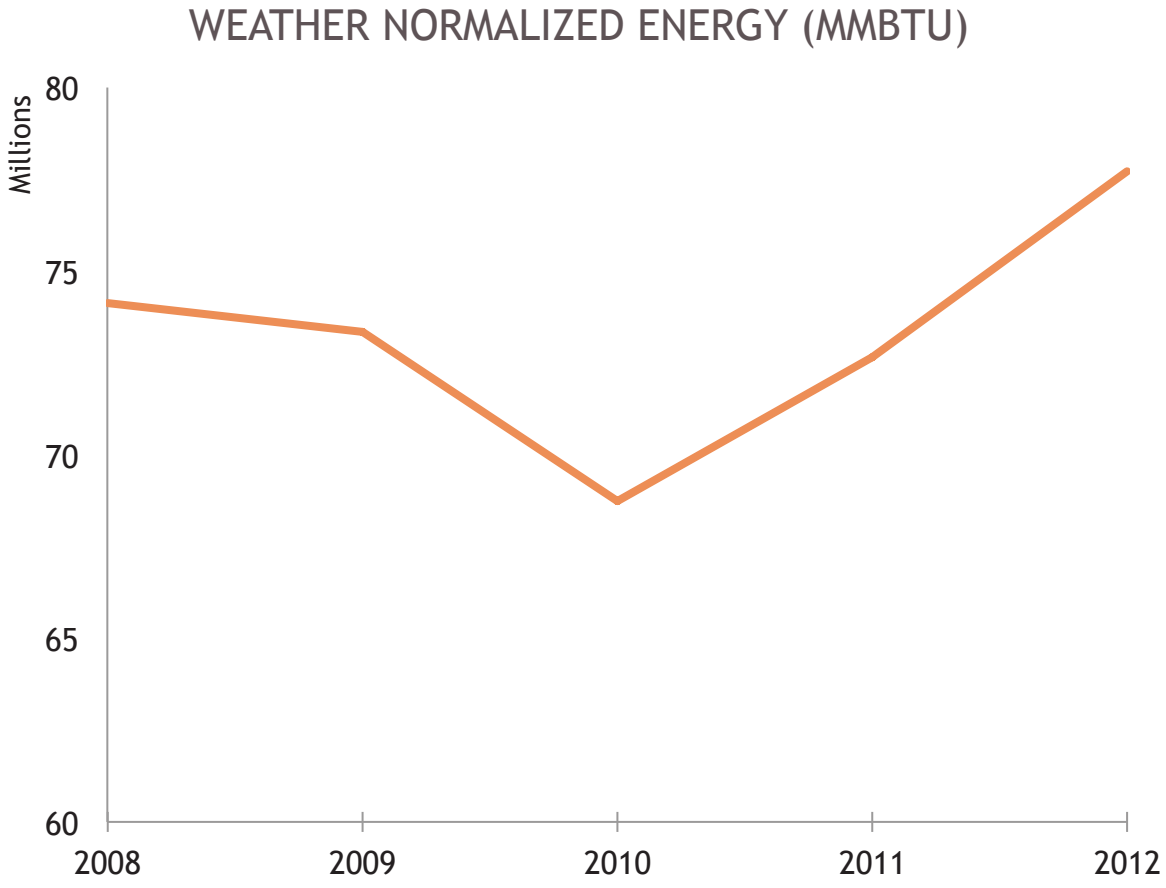


INITIAL 2012 DATA

TWELVE CITIES

2012 was a hot year, with increased electricity use from 2011 and decreased natural gas use in most cities.

