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April 24, 2007

Via E-Filing and Mail
Charles L. A. Terreni
Chief Clark/Administrator
South Carolina Public Service Commission
101 Executive Center Drive, Suite 100
Columbia, South Carolina 29210

RE: Petition of the Office of Regulatory Staff to Establish Dockets to Consider Implementing the Requirements of Section 1251 (Net Metering and Additional Standards) of the Energy Policy Act of 2005
PSC Docket No.: 2005-385-E

Dear Mr. Terreni:

Enclosed please find the original and one copy of the Direct Testimony and Exhibits of Tom Howell in the above referenced docket. I am filing this testimony on behalf of myself and Pamela Greenlaw, another of the interveners. I am not acting in a representative capacity for any party other than myself.

Please note that the attached documents are exact duplicates, with the exception of the form of the signature, of the e-filed copy submitted to the Commission in accordance with its electronic filing instructions.

By copy of this letter we are also serving all other parties of record. Please let me know it you have any questions.

Yours truly,

John F. Hardaway

jem
Enclosure

cc: Parties of Record

TESTIMONY OF
TOM HOWELL
ON BEHALF OF
INTERVENERS
DOCKET NO. 2005-385-E

Q: Please state your name, address, and occupation.

A: Tom Howell, 725-D Montague Road, Columbia, SC 29209. I am a retired social studies teacher.

Q: Please state your educational background.

A: Bachelors degree in history.

Q: What is the purpose of your testimony today?

A: My testimony is to provide useful remarks concerning the implementation of Net Metering in South Carolina.

Q: Are you aware that the electric utilities in South Carolina subject to this proceeding of Docket #2005-385-E are the private, investor-owned utilities of Duke Energy Carolinas, LLC; Carolina Power & Light d/b/a Progress Energy Carolinas, Inc.' and South Carolina Electric and Gas?

A: Yes.

Q: Are you aware that under EPAct 2005 states must consider standards that encourage private, investor-owned electric utilities to use energy resources more efficiently?

A: Yes.

Q: Are you also aware that Section 1251 of EPAct 2005 requires states to consider the following:

1. "implementation of Net Metering Service,"

2. "development of a plan to minimize dependence on one fuel source & to ensure the electric energy it sells to consumers is generated from a diverse range of fuels and technologies, including renewable technologies"

and

3. "development of a ten-year plan to increase the efficiency of the utility's fossil fuel generation?"

A: Yes.

Q: Why do you think net metering would be good for South Carolina?

A: South Carolina, like other states, faces possible energy problems. With the rise of China, India, and other countries that are modernizing their economies, more people around the world want to live like Americans. As the incomes of people of other countries increase there will be more competition for resources, including energy resources. This can mean increases in the prices of every kind of fuel, including nuclear fuels. Political disruptions in regions that produce energy resources can result in shortages. States that are heavily dependent on imported fuels could suffer serious economic difficulties if there are significant price rises or interruptions in deliveries of those fuels.

Many fossil fuels come from unstable regions of the world, and involve costly exploration, extraction, processing, and shipping expenses. I understand that nuclear fuels can only be recycled a few times, and then the leftover radioactive waste must be safely stored for many generations. Safe storage of radioactive waste over long periods of time is expensive and involves serious problems. Since the sun is expected to continue shining for billions of years, solar energy is an option that deserves serious thought and development. Solar energy, and other renewable energy methods, should be part of our mix of energy

solutions. Solar energy does not produce the pollution and waste problems inherent in some of our conventional energy sources, and delivery is free.

Considering these problems and other problems related to energy production and distribution, it would be prudent for South Carolina to develop a wider variety of energy sources, especially those based on resources located in South Carolina. As renewable technologies for generation of power increase and become more efficient, more benefits will accrue to South Carolina. Solar energy looks to me to be one of the most useful alternative energy sources for South Carolina. Incentives, such as net metering, for individuals and businesses to invest in new energy resources would help speed the development of a more flexible, resilient energy system. To be effective, the incentives should be designed to attract investment and effort from a wide variety of citizens and businesses.

