$5.95 2012 Issue 5

Photon

Photon

The Photovoltaic Magazine

UNLIKELY ALLIES

Shade and sun mix to fuel the popularity of PV carports

PEER PRESSURE In a region increasingly embracing PV, South Carolina tries to keep up

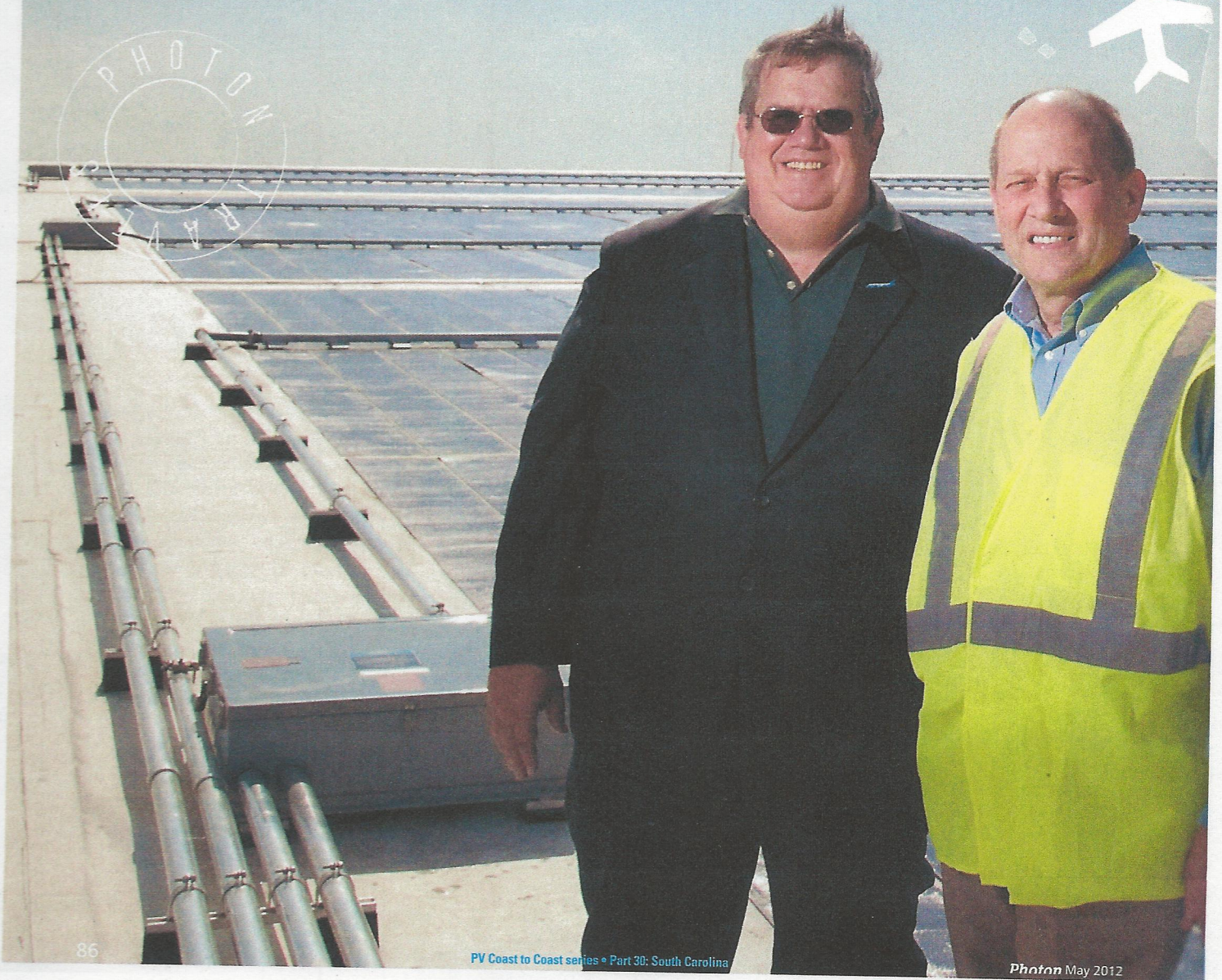
STILL SPINNING BACKWARD PHOTON's in-depth review of net-metering programs

SURPRISE Commerce sides with Solarworld against Chinese PV makers – but imposes weak tariffs

05
74470 25147 7
$5.95

NOW ARRIVING

Since landing a jumbo PV project, South Carolina is viewing the solar industry in a new light



It's a deal: John Rhodes at Boeing (left) and Bob Long at South Carolina Electric & Gas negotiated a special agreement so Boeing could use only renewable energy at its North Charleston production site. Solar provides 20 percent of the power.

Johannes Kroemer / photon-pictures.com

Two-thirds of South Carolina's solar generating capacity resides on a single rooftop near Charleston International Airport. That tells you how small the photovoltaic (PV) market was before this 2.6 MW system came online last year. It was tiny. The market needs incentives to grow further. South Carolina isn't crazy about renewable energy subsidies, but it has seen how other states in the region, notably North Carolina, have used them to attract investment. Change is in the air.