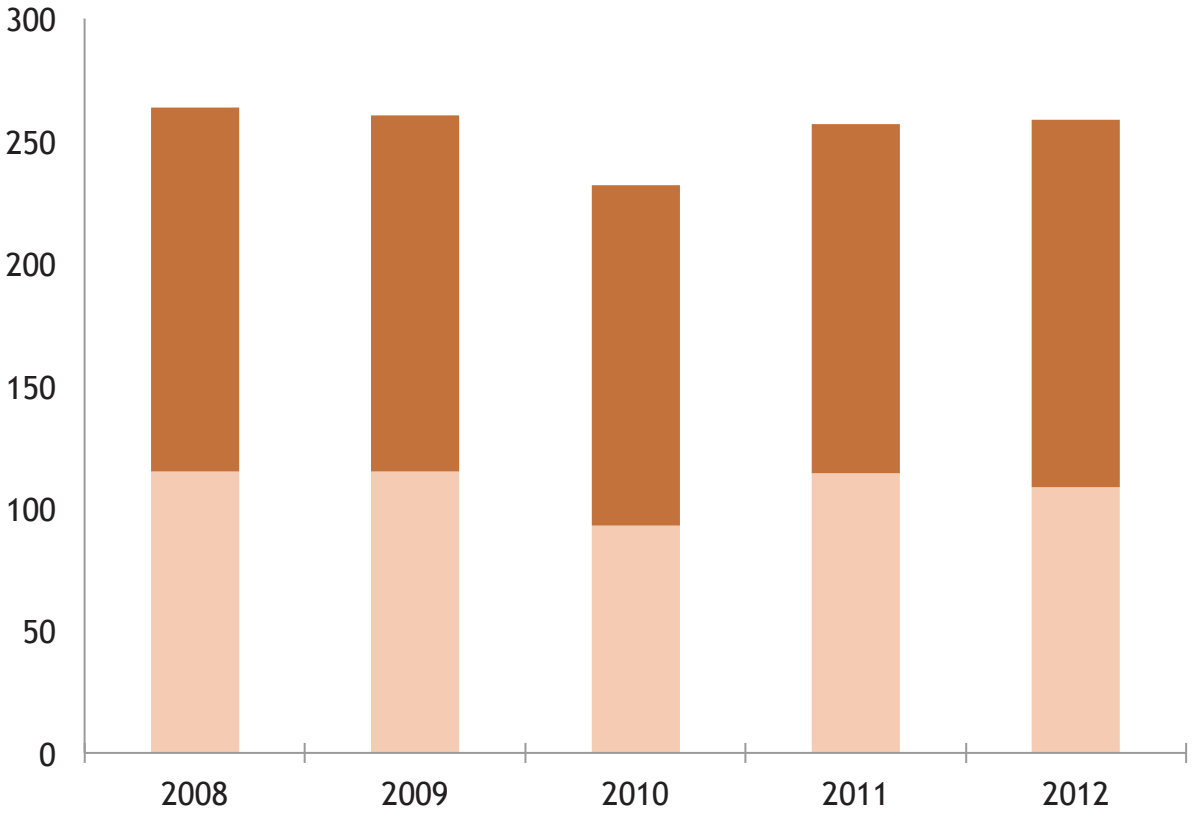




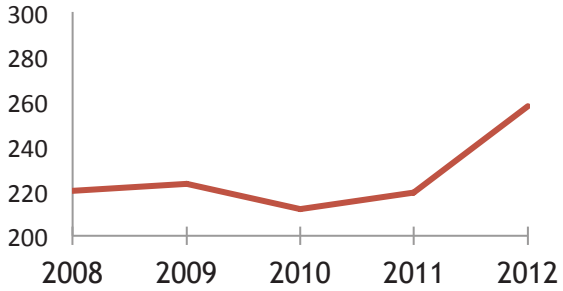
INITIAL 2012 DATA

TWELVE CITIES – WEATHER NORMALIZED

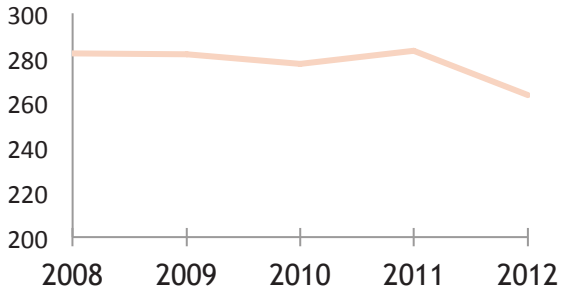
ENERGY/CAPITA/DAY



COMMERCIAL/INDUSTRIAL ENERGY/JOB/DAY

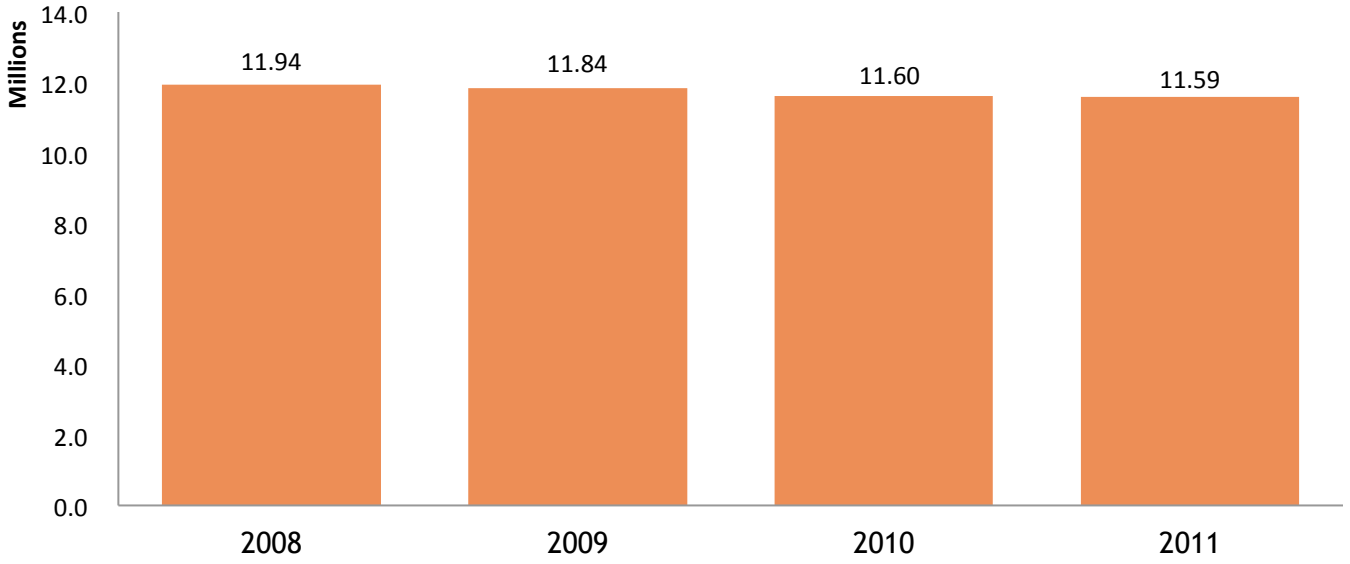


RESIDENTIAL ENERGY/ HOUSEHOLD/DAY



EXPLORE THE DATA

WEATHER NORMALIZED ENERGY – DULUTH (MMBtu)



CITIES

- ALL CITIES
- ALL CENTRAL / STAND-ALONE
  - Duluth
  - Minneapolis
  - Rochester
  - St. Paul
- ALL INNER-RING SUBURBS
  - Richfield
  - Hopkins
  - St. Louis Park
  - St. Anthony
  - Edina
  - Falcon Heights
  - Maplewood
- All OUTER-RING SUBURBS
  - White Bear Lake
  - Coon Rapids
  - Oakdale
  - Shoreview
  - Eagan
  - Eden Prairie
  - Minnetonka
  - Woodbury
  - Lake Elmo

TIMELINE

- ALL YEARS (2008-2011)
- 2008
- 2009
- 2010
- 2011

ADD AVERAGES

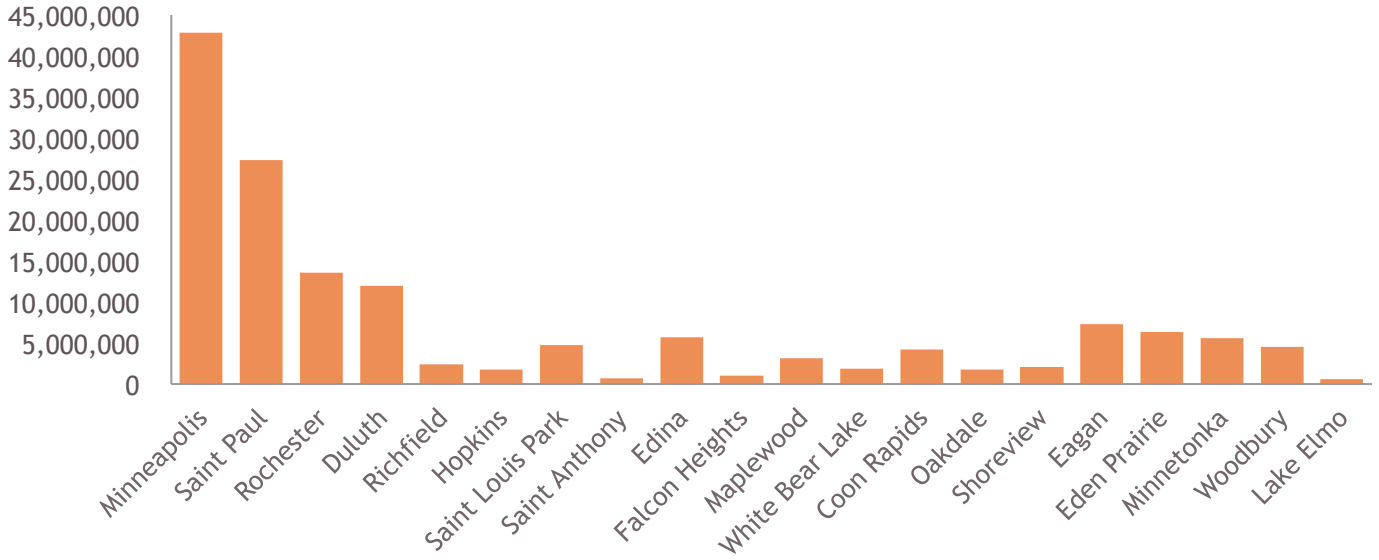
- Central/Stand-Alone Cities
- Inner-Ring Suburbs
- Outer-Ring Suburbs
- MN State average
- US Average

NORMALIZE

- None
- By Population (per capita)
- By Weather/Rainfall
- By Household
- By Job

EXPLORE THE DATA

TOTAL ENERGY - 2011 (kBtu)



