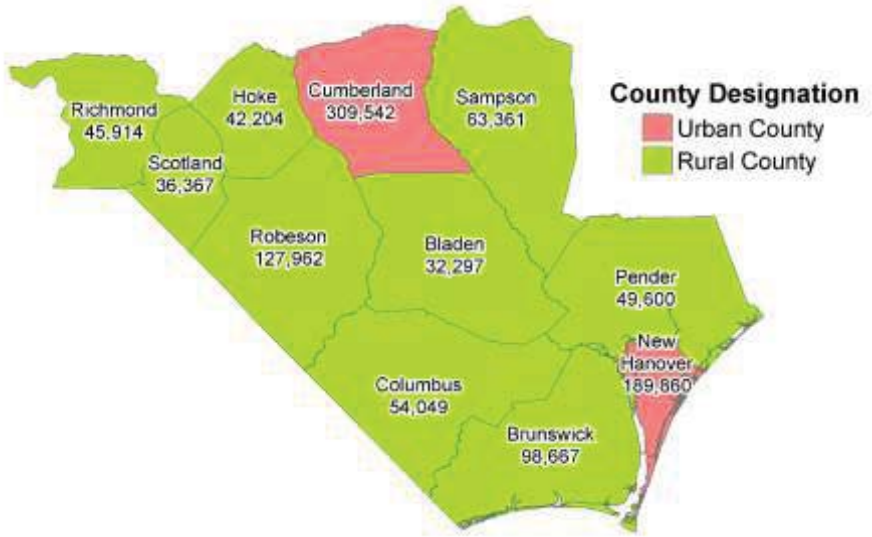
CHAPTER 9: SOUTHEAST REGION

- ★ **Strong clustering of firms in New Hanover County.**
- ★ **Strong solar and biomass resource base and presence of relevant firms.**
- ★ **High proportion of manufactured housing stock found in counties throughout region.**
- ★ **Established military presence at Fort Bragg in Cumberland County.**
- ★ **Received nearly $9.5 million in energy related ARRA funding, 96 percent allocated to energy efficiency.**

Exhibit 77: County population and designation.



Sources: U.S. Census Bureau, NC Rural Center, NC Sustainable Energy Association.

Exhibit 78: Southeast region rankings compared to other North Carolina regions.

Overview of Existing Firms	Number of Firms	State Rank	Region Location
Renewable Energy	22	5	
Energy Efficiency - Non Builder	17	5	
Energy Efficiency - Builder	90	5	
Smart Grid or Energy Storage	2	5	
Region Total	**131**	**5**	

Existing Commercial Energy Efficiency	Number of Buildings	State Rank	Project Square Footage	State Rank
LEED (Registered & Certified)	157	3	12,417,038	3
Energy Star (Certified)	75	5	3,127,939	5
Region Total	**232**	**3**	**15,544,977**	**4**

Potential for Residential Energy Efficiency	Homes Built Prior to 1970	State Rank	Manufactured Homes	State Rank
Number of Units	132,952	5	106,769	2

Registered Renewable Energy Systems	Number of Systems	State Rank	System Capacity (MW)	State Rank
Biomass	5	2 (T)	196.43	1
Geothermal	77	5	N/A	N/A
Hydroelectric	1	7	0.8	7
Solar	40	6	3.29	7
Wind	3	4	<0.01	4
Region Total	**126**	**6**	**200.53**	**4**

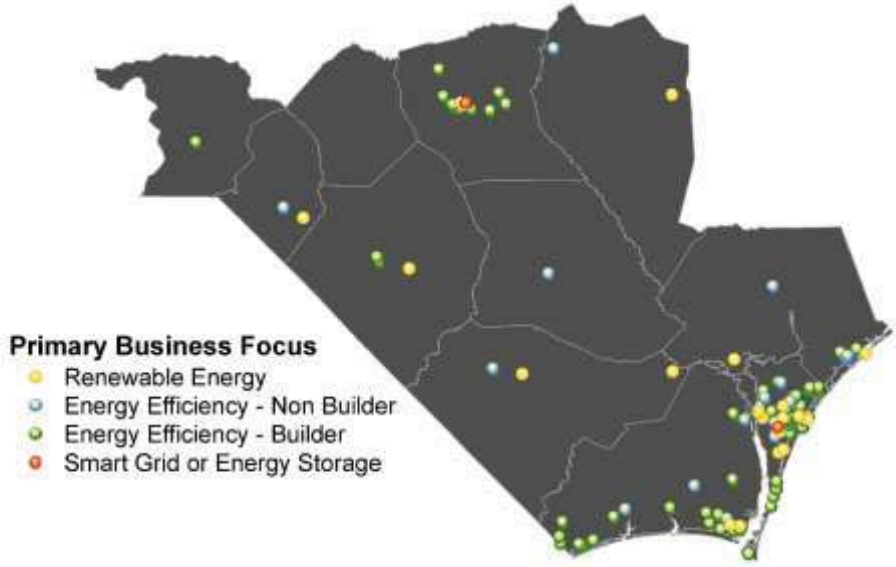
Notes: Geothermal data only includes vertical systems; solar data includes solar thermal in the number of systems but does not assign a system capacity value. Source: NC Sustainable Energy Association.