It doesn't have to make sense. South Carolina state Sen. Jake Knotts says he wants other legislators to consider increasing tax credits for PV systems, but he won't commit to voting for the tax breaks himself. »I haven't had time to look at the proposal yet,« he says one late-winter morning in the main lobby of the State House. As for owning a PV system himself, well, that's out of the question: »I just don't have a business. And I'm not putting no solar panels on my home 'cause they ugly.«

Knotts doesn't rank among the solar industry's strongest allies in public office – unlike former California Gov. Arnold Schwarzenegger, for example – but in conservative South Carolina, you take

Tissue, please: In late winter, large amounts of airborne pollen were coating solar modules around coastal South Carolina. The powder is seen here on the PV system at Stephen Miller's James Island home.

whatever you can get. Consider the alternatives. Two state senators, Michael Fair and David Thomas, recently introduced a resolution to condemn a perceived left-wing conspiracy by the United Nations that uses environmental programs to undermine »the American way of life of private property ownership, single-family homes, private car ownership, and individual travel choices, and privately owned farms.« Don't count on these guys to stand up for PV subsidies.

The truth is, South Carolina's reliance on Kentucky coal and its own nuclear power has dampened its appetite for clean energy alternatives. South Carolina has seven operating nuclear reactors with four additional reactors in the works. There's a common theme among its notable PV installations: in each case, out-of-state decisions helped bring about approval for these projects. The German automaker BMW commissioned a commercial-scale project at its manufacturing site in Greenville. The American Recovery and Reinvestment Act provided funds for Santee Cooper, a state-owned utility, to build a 311 kW project at a service center in Myrtle Beach. That was the state's largest PV project until the private utility South Carolina Electric & Gas Co. completed a 2.6 MW system at the new Boeing airplane factory in North Charleston. The utility owns this system, but the impetus for the project was Boeing.

South Carolina's first megawatt-sized project is nevertheless a strong symbolic gesture. Travelers who fly into Charleston International Airport from the south end of the runway can look down on the rectangular module array covering Boeing's 787 Dreamliner final assembly building. It resembles a blue, thin-film welcome mat on South Carolina's doorstep.

PV industry leaders are trying to capitalize on the momentum from these recent installations by asking policymakers for better market support, primarily via tax breaks. In a conservative political climate, state mandates for solar generation and feed-in tariffs may be out of reach. South Carolina has shown it won't be at the leading edge of a renewable energy revolution. But state leaders can see what's happening all around them. North Carolina is opening up to the solar industry. So are Tennessee and Georgia. South Carolina will come along too, on its own terms, just so long as people don't go putting ugly things up on their homes.

Johannes Kroemer / photon-pictures.com (2)

Leading by doing: One political insider says state Sen. Jake Knotts was instrumental in advancing solar tax legislation out of the Senate finance subcommittee.

These incentives are not for everyone

Electricity is fairly cheap in South Carolina, less than 9¢ per kWh compared with a 10¢ national average. But until recently it was a big part of

Must be an evergreen: Half-moon Outfitters Inc., planted a solar tree in the parking lot of the Columbia retail store it opened last year.

Stephen Miller's monthly household expense. The reason: he was using too much of it. After Miller removed a layer of defective insulation from his five-bedroom family home on James Island, near Charleston, the bills climbed above $700. Replacing the insulation wasn't an option. Miller would have had to tear out the walls. So he made other efficiency upgrades and started looking into renewable energy. At first he was told a PV system would cost him $200,000. That was too expensive. He got more bids, and in 2009 Sunstore Solar, a South Carolina installer, sold him a 14.2 kW Sunpower system for $94,000.

The incentives available to Miller made this a profitable investment. He claimed the 30 percent federal tax credit and a 25 percent state income tax credit. Since Miller runs a few businesses out of his home, he also claimed deductions for capital depreciation, leaving him with a total cost after taxes of about $20,000. The only drawback is he had to wait several years to collect the full South Carolina tax credit because it's capped at $3,500 a year. Based on energy savings, Miller still expects to recover the investment in 4 years. »Why wouldn't everybody do this?« he asks.

The reasons are clear: capital depreciation is available only for people who run a business of one sort or another. And the state tax credit is designed for people who have a big income tax liability. You would have had to earn over $100,000 last year to use up the full credit that can be claimed on a 2011 tax return. South Carolina's median household income is $42,000, according to the Bureau of Labor Statistics. Most people in the state simply don't have as much financial incentive to buy a PV system as Miller did.

The market for residential systems has predictably suffered from a lack of widely available subsidies. There is no solar rebate. Palmetto Clean Energy, a program backed by 3 investor-owned utilities, has offered a 15¢ per kWh tariff for small PV system owners, but it suspended the program while incentive rates are under review. Besides tax credits, some of the only available incentives come from Duke Energy and Progress Energy, which offer tariffs to acquire solar power from South Carolina customers that helps them comply with North Carolina's solar power mandates.

Johannes Kroemer / photon-pictures.com (2)

Room for more: In 2010, the South Carolina Energy Office used federal stimulus funds to help pay for three commercial-scale PV projects, including a 42 kW system at the Columbia Museum of Art.

