

Energy Element

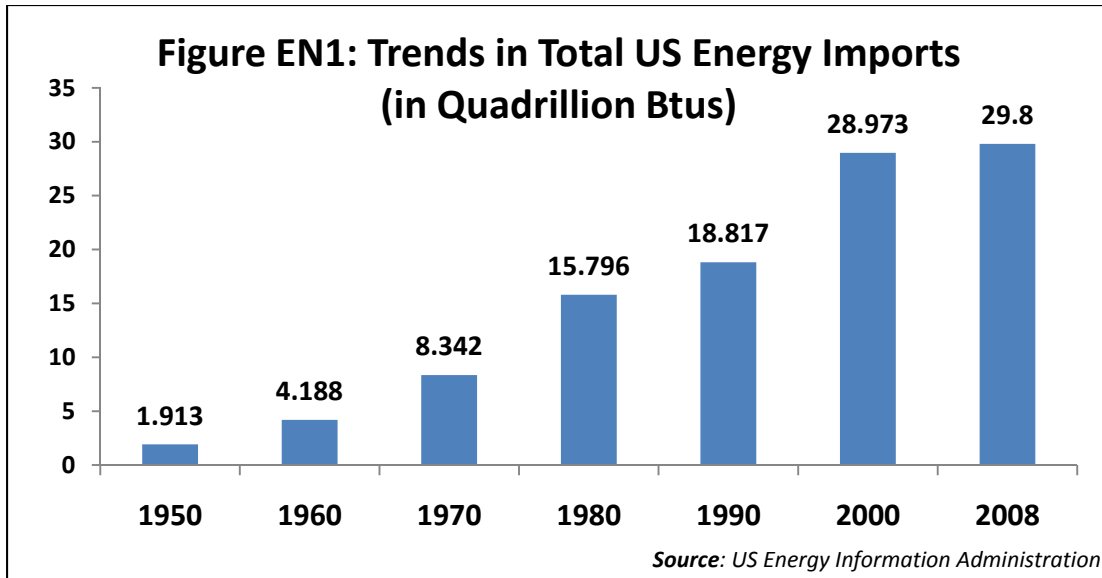
Overview

The Energy Element will discuss the type, quantity, and uses of energy in Summerville. It will discuss the current energy resources utilized by the Town of Summerville and the current energy usage of the Town and its residents. The Energy Element will help the Town outline goals for the reduction of energy use and strategies by which to achieve these goals both within the Town limits and elsewhere within the Summerville Planning Area, as set forth by the Summerville Town Council.

Summerville has abundant energy resources and several local and regional energy companies that will continue to provide energy for the Town and its residents far into the future. The Town has the opportunity to reduce their energy usage and save money while helping reduce pollution. There are several ways that the Town and its residents and businesses may reduce usage of traditional energy sources. These options may include the use of solar energy, the use of transit, the use of architecture to take advantage of natural heating and cooling, and the placement of trees and landscaping in locations that take advantage of natural heating and cooling. A reduction in energy usage will not only help to lower energy costs to residents and businesses, but it will also improve the quality of life for residents of the Planning Area.

Background

Since the 1950's, the United States has increasingly become dependent on imported energy sources, primarily, but not exclusively, in the form of petroleum products. While there are some petroleum sources that are still available in the US and elsewhere in North America, the extraction of these sources is increasingly difficult, both from a cost standpoint and from the effect of the extraction on sensitive lands, waterways, or nearby ecosystems. These petroleum products are derived from crude oil with end products including gasoline, jet fuel, asphalt, fuel oil, waxes, asphalt, and other lubricants, as well as base products for the manufacture of plastics. In 2010, the US is expected to import 53 percent of the petroleum that is consumed in the country. While the US produces 10 percent of the world's petroleum, it consumes nearly a quarter of all petroleum products that are extracted worldwide.



In order to reduce our dependence on foreign oil and the impacts that energy extraction and consumption have on our planet, a sensible approach to energy conservation must be addressed by all levels of government. Before energy consumption can be addressed on the regional or national level, communities need to assess the issue at the local level. The Energy Element will assist Summerville in assessing its energy needs and will provide the framework for creating an action plan for energy conservation in the Planning Area in future years.

Local Effects

While Summerville and its residents continues to be reliant on fossil fuels for its transportation needs for its transportation and heating needs; the location of Summerville in the Lowcountry region has allowed for a wide variety of energy resources for the community and serve to benefit homes and businesses that are located in the Town. According to the US Energy Information Administration, the Town's energy needs are supplied by hydroelectricity, coal, wood, solar energy, nuclear power and natural gas. While Summerville's residents struggled with the rise in gasoline prices in 2008 (when the price of crude oil rose to over \$145 per barrel), in dealing with its transportation needs; for the most part, the abundance of existing energy resources available to residents for its overall needs has limited the worry of Summerville residents at this time.