9.1 Overview of Existing Clean Energy Firms

The Southeast region contains the primary location of 131 clean energy firms. While several business focus areas are well represented, including energy efficiency and solar, the region lacks firms across all business focus areas. Firms are largely clustered in New Hanover County, with a smaller sub group of energy efficient builders along the southern coast and in the Fayetteville area (see Exhibit 79).

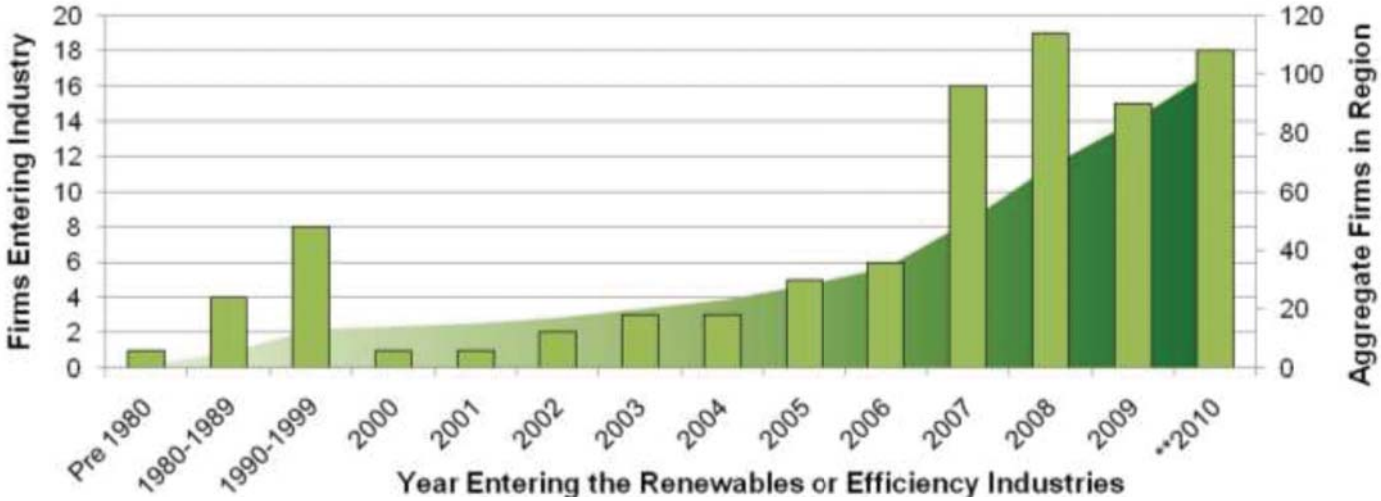
The 67 firms found in New Hanover County consist of 48 energy efficient builders and 8 solar firms. The county also has clean energy representation from biomass, general energy efficiency, and a smart grid firm. Brunswick County ranks second in the region with 30 firms, with 80 percent focused on energy efficient building. Cumberland County ranks third with 16 firms—nearly all are energy efficiency builders. The region has experienced a consistent expansion of clean energy firms over the last decade (see Exhibit 80). This growth has been fostered, in part, by coastal development and the emergence of a community of energy efficient builders.

Exhibit 79: Clean energy firms with a primary location in the Southeast region.



Source: NC Sustainable Energy Association.

Exhibit 80: Evolution of clean energy firms in the Southeast region.



Notes: Exhibit only includes firms reporting a year of entry in the Energy Star program or annual North Carolina Renewable Energy and Energy Efficiency Industries Census; therefore, aggregate firms may be lower than total firms reported elsewhere. Data for 2010 is through August 31, 2010. Sources: EPA Energy Star Program, NC Sustainable Energy Association.

