



# IDEAS FOR ACTION

## ASK QUESTIONS, UNPACK SYSTEMS

(AS PART OF PUBLIC EDUCATION)

## MAKE SOLUTIONS VISIBLE (ENVISION, IMAGINE, DISCUSS, COMMUNICATE)

Kaja Kühl  
Adjunct Associate Professor in Architecture  
Hudson Valley Initiative  
Columbia University GSAPP



# 2016 New York State Greenhouse Gas Emissions Inventory

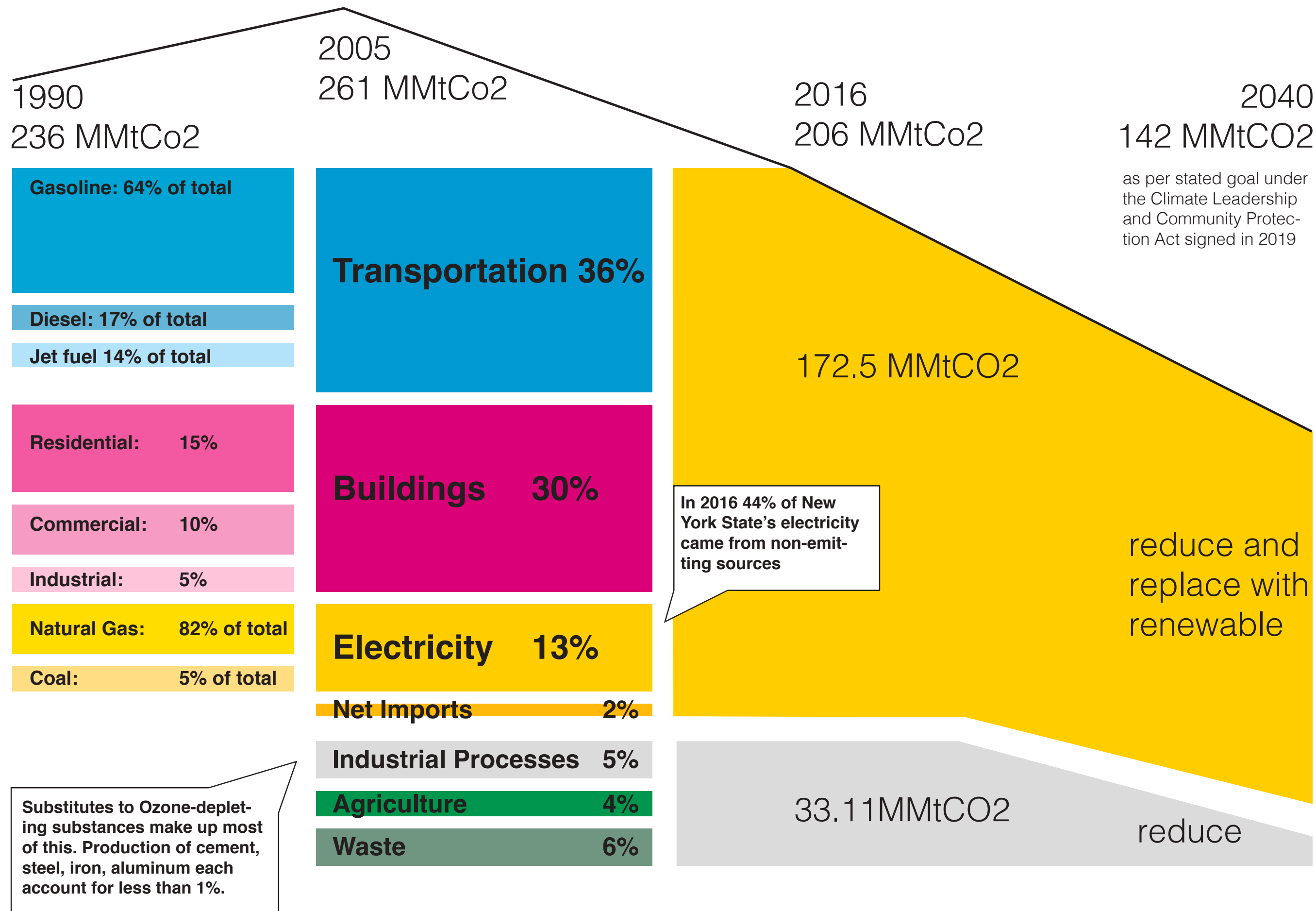


Table S-1. 2016 New York State Greenhouse Gas Inventory (MMtCO<sub>2</sub>e)

	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	PFC	HFC	SF <sub>6</sub>	Total	% of Total
<b>Energy</b>	<b>168.84</b>	<b>3.12</b>	<b>0.83</b>	-	-	-	<b>172.80</b>	<b>84%</b>
Fossil Fuel Combustion	166.11	0.40	0.78	-	-	-	167.28	81%
Fossil Fuel Combustion (excl. net imports)	162.31	0.39	0.77	-	-	-	163.47	80%
Electricity	27.70	0.00	0.02	-	-	-	27.72	13%
Net Imports	3.80	0.00	0.01	-	-	-	3.82	2%
Residential	30.66	0.17	0.05	-	-	-	30.89	15%
Commercial	20.57	0.07	0.02	-	-	-	20.66	10%
Industrial	10.15	0.03	0.05	-	-	-	10.23	5%
Transportation	73.23	0.12	0.63	-	-	-	73.98	36%
Incineration of Waste	2.74	-	0.05	-	-	-	2.79	1%
Oil & Gas Systems	-	2.73	-	-	-	-	2.81	1%
<b>Industrial Processes and Product Use</b>	<b>1.16</b>	-	-	<b>0.34</b>	<b>9.48</b>	<b>0.17</b>	<b>11.15</b>	<b>5%</b>
Aluminum Production	0.17	-	-	0.20	-	-	0.38	< 1%
Cement Production	0.26	-	-	-	-	-	0.26	< 1%
Electricity Transmission and Distribution	-	-	-	-	-	0.17	0.17	< 1%
Iron & Steel Production	0.15	-	-	-	-	-	0.15	< 1%
Limestone Use	0.44	-	-	-	-	-	0.44	< 1%
ODS Substitutes	-	-	-	-	9.48	-	9.48	5%
Semiconductor Manufacturing	-	-	-	0.14	-	-	0.14	< 1%
Soda Ash Use	0.13	-	-	-	-	-	0.13	< 1%
<b>Agriculture</b>	-	<b>4.51</b>	<b>4.35</b>	-	-	-	<b>8.86</b>	<b>4%</b>
Agricultural Animals	-	3.57	-	-	-	-	3.57	2%
Agricultural Soil Management	-	-	4.02	-	-	-	4.02	2%
Manure Management	-	0.94	0.34	-	-	-	1.27	1%
<b>Waste</b>	-	<b>12.20</b>	<b>0.61</b>	-	-	-	<b>12.80</b>	<b>6%</b>
Landfills	-	10.61	-	-	-	-	10.61	5%
Municipal Wastewater	-	1.59	0.61	-	-	-	2.20	1%
<b>Total (inc. Net Imports of Electricity)</b>	<b>170.00</b>	<b>19.83</b>	<b>5.79</b>	<b>0.34</b>	<b>9.48</b>	<b>0.17</b>	<b>205.61</b>	<b>100%</b>
% of Total Emissions	83%	10%	3%	< 1%	5%	< 1%	100%	-
<i>Total (excluded Net Imports of Electricity)</i>	<i>166.20</i>	<i>19.82</i>	<i>5.74</i>	<i>0.34</i>	<i>9.48</i>	<i>0.17</i>	<i>201.80</i>	-