Existing Energy Conditions

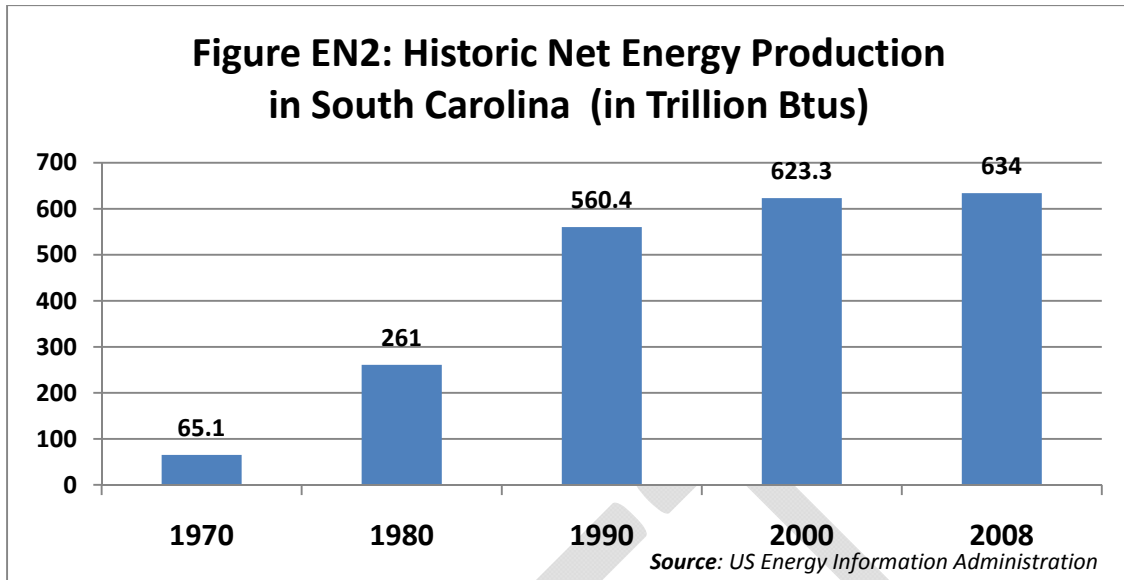
Sources and Production

The energy used by Summerville residents and businesses comes from a variety of sources. These sources are both regional and national in nature. These sources include hydropower plants overseen by Santee Cooper at Lake Moultrie and Lake Marion in Berkeley County and the four nuclear power plants located throughout the state. The energy is transmitted along the section of the Eastern Interconnection Grid overseen by the SERC Reliably Corporation. South Carolina Electric and Gas (SCE&G) is a major supplier of electricity and natural gas to residences and businesses in the Summerville Planning Area, while Berkeley Electric Cooperative also supplies electricity to a number of customers within the Berkeley County portion of the Planning Area.

Santee Cooper is South Carolina's state owned electrical and water utility. Santee Cooper, through energy production at its various production facilities, encompassing biomass, coal, natural gas and nuclear power in addition to its hydropower facilities in Berkeley County, creates the electricity to power over 2 million homes throughout the southeastern US, including energy for all electrical cooperatives in the state. Santee Cooper is also the primary water source for over 137,000 homes in Berkeley and Dorchester counties, including all homes served by the Summerville Commissioner of Public Works.

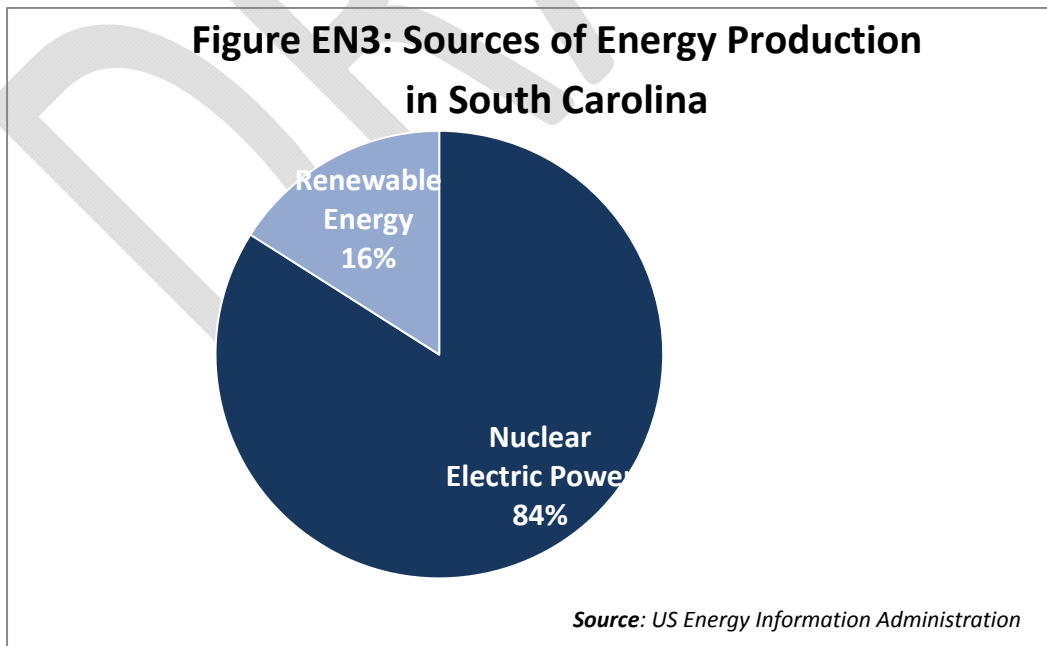
SCE&G is the principal subsidiary of SCANA Corporation, a Fortune 500 energy holding company with over \$12 billion in assets. SCANA's businesses include regulated electricity and natural gas operations in North Carolina, South Carolina, and Georgia. SCE&G serves approximately 659,000 residential electrical customers in a 24-county area of South Carolina encompassing nearly 17,000 square miles. Additionally, SCE&G serves over 313,000 natural gas customers in a service area of nearly 25,000 square miles in the central and southern parts of the state.