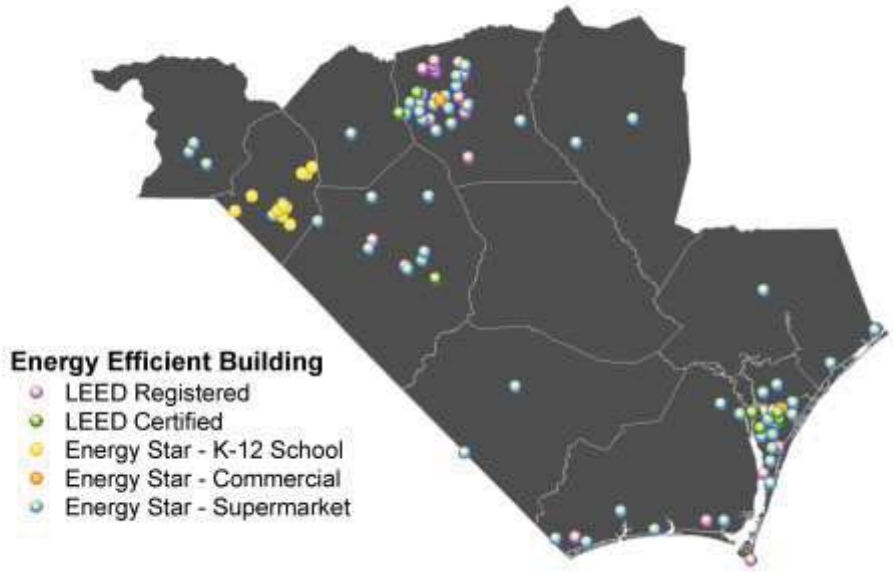
9.2 Existing Commercial and Government Energy Efficiency

Almost every county in the Southeast region has at least one registered or certified energy efficient building—Bladen County is the sole exception (see Exhibit 81). In total, the region has 232 registered or certified energy efficient buildings in the LEED and Energy Star programs, totaling over 15.5 million square feet of floor space. LEED registered military buildings are a key contributor to these impressive numbers.

Cumberland County leads the region with 154 registered and certified buildings, totaling 11.3 million square feet. New Hanover County ranks second with 32 buildings and 2.2 million square feet. Within New Hanover and Cumberland counties, energy efficient buildings display notable clustering. Beyond these counties there is a considerable decline in the density of registered or certified buildings.

The Southeast region's 11 Energy Star certified schools occur in Scotland County. Food Lion is the regional leader in Energy Star certified supermarkets with 55 of the 61 certified supermarkets in the region. In Cumberland County, the significant presence of LEED registered buildings indicate a preference of the military to participate in the LEED program instead of the Energy Star certification program.

Exhibit 81: Southeast region commercial and government energy efficient buildings.



Sources: EPA Commercial Energy Star Program, USGBC LEED Public Directory, NC Sustainable Energy Association.

Exhibit 82: Southeast Region energy efficient projects and square feet in urban and rural counties.

	Rural Counties		Urban Counties		Southeast Region	
	Number of Buildings	Total Square Feet	Number of Buildings	Total Square Feet	Number of Buildings	Total Square Feet
LEED Registered	5	218,365	144	11,474,143	149	11,692,508
LEED Certified	2	2,800	6	721,730	8	724,530
Energy Star - K-12 School	11	770,391	0	0	11	770,391
Energy Star - Commercial	0	0	3	160,515	3	160,515
Energy Star - Supermarket	28	954,174	33	1,242,859	61	2,197,033
Region Total	**46**	**1,945,730**	**186**	**13,599,247**	**232**	**15,544,977**