- MMtCO<sub>2</sub>e = million metric tons of carbon dioxide equivalent; CO<sub>2</sub> = carbon dioxide; CH<sub>4</sub> = methane; N<sub>2</sub>O = nitrous oxide; PFC = perfluorocarbon; HFC = hydrofluorocarbon; SF<sub>6</sub> = sulfur hexafluoride.
- In the 2016 New York State Energy Plan (SEP) energy-related emissions were defined to include Fossil Fuel Combustion, Net Imports of Electricity, Incineration of Waste, Oil & Gas Systems, and Electricity Transmission and Distribution sources. Note that this definition differs slightly from the Energy source category in this report, which follows IPCC source categorization guidelines and therefore excludes Electricity Transmission and Distribution.
- Methane emissions would increase to 57.11 MMtCO<sub>2</sub>e were this report to account for emissions using 20-year Global Warming Potential factors derived in the IPCC AR4, rather than the 100-year GWP presented above.



Urban Design Studio

# The Climate Crisis: Imagining a Green New Deal in the Hudson Valley

Faculty: Kaja Kühl (Coordinator), Anna Dietzsch, Jerome Haferd, Liz McEnaney, Justin Moore, Shachi Pandey, Raafi Rivero, David Smiley, Dragana Zoric



COLUMBIA  
**GSAPP**



H. RES. 109

Recognizing the duty of the Federal Government to create a Green New Deal.

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 7, 2019

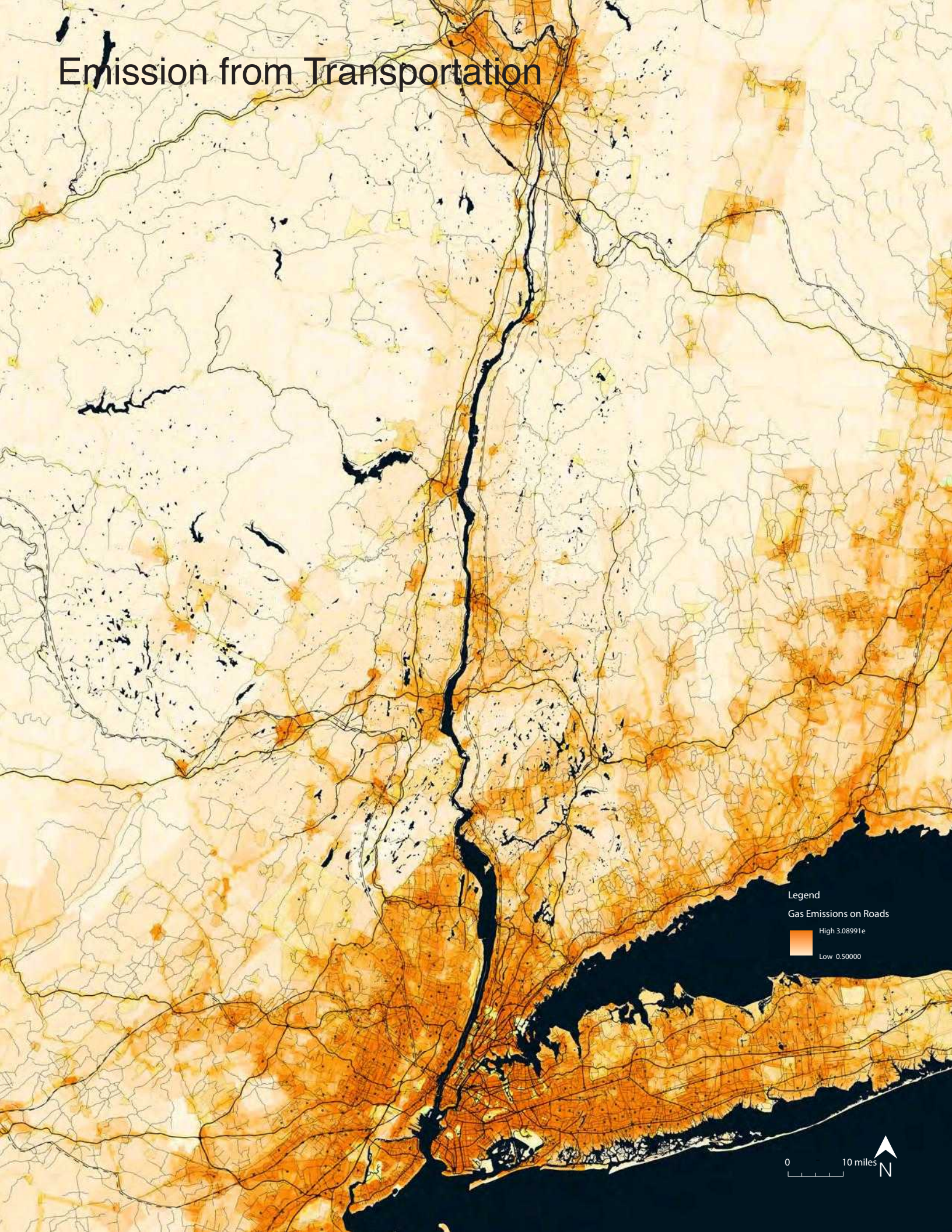
Ms. OCASIO-CORTEZ (for herself, Mr. HASTINGS, Ms. TLAIB, Mr. SERRANO, Mrs. CAROLYN B. MALONEY of New York, Mr. VARGAS, Mr. ESPAILLAT, Mr. LYNCH, Ms. VELÁZQUEZ, Mr. BLUMENAUER, Mr. BRENDAN F. BOYLE of Pennsylvania, Mr. CASTRO of Texas, Ms. CLARKE of New York, Ms. JAYAPAL, Mr. KHANNA, Mr. TED LIEU of California, Ms. PRESSLEY, Mr. WELCH, Mr. ENGEL, Mr. NEGUSE, Mr. NADLER, Mr. MCGOVERN, Mr. POCAN, Mr. TAKANO, Ms. NORTON, Mr. RASKIN, Mr. CONNOLLY, Mr. LOWENTHAL, Ms. MATSUI, Mr. THOMPSON of California, Mr. LEVIN of California, Ms. PINGREE, Mr. QUIGLEY, Mr. HUFFMAN, Mrs. WATSON COLEMAN, Mr. GARCÍA of Illinois, Mr. HIGGINS of New York, Ms. HAALAND, Ms. MENG, Mr. CARBAJAL, Mr. CICILLINE, Mr. COHEN, Ms. CLARK of Massachusetts, Ms. JUDY CHU of California, Ms. MUCARSEL-POWELL, Mr. MOULTON, Mr. GRIJALVA, Mr. MEEKS, Mr. SABLAN, Ms. LEE of California, Ms. BONAMICI, Mr. SEAN PATRICK MALONEY of New York, Ms. SCHAKOWSKY, Ms. DELAURO, Mr. LEVIN of Michigan, Ms. MCCOLLUM, Mr. DESAULNIER, Mr. COURTNEY, Mr. LARSON of Connecticut, Ms. ESCOBAR, Mr. SCHIFF, Mr. KEATING, Mr. DEFazio, Ms. ESHOO, Mrs. TRAHAN, Mr. GOMEZ, Mr. KENNEDY, and Ms. WATERS) submitted the following resolution; which was referred to the Committee on Energy and Commerce, and in addition to the Committees on Science, Space, and Technology, Education and Labor, Transportation and Infrastructure, Agriculture, Natural Resources, Foreign Affairs, Financial Services, the Judiciary, Ways and Means, and Oversight and Reform, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