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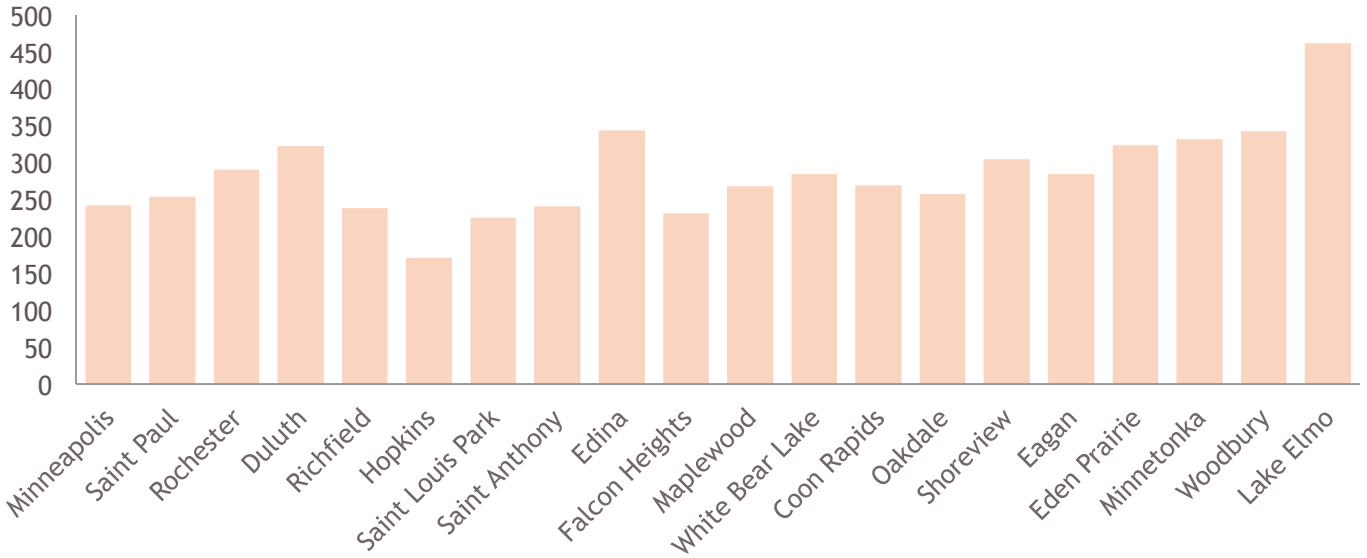
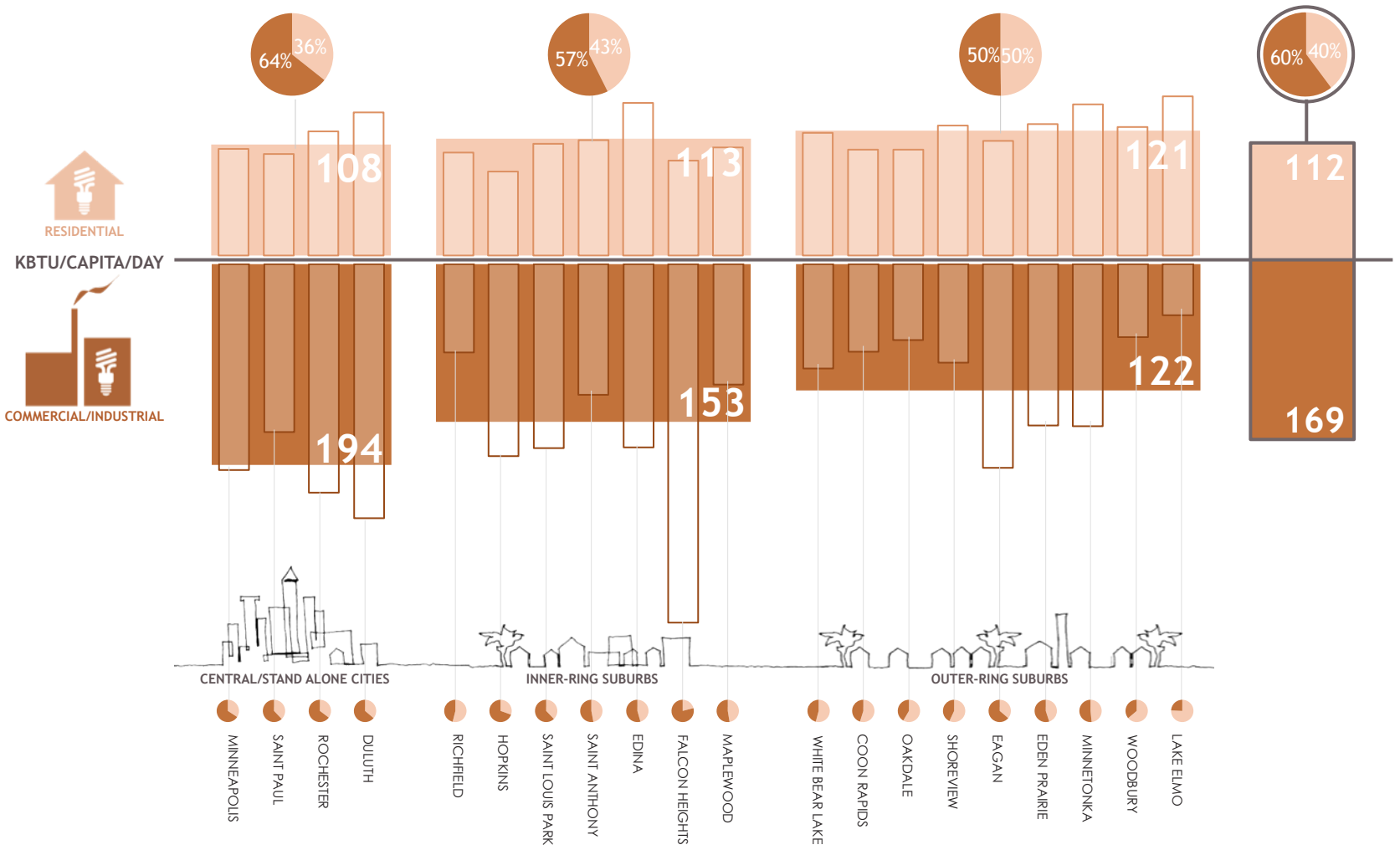
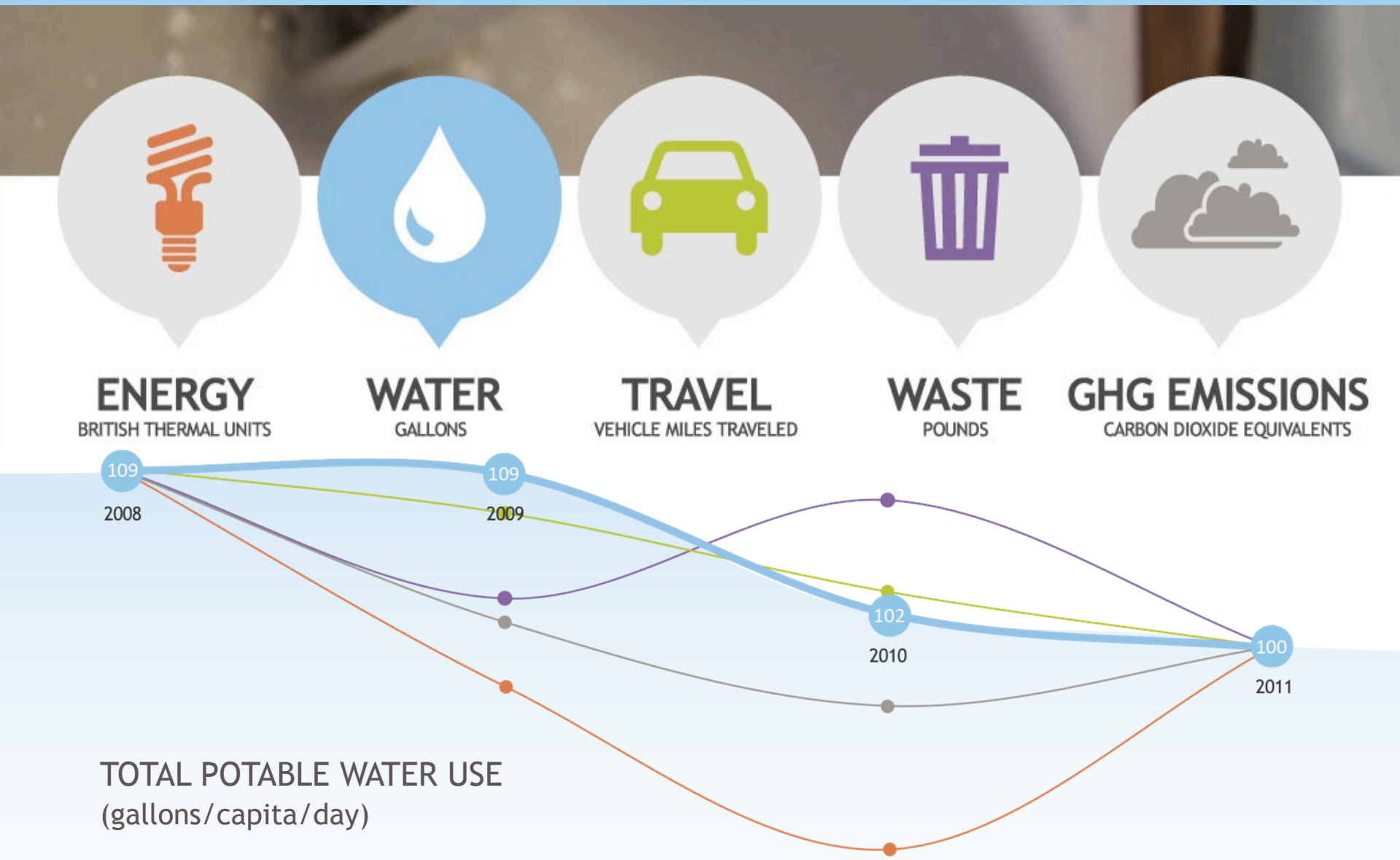
EXPLORE THE DATA