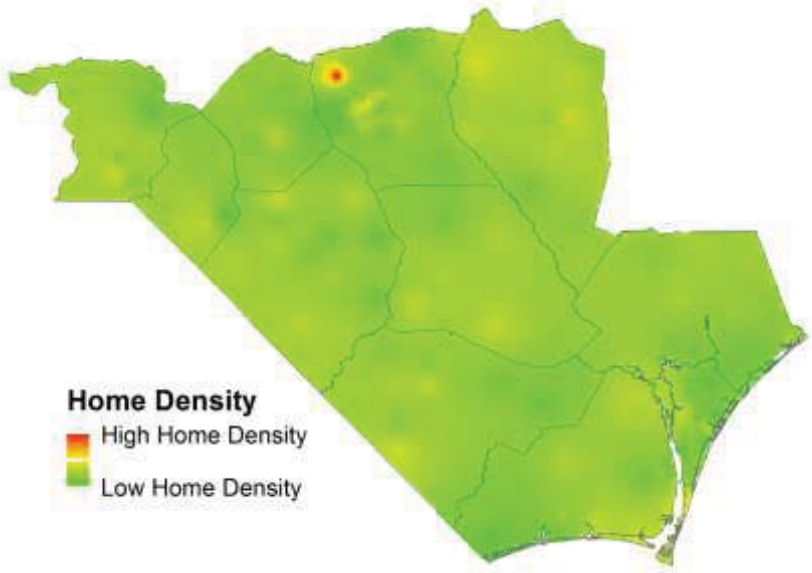
Sources: EPA Commercial Energy Star Program, USGBC LEED Public Directory, NC Sustainable Energy Association.

9.3 Potential Residential Energy Efficiency

Opportunities for residential energy efficiency exist across the Southeast region, which has nearly 133,000 homes built prior to 1970 (see Appendix 1). While these opportunities are well dispersed, there is considerable variation between individual counties. For example, only 14 percent of the homes in Brunswick County are built prior to 1970, compared to 41 percent of homes in Columbus County. Due to the rural nature of the region, the housing stock predating insulation requirements in the building code is widely dispersed within the interior. The largest and most dense concentration occurs in Cumberland County (see Exhibit 83).

An equally important energy efficiency opportunity for the region is the high presence of manufactured homes in the region (see Exhibit 84). Manufactured homes exceed 29 percent of the housing stock in Bladen, Brunswick, Hoke, Pender, Robeson, and Sampson counties (see Exhibit 12). The high concentration of manufactured homes create a compelling case to pursue energy efficiency retrofits, with a potential focus on low income households who can spend over 50 percent of annual income on household energy expenditures.

Exhibit 83: Probable density of homes built prior to 1970 in the Southeast region.



Sources: U.S. Census Bureau, NC Sustainable Energy Association.

Opportunities within multiple unit buildings are relatively limited and county specific. Nearly 50 percent of housing that contain more than 10 units is in New Hanover County and accounts for 15 percent of the county's housing stock. Meanwhile, Cumberland County has a third of the housing containing 10 or more units.

Exhibit 84: Housing type in the Southeast region.

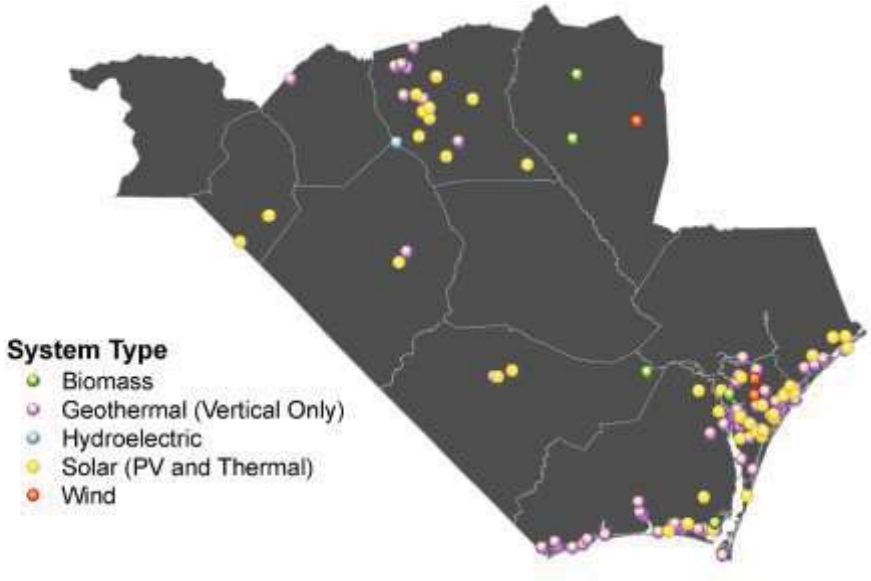
Housing Type	Number	Share
Single Unit	320,673	65%
2 to 10 Units	45,186	9%
More than 10 Units	23,562	5%
Manufactured Housing	106,769	22%

Source: U.S. Census Bureau.

