Local Opportunities to Influence Carbon Footprints

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Montgomery County Speaker Series

Outline

- What is a carbon footprint?
- How do we calculate footprints?
- What do we know about footprints?
  - What factors are really important?
- What opportunities exist to influence footprints?

“Carbon footprint”

- Estimate of the greenhouse gases (GHG) emitted from human activities
- Carbon footprints because carbon dioxide is the most common GHG emitted by U.S. (84%)
- 98% carbon dioxide emitted is due to energy production and consumption

  ➔Energy-related carbon footprints

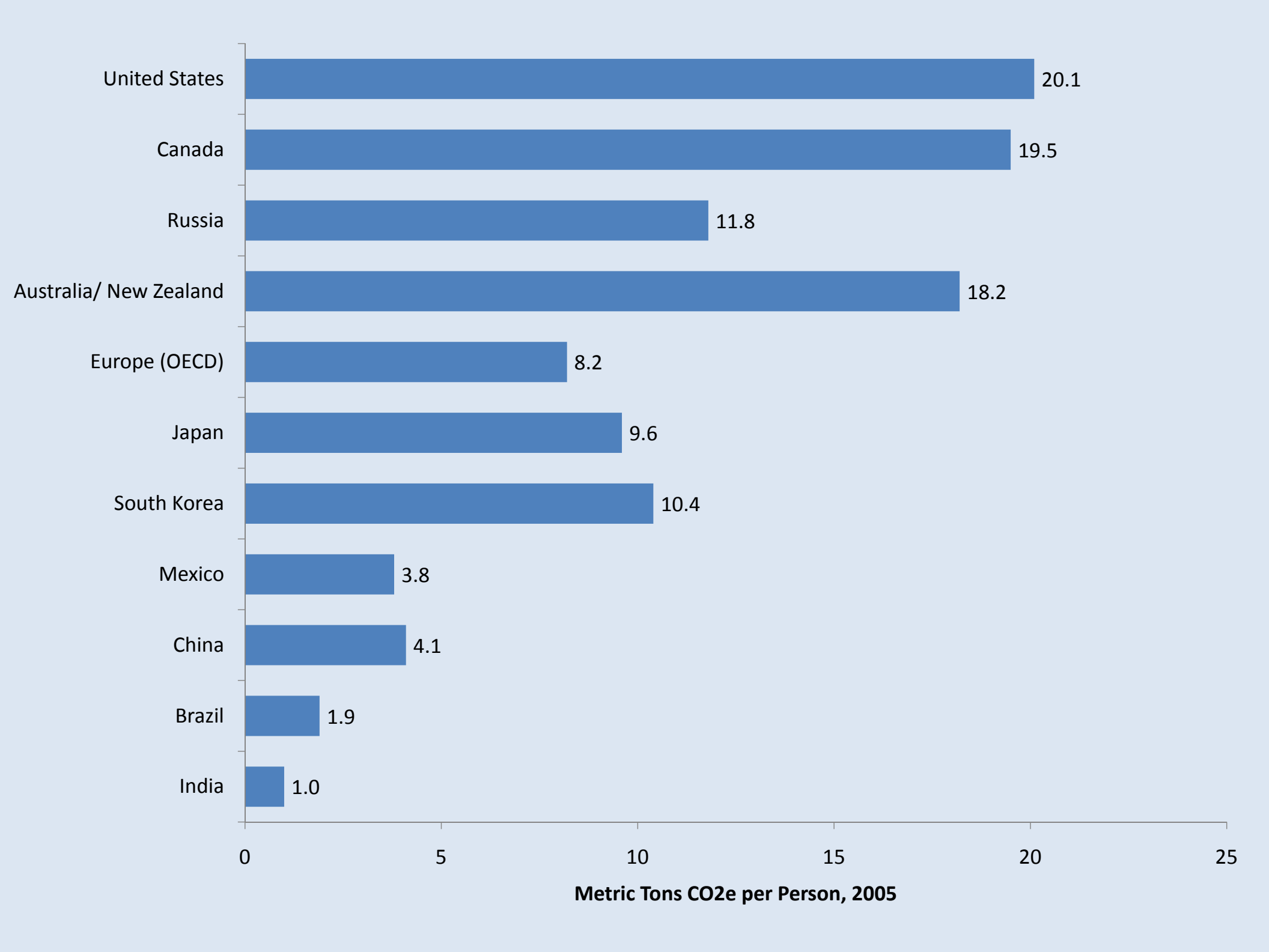
Calculating carbon footprints

- Product of:
  - Energy consumption (by sector, by fuel)
  - Carbon intensity of energy (by sector, by fuel)
    - Carbon dioxide emissions emitted per unit of energy produced (by sector, by fuel)