RESIDENTIAL ENERGY – 2011 (kBtu/household/day)



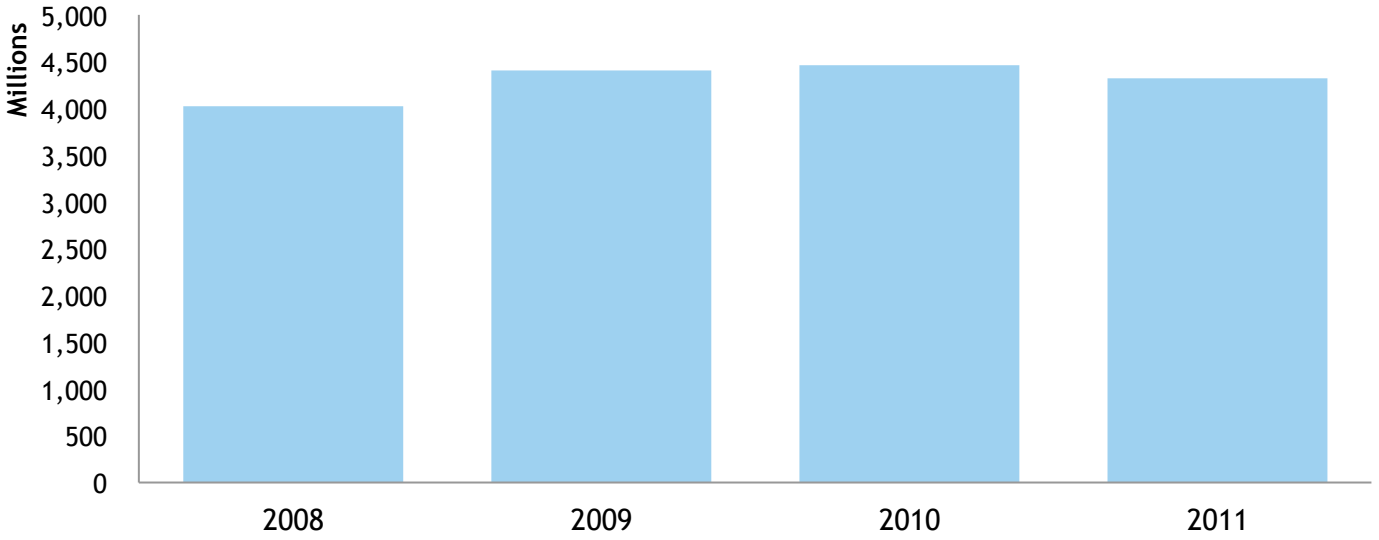
ENERGY USE - 2011




ENERGY
BRITISH THERMAL UNITS
WATER
GALLONS
TRAVEL
VEHICLE MILES TRAVELED
WASTE
POUNDS
GHG EMISSIONS
CARBON DIOXIDE EQUIVALENTS
109
2008
109
2009
102
2010
100
2011
TOTAL POTABLE WATER USE
(gallons/capita/day)

EXPLORE THE DATA

WATER USE – DULUTH (gallons)



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ADD AVERAGES

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- MN State average
- US Average

NORMALIZE

- None
- By Population (per capita)
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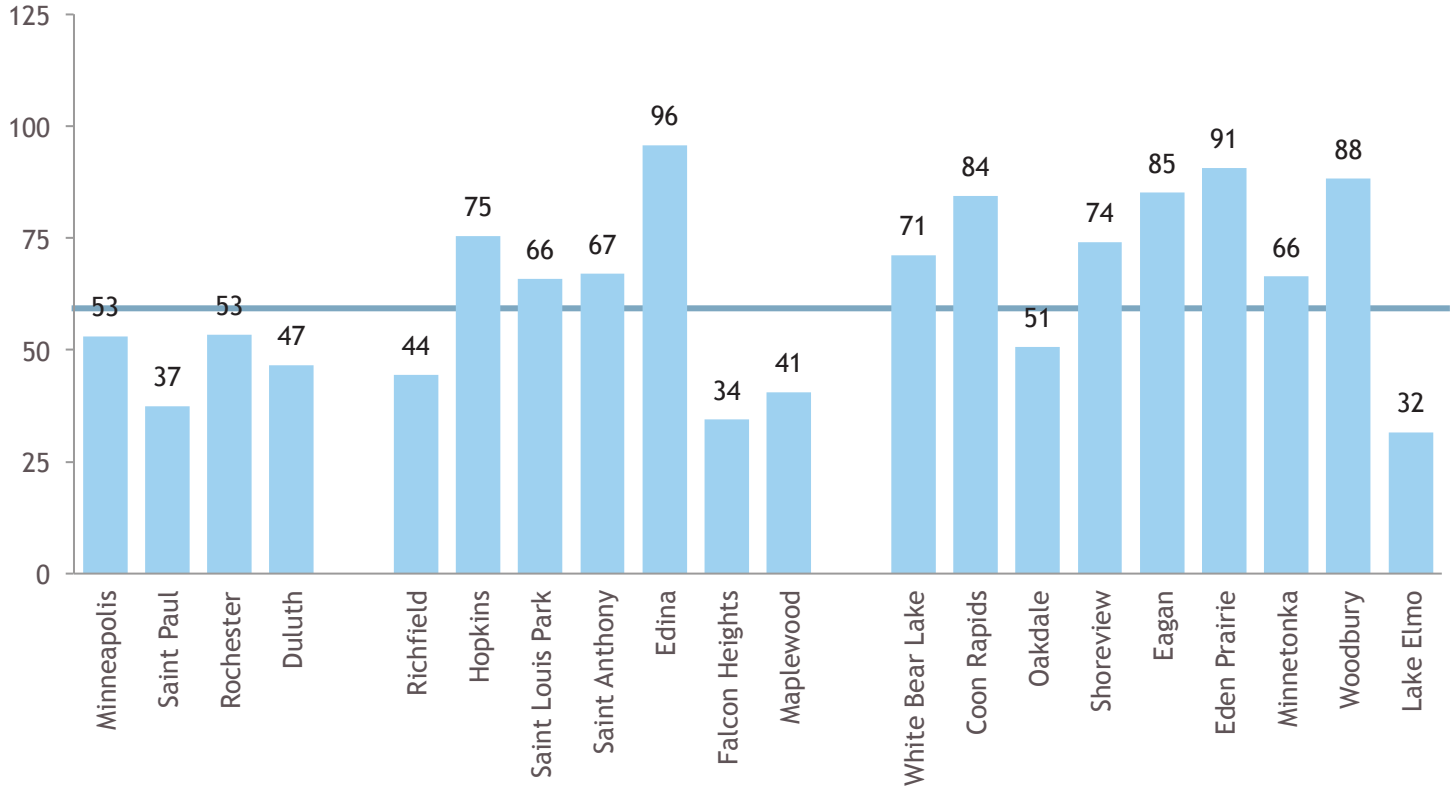
- By Household
- By Job