Even though incentives have been scarce, local installers report that PV system prices continue to fall. In an anonymous survey, the lowest price for residential projects was $4.50 per W. Compare this with PHOTON's latest complete systems survey, and you can see that South Carolina's low price is just slightly below the average price for 5 to 10 kW systems nationwide (see PHOTON 4/2012, p. 54). This suggests that there's room for system prices in South Carolina to fall further. A concerted effort to stimulate the market would certainly speed things up.

PV system size matters

The proposal that state Sen. Knotts hadn't read when he spoke with PHOTON about PV subsidies is a bill that would increase South Carolina's solar energy tax credit from 25 to 35 percent. The bill would also raise the maximum credit for nonresidential systems from $35,000 to $2.5 million, making the deal more attractive for commercial investors. These provisions would match North Carolina's renewable energy tax credit. The South Carolina House of Representatives approved the bill last

State flag, writ large: The crescent moon and the palmetto tree are symbols of South Carolina.

year. In the waning days of winter, it appeared that the state Senate would not vote on the bill, or anything remotely controversial, until a candidate filing deadline passed and legislators knew if they would face challengers in the next election.

Members of civic and trade groups who've been urging the Senate to pass the solar tax bill have also been wary of upsetting the apple cart. They say that in mid-March with legislative discussions of the tax credit underway, a specialty finance firm named Stonehenge Capital Co. LLC got involved and started steering the conversation in a different direction. Suddenly, two groups that favor solar energy investments were at odds over how to distribute the tax incentive. Representatives of the South Carolina Coastal Conservation League and the South Carolina Solar Business Alliance say they want funding preserved for the largest number of PV projects so the tax credit functions as a local jobs creator. If there's a limit to the overall pool of funds available for tax credits – and it appears that legislators want such a limit – they oppose using the credits on big solar power plants. (Stonehenge Capital did not return calls to discuss this article.)

Ryan Black, a project manager at the Coastal Conservation League, admits there would be advantages to developing large-scale PV projects in South Carolina. These kinds of projects, like the Boeing factory system, would draw attention and lend credibility to solar investments. But Black says that big projects are more likely to use out-of-state workers and out-of-state financing. As a result, the economic benefits of the project would more likely flow out of state. »We want to grow a South Carolina industry. We don't want to hand this over to the outside interests,« he says.

The legislative session carries on through the first week of June. The risk is that the tax credit won't pass the Senate in any form, and then there's nothing of significance remaining for South Carolina PV investors or outside interests. State Sen. Lee Bright embodies this risk. Standing in the State House lobby beneath a marble replica of the Civil War-era Ordinance of Secession, Bright responds to a question about the solar tax credit by labeling himself »a free market person.« Without clearly stating whether he supports or opposes the solar tax credit, Bright says he's against existing fossil fuel subsidies and he wants more information about the existing solar tax credit. »I think we need to look at every incentive each year, individually, and see what the impact has been,« he says.

The Board of Economic Advisors, which does research for South Carolina legislators, has already compiled information about the existing 25 percent solar tax credit. From 2007 to 2010, an average of 100 PV and solar hot water system owners claimed the credit each year. The total value of credits claimed in a year was a little over $200,000. If the House version of the tax credit increase is approved, the estimated budget impact for the most recent fiscal year would be $271,000. This might allay fears that the credit will be too costly for the state. But it also suggests that the boost in business activity, at least in the immediate future, may be rather small.

Claiming the commercial market

David Odell, president of the South Carolina Solar Business Alliance, offers perspective regarding a tax credit increase. The proposal arrived in the

Reunion: Southern Energy Management's David Odell (right) worked for Bruce Wood (left) at Sunstore Solar early in his PV career. The two teamed again on a recent PV project at BMW's auto manufacturing site in Spartanburg.

Johannes Kroemer / photon-pictures.com (3)

Power to the people: South Carolina Solar Business Alliance founder Andrew Streit (left) and Ryan Black of the Coastal Conservation League have asked legislators to steer incentives towards small-scale distributed solar projects.

state Senate late in the 2011 legislative session and advanced out of a Senate finance subcommittee in the current session after 2 months. An earlier push to introduce net metering, the incentive that helps PV system owners save on their utility bills, took a full year and a half. The slow pace of progress on net metering frustrated Odell until he had a look around. »All the old solar guys were high-fiving and back flipping because they'd been waiting 30 years for that,« he says.

This is not to say that Odell has grown complacent. He says failure to pass the tax credit increase would be »a huge blow,« especially for existing South Carolina installers. As system prices continue to drop, reducing the need for incentives, businesses that have grown strong in southeastern states with better market support, like North Carolina and Tennessee, will be poised to rush across state lines and take business away from homegrown companies. If South Carolina installers plan to compete for big contracts, Odell says, they'll need a market that enables them to accelerate up the growth curve now. »When the utilities ask for a safety plan and a hazardous materials plan, they want to see 3 years of audited financial statements. The mom and pops can't do that sort of thing,« he says.