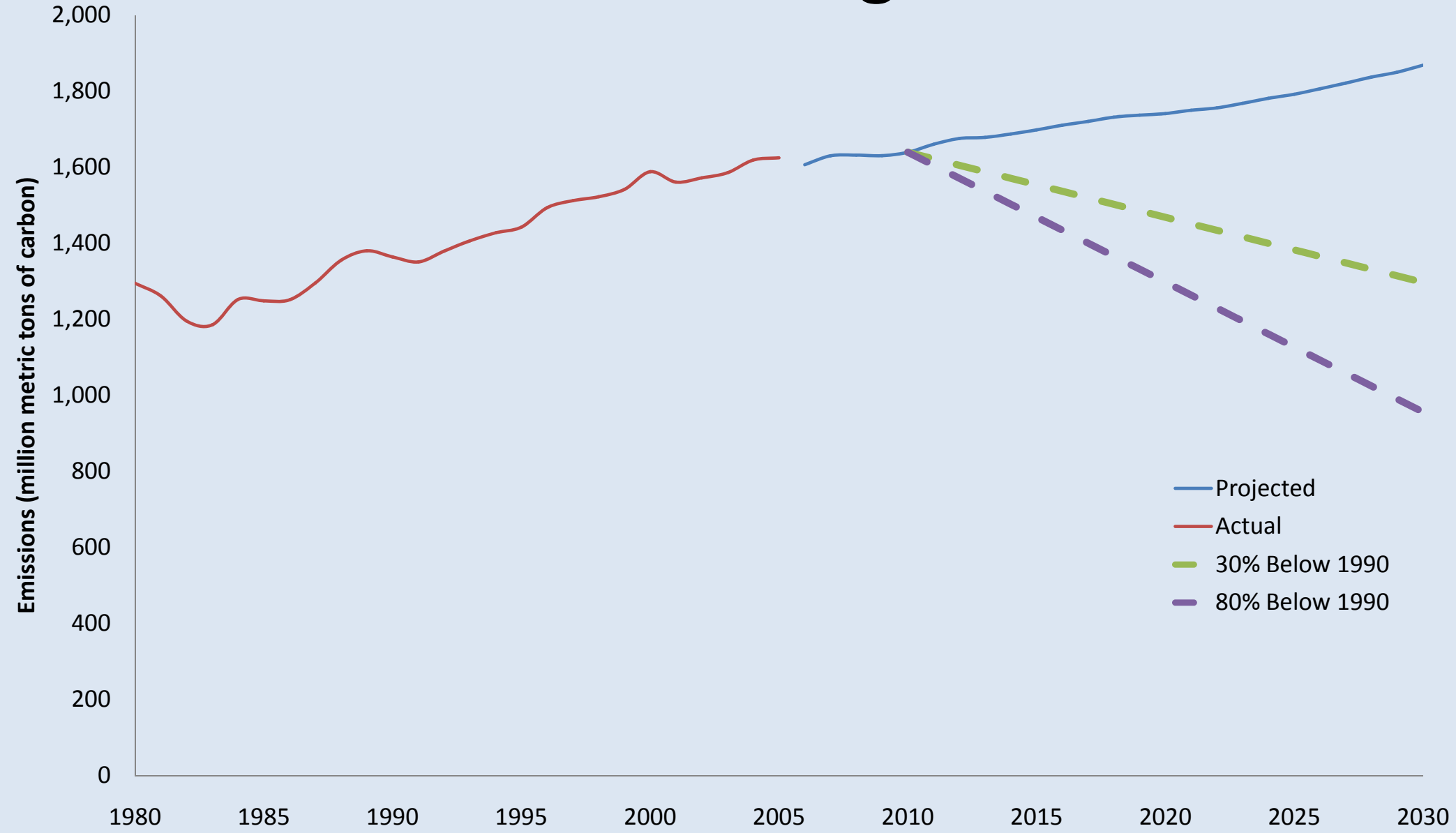
NATIONAL CONTEXT

Carbon footprint

- U.S. in 2005:
  - 6 billion metric tons of carbon dioxide (CO2)
  - 296 million people
  - 20 metric tons of CO2 per person