The Berkeley Electric Cooperative is the largest electric cooperative in the State of South Carolina. Formed in 1940 under President Franklin Roosevelt's Rural Electrification Administration by six Berkeley County residents in coordination with the County Agent's office, the Cooperative today is a state of the art utility serving over 80,000 accounts in Berkeley, Charleston, and Dorchester counties along a 5,000 mile transmission system. The Cooperative operates on a member-owned, not for profit, cost of service basis, and gives price margins back to the Cooperative members in the form of capital credits to reduce overall energy costs.



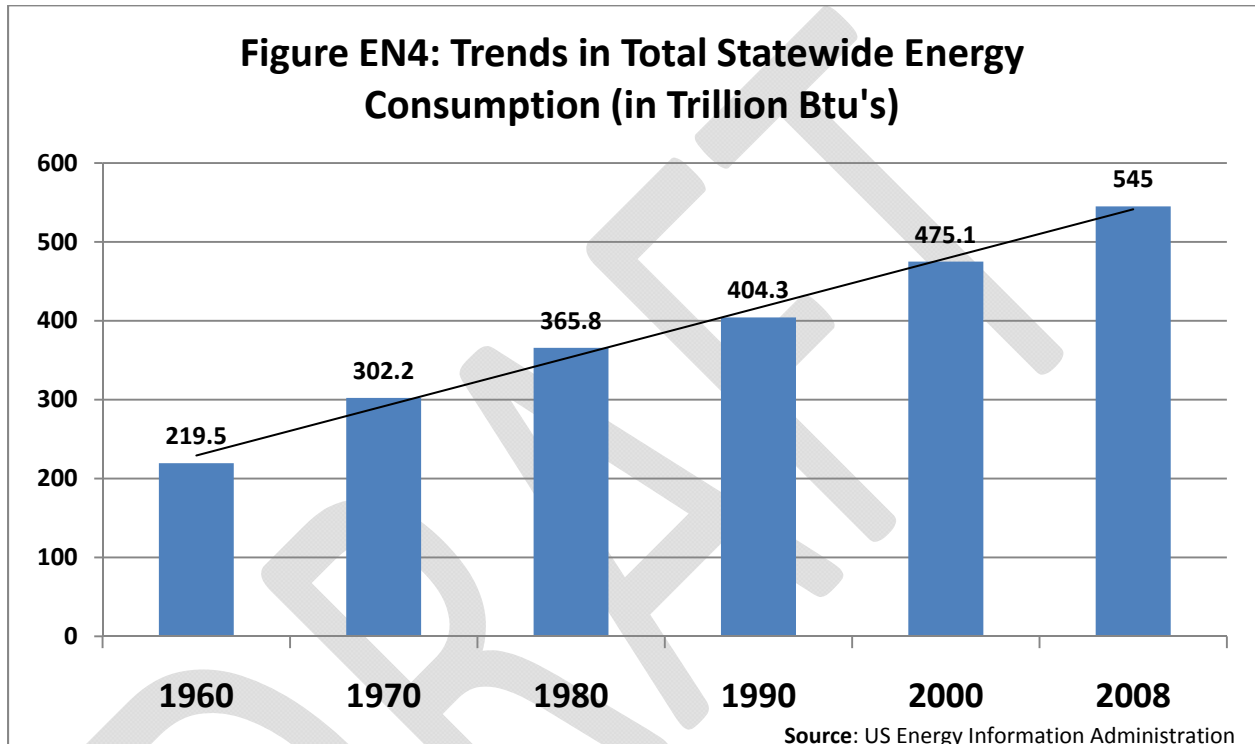
Production Sources

Of the 634 trillion Btus of energy production that occurred in South Carolina in 2008 from internal sources (not including coal-powered plants), 541 trillion Btus were produced by the four nuclear power facilities located in the state, while the remaining 92.8 trillion Btus were produced by renewable sources. The majority of this power was created by the numerous hydropower facilities in the state, and the remainder created by a variety of other renewable sources, including solar power, wind, geothermal power, and tidal action. As of 2008, there is no extraction of coal, natural gas, or crude oil occurring within South Carolina's borders.