RESIDENTIAL WATER USE

GALLONS/CAPITA/DAY - 2011



RII AVERAGE, 58.0

CENTRAL/STAND-ALONE CITIES

47.3

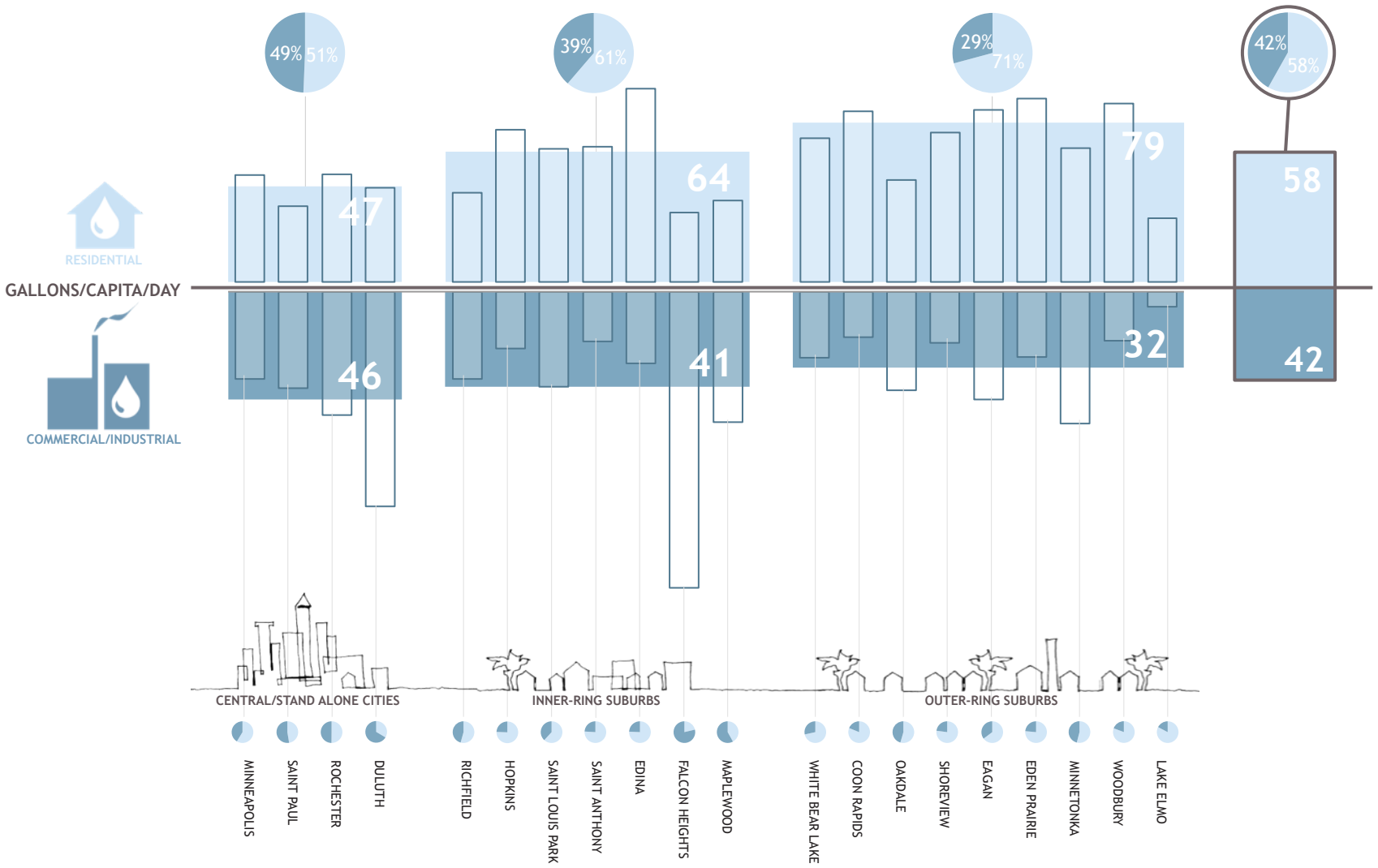
INNER-RING SUBURBS

64.4

OUTER-RING SUBURBS

78.8

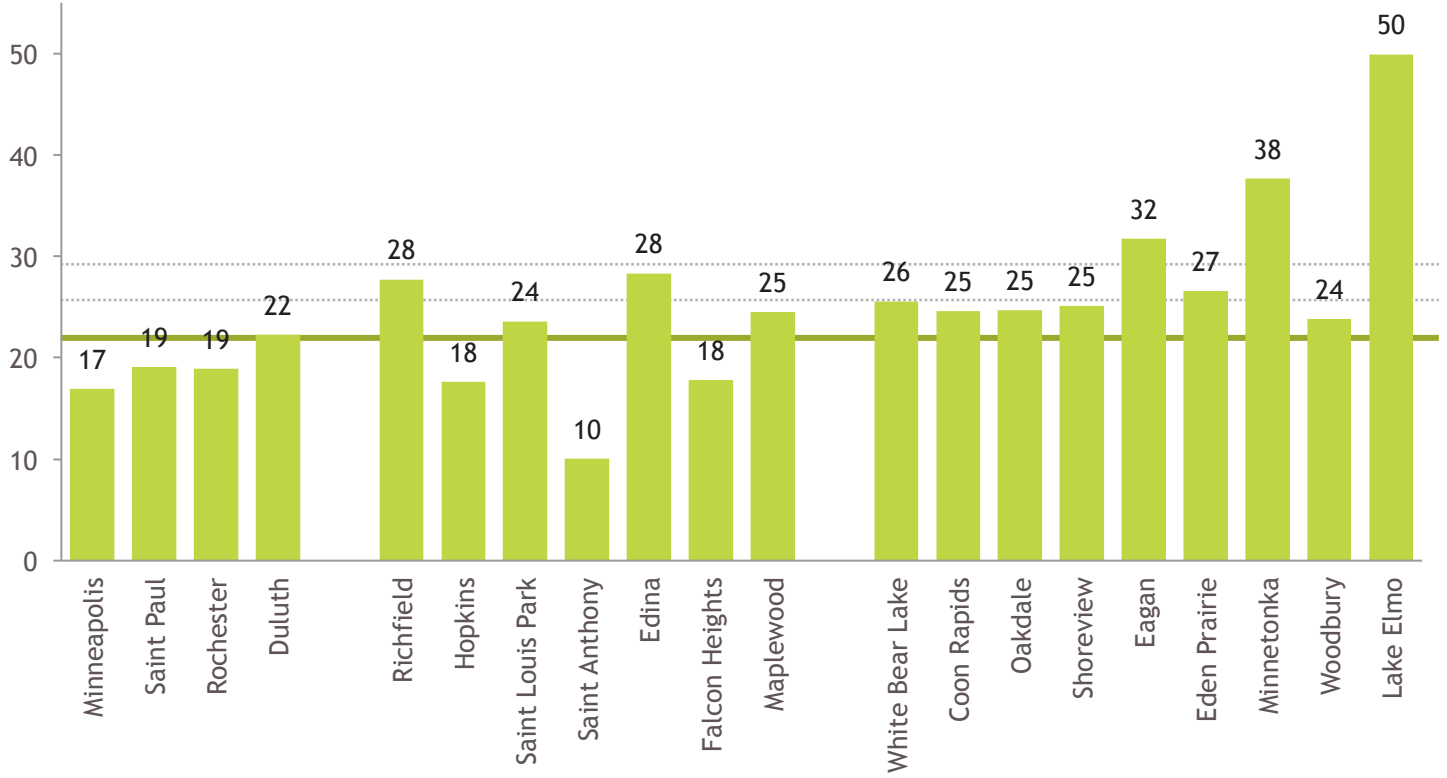
WATER USE - 2011




ENERGY
BRITISH THERMAL UNITS
WATER
GALLONS
TRAVEL
VEHICLE MILES TRAVELED
WASTE
POUNDS
GHG EMISSIONS
CARBON DIOXIDE EQUIVALENTS
26.5
2008
26.4
2009
26.2
2010
26.1
2011
TOTAL VEHICLE MILES TRAVELED