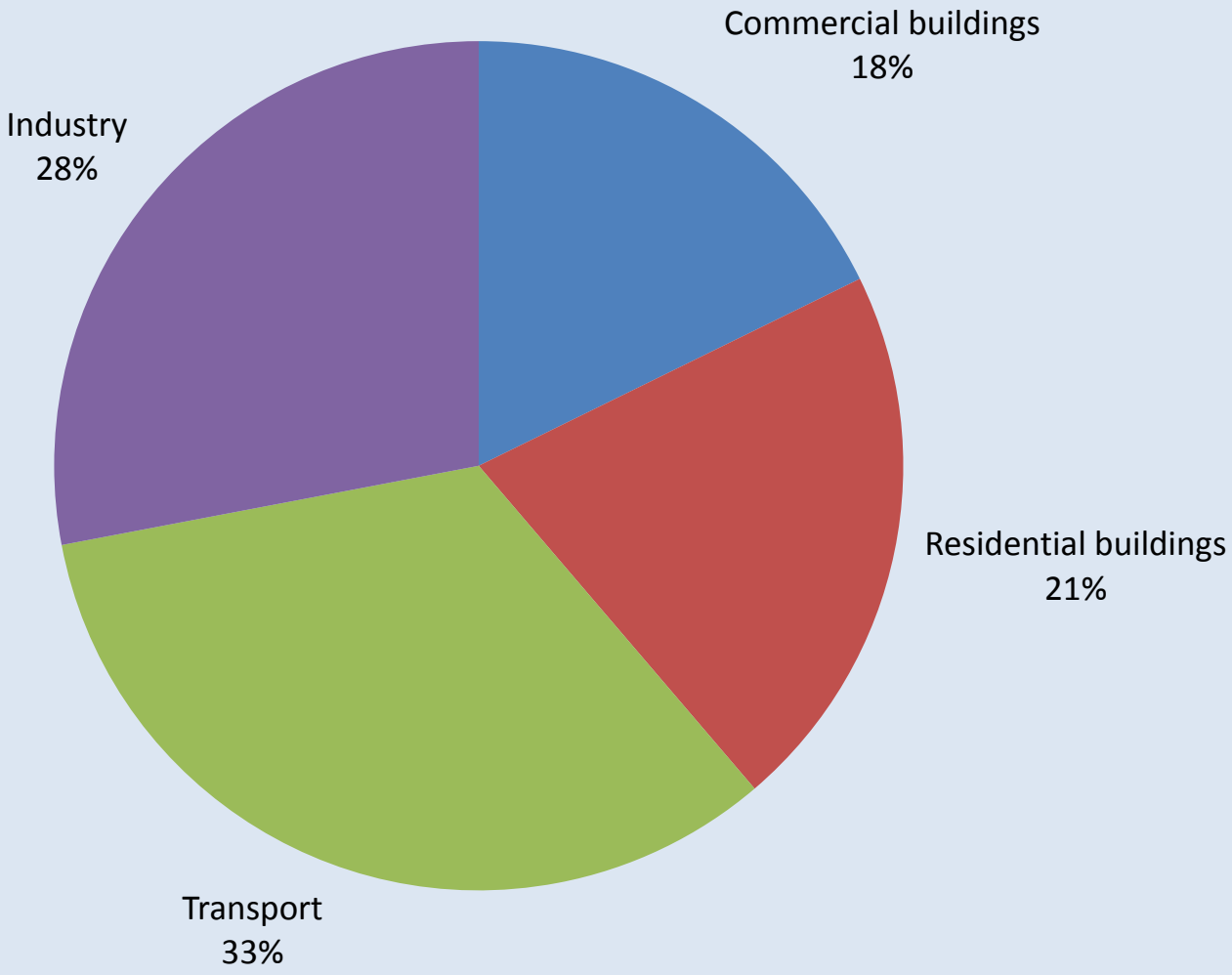

United States
20.1
Canada
19.5
Russia
11.8
Australia/ New Zealand
18.2
Europe (OECD)
8.2
Japan
9.6
South Korea
10.4
Mexico
3.8
China
4.1
Brazil
1.9
India
1.0
0
5
10
15
20
25
Metric Tons CO2e per Person, 2005