9.4 Registered Renewable Energy Facilities

Solar, wind, biomass, and hydroelectric systems are all present in the Southeast region (see Exhibit 85). The region has over 200 megawatts of capacity from 126 renewable energy systems. Biomass accounts for the large majority of this capacity with over 196 megawatts, followed by solar energy (see Exhibit 86). In terms of registered projects, vertical geothermal systems lead with 77 projects, followed by solar and biomass.

Exhibit 85: Location of registered renewable energy systems in the Southeast region.



Sources: North Carolina Utilities Commission, North Carolina Department of the Environment and Natural Resources, Appalachian State Wind Node, NC Sustainable Energy Association.

Exhibit 86: Registered renewable energy systems in the Southeast region.

	Rural Counties		Urban Counties		Southeast Region	
Technology	Number of Projects	Total Capacity (MW)	Number of Projects	Total Capacity (MW)	Number of Projects	Total Capacity (MW)
Biomass	4	186.028	1	10.400	5	196.428
Geothermal	31	N/A	46	N/A	77	N/A
Hydroelectric	0	0.000	1	0.800	1	0.800
Solar	16	1.969	24	1.322	40	3.291
Wind	1	0.002	2	0.006	3	0.008
Region Total	**52**	**187.999**	**74**	**12.528**	**126**	**200.527**

Notes: Geothermal data only includes vertical systems; solar data includes solar thermal in the number of systems but does not assign a system capacity value. Sources: North Carolina Utilities Commission, North Carolina Department of the Environment and Natural Resources, Appalachian State Wind Node, NC Sustainable Energy Association.

The largest system is a 110 megawatt biomass cofiring combined heat and power facility in Brunswick County supplying process stream to a manufacturing facility. The largest solar project is a 1.9 megawatt system and the largest hydroelectric unit is a small 800 kilowatt system. Wind systems are limited to residential turbines.

Nearly half of the vertical geothermal systems are in New Hanover County, and another 23 installations are in Brunswick County. Cumberland County ranks third with 9 vertical geothermal systems. These figures may be misleading as the military, with a significant presence in Cumberland County, may also be pursuing horizontal ground loop systems, which are not reported in North Carolina.

The second largest share of projects comes from residential solar installations. Two utility scale solar projects exist—a 1.9 megawatt unit in Scotland County and a 1.2 megawatt unit in New Hanover County. The region is also home to North Carolina's only operating facility recovering energy from waste located in New Hanover County. Several of the other large biomass units are combined heat and power plants, representing a highly efficient means for generating energy through the use of both electrical and thermal energy.

There is limited development of the strong swine and poultry waste resources that exist in the region. These resources must be converted to energy as a requirement of the North Carolina Renewable Energy and Energy Efficiency Portfolio Standard (REPS). Wind development is limited to residential wind turbines. Utility scale opportunities exist in both the onshore and offshore environments.

9.5 Training, Support, and Community College Assets

(See Appendix 8 for detailed maps and tables of Southeast region assets)

Cape Fear Community College offers a degree in Sustainable Technologies. Several others have the potential to develop energy efficiency or renewable energy focused units as part of the community college system's Curriculum Improvement Project (CIP)—a process that adds clean energy components to existing degrees. Richmond and Robeson Community Colleges already offer degrees in HVAC, Electrical Systems, and Industrial Systems. The majority of the remaining colleges listed in Appendix 8 offer at least one of these three degrees.

The Southeast region has two resource and conservation development (RD&C) councils, which are active in six of the 11 counties. Several counties do not belong to any RD&C council which may put them at a competitive disadvantage by reducing available support for clean energy programs. In addition, third party training assets are present in New Hanover County including both Building Performance Institute (BPI) and Residential Energy Network (RESNET) potential opportunities. The only identified resources in the interior of the region are the two Small Business Technology and Development Centers (SBTDC).

9.6 Strengths, Weaknesses, Opportunities, and Threats

Strengths

- Established industry clusters in both the northern and southern portions of the region.
- Diversity of biomass fuels, including comparatively large swine and poultry waste bases.
- Strong presence of energy efficient builders along coast.
- Relatively strong installed capacity of biomass despite low overall number of firms.
- Established coastal geothermal presence.

Weaknesses

- Interior region lacks significant industry presence.
- No identified companies with a focus on wind or hydroelectric resource development.
- Commercial and government energy efficiency activities largely confined to Wilmington and Fayetteville.