(VMT/capita/day)

VEHICLE MILES TRAVELED INCREASES AT GREATER DISTANCES FROM CENTRAL CITIES

VMT/CAPITA/DAY - 2011



MN AVERAGE, 29.1
US AVERAGE, 26.1
RII AVERAGE, 21.7

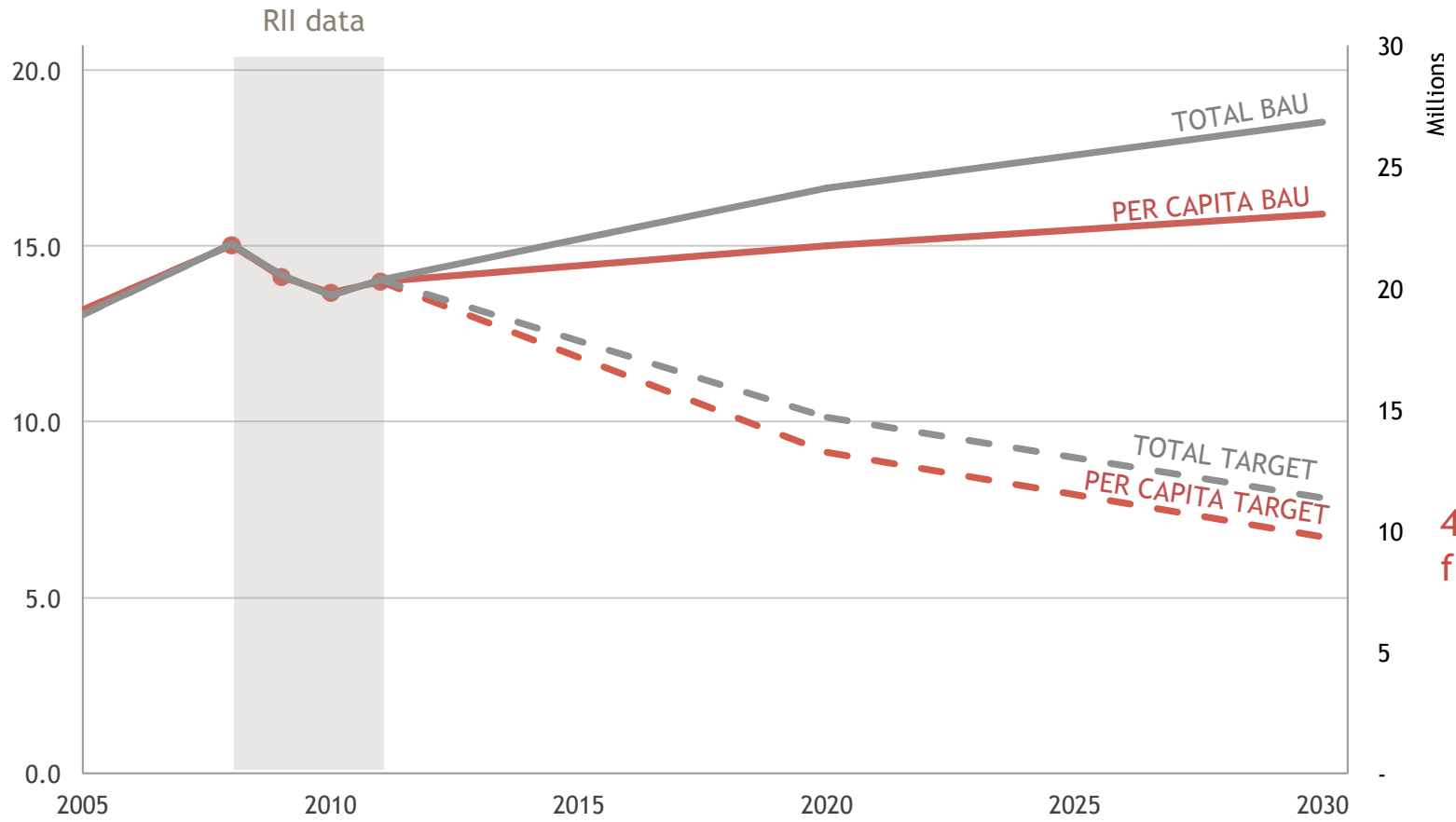
CENTRAL/STAND-ALONE CITIES
19.5

INNER-RING SUBURBS
21.4

OUTER-RING SUBURBS
30.1

SO WHAT?

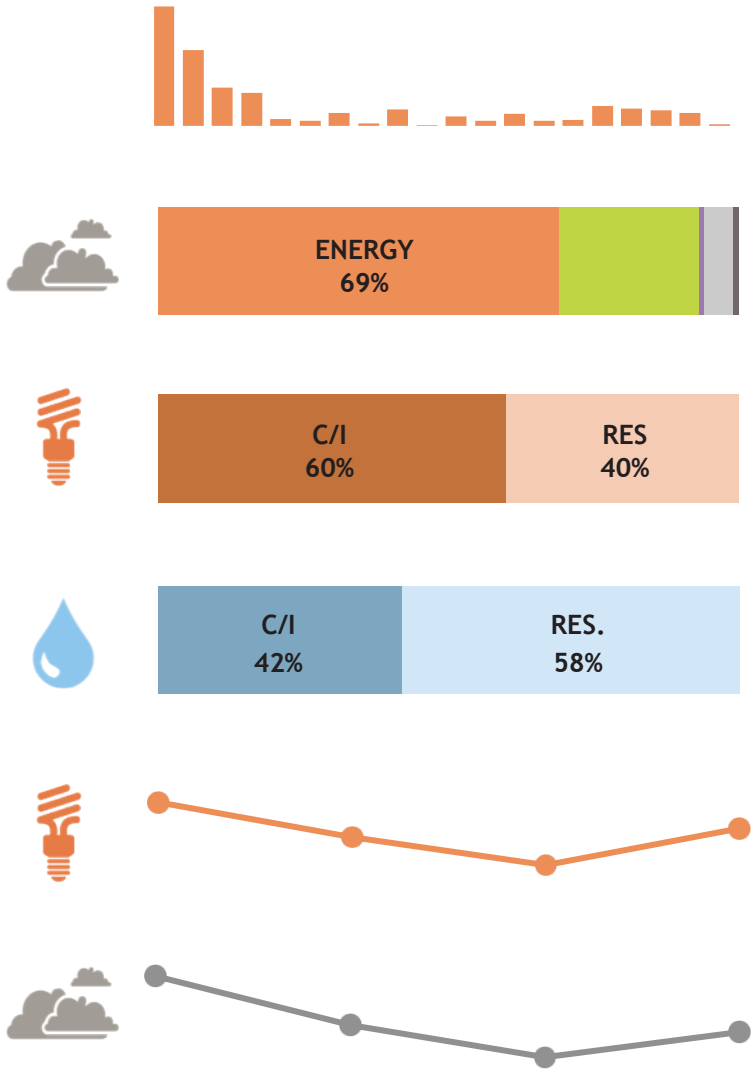
TOTAL GREENHOUSE GAS EMISSIONS FROM PRIMARY SOURCES (tonnes CO_2e/capita/year)



