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Estimated Energy Use in the Town of Caroline, NY Preliminary Report October 17, 2011

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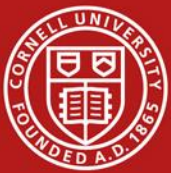
Objective

- **Assist Energy Independent Caroline to identifying types and amounts of energy utilized by the community;**
- **Lay groundwork for exploring ways in which Caroline residents & businesses can localize their energy sources, better control their future, & circulate a larger amount of residents' incomes in the local community.**



- Tompkins County Assessment Department;
- Ithaca - Tompkins County Transportation Council.
- US Census of Population;
- US Department of Energy, Energy Information Admin.;
- Transportation Energy Data Book Edition 30, 2011.

Data Sources



HOUSING OCCUPANCY	
Total housing units	1,495
Occupied housing units	1,403
Vacant housing units	92
For rent	16
Rented, not occupied	4
For sale only	8
Sold, not occupied	1
For seasonal, recreational, or occasional use	27
All other vacants	36

Source: 2010 Census of Population & Housing



HOUSING TENURE	
Occupied housing units	1,403
Owner-occupied housing units	988
Population in owner-occupied housing units	2,392
Average household size of owner-occupied units	2.42
Renter-occupied housing units	415
Population in renter-occupied housing units	861
Average household size of renter-occupied units	2.07

Source: 2010 Census of Population & Housing



- **2010 Census data on household heating source not yet available;**
- **Apply 2000 Census household heating fuel data to 2010 data;**
- **Apply NYS fuel use in BTUs by category from 2005 RECS to Caroline;**
- **Adjust estimated fuel use to account for smaller average household size in Caroline.**