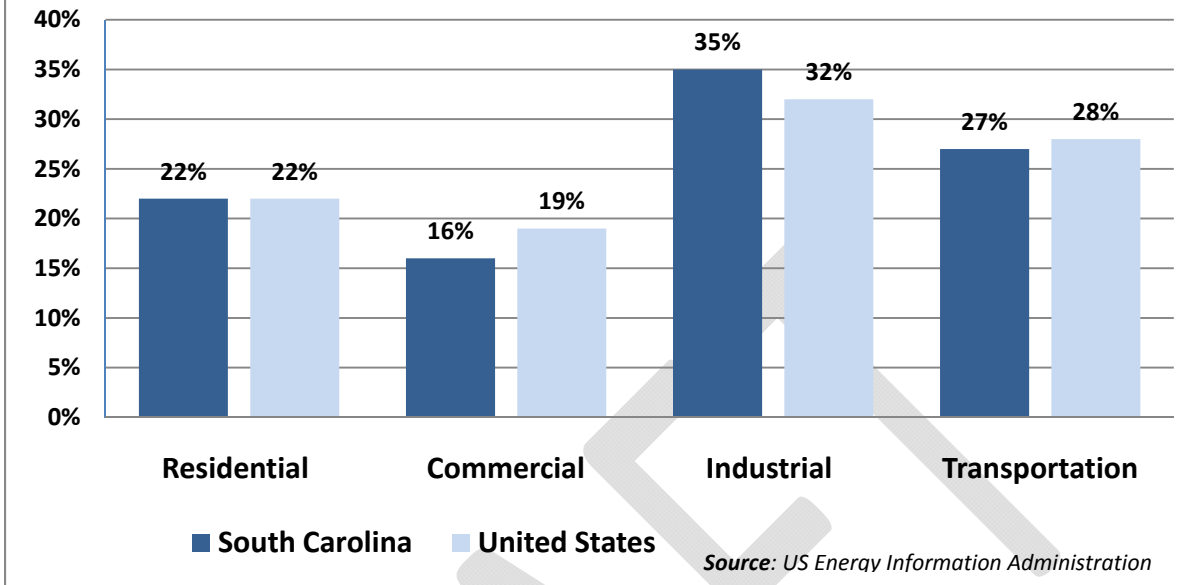
Consumption

In 2008, South Carolina residents and businesses consumed 545 trillion Btus of energy. In 2008, the average resident of South Carolina consumed a total of 369 million Btus over the course of the year. This placed the state 19th in the nation in terms of per-capita energy consumption (see Figure EN4). This ranking can be attributed to a number of factors, including the high demand for air conditioning during the summer months and the widespread use of less-efficient electricity for home heating during the winter months.



In 2008, South Carolina's total energy consumption was 1,660 trillion Btus. Of this amount, 35 percent of the consumption was by the industrial sector, 27 percent was by the transportation sector, including by commuters, 22 percent was by residences, and 15 percent was by commercial businesses, as shown in Figure EN5. In comparison to the US (Figure EN6), South Carolina's industrial sector uses more energy in relation to other user types than in the nation as a whole.

Figure EN6: Energy Consumption by Sector, South Carolina vs. United States, 2008



Residential Use

In 2008, the average South Carolina residential energy user consumed approximately 214,569,680 Btus of energy. Based on data from the US Energy Information Administration, this consumer paid an average of \$31 per million Btus of energy, or \$6,651.66 per year for energy. The total amount of energy consumed in 2008 by residents of the Town of Summerville was 2,897,548,961,000 Btus, at a cost of \$89,824,017.

| Table EN1: Residential Energy Use for the Town of Summerville, 2008 | |
|--|------------------------|
| Total SC Residential Energy Consumption | 361.887 Trillion Btus |
| Total Residential Energy Consumers in SC | 1,852,667 |
| Average SC Energy Price per Million Btu | \$31 |
| Average Annual Energy Consumption per Residential Consumer | 214,569,680 Btus |
| Total Number of Summerville Residential Consumers | 13,504 |
| Total Annual Residential Energy Consumption for the Town of Summerville | 2,897,548,961,000 Btus |
| Total Annual Residential Energy Expenditure for Summerville Resident | \$6,651.66 |
| Total Annual Residential Energy Consumption for Summerville | \$89,824,017 |
| <i>Sources: US Energy Information Administration, South Carolina Energy Profile and US Economic Census</i> | |

Home Heating and Cooling

The majority of homes (70% of owner-occupied homes and 89 % of rental homes) (Figures EN7 & EN8) in Summerville are heated with electricity, with most of the remainder of homes relying on natural gas for heating and cooking. A small number of homes utilize a variety of energy sources, including wood, coal, or solar heating for home heating and cooking needs.