Q: What energy planning goals do you think South Carolina should pursue?

A: I want to see South Carolina take advantage of the opportunity to use net metering to enhance our energy systems and sources, improve our energy security, preserve our natural resources, and cut energy expenses. Solar technology is improving and costs are coming down. South Carolina can benefit from these improvements with judicious study and development of this improving technology. Sunlight is free and South Carolina has plenty of sunlight. We also have a lot of roof space on homes and businesses suitable for solar energy collection. Encouraging citizens and businesses to develop effective and efficient use of energy, including their own renewable energy generation systems with connections to our existing energy grid, is in the best interests of South Carolina.

Q: What economic benefits do you think South Carolina can derive from research into renewable energy technology?

A: We should begin research and development to make optimum use of solar and wind power for individual citizens, for families, and for businesses. Researching and developing solar technology, systems, and services would be a good match for South Carolina's research plans for hydrogen technology. There may be possibilities for export business of solar technology for South Carolina companies. If we can use our plentiful supply of sunshine to solve some of our own energy needs we should be able to sell our solutions to others. If we are successful in developing better, more economical solar energy systems, we could reduce energy expenses for families and businesses. Reduced expenses can result in higher standards of living and higher profits.

Q: What advantages do you see for local solar power generation?

A: Much of our power usage comes from using air conditioning during the hottest months when we have a lot of sunshine. If energy produced from sunlight can be used closer to where it is generated that reduces transmission costs and losses of electricity during transmission. Passive collection of solar heat in the winter can cut home and business heating expenses and reduce use of fuel and electricity. If fewer transmission lines need to be built, the pressure on our land from urban and industrial sprawl can be reduced or better contained.

Q: How do you see solar technology and net metering affecting employment and business in South Carolina?

A: Developing solar technology and a net metering system can provide jobs in many communities. Existing power companies and individual entrepreneurs

could develop and expand design, installation, and maintenance services for homeowners and businesses. Developing research in this area can attract talented scientists and businessmen to our state. Successful solar and wind research could help develop local businesses, bringing more income to our state and retaining more profits locally. The sooner we begin working out the problems involved in effectively producing and using solar energy the sooner we can enjoy the benefits, including the profits derived from selling solar technology to others. Setting statewide policies that encourage the use and development of solar power will help achieve such a goal.

Q: What advantages do you see for developing diverse energy sources?

A: By increasing the diversity of our sources of power we can increase energy security in South Carolina. Our power system can become more flexible and more resilient. Periodic decreases in delivery of conventional fuels would be less disruptive.

We could reduce our dependence on foreign sources of fuel. With more of our energy generated locally we would be less vulnerable to supply interruptions and price fluctuations for fuels from outside sources. We might even be able to reduce some of the growth of traffic on our highways if we don't have to transport as much fuel in the future. Highways and roads would then last longer, thereby cutting expenses of road building and repair.

An increasingly diverse energy base could help to stabilize prices of fuels, since suppliers would know that more customers would have more alternatives when prices for some fuels rise. There might then be less inclination to

manipulate fuel prices for political or other reasons. Energy users who rely on diverse energy sources could have more bargaining power on prices of conventional fuels.

Q: How do you see solar generation and net metering affecting urban and industrial sprawl?

A: With a growing economy and a growing population we already have a problem with urban sprawl. South Carolina is an attractive place to live, but if urban and industrial sprawl continue it will not continue be as attractive. Using existing roof space on homes and commercial buildings to collect solar power can reduce the amount of land necessary for the construction of new power plants and transmission lines.

Q: What advantages do you see for distributed generation of electricity?

A: If photovoltaic and wind generation of electricity, and passive collection of solar heat in the winter, are encouraged and become widely developed, we can have a less centralized energy system. Net metering could make it a very flexible system, allowing excess energy from some areas to flow to other areas that need it. The less centralized nature of such a system could make it less vulnerable to natural disasters and possible terrorist sabotage. There could be fewer high value targets to tempt terrorists with a less centralized energy generation system. Areas with developed solar and other renewable generators of energy could be less vulnerable to the effects of downed power lines or damage to large power plants. The ability of hospitals and other emergency services to carry on their work using their own power facilities when power lines are damaged would make them more

1 effective. Solar power could be part of this ability, which could, when fully
2 developed offer cost savings during normal times as well.