U.S. carbon dioxide emissions are increasing



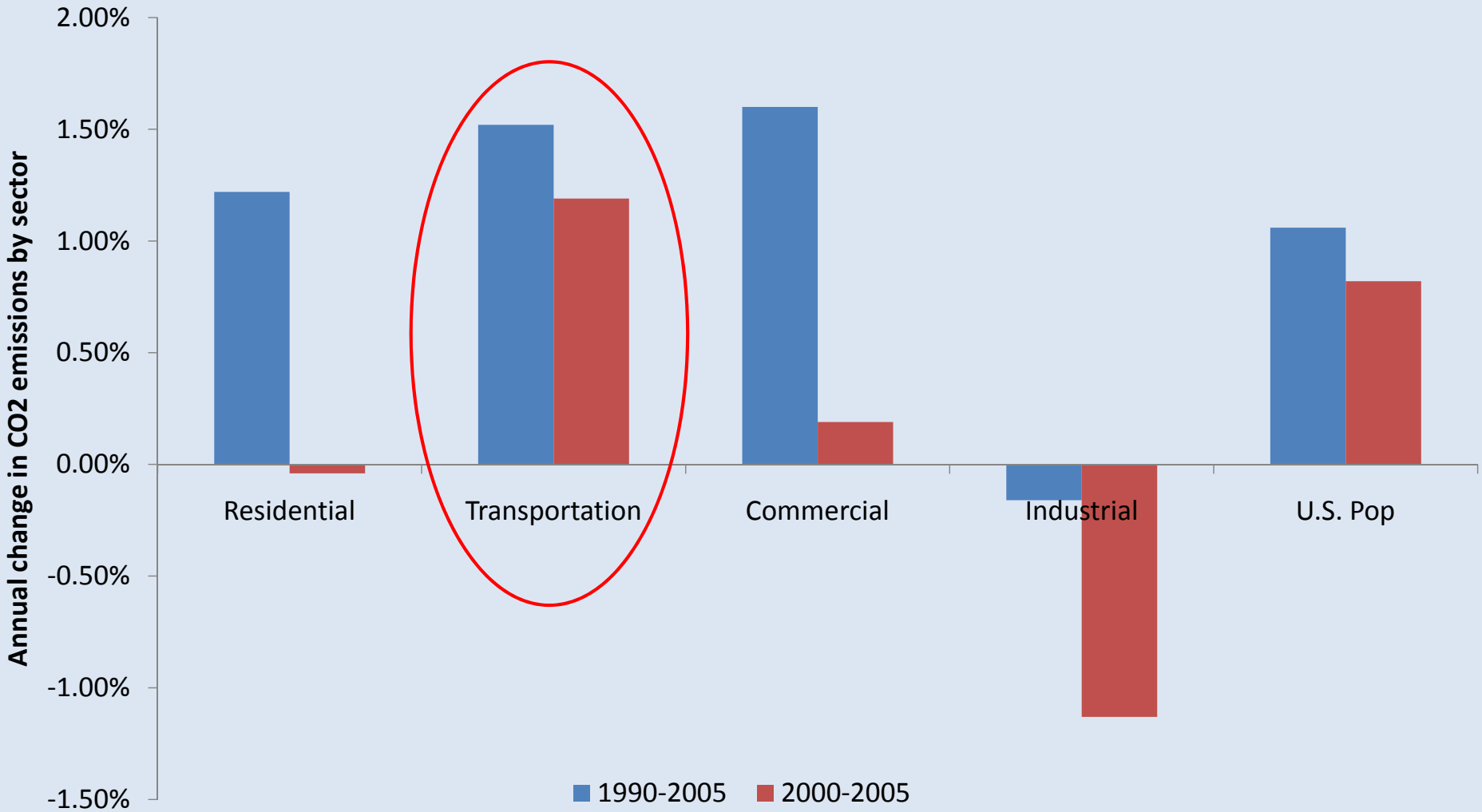
Source: Energy Information Administration

Energy-related carbon emissions mostly from buildings & transport



Source: U.S. Energy Information Administration (EIA); data for 2005.

Transport emissions growing fastest



General policy strategy

- Focus on reducing GHG emissions from
  1. Auto & trucks
  2. Energy used in buildings
  3. Industrial activities

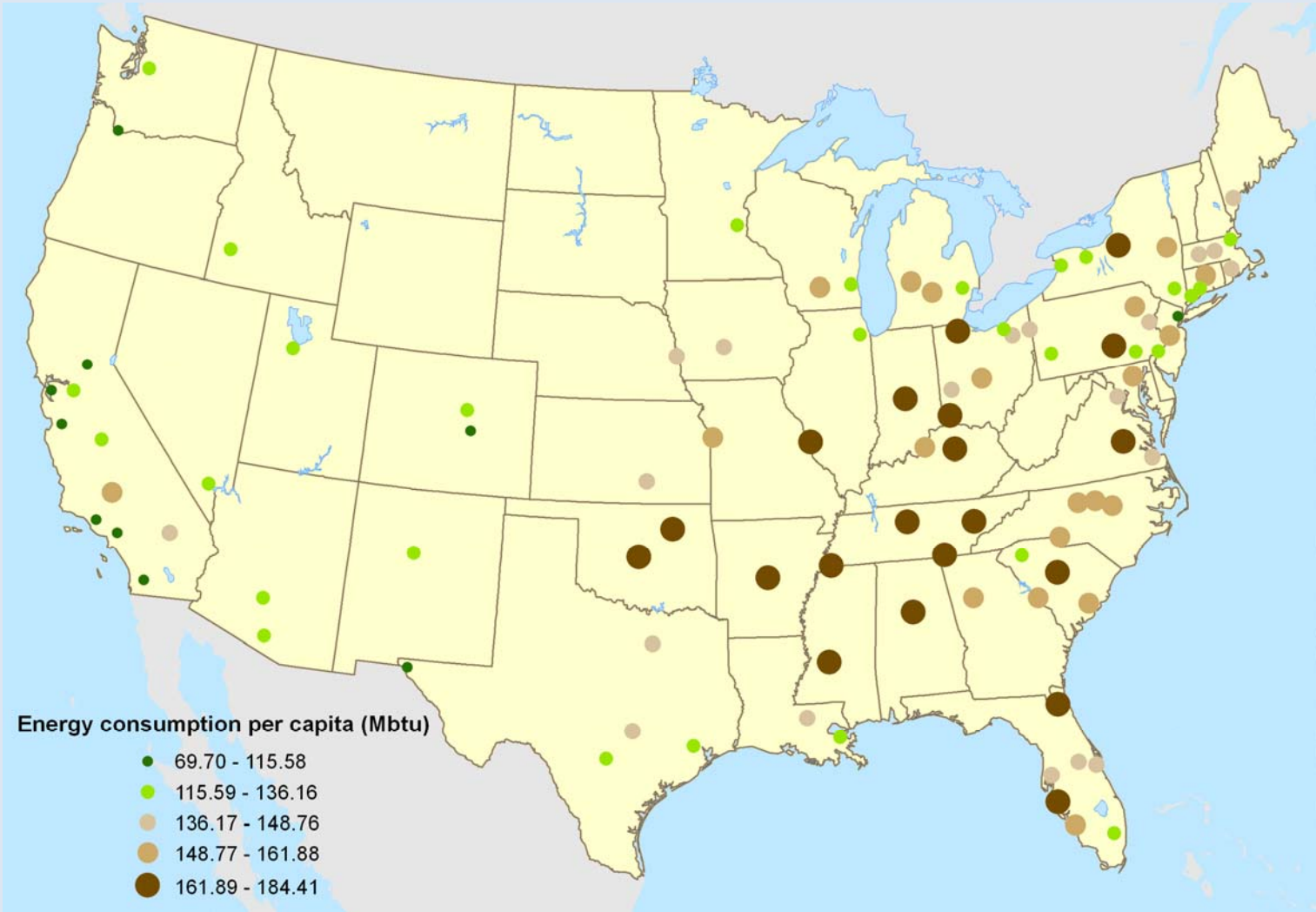
- What specific actions should we take?
- Should we focus on particular places?