49% reduction from 2005

CONCLUSIONS

- It is possible to measure community-wide data and normalize by jobs, population, households, and weather
- This data collection helps cities establish a baseline to enable action and track their progress over time.
- Minnesota cities are interested in reducing their emissions, but our data shows that emissions are increasing.
- The Metropolitan Council decided to incorporate the Regional Indicators into the Thrive 2040 Regional Framework process.
- A next step could be reporting indicators in city comprehensive plans.



CITIES

- Bloomington
- Coon Rapids
- Duluth
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- Eden Prairie
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- Woodbury

HTTP://REGIONALINDICATORSMN.ULI.ORG/.

Peoples Cooperative Power Association

PARTNERS

CLIMATE CHANGE REALITY

DECEMBER 20, 2013

DyAnn Andybur, Duluth Minnesota, Climate Reality Project Volunteer

CLIMATE CHANGE

OR

CLIMATE CATASTROPHE

CLIMATE CHANGE IS REAL

CALL IT GLOBAL WARMING OR CALL IT WHAT IT WILL BE…….CLIMATE CATASTROPHE…IF WE DON'T FUNDAMENTALLY CHANGE WHAT WE ARE DOING

Climate change is occurring, is caused largely by human activities, and poses significant risks for--and in many cases is already affecting--a broad range of human and natural systems.

The compelling case for these conclusions is provided in *Advancing the Science of Climate Change (2010)*, part of a congressionally requested suite of studies known as America's Climate Choices.

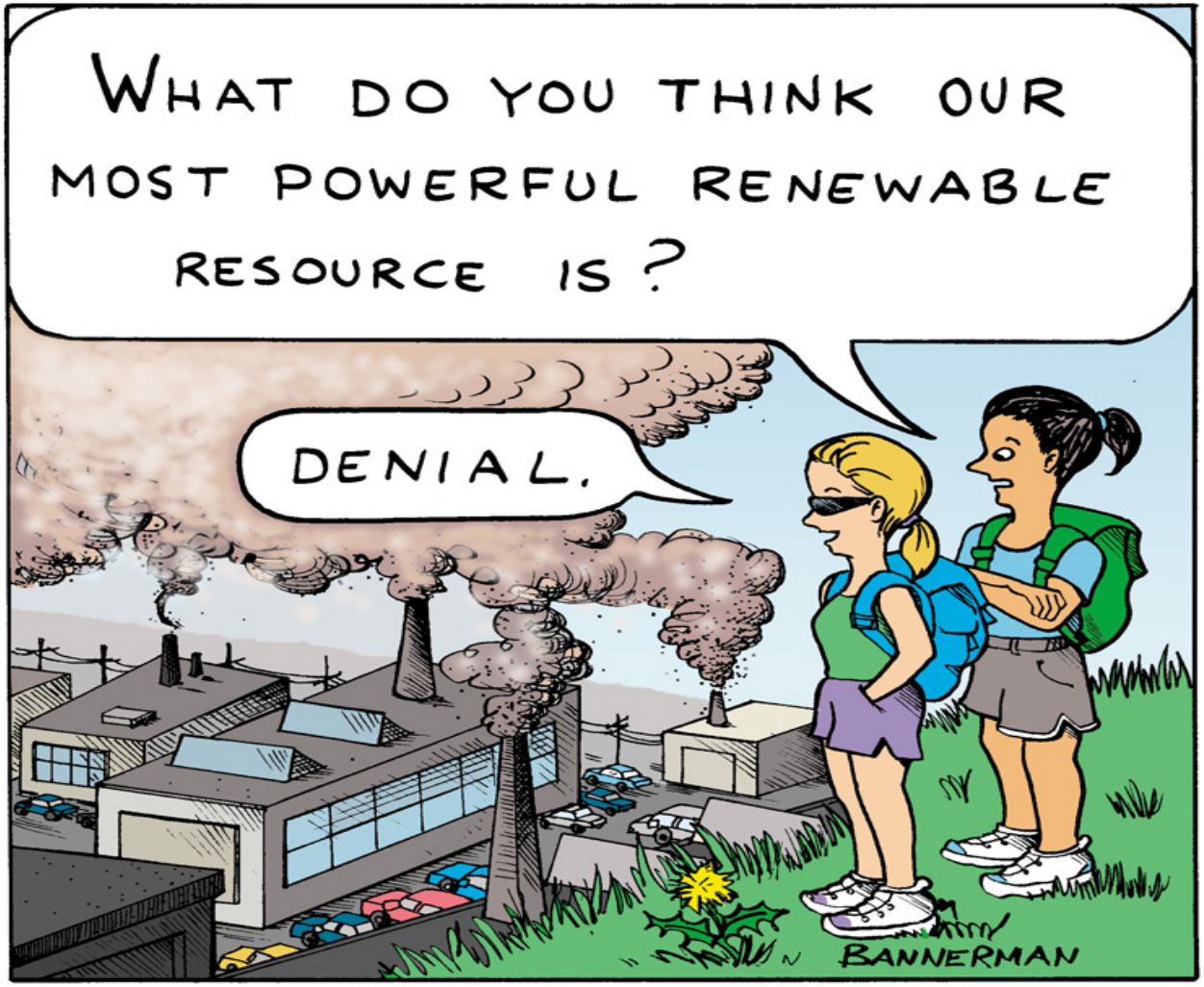
Climate change, driven by the increasing concentration of greenhouse gases in the atmosphere, poses serious, wide-ranging threats to human societies and natural ecosystem around the world.

The global atmospheric concentration of carbon dioxide, the dominant greenhouse gas of concern, is increasing roughly 2 parts per 1,000,000 per year, and the US is currently the second-largest contributor to global emissions behind China.