IV

- 1
- (A) building resiliency against climate
- 2
- change-related disasters, such as extreme
- 3
- weather, including by leveraging funding and
- 4
- providing investments for community-defined
- 5
- projects and strategies;
- 6
- (B) repairing and upgrading the infra-
- 7
- structure in the United States, including—
- 8
- (i) by eliminating pollution and green-
- 9
- house gas emissions as much as techno-
- 10
- logically feasible;
- 11
- (ii) by guaranteeing universal access
- 12
- to clean water;
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- (iii) by reducing the risks posed by cli-
- 14
- mate impacts; and
- 15
- (iv) by ensuring that any infrastruc-
- 16
- ture bill considered by Congress addresses
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- climate change;
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- (C) meeting 100 percent of the power de-
- 19
- mand in the United States through clean, re-
- 20
- newable, and zero-emission energy sources, in-
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- cluding—
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- (i) by dramatically expanding and up-
- 23
- grading renewable power sources; and
- 24
- (ii) by deploying new capacity;



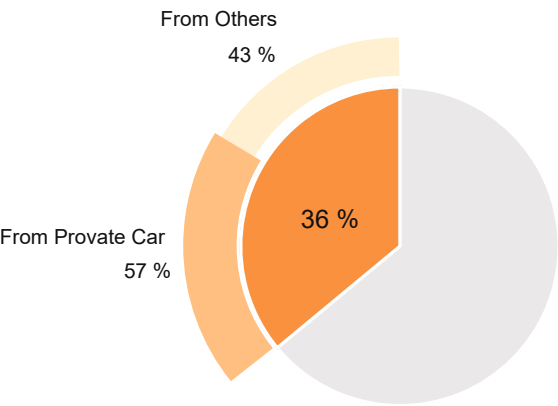
# Emission from Transportation



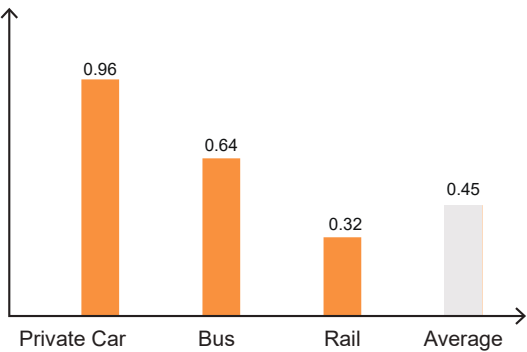
## The Carbon Footprint of Private Cars

70% of residents in the Hudson Valley region drive alone to work.

GHG from Transportation in New York State



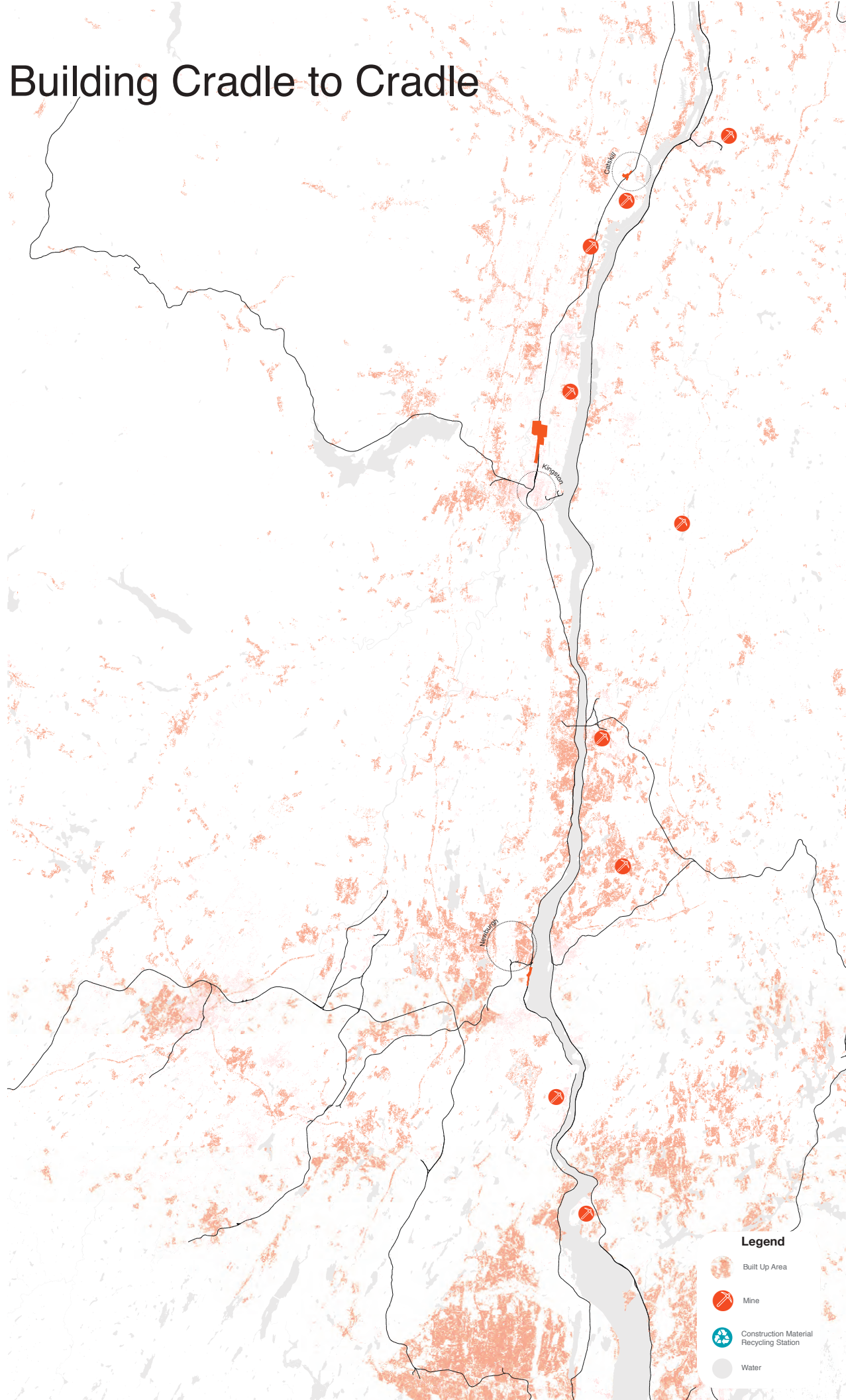
GHG per Passenger Mile for Transit and Private Cars



Sources: New York State Greenhouse Gas Inventory: 1990–2016.  
The Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC) for Biogeochemical Dynamics