Figure EN7: Home Heating Source for Owner- Occupied Units in Summerville

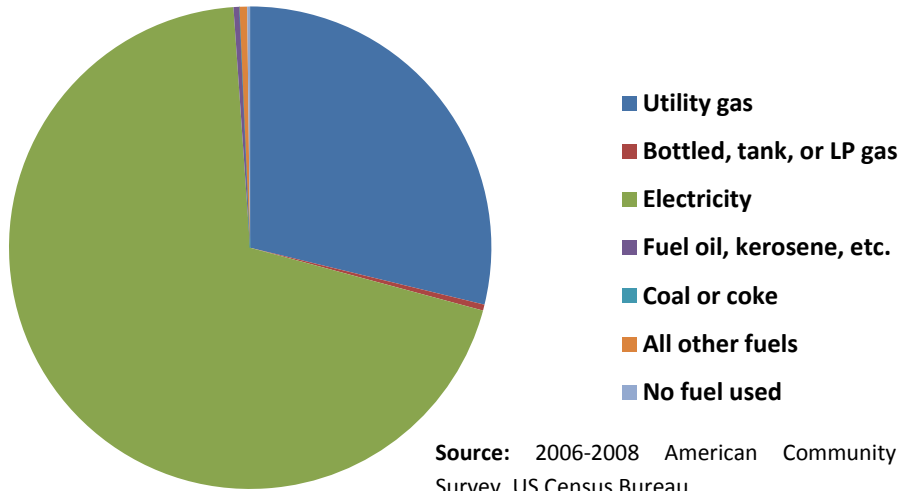
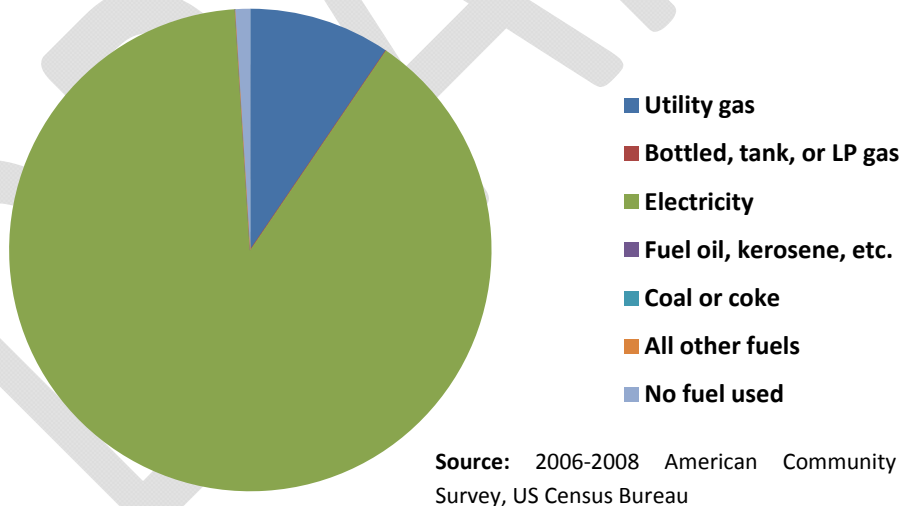


Figure EN8: Home Heating Source for Rental Units in Summerville



Commercial Use

The average South Carolina commercial consumer in 2008 consumed approximately 742,240,956.6 Btus of energy. This commercial consumer paid an average of \$28.12 per million Btus, or \$20,871.82 per year for energy. The total amount of energy consumed by commercial consumers in the Town of Summerville was 1,192,993,630,000 Btus, at a cost of \$ 11,548,178.34, as seen in Table EN2.

| Table EN2: Commercial Energy Use for the Town of Summerville in 2008 | |
|---|-----------------------|
| Total SC Commercial Energy Consumption | 265.785 Trillion Btus |
| Total Commercial Energy Consumers in SC | 273,294 |
| Average SC Energy Price per Million Btus | \$28.12 |
| Average Annual Energy Consumption per Commercial Consumer | 742,240,956.6 Btus |
| Total Number of Summerville Commercial Consumers | 720 |
| Total Annual Commercial Energy Consumption for the Town of Summerville | 53,441,348,880 Btus |
| Total Annual Energy Expenditure for Summerville Commercial Customer | \$20,871.82 |
| Total Annual Commercial Energy Expenditure for Summerville | \$15,027,530.40 |
| Sources: US Energy Information Administration, South Carolina Energy Profile, and US Economic Census | |

In 2008, the average South Carolina industrial consumer consumed approximately 121,271,597,300 Btus. This industrial consumer paid an average of \$28.12 per million Btus, or \$3,410,157.54 for energy per year. The total amount of energy consumed by industrial consumers in the Town of Summerville was 58,453 billion Btus, or \$1,653,695,674 of energy as shown in Table EN3.

| Table EN3: Industrial Energy Use for the Town of Summerville in 2008 | |
|--|------------------------|
| Total SC Industrial Energy Consumption | 585.378 Trillion Btus |
| Total Industrial Energy Consumers in SC | 4,827 |
| Average SC Energy Price per Million Btu | \$28.12/Million Btus |
| Average Annual Energy Consumption per Industrial Consumer | 121,271,597,300 Btus |
| Total Number of Summerville Industrial Consumers | 247 |
| <i>Total Annual Industrial Energy Consumption for the Town of Summerville</i> | 2,995,408,450,000 Btus |
| Total Annual Energy Expenditure for Summerville Industrial Customer | \$3,410,157 |
| Total Annual Industrial Energy Consumption for Summerville | \$842,308,857 |
| Sources: US Energy Information Administration, South Carolina Energy Profile and US Economic Census | |

Auto Use and Fuel Consumption

The 2006-2008 American Community Survey, a three-year average that replaces the “long form” of the US Census, describes the method by which Town residents commute to work. The results of the ACS show that 18,196 Town residents commute to work. Of the total of Summerville commuters, 15,428 residents drive themselves to work, while over nineteen hundred (1,927) Summerville residents utilized a carpool for their commute to work. It is estimated that as of 2008, no Summerville residents utilize some sort of public transportation to commute to work. However, 90 Summerville residents use other means, such as bicycling, to commute, and 215 individuals walk to work. Finally, the mean one-way travel time to work for Summerville residents was approximately 27.3 minutes. The consequences of the need of Summerville residents to commute great distance to work in relation to others in the metro Charleston region are described in more detail in the Transportation and Economic Development Elements of the Comprehensive Plan.