Limiting the Magnitude of Future Climate Change (2010)

THE PROBLEM WITH CARBON & COAL

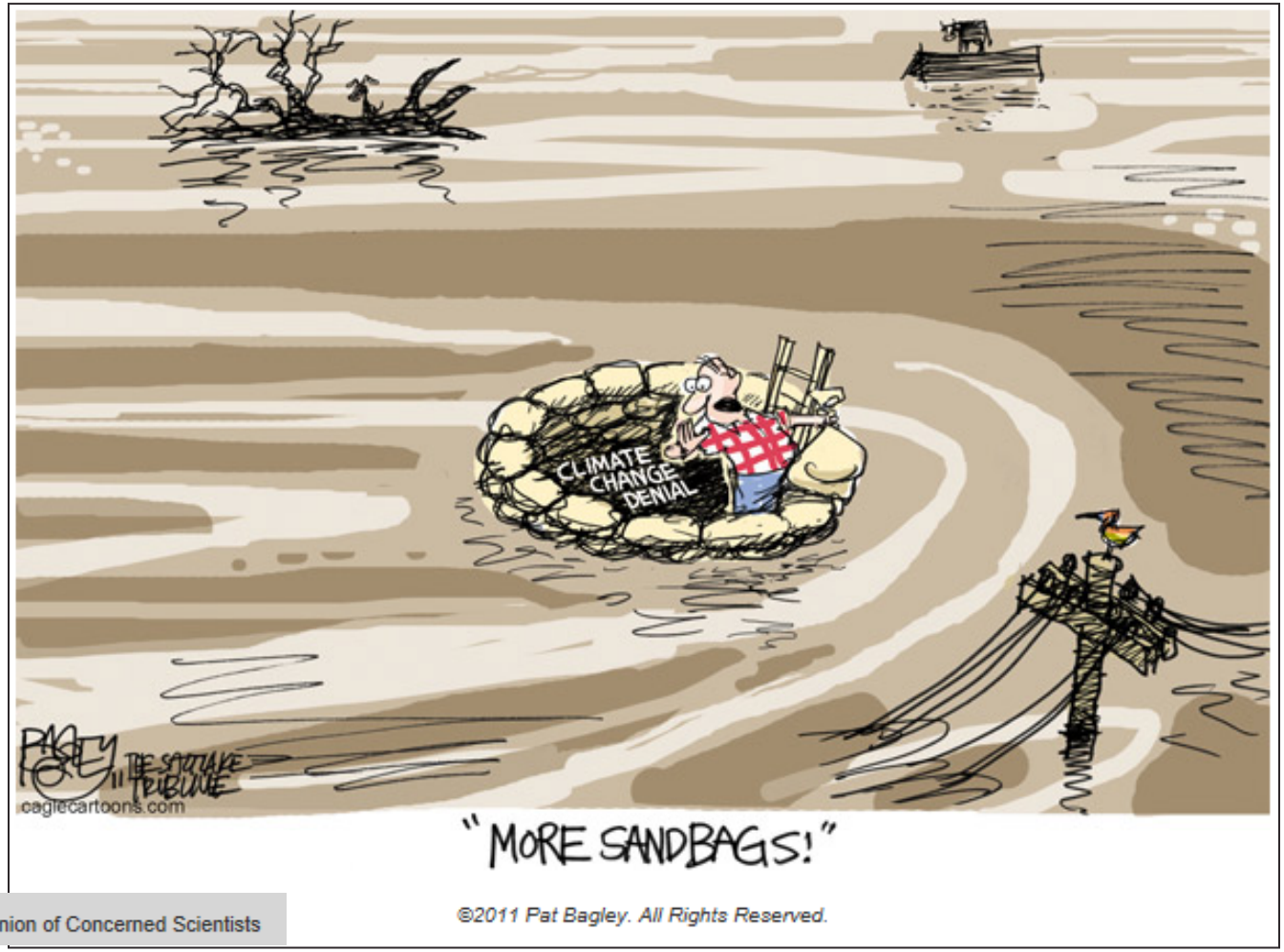
THE LARGEST OVERALL SOURCE OF GREENHOUSE GAS EMISSION IS THE BURNING OF FOSSIL FUELS.



- **2012 UCS Editorial Cartoon Contest Winner**
  - Isabella Bannerman of Hastings-on-Hudson, NY

Union of Concerned Scientists

Denial has certain benefits



Union of Concerned Scientists

- **2011 UCS Editorial Cartoon Contest**

Union of Concerned Scientists

By denying that climate change is man-made

A denier shrugs accountability and continues to contribute to the problem

What's your reaction?

Climate change reality
Duluth Flood – June 2012

Flood – June 2012

Flood – June 2012

Flood – June 2012

What can we do about it?

- Become a Climate Leader

TELL YOUR FRIENDS, FAMILY AND NETWORKS THAT CLIMATE CHANGE MATTERS TO YOU

- Become a Climate Leader

STAND UP TO DENIAL

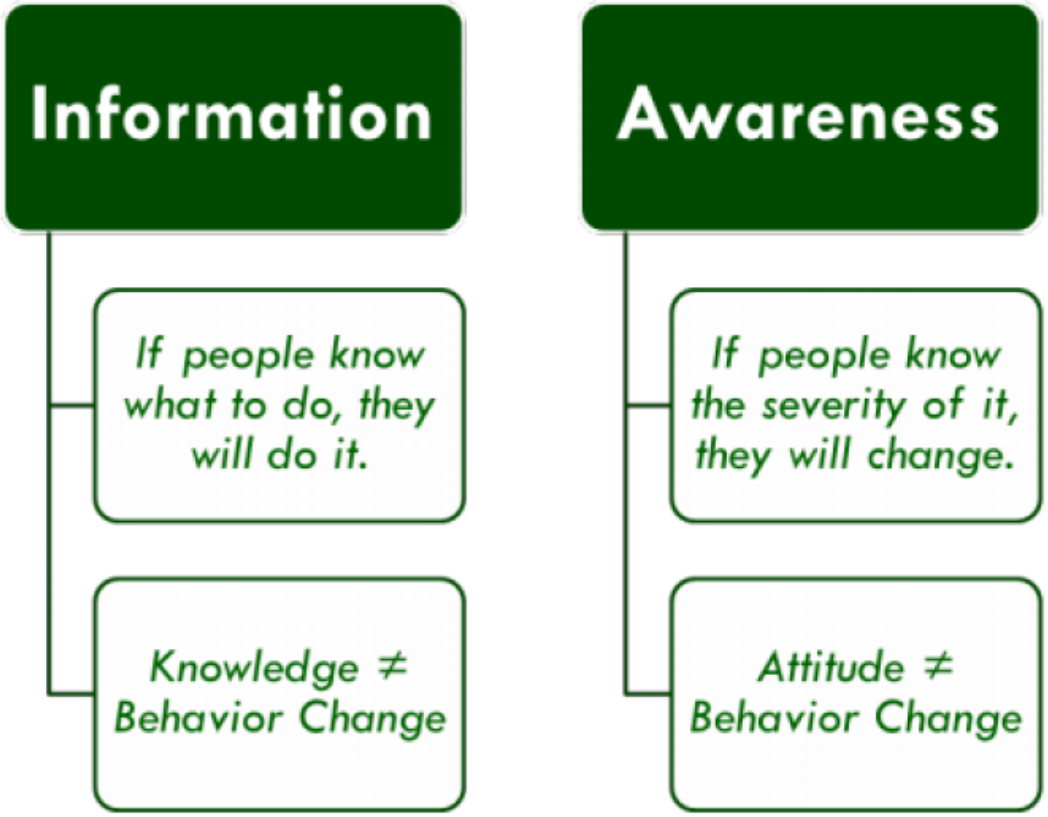
- Become a Climate Leader

TELL YOUR LEADERS THIS MATTERS TO YOU

Polling Trends

- 63% of Americans believe global warming is happening *(Yale/George Mason 2013)*
- 58% of Americans say they WORRY a great deal or fair amount about global warming *(Gallup 2013)*
- 54% of Americans say the EFFECTS of global warming have already begun *(Gallup 2013)*
- 49% of Americans think global warming is an environmental problem that is causing a serious IMPACT NOW *(CBS News Poll 2013)*

Raise awareness to drive change



Source: http://www.vecan.net/wp-content/uploads/CBSM-Overview.pdf

How do we motivate change?

1. TENSION: Dissonance between a desired & current condition.

2. EFFICACY: Confidence I one's capacity to reduce tension.

3. BENEFITS: Belief that the benefits of new behavior are greater than the downsides of change.

"The question of reaching sustainability is not about if we will have enough energy, food, or other tangible resources… The question is: Will there be enough leaders in time?"

~ Dr. Karl Henrik Robert, Founder of the Natural Step