# 10 Building Cradle to Cradle

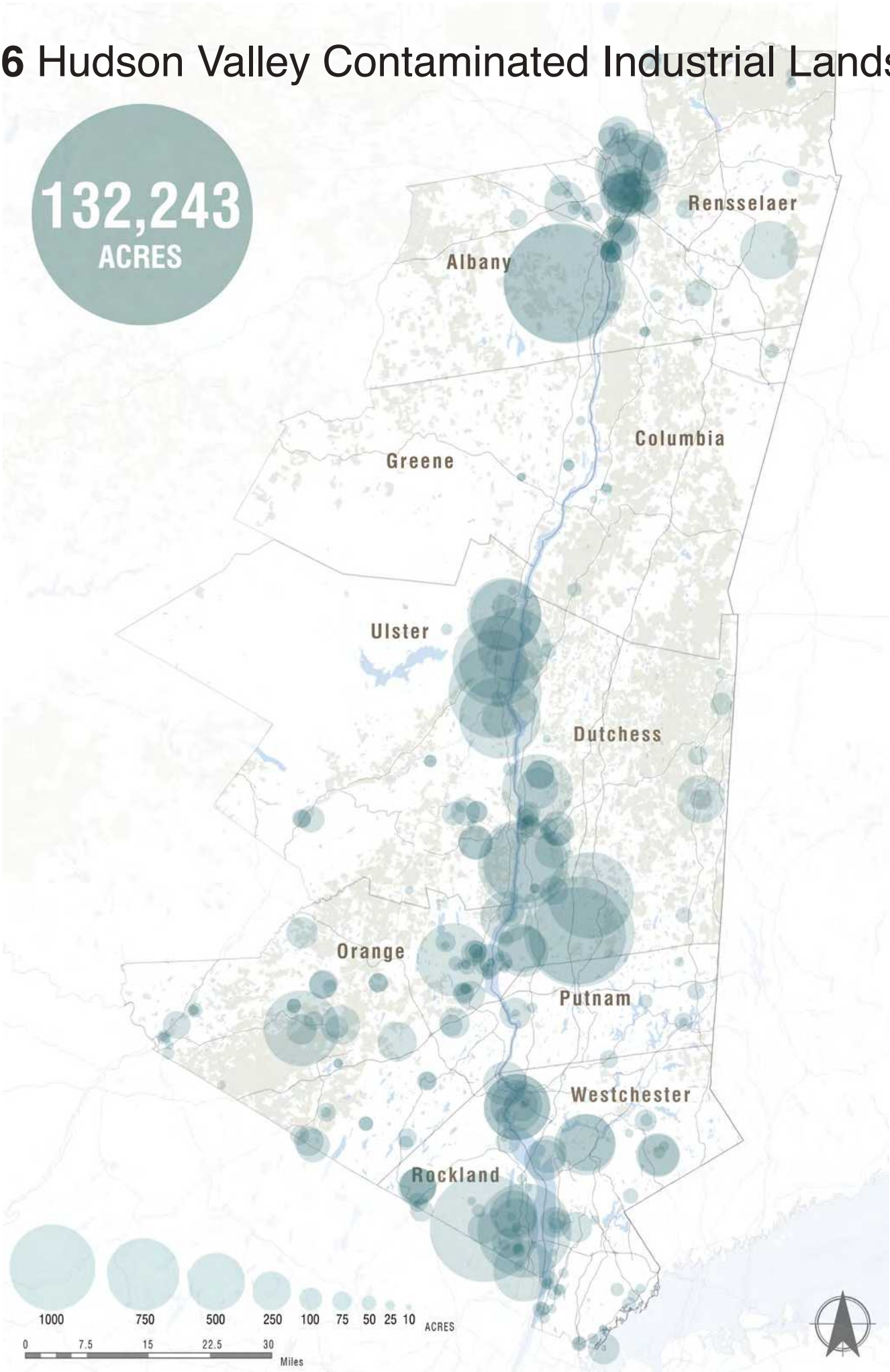


## The Carbon Footprint of Waste

Recycling construction debris saves on average 65% of energy to produce construction materials.



06 Hudson Valley Contaminated Industrial Lands



The Carbon Footprint of Land Use

Over 130,000 acres of land in the Hudson Valley are abandoned, polluted and untreated.



The former IBM manufacturing site north of Kingston was abandoned in 1992. What used to be an economic engine for Ulster County, is now an economic and environmental liability.





Former IBM Recycling Center

Recycling Potential

Deconstruction

Workers

Time Line

Recycling

10X THE JOBS

Production

26X THE JOBS

1. Steel Manufacture

70,000 SF.

65,000 SF. Storage
2. CLT Manufacture

45,000 SF.

100,000 SF. Storage
3. Wool Brick Manufacture

28,000 SF.

175,000 SF. Storage
4. Green Mix Concrete Manufacture

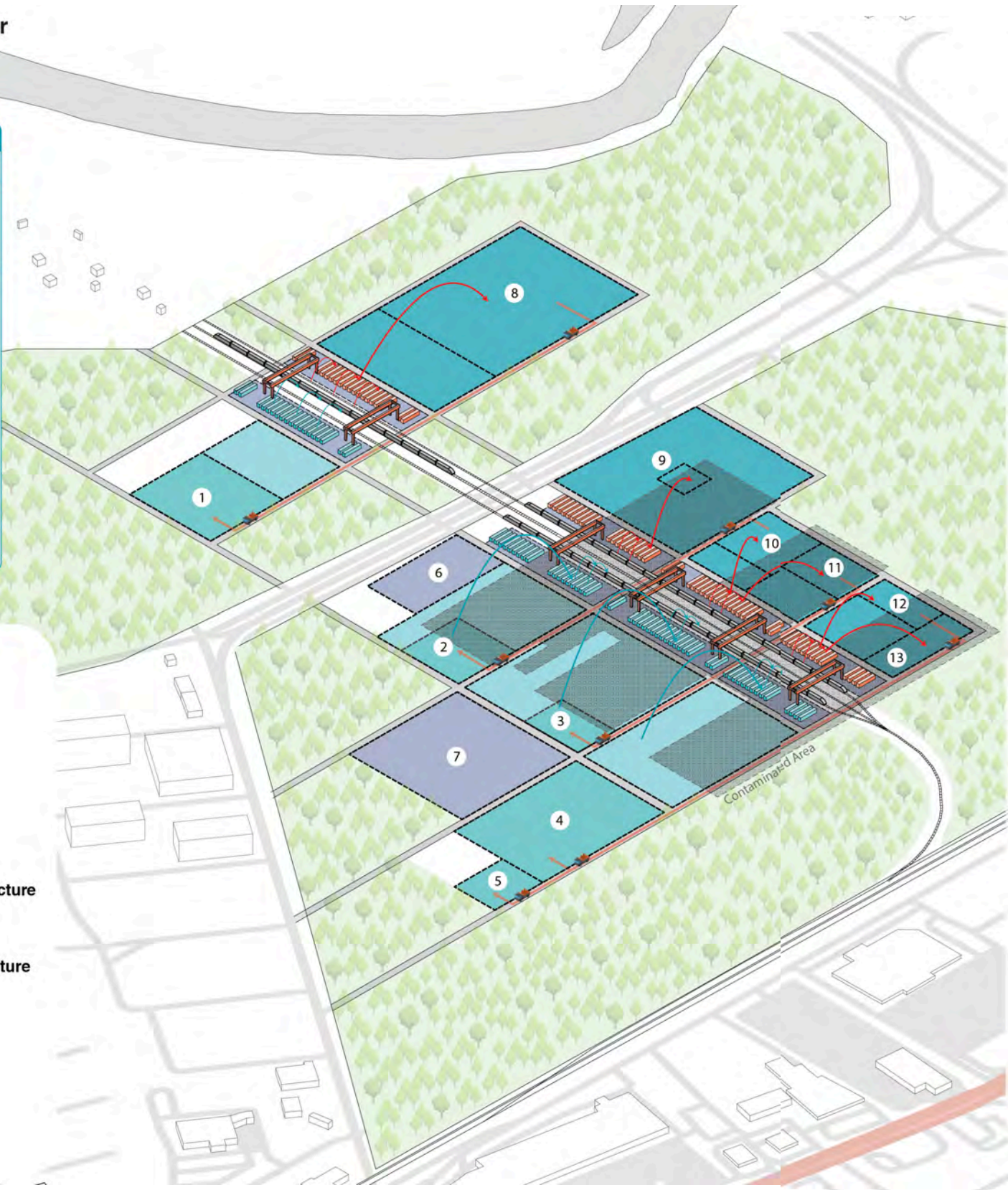
150,000 SF.