3 Having our generating capacity dispersed across many roof tops and on
4 many properties around the state, in addition to existing conventional generating
5 facilities, would make the system less vulnerable to localized disasters like
6 tornadoes or ice storms.

7 **Q: How do you think increased use of solar power will affect problems of**
8 **transmission of electricity?**

9 **A:** Substituting increased solar generation on existing roof tops at dispersed
10 sites across the state for building large coal fired or nuclear plants reduces the
11 amount of land needed, including land for transmission wires. With shorter
12 transmission distances there would be less loss of electricity before reaching the
13 users.

14 **Q: What environmental considerations do you think are related to expanding**
15 **the use of solar power?**

16 **A:** Solar and wind power produce far fewer waste products than generating
17 plants that burn fossil fuels or nuclear plants. Using solar and wind power avoids
18 many air and water pollution problems, as well as avoiding many health problems
19 related to pollution. Treating health problems related to pollution can be quite
20 expensive. The medical treatment is expensive, and the cost of lost work days and
21 lost school days due to increased illness is a cost borne by families and our entire
22 society in a variety of ways. Those who suffer most from pollution related
23 illnesses tend to be the young, the elderly, and those already suffering from

respiratory illnesses. Cancer rates have been shown to be more concentrated in areas that have high rates of pollution.

Reduced pollution means avoiding many costs of cleaning up unwanted chemicals out of our land and water.

Q: How do you think solar and wind power generation will affect the problem of global warming?

A: Greater use of solar and wind generated power can also reduce the amount of greenhouse gases produced, which would help reduce the problem of global warming.

Q: How might taxes and government expenditures be affected by an increase in solar power?

A: Greater use of solar technology to generate electricity by governmental agencies could also help reduce government expenditure and possibly reduce or contain the growth of taxes. This potential can best be realized through improved research and development promoted by our state government.

Q: Do you see educational benefits to the development of solar power technologies?

A: Universities, colleges, technical schools and colleges, high schools and elementary schools could all benefit in various ways. Schools using solar generated electricity could cut power expenses, freeing funds for other educational expenses. School alternative energy systems could also be used as part of science, architecture, and engineering lessons, helping to inspire and instruct future generations of energy technicians, engineers, and scientists. The

earlier you get people thinking about interesting problems the more solutions they are likely to create in the future. We have a lot of talent in South Carolina. If we train our talented students and give them opportunities here many of them will be less likely to move out of state. If they stay here to conduct research and develop businesses we will benefit from their talents and the profits they generate. Solar and other renewable energy engineering and design programs in our colleges and universities could become a base for strong business growth in energy technology in South Carolina.

Q: How do you think emergency preparedness can be enhanced by the development of solar power?

A: Hospitals, police, fire fighting installations, National Guard units, and other agencies involved in responding to natural or man made disasters could benefit from having solar generating equipment. Between emergencies solar generation of electricity could hold down expenses, thereby freeing money for other equipment and personnel needs. During and after disasters, when normal power distribution is disrupted by downed power lines or damaged generating facilities, surviving photovoltaic installations could help keep essential services operating.

By encouraging the development and installation of photovoltaic solar power, and other alternative energy methods, across South Carolina we can help to reduce the impact of disasters that strike our state. If power generation is distributed across thousands of roof tops, yards, and business properties around the state, as well as being generated by our existing conventional generating plants, we will have a more resilient system. The areas not directly hit by a

disaster could continue some functions , even with power lines down, since they would have some generating capacity of their own.

Refrigeration for food and for medicines sensitive to high temperatures could be preserved. Communications could be kept open more easily. Gasoline fueled generators would be needed less during daylight hours. Rescue operations could proceed more rapidly and more effectively.