Odell ought to know about opportunities for out-of-staters. He serves as the South Carolina business development director for Southern Energy Management Inc., a North Carolina provider of solar power and energy efficiency systems. Odell is himself a resident of Greenville, South Carolina, but he recognizes the advantages of having operational staff in a more seasoned PV market. Southern Energy Management, with backing from its regional office in Charlotte, North Carolina, won a competitive bid to install a 96 kW project and electric vehicle charging stations at a BMW Manufacturing Co. LLC site in Spartanburg, South Carolina. Sunstore Solar did consulting work on the project.

Time to go mainstream

Many of the people trying to make South Carolina more than a niche market see only room for growth. Bruce Wood, the owner of Sunstore Solar, was

Warming up: The Charleston Battery soccer team conducts preseason drills on the practice field beside its solar-powered stadium.

there from the start. In the solar thermal business since 1976, Wood tried out a small PV installation at his home in the late '90s and invited visitors to come see it during an annual solar tour. His first customers were computer engineers who ordered stand-alone systems to prepare themselves for the year 2000, or Y2K, when some feared that a software glitch would send civilization back to a pre-digital Stone Age.

Wood has survived in business without the state solar tax credit, which expired in the 1980s and wasn't reinstated until 2005. He also survived a market slowdown that coincided with the first term of George W. Bush's presidency. Even now, with Sunstore operating at about 60 percent capacity, Wood has no real complaints. »For us personally – it is a family-run business – we're comfortable where we're at from a financial standpoint,« he says.

In large part due to Sunstore, South Carolina now has attention-grabbing PV installations planted all around the state. A portion of Santee Cooper's Grand Strand Solar Station is visible from the roadside on the way to Myrtle Beach's tourist-oriented coastline. High-rise buildings in the state capitol offer nice views of a rooftop system at the Columbia Museum of Art. Fans of the Charleston Battery professional soccer team can't miss the six pole-mounted arrays behind the goal at Blackbaud Stadium.

The missing element has been a state strategy aimed at people who see these installations and get inspired to do PV projects of their own. And South Carolinia's disjointed electric policy has done little to help. People in the cities who've been eligible to participate in utility net metering programs enjoy some of the lowest electricity rates. And people in remote areas who pay more for power haven't had access to net metering because the electric cooperatives were slower to make the option available.

That's finally starting to change. The electric cooperatives, under pressure from their own members, have begun bringing their net metering rules in line with the investor-owned utilities. Wood is looking to these coop members – the rural homeowners and farmers, the small businesses and machine shops – to stir up a new wave of interest in PV projects. South Carolina didn't start the solar energy revolution, but the state may be getting ready to join it. »There is the potential to get in there and just really kick butt,« Wood says.

Matthew Hirsch

ASCENDING TO NEW HEIGHTS

A 2.6 MW project lifts the bar for rooftop PV systems in the Southeast

Boeing's decision to open an airplane factory near the Charleston International Airport transformed South Carolina's economy. It's the single-largest corporate investment in state history. Along with the factory came the state's largest PV system, a showcase installation that airplane passengers can see from the sky as they swoop down upon South Carolina's biggest city. Both of these projects were unique – other companies are unlikely to get PV systems built the way Boeing did.

Ready to roll: Boeing has targeted an April 2012 completion for the first airplanes assembled in South Carolina.

Boeing Corporate Headquarters (2)

Mission accomplished: Boeing's South Carolina facility is the company's first to use only renewable energy – onsite solar and offsite biomass.

The proportions are enormous. Three airplanes, each with a 60 m wingspan, idle along a U-shaped path through Boeing's final assembly building in South Carolina. And the place feels half-empty. It hasn't yet approached its production capacity.

As part of a company-wide sustainability initiative, Boeing had committed to using only renewable energy in South Carolina. To help achieve this goal, Boeing decided to cover the roof with solar modules.

John Rhodes, a Boeing system engineering manager, says the company asked commercial developers for input on how it could buy energy through a third-party power purchase agreement (PPA). Almost half the states in the US have laws permitting this arrangement, but most of them are located in the Southwest and the Northeast. Rhodes says not all the developers that responded to Boeing were aware that South Carolina does not allow PPAs.

Because it does not, South Carolina Electric & Gas Co. (SCE&G), was the one supplier that could provide Boeing with solar power – or power from any source. Boeing Vice President and General Manager Marco Cavazzoni approached executives of SCE&G's parent company, Scana Corp., about renewable energy projects during a construction site visit in 2010. Scana CEO Kevin Marsh said the utility considered this an important opportunity.

»Everybody has heard the clamor nationwide for wind and solar projects to provide clean energy for the state and the nation, and we've said there will be applications where that makes sense,« Marsh noted in a recorded interview that SCE&G posted on Youtube.

Price is »confidential«

Regulatory priorities in South Carolina favor the lowest-cost energy so SCE&G structured the power sales agreement to shield other customers from indirectly paying for energy from Boeing's factory roof. The utility owns and operates the photovoltaic (PV) system, but Boeing pays the full cost of installation – while keeping tax credits and renewable energy credits in the deal.

In fact, Rhodes says, Boeing pays a premium. Under its contract, Boeing pays an industrial rate for power – about 4.6¢ per kWh – plus a fixed monthly facilities charge and a variable demand charge. In addition, Boeing has committed to pay a monthly charge over 20 years for PV project costs. The company has also agreed to pay extra for energy imported from a biomass power plant nearby. Boeing expects to use 20 percent solar and 80 percent biomass.