150,000 SF. Storage
5. Fiberglass Window Manufacture

30,000 SF.
6. Admin

60,000 SF.
7. Green Depot

175,000 SF.



8. Steel Recycling

230,000 SF.

100,000 SF. Pile

1 ton of steel produces about 1.83 tons of CO2

MELTED STEEL

+

RECYCLED ALUMINUM

LIGHTWEIGHT STEEL

Easily reused or recycled

Less weight

Stronger

9. Asphalt Recycling

10,000 SF.

200,000 SF. Pile

1 ton of asphalt pavement produces about 0.0103 tons of CO2

RECLAIMED ASPHALT PAVEMENT (RAP)

Easily reused or recycled

Not heated

Stronger

10. Lumber Recycling

35,000 SF.

10,000 SF. Pile

100 cubic feet of wood produces 0.65 tons of CO2

PLANED LUMBER

+

RESIN ADHESIVE

LAMINATED TIMBER

Reduce deforestation

More fire and water resistant

Stronger

11. Brick Recycling

30,000 SF.

30,000 SF. Pile

1000 bricks produces 0.427 tons CO2

CRUSHED BRICK POWDER

+

SEAWEED

WOOL

WOOL BRICK

Unfired process

Better insulated

Stronger

12. Concrete Recycling

20,000 SF.

40,000 SF. Pile

1 ton of concrete produces about 0.125 tons of CO2

CRUSHED CONCRETE AGGREGATE

+

FLY ASH

SAND

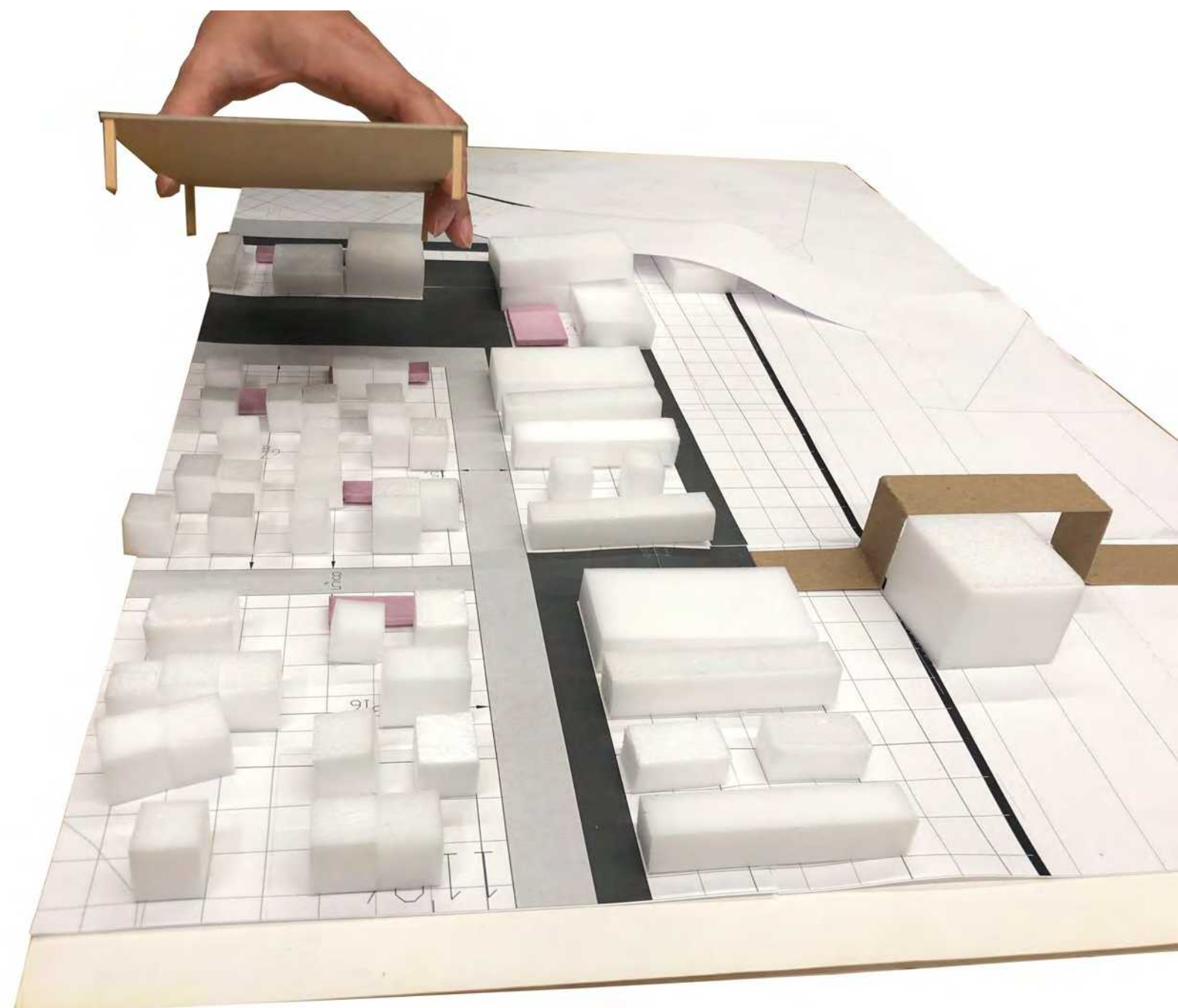
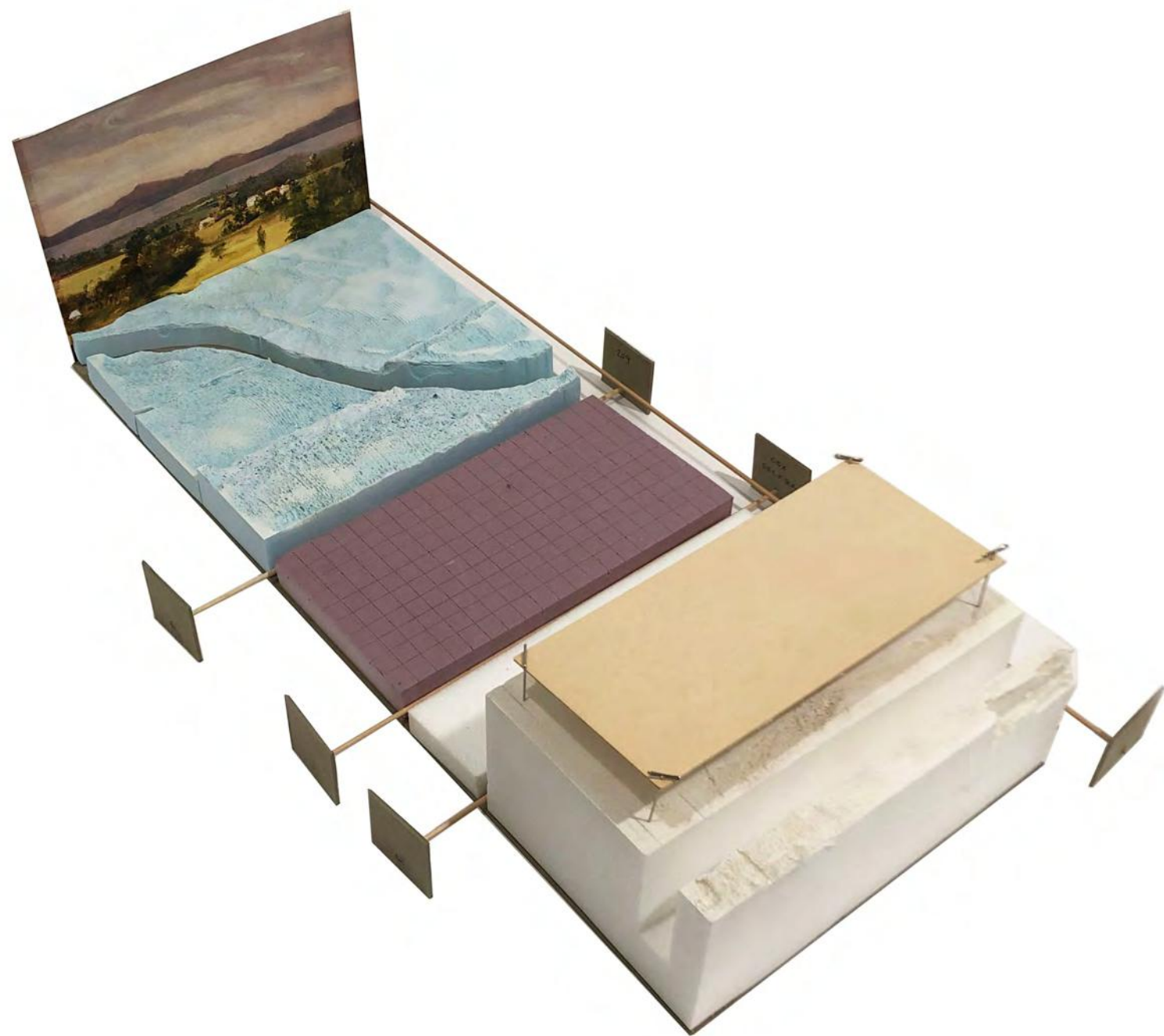
GREEN MIX CONCRETE BLOCKS