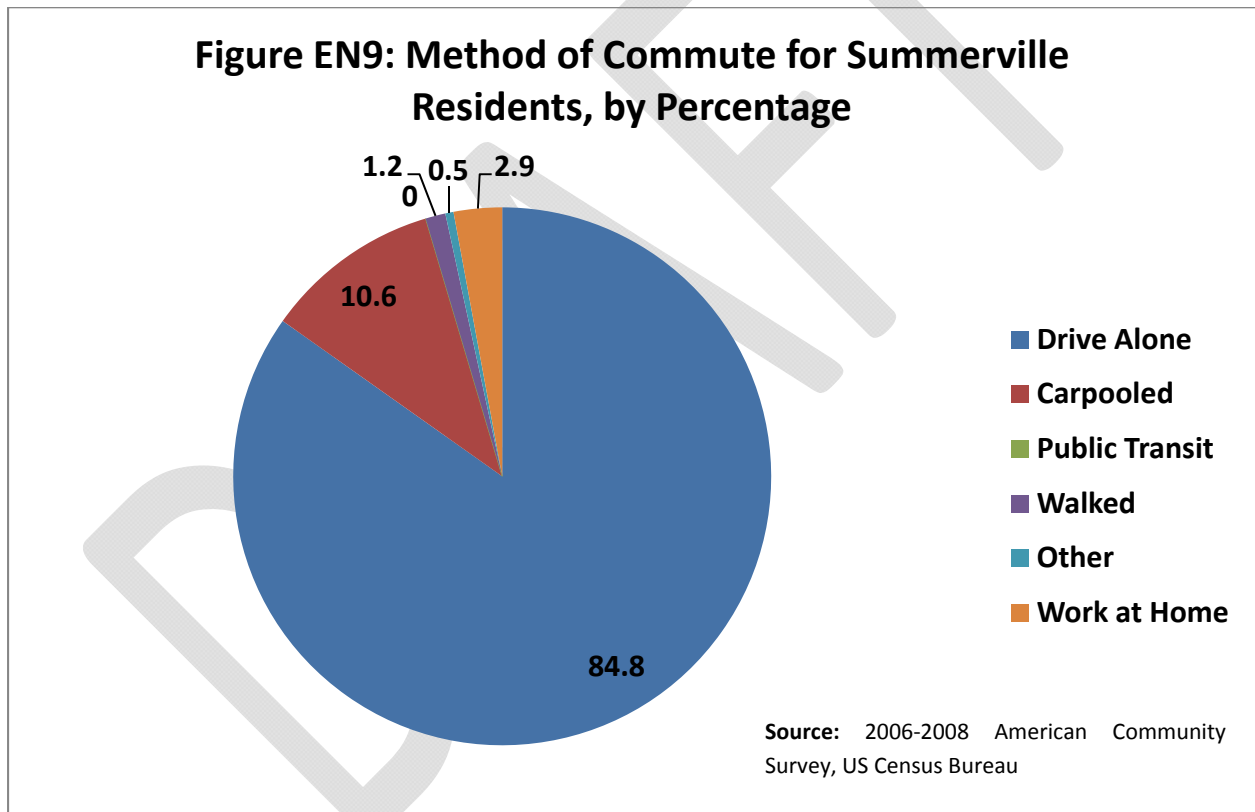


Table EN4 shows the fuel consumption patterns for the Town of Summerville. There are approximately 13,504 households in Summerville as of 2008. The average gasoline consumption per household in Summerville in 2008, based on an average annual gasoline consumption of 583 gallons per individual is approximately 1,573 gallons per year.

Table EN4: Fuel Consumption for Households in Town of Summerville

| Vehicle Type | 2008 US Average Fuel Consumption Per Vehicle (Gallons per Year) | 2008 SC Average Fuel Consumption per Capita (Gallons per Year) | Number of HH in Summerville | Total Consumption | 2008 Fuel Rate (MPG) | September 2010 Cost per Gallon | Total Expenditures |
|--------------------------------|---|--|-----------------------------|--------------------|----------------------|--------------------------------|--------------------|
| Passenger Cars | 522 | N/A | N/A | N/A | 22.6 | N/A | N/A |
| Vans, Pickup Trucks, and SUV's | 605 | N/A | N/A | N/A | 18.1 | N/A | N/A |
| Large Trucks | 4,075 | N/A | N/A | N/A | 7.7 | N/A | N/A |
| All Motor Vehicles | 667 | 582.68 | 13,504 | 21,245,156 gallons | 17.4 | \$2.53 | \$53,750,246 |

Sources: 2006-2008 American Community Survey, US Census Bureau; US Energy Information Administration, Gasbuddy.com

Renewable Energy

In recent years, the extraction of fossil fuels has increased substantially in cost and effort to obtain, both within the US and elsewhere in the world. Consequently, the availability of easily obtained fossil fuels has diminished. As the awareness of the effects of the use of fossil fuels on the environment has become more documented over time, customers and businesses have increasingly considered renewable energy as a viable source of power for home or business use.