REGIONAL AND STATE CONTEXT

Focusing on metros

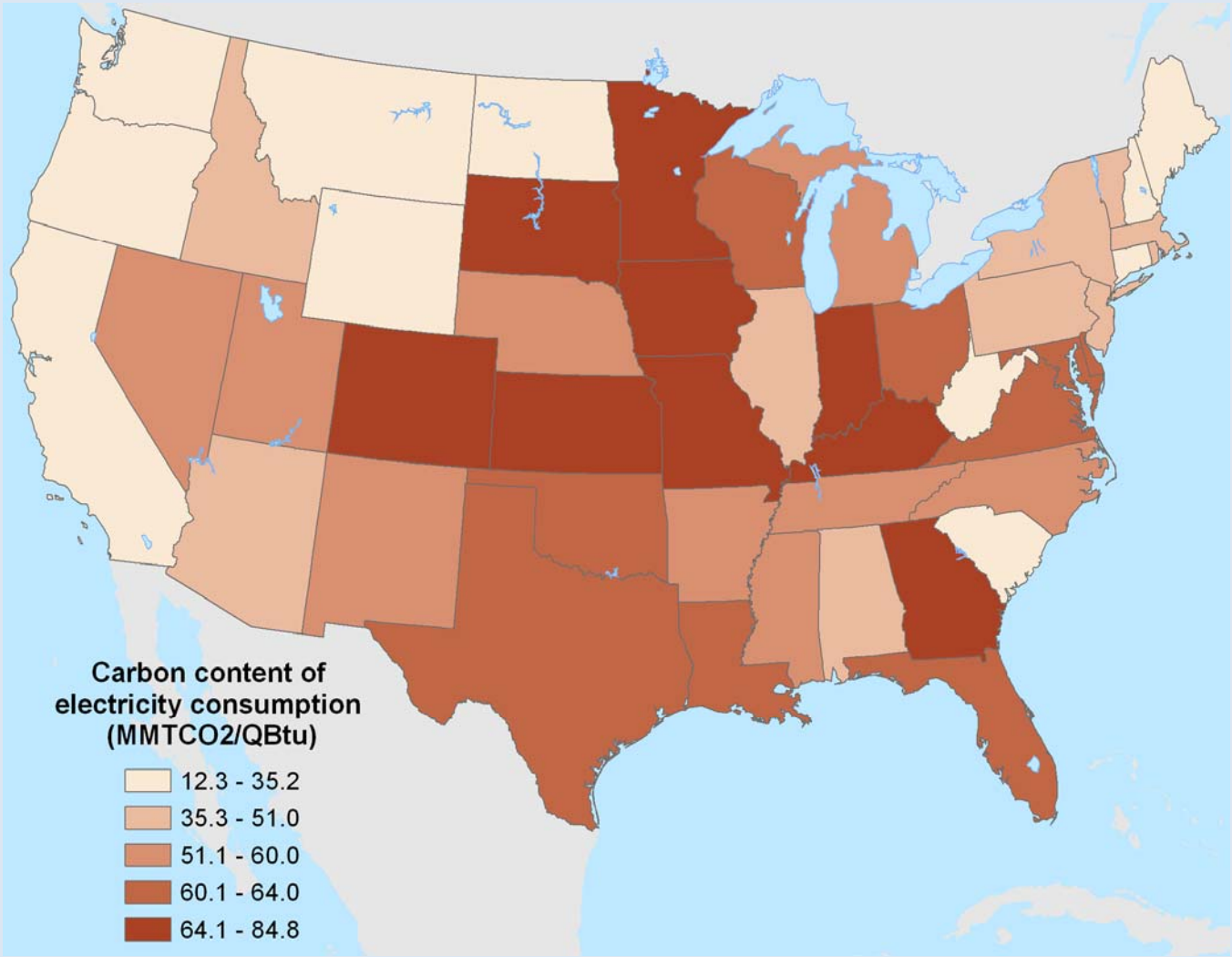
- Estimated **partial** energy & carbon footprints for 100 largest metro areas
- Emissions from
  - Highway transportation
    - Passenger vehicles + freight
  - Residential buildings
    - Electricity + fuels use