Methodology: Residential Energy Use



**Estimated Residential
Energy Consumption by
Fuel Type**

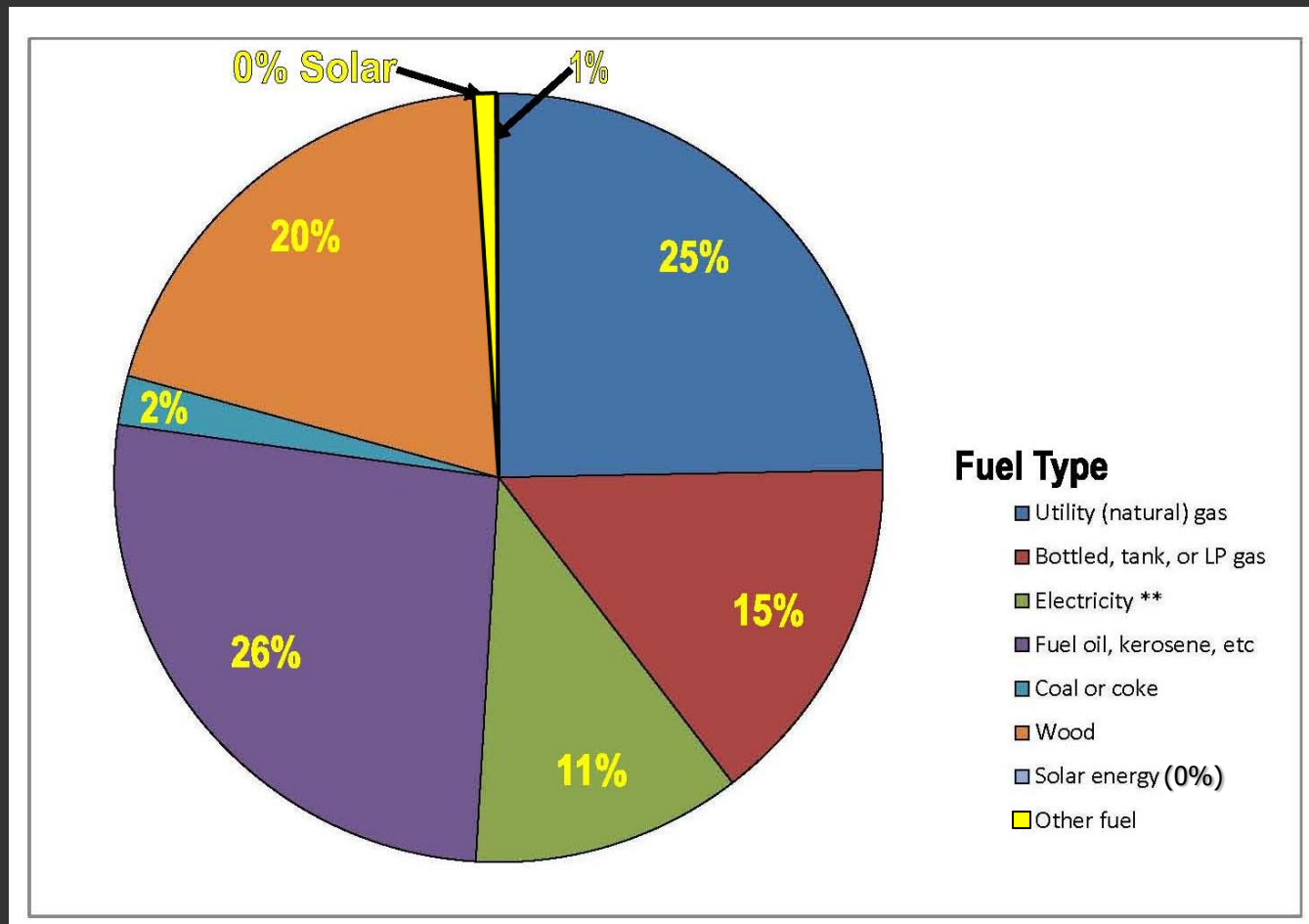
Fuel Type	Number of Households in Caroline - 2000 Census	Adjustment for # of Households in Caroline - 2010 Census	Estimated 2010 Town of Caroline Consumption for Heating (BTUs)*	Estimated Consumption Adjusted for Average Household Size***
Total - Occupied housing units*	1,162	1,403	164,012,980,000	139,886,670,642
Utility (natural) gas	287	347	40,509,230,000	34,550,322,267
Bottled, tank, or LP gas	173	209	24,418,455,714	20,826,500,879
Electricity **	132	159	18,631,422,857	15,890,740,555
Fuel oil, kerosene, etc	305	368	43,049,878,571	36,717,241,434
Coal or coke	24	29	3,387,531,429	2,889,225,555
Wood	232	280	32,746,137,143	27,929,180,369
Solar energy	-	-	n/a	
Other fuel	9	11	1,270,324,286	1,083,459,583

* Based on total New York State BTUs consumed (.88 quadrillion BTU - Table 1, pt. 1, Table 4) and proportion of Town of Caroline housing units to total number of housing units in State

** Conversion between kWh and BTU is: 3,412 Btu per kWh,

*** Household size in Caroline in 2010 is 2.32 persons, versus New York Average Household size in 2005 RECS tables of 2.72 persons

Source for BTU data: Energy Information Administration, Office of Energy Markets and End Use



Home Heating Fuel by Percent



Energy Uses	Number of Households in Caroline - 2000 Census	Adjustment for # of Households in Caroline - 2010 Census	Estimated 2010 Town of Caroline Consumption (BTUs)*	Estimated Consumption (BTUs) Adjusted for Average Household Size***	Use as Percent of Total
Total - Occupied housing units*	1,162	1,403			
Non-Heating Uses					
Air Conditioning			3,952,112,676	3,370,756,901	2%
Water heating			29,640,845,070	25,280,676,761	18%
Refridgerators			5,928,169,014	5,056,135,352	4%
Other Appliances & Lighting			31,616,901,408	26,966,055,211	19%
Subtotal - Non-Heating Uses			71,138,028,169	60,673,624,225	43%
Space Heating Use			92,874,647,887	79,212,787,183	57%
Total Energy Use - Occupied Housing Units			164,012,676,056	139,886,411,408	100%

* Based on total New York State BTUs consumed (.36 quadrillion BTU - Table 12) and proportion of Town of Caroline housing units to total number of housing units in State