Communities hit by disasters like hurricanes could recover more quickly, save more lives, and get their businesses back to business more rapidly. Every day that a business is closed means lost profits and lost pay for employees, while some of the normal expenses of the businesses and families continue. Lost income for employees affects their families and reduces the overall business of the community, which means a drop in income for other businesses and individuals in the region, since people have less money to spend. Delays in recovery from disasters can mean lost school days for students. The education they lose out on can have effects for them and the community at large.

Q: Do you see any advantages to the development of solar power for power companies now serving South Carolina?

A: There would be less need to raise capital for the construction of new power plants. If solar installations for individuals and businesses become widespread, the existing power companies could have more energy to distribute without having to go through the expense and trouble of building as many new power plants as they otherwise would. We need to maintain a good power grid

with diverse sources of power. There would be less danger of brownouts or blackouts during times of peak usage.

Q: What advantages do you think power customers can expect from distributed generation of power?

A: Customers of electric companies would not be charged for costs of construction of new power plants since fewer large generating plants would be needed. During times of peak usage, such as hot summer days, strains on the system would be reduced if enough customers have their own alternative systems to use. After disasters and storms, those customers not directly affected by the disaster might still be able to keep basic appliances, like refrigerators, going if they have alternative systems.

Q: What incentives and conditions do you think are needed to promote a good mix of power generating technologies, including adequate renewable technologies, and provide the conditions for South Carolina to get the best in benefits from solar and other renewable technologies?

A: Net metering can provide incentives for home owners and businesses to invest in renewable energy systems, which can contribute to statewide improvements in energy supply and security. Without adequate incentives few individuals or businesses will invest enough for us to gain the experience we need to solve enough of the problems to bring us to the point of getting the best out of solar and other renewable technologies.

1 Individual systems installed by families or businesses need to be allowed
2 to generate enough power to make the investments worthwhile. The aggregate
3 limit of all the net metered systems in the state needs to be high enough to make a
4 significant improvement in the power available. The metering, billing, and credit
5 standards should be clear and easy to understand. I think more people will be
6 willing to install renewable energy generating systems if they get the retail rate
7 for the excess power they feed into the grid. There should be favorable carryover
8 provisions for customers who generate excess power and renewable energy
9 credits should have favorable treatment. Mandatory switching to time of use
10 tariffs would probably not encourage customers to engage in net metering.

11 The public needs to be aware of the possibilities of net metering. If
12 families and businesses are to take advantage of the savings and business
13 possibilities they need accurate and timely information. If voters and politicians
14 are to take advantage of the public savings and increased energy security
15 possibilities they also need to know what all the possibilities are.

16 Our public schools and institutions of higher education, if they are to
17 benefit from energy savings and train the technicians, architects, and engineers
18 necessary for the new technologies, need good information and policies that
19 enable them to participate in the new technologies.

20 Good policies will also help us to compete more effectively in national
21 and world markets for improved energy services, design, and technology. That
22 market is likely to be very competitive and could be very lucrative for those who

are well trained and supported by a favorable educational and institutional climate. Good state policies and regulations would be important in that regard.

We need to develop the best possible standards and policies for our state. Over 30 states have tried net metering. Some states have had more success than others. We should carefully look at the results in the states with the most experience and see which programs worked best. Our late start could be an advantage. We have the opportunity to avoid the mistakes of others and use knowledge of the successes of the best systems to design our system. We should not adopt any untried or unproven standards.

BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA

DOCKET NO.: 2005-385-E

IN RE:
Petition of the Office of Regulatory Staff to)
Establish Dockets to Consider Implementing)
the Requirements of Section 1251 (Net)
Metering and Additional Standards) of the)
Energy Policy Act of 2005)

CERTIFICATE OF SERVICE

This is to certify that I, John F. Hardaway, have this date served one (1) copy of the Direct Testimony and Exhibits of Tom Howell in the above referenced matter to the person(s) named below by causing said copy to be deposited in the United States Postal Service, first class postage prepaid and affixed thereto, and addressed as shown below:

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April 24, 2007
Columbia, South Carolina