Citing the »highly competitive nature of the industry in which Boeing operates,« SCE&G won approval from the South Carolina Public Service Commission to keep contract details, including the overall price, confidential. The most that SCE&G General Manager Bob Long would say is that the utility was »competitive« with the deals Boeing initially heard from commercial developers. »We did everything we could to get the best price,« he says.

After a competitive bid of its own, SCE&G selected North Carolina PV system integrator Baker Renewable Energy to install over 18,000 of Uni-solar modules from United Solar Ovonic LLC (USO). Two months after SCE&G commissioned the project, USO filed for bankruptcy as it awaits a sale by its struggling parent company, Energy Conversion Devices Inc. USO continues to operate its thin-film PV business.

SCE&G announced the solar energy agreement with Boeing in April 2011. A year later, the utility has yet to form another customer partnership of this kind.

Matthew Hirsch

ADAPTATION

An auto-manufacturing hub in South Carolina's Upcountry region opens some doors for the PV business

The Refusol string inverter has found success in Europe. It performed well in PHOTON Laboratory tests and there are 2 GW of the devices installed. Prettl, the manufacturer, saw no need to go back to the drawing board to bring it to the US market. So it took a simpler route: adaptation. Prettl made some minor changes to the product, some minor changes to its work space and – voila! South Carolina has a small solar manufacturing base with room to grow.

All in the family: Refusol chose South Carolina as a production site because there was space available in the factory of its parent company, which supplies the auto industry.

Johannes Kroemer / photon-pictures.com

Andrew Morrow is in the midst of some on-the-job training. He grips a handheld power tool hanging over the assembly line and then presses it down inside a photovoltaic (PV) string inverter lying open in front of him. The tool is calibrated to use a preset torque each time it turns a screw, then it switches off automatically. This should increase productivity and reliability, but the technique takes a little getting used to. A console attached to the tool flashes green to indicate that one screw went in properly. Another green light flashes. Then a red light. Something's wrong, says the director of manufacturing, Christian Priess, marveling at the simplicity of the machine.

The tool is part of a high-tech fastening system that the manufacturer, Prettl Group, is introducing in Greenville, South Carolina, before it does so in any of its other locations around the world. The fact that South Carolina has become a home for this device, and for solar manufacturing, should be viewed as good fortune. The state offers no special incentive for recruiting PV manufacturers, and business leaders could point to no local companies that started in South Carolina and became important players in the PV industry.

Prettl is now producing inverters for its Refusol line in South Carolina, due to a series of events that started with German automaker BMW's decision to open its US production in the area almost 20 years ago. The decision ensured that Robert Bosch GmbH, a BMW supplier of fuel injection systems, would operate close by. This, in turn, meant that Prettl, a components supplier for Bosch, would do the same. Unused space in Prettl's South Carolina factory provided an obvious location for the company to assemble its Refusol product line with Underwriters Laboratories (UL) certification for the US market.

New look, same core technology

Prettl made a simple design change to adapt its 1,000 V European inverter for the US market, which adheres to a 600 V standard. It attached a 12-string combiner box to the bottom of the unit, so the

Tax credits: A double-edged sword

South Carolina was the first state to secede from the Union before the Civil War. To this day, a Confederate flag flies in front of the State House as a reminder of past battles (and lingering controversies) with the nation's capital. If you think about South Carolina's historical position at odds with the federal government, its choice of solar subsidy is a little ironic. Each time someone claims the incentive, which is a state tax credit, money comes out of the state budget, and some usually ends up with the US Treasury Department.

The reason this happens is explained in photovoltaic (PV) finance expert Andy Black's reference guide, »Economics of Solar Electric Systems for Consumers.« When taxpayers file a federal return with itemized deductions, they can usually count any state tax liability to reduce the taxable income that determines how much federal tax is owed. The state credit brings down the taxpayer's state tax liability, but in doing so, it takes away a means of shrinking his or her federal tax bill.

This matters because it makes the state tax credit seem more valuable than it really is. »For most people, a state tax credit is worth about 65 to 85 percent of its face value,« Black says. Solar rebates that are subject to federal tax and some performance-based incentives can also be worth less than they seem, for the same reasons.

Another drawback to the tax credit is that it rewards the market for keeping prices high. The only limits on prices are the caps on allowable incentives per project and an investor's willingness to pay more than the market will bear. A proposal to increase South Carolina's tax credit from 25 to 35 percent would also raise the cap from $35,000 up to $2.5 million.

This change provides the most benefit to commercial investors. For homeowners and small business owners, the best incentive (if it's available where they live) is net metering – an arrangement with the power company that gives customers credits for PV production at retail rates. Based on South Carolina's average residential electricity rates and the average solar irradiance in the state's largest city, Charleston, a 5 kW system on a south-facing roof with no shade could be expected to yield net-metering credits of $755 per year. Over the 20-year operating life of the system, these credits would easily return more to the investor than the value of the tax credit. Even a modest solar tariff, combined with net metering, would go further to encourage small investors than a boost in the tax credit (see table).