Regional variation in energy use…



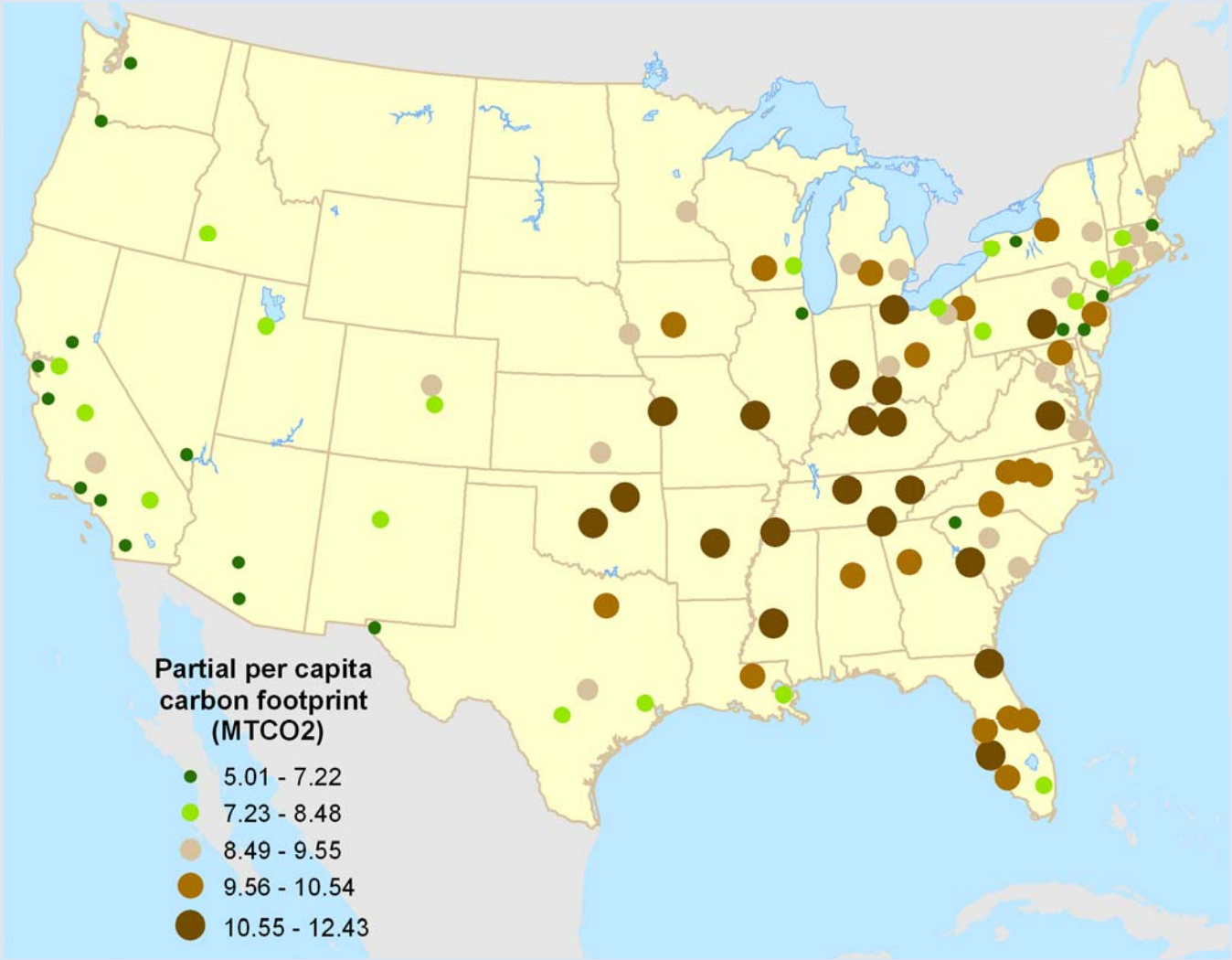
Data for 2005; consumption from residential energy use and highway transportation.