Opportunities

- Large presence of electrical cooperatives may improve financial attractiveness of clean energy investments.
- Strongest solar energy resource in North Carolina.
- Large percentage of manufactured homes creates energy retrofit opportunities.
- Abundance of open space may favor development of utility scale solar projects.
- Existing base of LEED registered buildings that have not progressed to certification energy systems in Fayetteville.
- Integration of hydroelectric units at existing locks.

Threats

- Disposable income may be limited in interior region, inhibiting clean energy investments.
- Development of offshore wind resource may be inhibited by restrictions from competing uses.
- Regulatory changes may alter the swine and poultry generation requirements in the REPS and limit development of this resource base.
- Securing capital for renewable and efficiency projects may be more difficult in rural region.

The Southeast region has elements in place for continued growth of clean energy industries. However, clean energy firms are highly clustered in two areas of the region, while the clean energy opportunities are highly diffuse. More so than any other region, electrical cooperatives dominate the landscape resulting in consumers paying higher electric rates and annual expenses relative to other North Carolina consumers. Coupled with high proportions of manufactured homes and moderate numbers of homes built prior to 1970, residential energy efficiency could be a lasting and substantial economic development opportunity for the region. In the absence of disposable income though, capitalizing on these opportunities may be difficult. Innovative financing mechanism, such as revolving loan funds or on-bill financing, may be needed to assist and encourage consumers to pursue retrofit opportunities.

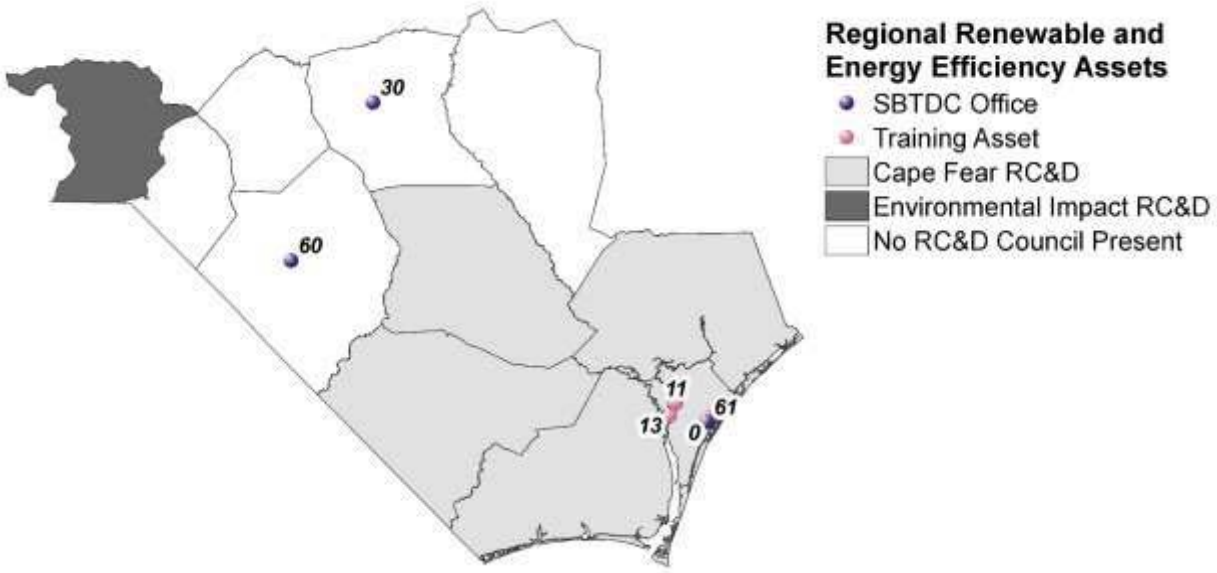
Commercial and government energy efficiency may be limited because of the rural nature of the region; however, there are two clear areas of opportunity: Energy Star K-12 schools and supermarkets. These types of buildings can be found in all counties and have well established energy profiles. The Southeast region can follow the experience of other regions and capitalize on these opportunities.

Despite the strong solar resource, especially along the southern coast, development of systems has been limited. This likely results from a combination of low population densities and observed consumer preference for geothermal systems instead of solar. Coastal vacation homes may be an ideal market for the future growth of residential solar as property owners may have discretionary income at their disposable. These systems could sell electricity to electric utilities even when the vacation home is unoccupied.