If retail electricity rates increase in the future, then so will the value of the net-metering credits. *mh*

Not all credits are created equal: A comparison

System data	Rated capacity	5 kW	
	Installed cost	$20,000	
	Annual energy production*1	1,336 kWh/kW	= 6,680 kWh
	Retail electricity price*2		× 11.3¢
Existing incentives	Net-metering credits*3		$755/year = $15,100 over 20 years
	25% state tax credit*4		$5,000
	30% federal tax credit		$6,000
New incentive options	10% tax credit increase*4		$2,000
	3¢ feed-in tariff		$4,000 over 20 years

sources:
*1 average irradiance for Charleston, South Carolina, according to PV Watts
*2 statewide average residential rate, according to the US Energy Information Administration
*3 assumes retail electricity prices don't change; if prices increase, the value of net metering goes up
*4 figures do not include value lost to federal taxes

Tariffs go further: The comparison of new incentive options shows that a modest feed-in tariff added to the net-metering credit would yield a better return for investors than the tax credit increase under discussion in the South Carolina Legislature. But like most US states, South Carolina has not formally considered a solar feed-in tariff.

inverter can accept two separate 500 V strings and internally recombine them in the original 1,000 V system. By December 2011, the Prettl subsidiary that handles US inverter sales, Refu Solar Electronics Inc., had received UL and California Energy Commission (CEC) approval and eligibility for the domestic-content provisions of the 2009 American Recovery and Reinvestment Act (ARRA).

Refu Solar Electronics CEO Ben Driver says between string inverters and central inverters, which the Greenville plant isn't yet set up to assemble, he expects to produce 100 MW of capacity in 2013. Long-term projects are to reach 250 MW and assemble a 1,500 V inverter in South Carolina. »That is really the future for us,« Driver says.

The future for South Carolina could see a burgeoning cluster of solar manufacturing in the high-tech northwestern region known as the Upcountry. The state Department of Commerce keeps a list of about 100 companies with ties to South Carolina that could potentially fit in the solar supply chain. Some of these companies, such as GE, already operate in the PV space and have a foothold in the Upcountry.

If nothing else, system integrators view these companies as likely PV project backers if new incentives help get the commercial installation market off the ground. BMW is once again setting the pace, having commissioned a 96 kW system to provide power for its Zentrum museum and visitor center. And the module supplier, Bosch, is a company that – as mentioned above – is familiar with both BMW and South Carolina. Matthew Hirsch

South Carolina fact sheet

BASICS

Population

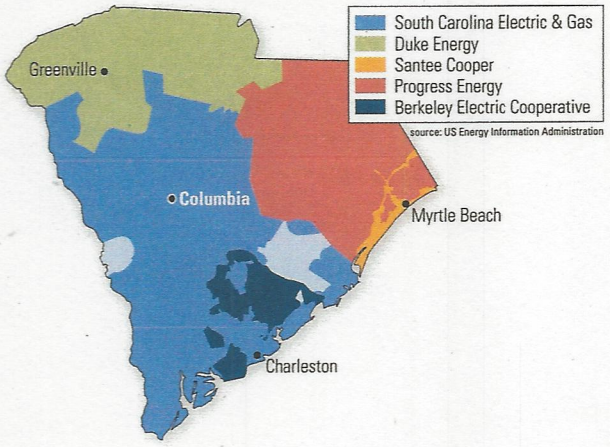
4,625,364

source: US Census Bureau

Utility structure

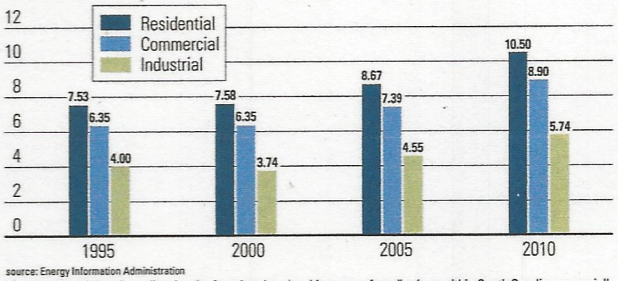
In South Carolina, the lion's share of electricity sales goes through three investor-owned utilities – South Carolina Electric & Gas (SCE&G), Duke Energy and Progress Energy – plus the state-owned South Carolina Public Service Authority, better known as Santee Cooper. Outside of these companies, there are 22 member-owned electric cooperatives, 21 city-owned utilities and one remaining small investor-owned utility, Lockhart Power Co. None of the electric coops is very large on its own, but together they represent more than 1.5 million customers.