…plus regional variation in carbon content of electricity consumed…



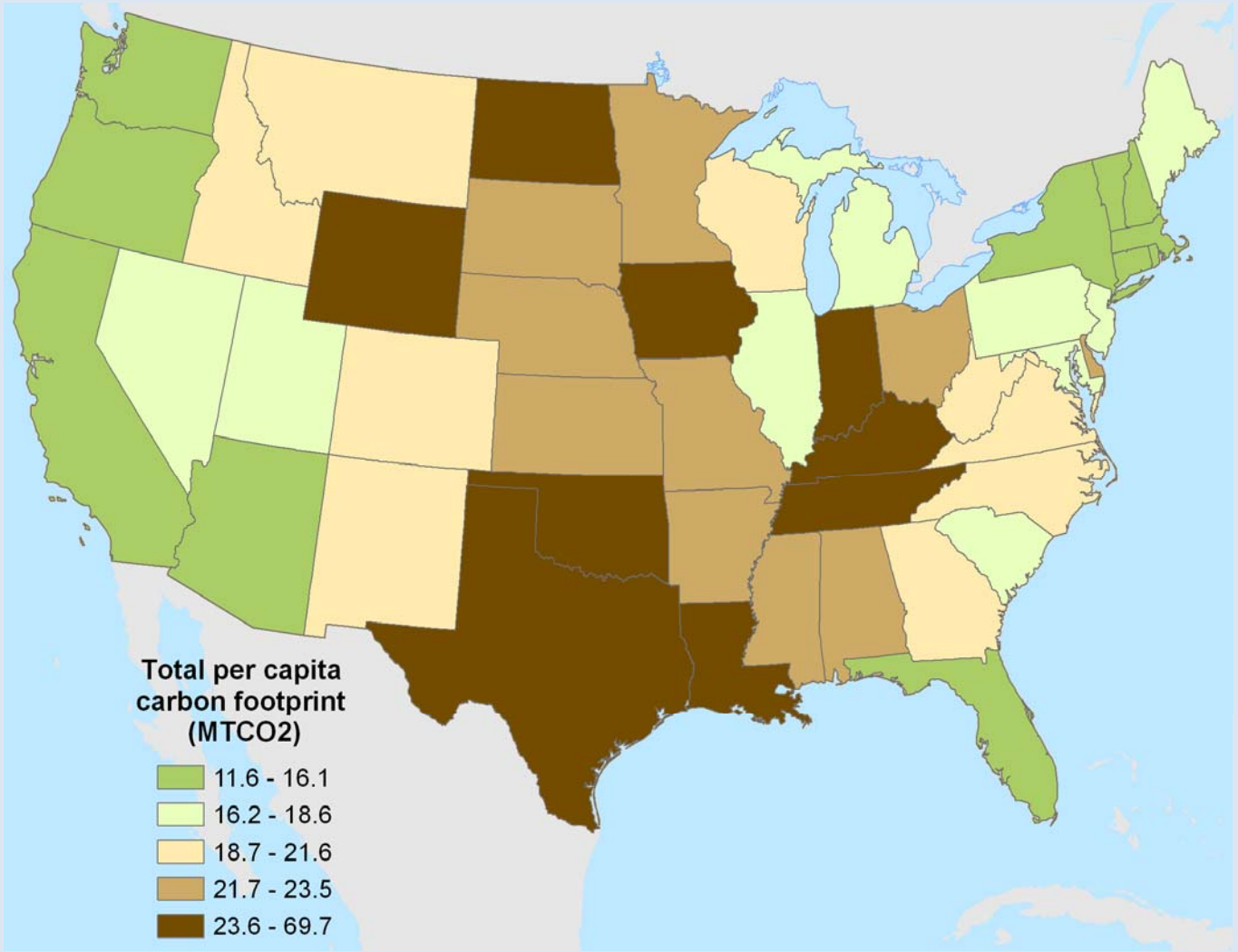
Data for 2005; updated methodology 3/09

…equals regional variation in metro carbon footprints



Data for 2005; updated methodology 3/09; from residential energy use and highway transportation

Similar variation in total per capita footprints for states



Data for 2005; updated methodology 3/09

What's going on?

- Weather (+/-)
- Development intensity (-)
- Transit availability (-)
- Proximity to major highways and ports (+)
- Use of clean energy fuels (-)
- Electricity prices (-)
- Environmental activism (-)