** Conversion between kWh and BTU is: 3,412 Btu per kWh,

*** Household size in Caroline in 2010 is 2.32 persons, versus New York Average Household size in 2005 RECS tables of 2.72 persons

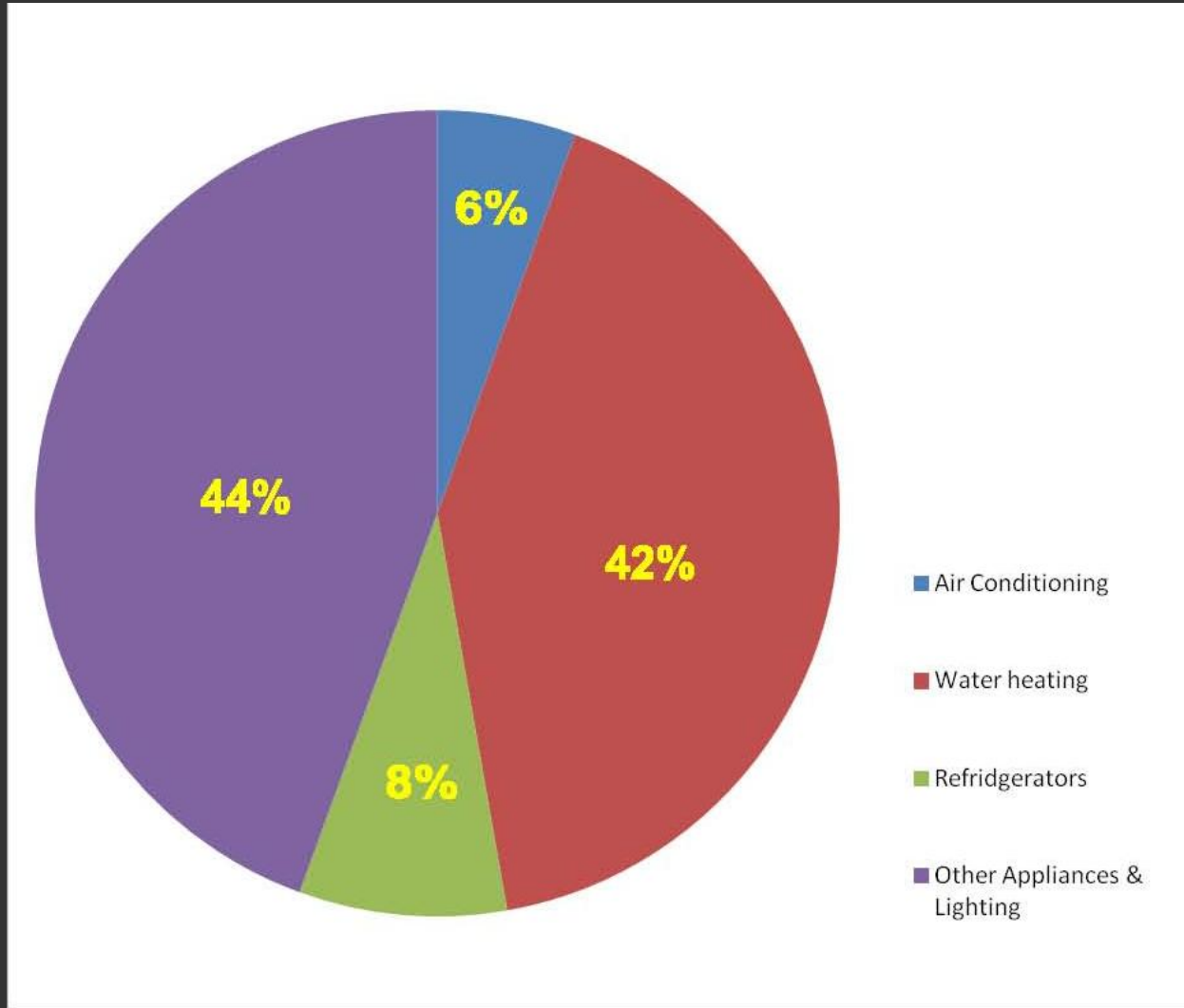
Source for BTU data: Energy Information Administration, Office of Energy Markets and End Use