Service areas for South Carolina's largest electric utilities



source: US Energy Information Administration

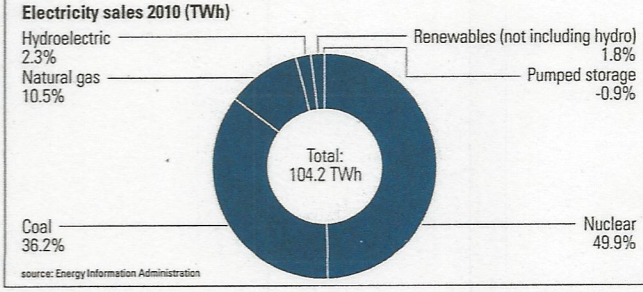
Electricity prices (¢/kWh)



source: Energy Information Administration

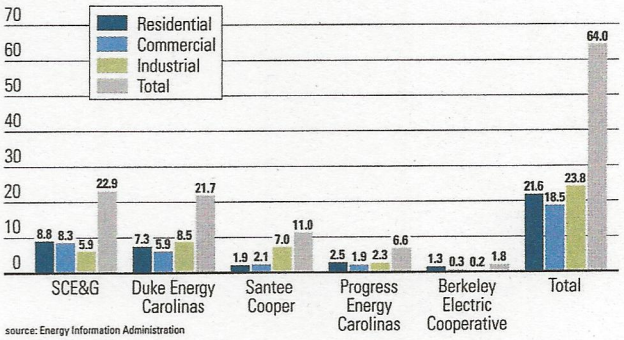
Average electricity prices disguise the fact that there's a big range of retail prices within South Carolina, especially in the residential sector. Thousands of electric cooperative members pay 13¢ per kWh or more, which is higher than the national average.

Electricity sales 2010 (TWh)



source: Energy Information Administration

Electricity sales 2010 (TWh)



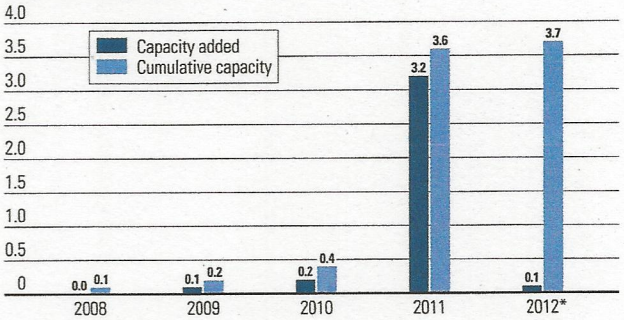
source: Energy Information Administration

PV system prices (per W)

Residential systems:	$4.50 to $6.00
Commercial systems:	$4.00 to $4.30

source: South Carolina installers

Installed PV capacity (MW)



source: SCE&G, Santee Cooper, Progress Energy

* 2012 data reflects installations through March 15

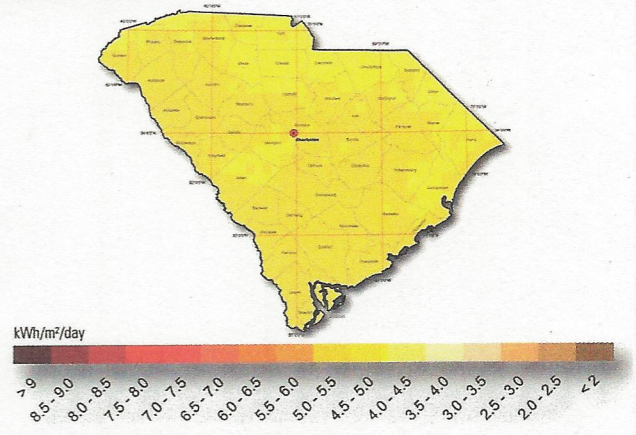
PV installed capacity per capita 2011

0.8 W

Portion of solar in the state energy mix

0.00008%

Average irradiance levels



source: the National Renewable Energy Laboratory for the US Department of Energy

SUPPORT

Low-interest financing
Santee Cooper, a state-owned power company, provides customers with $5,000 to $40,000 loans for photovoltaic (PV) installation projects. Borrowers get up to 10 years to repay. The minimum PV system size is 2 kW. There's no loan application fee, but borrowers must pay $100 for grid interconnection. Visit www.santeecooper.com and look for the »Smart Energy Loans« link to find the latest interest rate. In March, Santee Cooper reported a rate of 1.25 percent.

Net metering
South Carolina investor-owned utilities Duke Energy, Progress Energy and SCE&G offer net metering for residential PV systems up to 20 kW and nonresidential systems up to 100 kW. Each utility's overall net-metering program limit is 0.2 percent of peak power demand from the previous year. The limits amount to about 95 MW for SCE&G, 90 MW for Duke Energy and 27 MW for Progress Energy. Customers retain net excess generation from month to month, but each year on June 1, any remaining credits flow to the utility. Santee Cooper offers an alternative to net metering known as net billing. Unlike in net-metering programs, participants pay monthly fees to the utility, and energy charges don't correspond with retail electricity rates. Member-owned electric cooperatives have mostly offered net billing, but many are switching over to net metering.