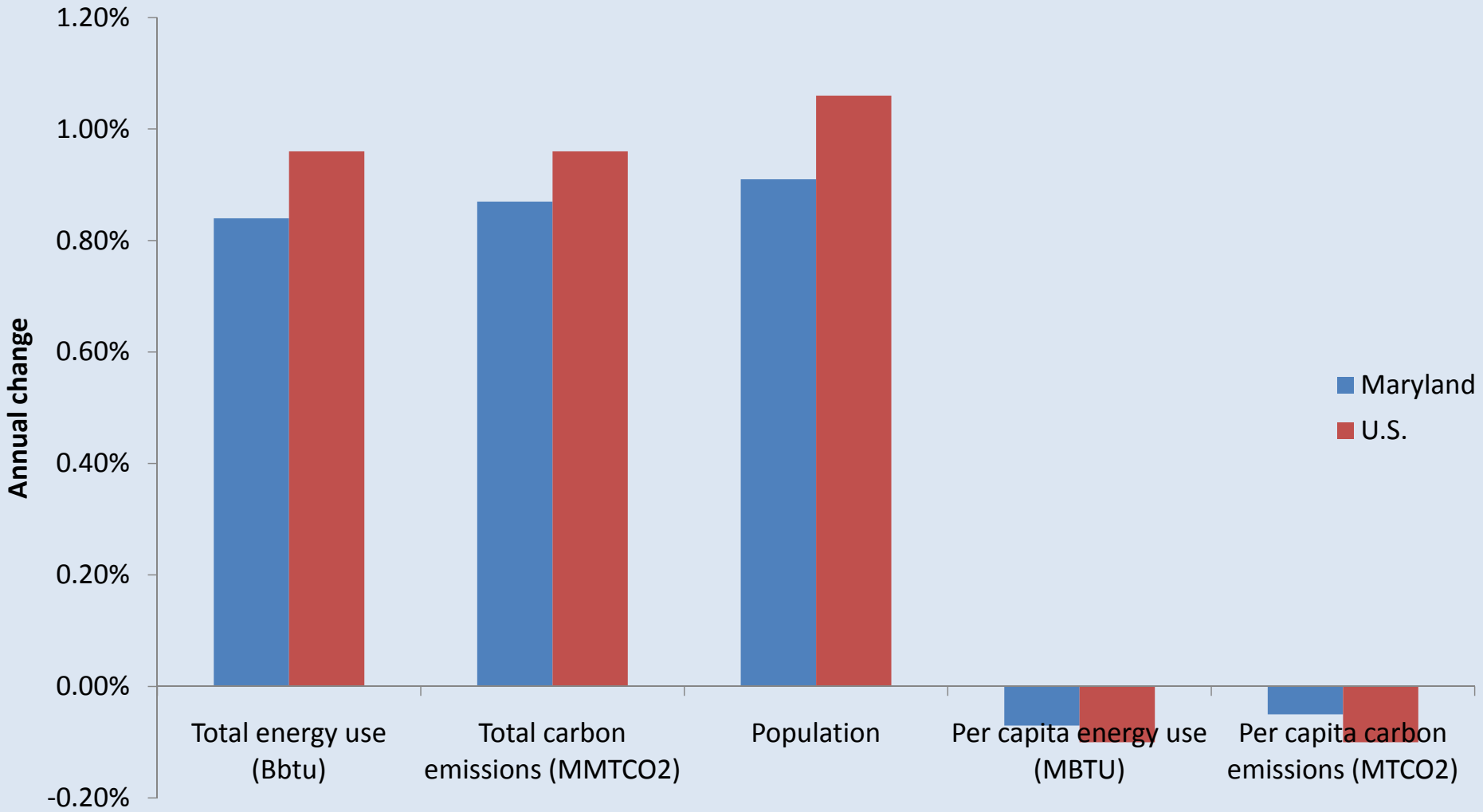
LOCAL OPPORTUNITIES

MC in context

2005	Montgomery County	Maryland	Washington Metro	U.S.
Per capita carbon emissions from all sectors (MTCO2)	13.4	17.6		19.8
Per capita carbon emissions from residential + transportation (MTCO2)	7.8 (excludes MFH)	9.0	9.36	10.9

State, metro, and U.S. values from updated methodology 3/09; MC values from CPP

Maryland already doing better than U.S. average…



Data for 2005; updated methodology 3/09

…but total emissions still growing

- To reach MC's CPP goal (80% of 2005 by 2050), will have to focus aggressively to
  - Reduce carbon intensity of energy consumed (electricity & fuels)
  - AND/OR
  - Reduce total energy use

Reducing carbon intensity

- Cleaner fuels for vehicles
- Cleaner fuels for power generation
  - Central generation
  - Reduce transmission losses
  - Distributed generation

Reducing energy use- transport

- Fuel efficiency standards for vehicles
- Modernize public vehicle fleets
- Planning & investment:
  - Improve neighborhood accessibility (mixed use zoning, project reviews)
  - Facilitate non-motorized travel
  - Expand transit availability & choices

Reducing energy use- buildings

- Energy efficiency standards for buildings & appliances
- Update building codes
- Offer “greenbuilding” incentives
  - Especially for new commercial development
- Weatherization, retrofitting, & conservation

Coordination

- Coordinate with feds, state, nearby jurisdictions, and business community regarding:
  - Jobs
  - Housing
  - Transportation facilities & choices
  - Energy choices & transmission

Next up: GW project

- GW students working with staff to outline possible carbon offsetting procedure for MC development review process
  - Identifying possible offsets with carbon reduction potential
  - Attempt to prioritize offsets based on CPP criteria + evidence of effectiveness
- Present results to MCPB in May 2009

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Brookings report:

http://www.brookings.edu/reports/2008/05_carbon_footprint_sarzynski.aspx

(Methodology has been updated 3/09;
revised data available upon request)