In South Carolina, the largest renewable energy source has traditionally been the power produced by the rivers located throughout the state. For the residents and businesses located within the Summerville Planning Area, whose power is primarily supplied via facilities owned by Santee Cooper, the renewable energy created at the hydroelectric dams at Lakes Moultrie and Marion are the main source of electricity. However, the ability to draw more power from the existing water supply is limited, due to

the current production that takes place along the Cooper River and other state rivers, including the Ashley and Edisto Rivers.

A second option for renewable energy in South Carolina is via the burning of biomass products from a variety of fuel sources. . An example of this is being proposed for the Oak Ridge landfill in Dorchester County by Santee Cooper, where waste wood product from existing forestry activities will be burned to provide energy. The power plant, which will produce an estimated 15 MW of energy, is expected to open in 2012 and will employ 20 individuals.

Another option to create usable energy is to convert methane and other gases created through the degrading of landfill products into electricity. This process is currently in place at a number of landfills throughout the state and has also been considered for the Oak Ridge landfill.

Another renewable energy option that South Carolina is considering is through the conversion of the wind blowing just off the state's shores into electricity through a series of windmills that would be connected to the electrical grid. While this could help the state in meeting a significant portion of its energy needs in the coming years, the cost of transmission both from the production site to shore and inland to the main electricity grid and the effects of the wind generation facilities on military readiness should be considered. Onshore, the potential for wind generation is limited, due to the lack of a constant breeze to power the wind turbines in most inland areas of the metro Charleston region.

A number of South Carolina homeowners and businesses have also begun to invest in solar power as a renewable energy source through the installation of photovoltaic cells that draw energy from the sun and convert it to power. This power can be stored locally in large battery grids for use at a later time, used at the time of generation (to assist in heating or cooling or to heat water for a swimming pool) or, in a limited (but expanding) number of cases, sold onto the larger power grid by the homeowner in exchange for a lowering of a home or businesses electric bill. While this solution may assist homeowners or businesses in addressing their energy needs, the potential for wide scale commercial solar power in the state is limited due to the amount of sunshine present during peak daylight hours. An example of this in the Summerville planning area can be found at IMO USA, a leading manufacturer of slewing rings and slew drives that assist in the generation of wind power, located in the McQueen Industrial Park. At IMO USA's new 40,000 square foot building where 190 people will eventually be employed, the largest dual axis PV solar tracker in the state has recently been installed. This will assist IMO USA in providing power for its manufacturing activities at the site.

In order to encourage the adoption of renewable power energy sources as a means of lowering energy cost and dependency, various state and federal agencies have created and continue to fund a series of incentive programs to aid in the purchase and installation of energy efficient products and materials. A full listing of federal and state energy efficiency and renewable energy incentive programs for homeowners and business customers can be found at the US Department of Energy's Database of State Incentives for Renewables and Efficiency (www.dsireusa.org).

Energy Element Goals, Objectives, and Strategies

The Energy Element will help residents and businesses in the Summerville Planning Area outline goals for the reduction of energy use and the increased utilization of renewable energy sources, as well as strategies by which to achieve these goals, as set forth by the Summerville Town Council.

Energy Usage

Goal: Promote energy efficiency in municipal buildings, equipment, and vehicles

| STRATEGY | PARTNERS | IMPLEMENTATION | | | |
|---|--|--|--|----------|-----------|
| | | TOOLS | FUNDING | PRIORITY | TIMEFRAME |
| Replace energy intensive equipment with energy efficient products i.e. light bulbs, appliances, machinery, windows, insulation, roofing, etc. | Town Staff, Town Council | Building Code, Comprehensive Plan | General Fund, Capital Improvement Plan, Grants | High | On-going |
| Replace fuel intensive vehicles and equipment with fuel efficient products such as alternative fuel vehicles, bicycles, etc | Town Staff, Town Council | Comprehensive Plan, Capital Improvement Plan | General Fund, Capital Improvement Plan | Medium | On-going |
| Explore efficient use of town vehicles such as route efficiency for trash collection | Town Staff | Comprehensive Plan, GIS | General Fund, Grants | Low | Long-term |
| Apply for energy rate reductions for energy efficiency and energy credits for retrofitting. | Town Staff, Electric Companies, Town Council | Franchise Agreement | General Fund, SCE&G, Berkeley Electric Co-Op | High | On-going |