Performance-based incentives
»Palmetto Clean Energy, a nonprofit supported by three investor-owned utilities, has offered 15¢ per kWh for the output from small-scale PV and wind energy systems. The maximum capacity for participating systems is 6 kW. Utility customers endow the program budget with voluntary contributions in $4 increments. Funding is made available to power producers on a first-come, first-served basis. In March 2012, an administrator reported that the program had been suspended while incentive rates are reviewed.
To help comply with North Carolina's Renewable Portfolio Standard (RPS), Duke Energy is offering to buy renewable energy credits (RECs) from solar developers in its South Carolina service territory at 2¢ per kWh for a period of 5 to 15 years. Projects must provide 35 to 250 RECs per year. By Duke estimates, eligible projects should therefore have a rated capacity of 25 to 180 kW. In March 2012, Duke said it had not yet issued a contract to a South Carolina solar developer for this program.
Progress Energy also offers South Carolina investors an incentive that's designed for North Carolina's renewable energy mandate. The Sunsense Commercial Solar PV program pays 15¢ per kWh for roof-mounted systems with a capacity of 11 to 500 kW. As the name of the program implies, residential systems are not eligible. In March 2012, Progress Energy said that there are no South Carolina participants in the program.«

Rebates
None

State tax credit
Since 2006, homeowners and business owners in South Carolina have been eligible for a 25-percent income tax credit for PV installation costs. The credit is limited to $3,500, or 50 percent of the taxpayer's liability – whichever is less. Unused credits may be applied up to 10 years after purchase. The taxpayer can't claim the credit until the installation is complete.

INDUSTRY

Manufacturing
Refu Solar Electronics Inc., a US subsidiary of Germany-based inverter maker Refusol GmbH, produces a line of UL-listed string inverters at the Greenville production site of its sister company, Prettl Electronics Inc. **Stäubli Corp.,** a Belgian company, manufactures solar connectors at its North American headquarters in Duncan. In 2011, California-based copper-indium-gallium-diselenide (CIGS) thin-film cell maker **AQT Solar Inc.** said it has selected Richland County as the site of a manufacturing facility with a projected capacity of 1 GW by 2014. AQT initially said it would begin production in early 2012, but there's no indication that the company has begun hiring or moving equipment into the South Carolina space.

Jobs 2012
PHOTON estimate: 15 manufacturing jobs, 12 integrator jobs

INDUSTRY (CONTINUED)

Associations, institutes and other organizations

South Carolina Solar Business Alliance
The South Carolina Solar Business Alliance puts forth an agenda that includes an RPS with set-asides for in-state generation and PV power, more tax breaks for PV projects, and an expansion of net metering. Some representatives on the leadership board are also members of the South Carolina Solar Council.
www.solarbusinessalliance.com

South Carolina Solar Council
The South Carolina Solar Council is an American Solar Energy Society (ASES) affiliate with about 68 members. The group hosts meetings, circulates a newsletter and organizes a yearly tour of solar installations to promote PV and solar thermal technology.
www.scsolarcouncil.org

South Carolina Coastal Conservation League
Last year, the Coastal Conservation League (CCL) campaigned successfully against the creation of a landfill for the storage of ash from a coal-fired power plant. CCL has representatives serving the Solar Business Alliance and the Solar Council, and it has provided legislative support for a proposed increase in state tax credits for PV investments.
www.coastalconservationleague.org

ADDITIONAL INFORMATION

Solar-related bills recently approved by the state Legislature
None

Significant renewable energy laws and regulations
Public Service Commission Order 2009-552 approved a settlement agreement that created the existing net-metering rules for SCE&G, Duke Energy and Progress Energy. The order, dated Aug. 6, 2009, sets up a review of the net-metering process within 4 years.

South Carolina's interconnection standard got the worst possible grade, an F, from the 2011 edition of Freeing the Grid. The rules, set out in Public Service Commission Docket 2005-387-E, uphold requirements for liability insurance and the installation of an external disconnection switch.

State incentives to attract PV manufacturers
The state Department of Commerce reports that there are no special incentives for the recruitment of solar companies.

Largest PV system in the state
The 2.6 MW Uni-solar system installed by Boeing on its commercial airplane manufacturing facility in North Charleston.

For further information on PV in South Carolina, please contact PHOTON Editor Matthew Hirsch at matthew.hirsch@photon.info.

Last updated: March 2012

Profiles past and present

Canada
Ontario (PHOTON 2/2010)
USA
Alabama (PHOTON 3/2012)
Arizona (PHOTON 7/2010)
Arkansas (PHOTON 6/2010)
California (PHOTON 10/2011)
Colorado (PHOTON 4/2010)
Connecticut (PHOTON 1/2010)
Florida (PHOTON 10/2010)
Georgia (PHOTON 4/2011)
Hawaii (PHOTON 8/2010)
Idaho (PHOTON 3/2010)
Louisiana (PHOTON 2/2012)
Massachusetts (PHOTON 4/2012)
Mississippi (PHOTON 11/2010)
Nebraska (PHOTON 9/2010)
Nevada (PHOTON 1/2011)
New Mexico (PHOTON 2/2011)
New York (PHOTON 7/2011)
North Carolina (PHOTON 11/2011)
Oregon (PHOTON 6/2011)
Pennsylvania (PHOTON 9/2011)
Rhode Island (PHOTON 8/2011)
Tennessee (PHOTON 5/2011)
Texas (PHOTON 12/2009)
Utah (PHOTON 1/2012)
Vermont (PHOTON 5/2010)
Washington State (PHOTON 12/2011)
West Virginia (PHOTON 3/2011)
Puerto Rico (PHOTON 12/2010)