Does not use new cement

Requires less repair

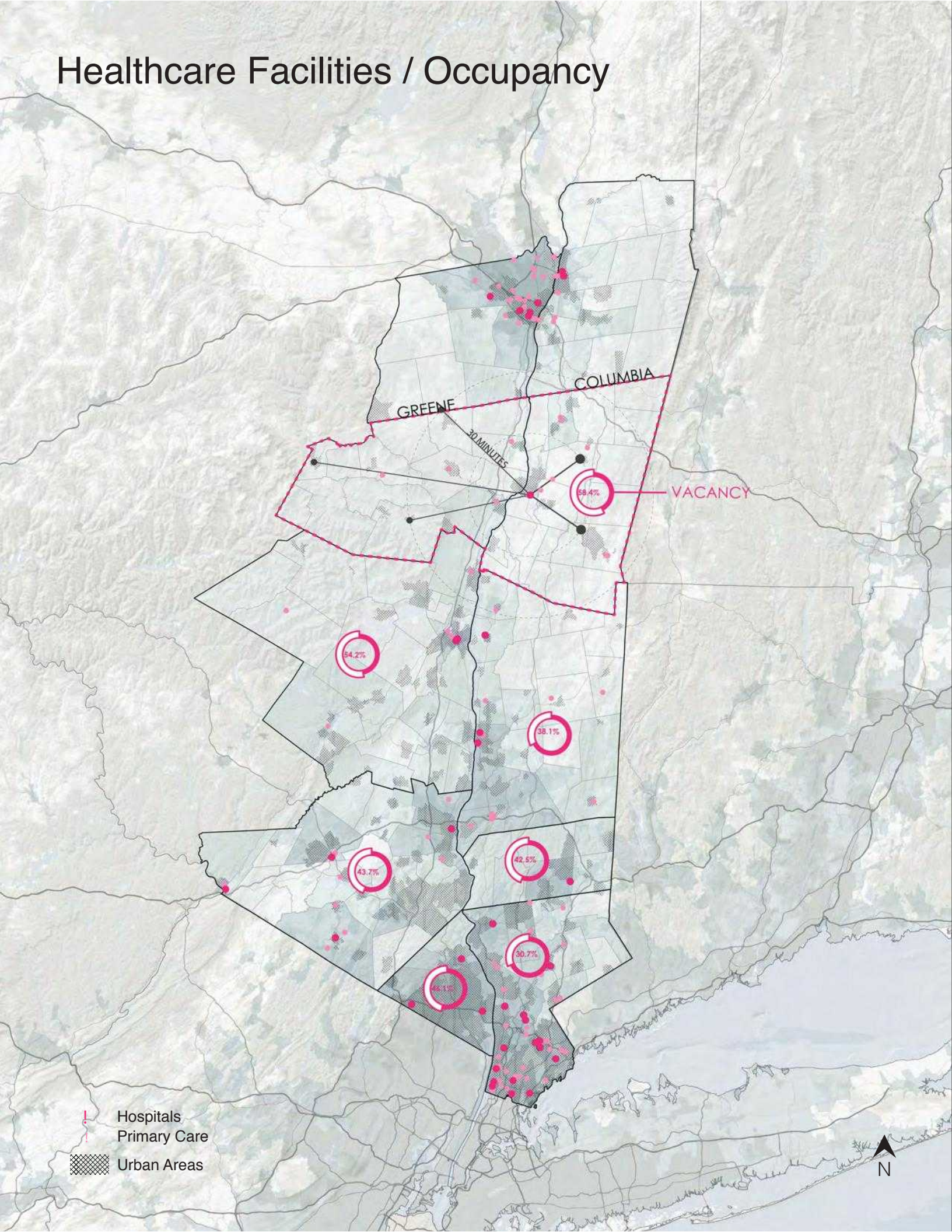
Better thermal properties





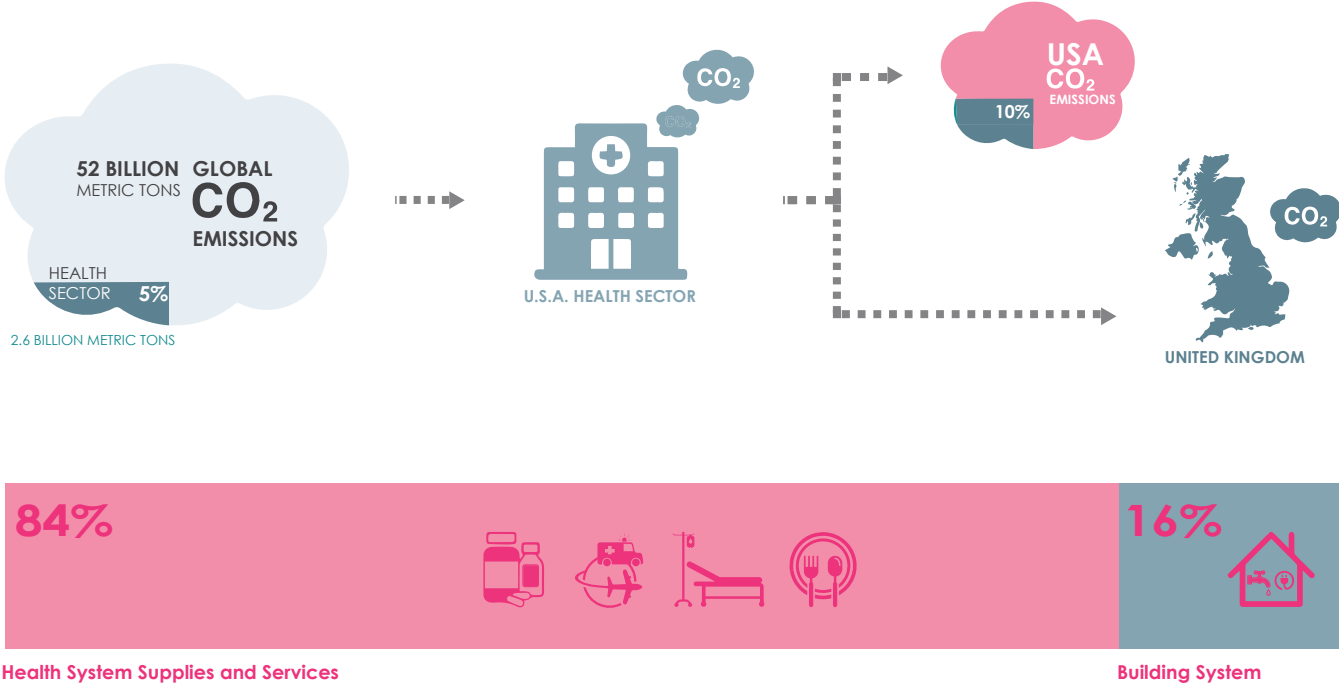


# Healthcare Facilities / Occupancy



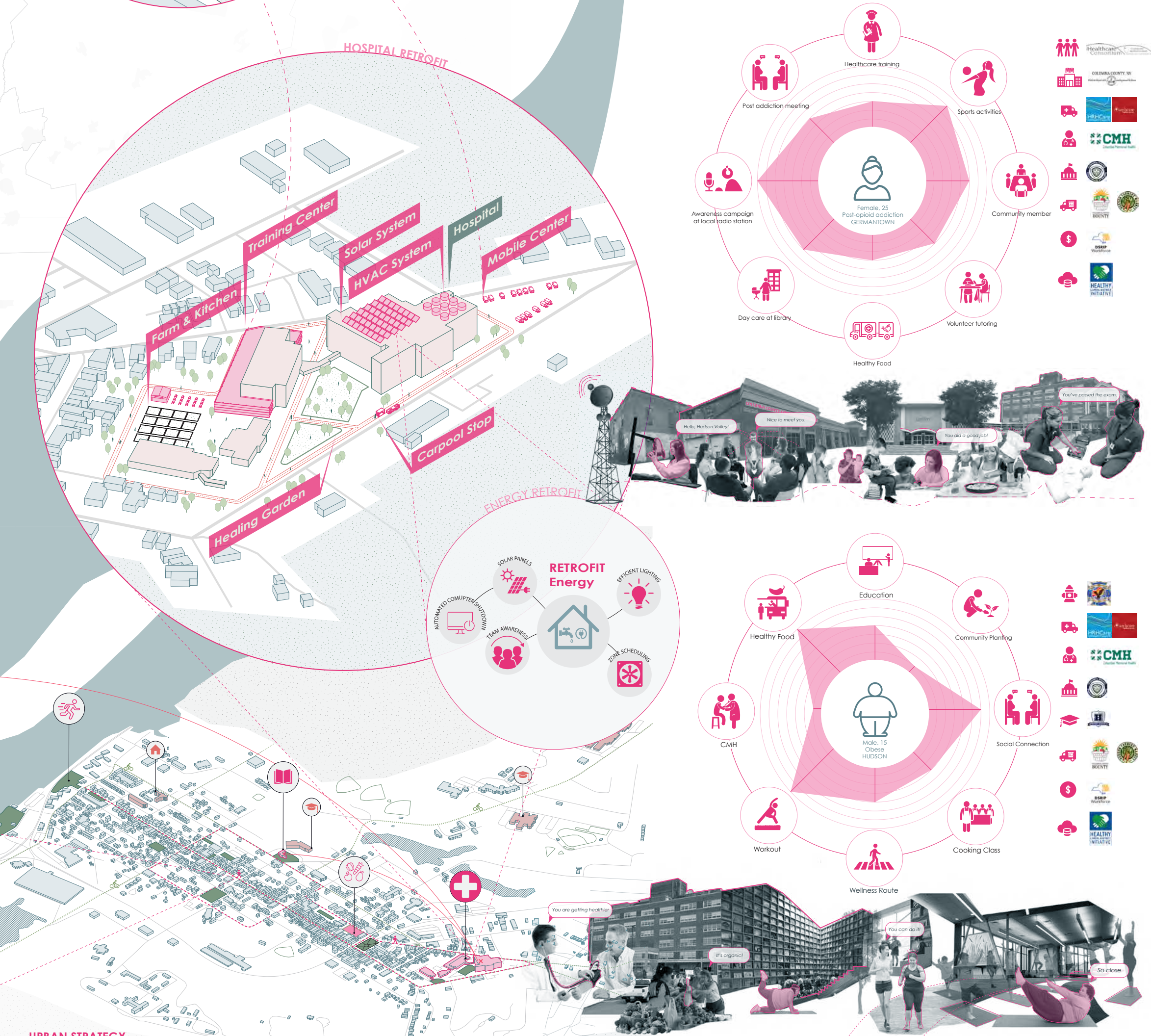
## The Carbon Footprint of Healthcare

The US produced an estimated 5.14 billion metric tons of CO<sub>2</sub> equivalent in 2017. Its healthcare industry accounts for 10% of that. Large Hospitals in cities make up the majority of this footprint, but are frequently 50% empty, while rural residents drive up 1.5 hours for basic services.