Goal: Promote energy efficiency in local businesses

| STRATEGY | PARTNERS | IMPLEMENTATION | | | |
|--|--|--|---|----------|-----------|
| | | TOOLS | FUNDING | PRIORITY | TIMEFRAME |
| Work with County Economic Development Departments to attract energy efficient companies and those that recycle and reuse byproducts to locate in the Summerville Planning Area | Town Council, Town Staff, County Economic Development Departments, BCDCOG | Comprehensive Plan, Economic Development Plan | General Fund, County Economic Development Funding, BCDCOG Loans | Medium | On-going |
| Encourage companies to reuse and recycle goods | Town Staff, Town Council, County Governments | County Recycling Programs | County Funds | High | On-going |
| Increase awareness of opportunities for residents and businesses to recycle electronic equipment such as computers, monitors, televisions, and cellular phones. | Town Staff, Counties, Town Council | County Recycling Programs | County Funds | High | On-going |
| Encourage businesses within the Summerville Planning Area to incorporate renewable energy sources into their building design | Town Staff, Counties, Town Council, Commercial Design Review Board, Developers | Building Code, Energy Code, Comprehensive Plan | General Fund, Grants, Tax Credits | High | On-going |

| STRATEGY | PARTNERS | IMPLEMENTATION | | | |
|---|---|-------------------------|---------------------------|----------|-----------|
| | | TOOLS | FUNDING | PRIORITY | TIMEFRAME |
| Increase awareness of state Smart Business Recycling Program and other state recycling programs for businesses. | Town Staff, SC Department of Commerce, Counties | State recycling program | General Fund, State Funds | High | On-going |

Goal: Encourage energy efficiency in existing development

| STRATEGY | PARTNERS | IMPLEMENTATION | | | |
|--|--|-----------------------------------|----------------------|----------|-----------|
| | | TOOLS | FUNDING | PRIORITY | TIMEFRAME |
| Encourage residents and businesses to apply for applicable SCE&G and Berkeley Energy Co-Op energy rate reduction | Town Staff, Town Council, Energy Companies | Comprehensive Plan, Building Code | General Fund | Medium | On-going |
| Encourage energy saving additions, retrofitting, and renovation to homes and businesses, such as installing double pane windows, installing energy efficient roofing, using insulation for homes, etc. | Town Staff, Town Council | Building Code, Energy Code | Grants, General Fund | High | On-going |
| Create awareness of state and federal tax incentives for energy efficient home improvements. | Town Staff | Building Code, Comprehensive Plan | Grants, General Fund | High | On-going |

Goal: Promote energy efficiency in new development

| STRATEGY | PARTNERS | IMPLEMENTATION | | | |
|--|--|--|----------------------|----------|-----------|
| | | TOOLS | FUNDING | PRIORITY | TIMEFRAME |
| Educate local developers on energy efficient building and landscaping techniques | Town Staff, Town Council, Commercial Design Review Board, Developers | Building Code, Zoning Ordinance | General Fund, Grants | High | On-going |
| Encourage energy efficient landscaping and xeriscaping | Town Staff, Commercial Design Review Board, Developers | Zoning Ordinance, | General Fund, Grants | High | On-going |
| Encourage compact, mixed use, and infill development within the Summerville Planning Area | Town Staff, Town Council, Planning Commission | Zoning Ordinance, Comprehensive Plan | General Fund | High | On-going |
| Encourage development within the Planning Area to integrate into existing transportation and infrastructure networks | Town Staff, Town Council, Planning Commission, Utilities, SCDOT | Land Development Regulations, Comprehensive Plan, Zoning Ordinance | General Fund | High | On-going |
| Enforce the International Energy Conservation Code | Town Staff, Town Council | Building Code, Energy Conservation Code | General Fund | High | On-going |

Goal: Promote energy efficiency in transportation decisions

| STRATEGY | PARTNERS | IMPLEMENTATION | | | |
|--|--|--|---|----------|-----------|
| | | TOOLS | FUNDING | PRIORITY | TIMEFRAME |
| Encourage connectivity between commercial and residential developments within the Planning Area | Town Staff, Planning Commission, Town Council, Commercial Design Review Board | Land Development Regulations | General Funds | High | On-going |
| Encourage and work to strengthen transit opportunities in the Planning Area, such as Teleride, Tri-County Link, etc. | Town Staff, Planning Commission, Town Council, Tri-County Link, BCDCOG | Comprehensive Plan, Long Range Transportation Plan, County Transportation Plan | General Funds, BCDCOG, Grants | High | On-going |
| Encourage pedestrian friendly developments and renovations to existing residential and commercial developments to be designed in ways that decrease reliance on motor vehicles | Town Staff, Planning Commission, Town Council, Commercial Design Review Board, Bike-Ped Advisory Committee | Zoning Ordinance, Comprehensive Plan, Land Development Regulations | General Fund, Developer Funded Projects | High | On-going |

| STRATEGY | PARTNERS | IMPLEMENTATION | | | |
|--|--|--------------------|----------------------|----------|-----------|
| | | TOOLS | FUNDING | PRIORITY | TIMEFRAME |
| Consider working with other local governments to implement a regional bike share program similar to the Capital Bike Share program in Washington DC. | Town Staff, Town Council, BCDCOG, Other Local Governments, Joint Base Charleston, Colleges and Universities, Bike Ped Advisory Committee | Comprehensive Plan | Grants, General Fund | Low | Long-term |
| Consider the implementation of a car share program similar to those in place in other parts of the US. This could be done at the local level, or in combination with other communities in the region | Town Staff, Town Council, BCDCOG, Joint Base Charleston Other Local Governments, Colleges and Universities | Comprehensive Plan | Grants, General Fund | Low | Long-term |