Table 2. Estimated Town of Caroline Residential Energy Consumption for Heating & Non-Heating Uses Based on 2005 (RECS) Data for New York State

Estimated Residential Energy Consumption: Town of Caroline



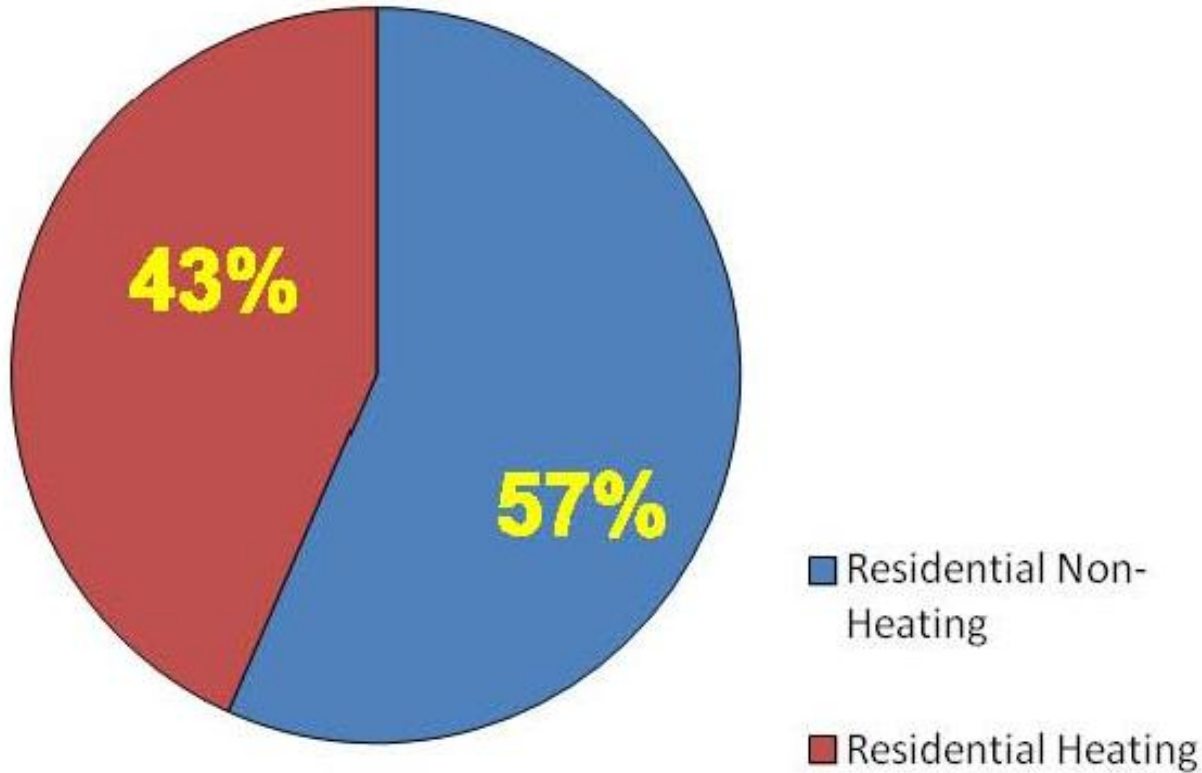
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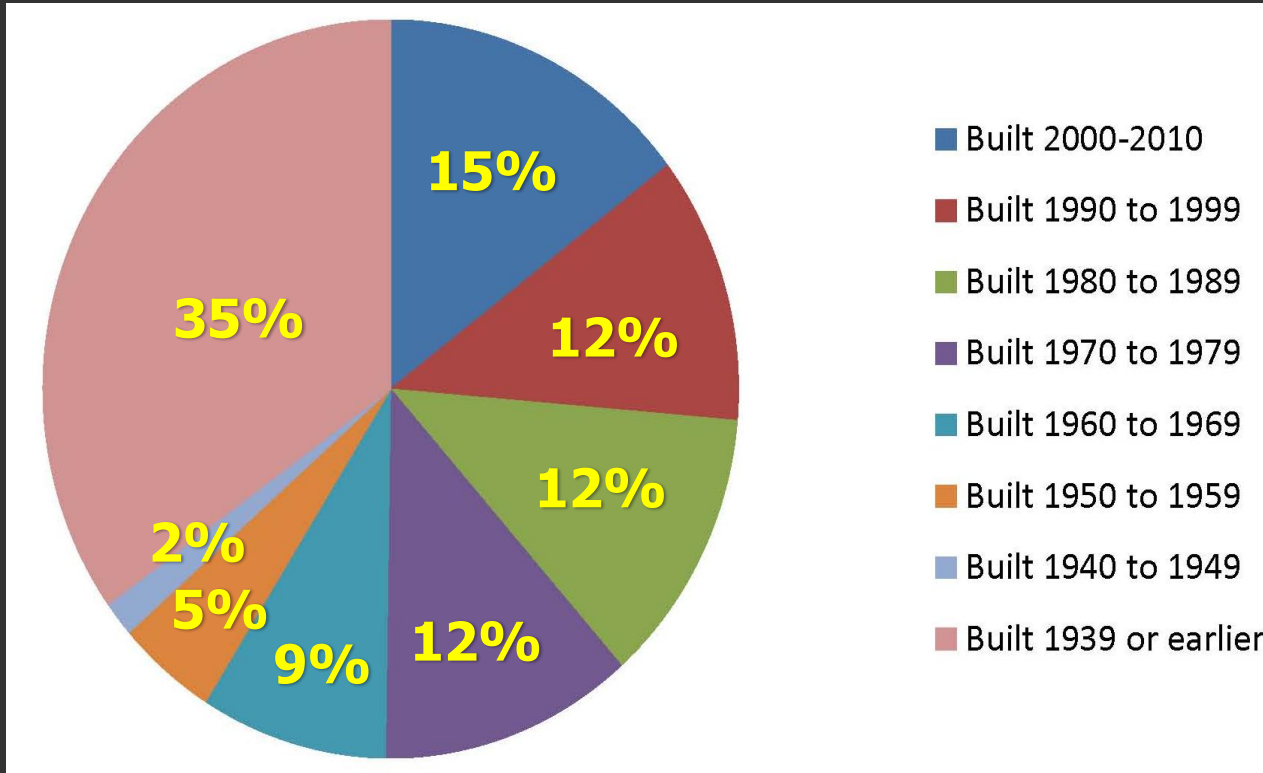
**Non-Heating Home
Energy Use by %**