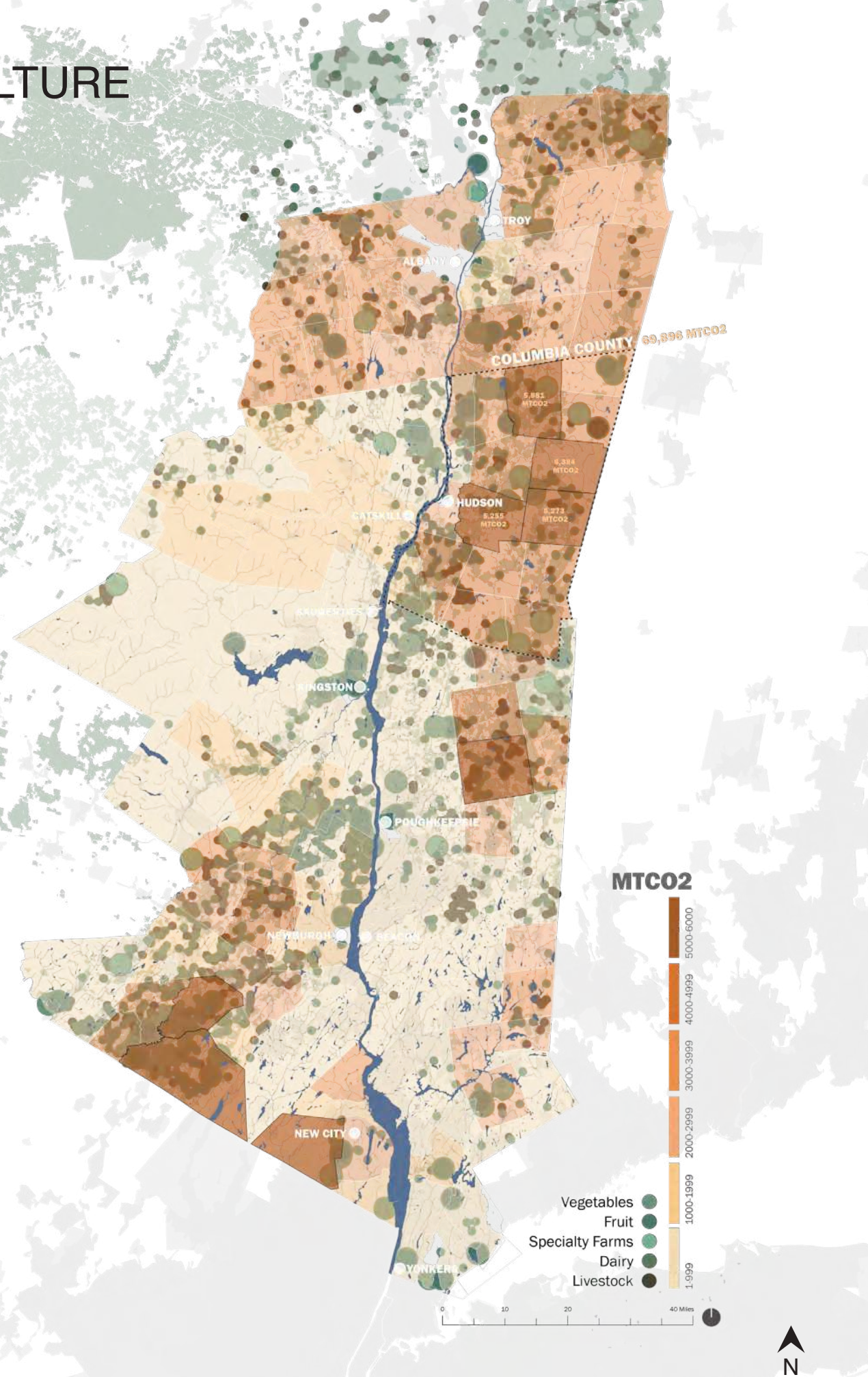
Sources: IOP, Environmental Research Letters, International comparison of health care carbon footprints, May 2019





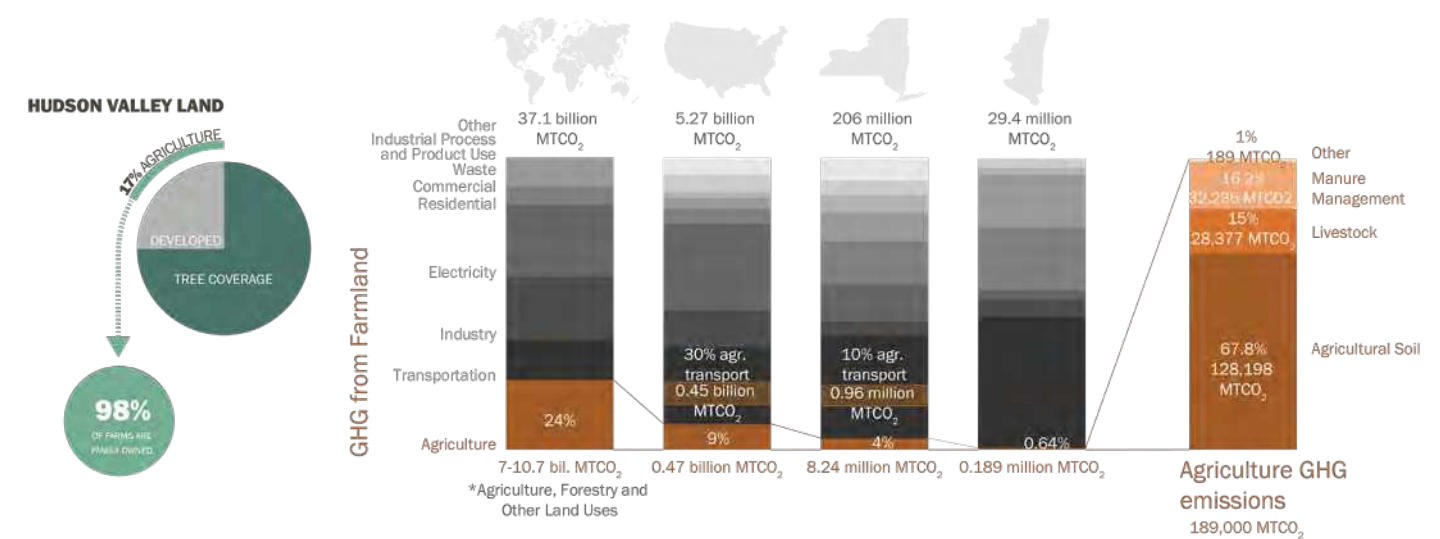


AGRICULTURE



Carbon Footprint of Agriculture

Agriculture and especially dairy and livestock farming are a big part of Hudson Valley’s economy. Industrial agriculture contributes to 9% of Green House Gas (GHG) Emissions in the United States.



Sources:  
New York State Greenhouse Gas Inventory: 1990–2016, 2019 report  
Mid-Hudson Regional Greenhouse Gas Emissions Inventory by ICF International 2012  
The Capital District Regional Planning Commission 2010, Mid-Hudson Regional Greenhouse Gas Emissions Inventory by ICF International 2012  
United States Environmental Protection Agency







Urban Design Studio

The Climate Crisis:  
Imagining a Green New Deal in  
the Hudson Valley

WORKSHOP  
DECEMBER 7

2:00 -5:30 PM

AVERY HALL