Training and education assets exist in the region, but are largely concentrated around Wilmington. The community college system has multiple colleges well positioned to incorporate clean energy training elements.

APPENDIX 8: SOUTHEAST REGION ASSET SUMMARY

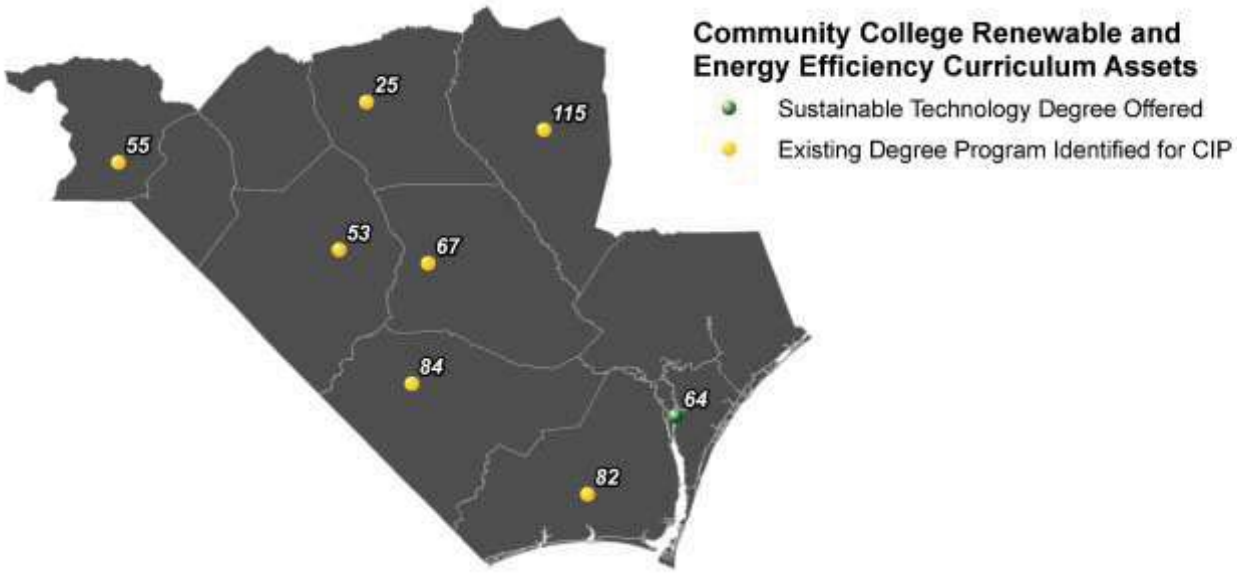
Southeast Region—Training & Support Assets



ID	Asset Name	Trainings Offered			Infrastructure Element		
		BPI	NABCEP	RESNET	Energy Center	SBTDC	Other
0	Above and Beyond Energy	-	-	trainer on staff	-	-	-
11	Building Performance Specialists	-	-	trainer on staff	-	-	-
13	Cape Fear Green Building Alliance	yes	-	-	-	-	-
30	Fayetteville State University	-	-	-	-	yes	-
60	UNC Pembroke	-	-	-	-	yes	-
61	UNC Wilmington	-	-	-	-	yes	-

Sources: Building Performance Institute (BPI), North American Board of Certified Energy Practitioners (NABCEP), Residential Energy Services Network (RESNET), Small Business Technology and Development Center (SBTDC), Interstate Renewable Energy Council (IREC), NC Department of Commerce, NC Sustainable Energy Association.

Southeast Region—Community College Assets



ID	Community College	Sustainable Technology Degree	Degrees Identified as CIP Candidates		
			HVAC	Electrical Systems	Industrial Systems
67	Bladen Community College	-	-	yes	yes
82	Brunswick Community College	-	-	-	-
64	Cape Fear Community College	yes	yes	yes	yes
25	Fayetteville Technical C.C.	-	yes	yes	-
55	Richmond Community College	-	yes	yes	yes
53	Robeson Community College	-	yes	yes	yes
115	Sampson Community College	-	-	-	yes
84	Southeastern Community College	-	yes	yes	-

Note: The Curriculum Improvement Project (CIP) is a community college system wide effort to integrate renewable energy and energy efficiency elements within the framework of existing degree offerings. Sources: North Carolina CIP Program, NC OneMap, NC Sustainable Energy Association.