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**Home Energy Use
by Percent**



Age of Caroline Housing Stock



Residential Use: Converting BTUs to Kilowatt Hours

Energy Use	BTUs	kWh	mWh
Heating	92,874,647,887	27,220,002	27,220
Non-Heating	71,138,028,169	20,849,363	20,849
Total	164,012,676,056	48,069,366	48,069

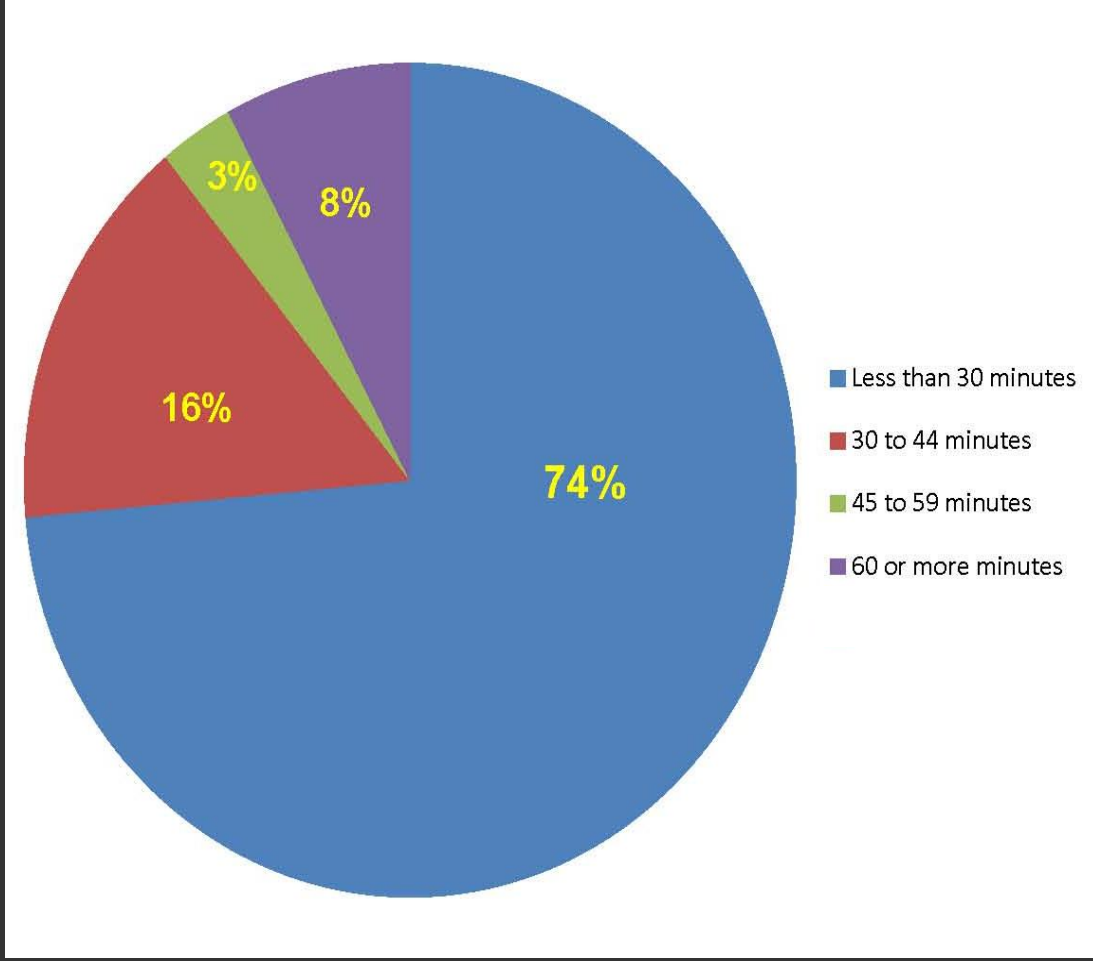


Transportation

- Annual vehicle miles traveled (VMT) by Caroline residents;
- Estimated trips by car & 2-axle light trucks;
- Average fuel mileage (nation);
- Gallons gasoline consumed converted to BTUs.

Methodology:

Vehicular
Energy Use



Journey to Work Times: Caroline Labor Force



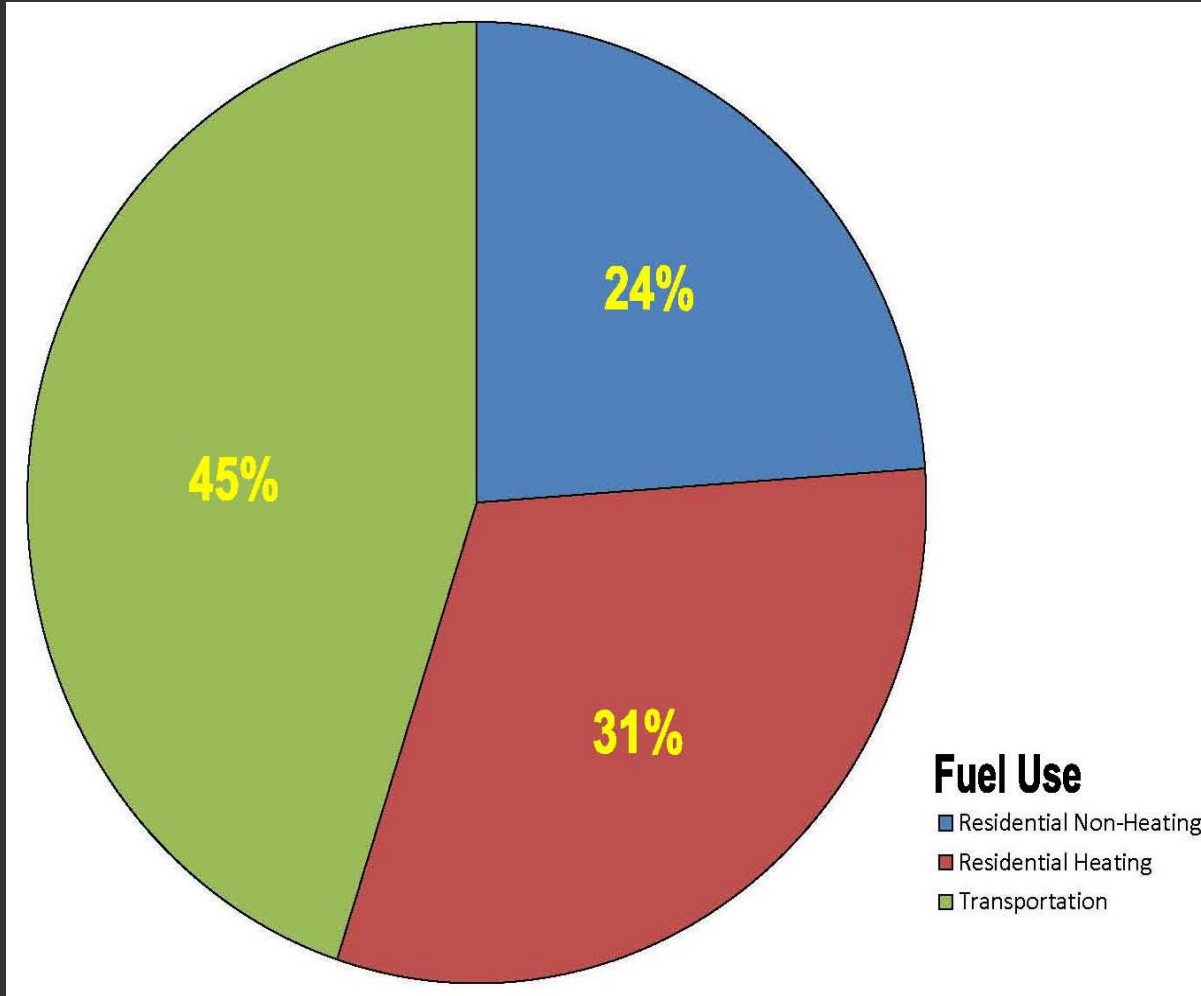
Transportation Energy Use

	VMT (million miles)	Percent	Avg. MPG	Gasoline Consumed (gals.)	BTU Equivalent (million BTUs)
Automobile VMT - Nationwide (million miles)	1,606,815	59%	22.5	71,414,000,000	8,176,903,000
2-Axle truck VMT - Nationwide (million miles)	1,108,656	41%	18.0	61,592,000,000	7,052,284,000
Total VMT Auto & 2-Axle Trucks	2,715,471			133,006,000,000	15,229,187,000
Estimated Automobile VMT - Caroline (million miles)	14.09628	59%	22.5	626,501	71,734
Estimated 2-Axle truck VMT - Caroline (million miles)	9.79572	41%	18.0	544,207	62,312
Total VMT Auto & 2-Axle Trucks	23.892			1,170,708	134,046
				Total BTUs Caroline	134,046,066,000
Gasoline mileage data from TRANSPORTATION ENERGY DATA BOOK: EDITION 30. Oak Ridge National Laboratory. 2011					
Vehicle Miles Traveled data from Ithaca-Tompkins County Transportation Council					

Sources: Ithaca – Tompkins County Transportation Council
Transportation Energy Data Book, Edition 30



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Total Residential
Energy Use by
Percent



Non-Residential Energy Use

	Sq. Feet
• Commercial/Office	59,742
• Industrial/Semi-Industrial (heated)	45,110
• Industrial/Semi-Industrial (unheated)	63,031
• Government Offices	5,198
• Church/Community Center	30,835
• Educational/Correctional	<u>123,454</u>
• Total	327,370



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Questions?

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