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July 2, 2020

Ms. Kimberley A. Campbell
Chief Clerk
North Carolina Utilities Commission
430 N. Salisbury Street
Raleigh, NC 27603

RE: *In the Matter of the Application of Apex Solar, LLC to Amend the CPCN to Construct a 30-MW Solar Facility in Cleveland County, NC Docket No. SP 11723, Sub 0*

Dear Ms. Campbell:

On behalf of Apex Solar, LLC, in the above referenced matter and docket, we herewith provide the **Direct Testimony of Chris Sandifer**.

Should you have any questions concerning this filing, please do not hesitate to contact me.

Sincerely,

/s/ Karen M. Kemerait

Karen M. Kemerait

KK:skb

Enclosure

Cc: All parties of record

A Pennsylvania Limited Liability Partnership

California Colorado Delaware District of Columbia Florida Georgia Illinois Minnesota
Nevada New Jersey New York North Carolina Pennsylvania South Carolina Texas Washington

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH**

DOCKET NO. SP-11723, SUB 0

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

**In the Matter of)
Application of Apex Solar, LLC, for a Certificate of)
Public Convenience and Necessity to Construct a 30-)
MW Solar Facility in Cleveland County, North Carolina)**

DIRECT TESTIMONY

OF

CHRIS SANDIFER, PE

ON BEHALF OF

APEX SOLAR, LLC

July 2, 2020

1 Q. **Please state your name and business address.**

2 A. My name is Chris Sandifer. My business address is 3118 Green Road, Spring
3 Hope, North Carolina 27882.

4 Q. **Please briefly summarize your educational background.**

5 A. I received a Bachelor's of Science degree in electrical engineering from Clemson
6 University in 1975. I have received the Certified Energy Manager designation
7 from the Association of Energy Engineers.

8 Q. **Please discuss your credentials.**

9 A. I am licensed by the State of North Carolina as an Electrical Contractor with the
10 Unlimited Classification, and I am registered by the State of North Carolina as a
11 Registered Professional Engineer. The license and registration allow me to
12 perform acts and provide opinions in public forums that those without these
13 privileges may not lawfully perform or provide.

14 I grew up on a farm in South Carolina and currently live on my own farm
15 in Nash County, North Carolina. I have managed an additional 1,700 acres of
16 family-owned, traditional farm lands in Lee County, Nash County, Edgecombe
17 County, and Warren County in North Carolina. My family and I currently lease
18 approximately 100 acres in Lee County for solar energy production (three 5 MW
19 farms), on jointly owned property.

20 As an engineer, electrical contractor, farmer, and land owner, I have an
21 abundance of experience with solar farm design, construction, operation, and
22 maintenance. Consequently, I understand the labor, equipment, and procedures
23 required for a safe and environmentally responsible decommissioning process that

1 provides for the removal of a solar farm's facilities. I also understand the
2 importance of having a steady and stable cash flow for a percentage of the farm
3 business income.

4 I serve on the Nash County Planning Board. Nash County was one of the
5 first counties in North Carolina to consider and approve a photovoltaic (PV) solar
6 farm. Nash County has approved thirty-seven utility-scale solar farms to
7 date. The Board's experience with solar farms, as well as that of the Nash County
8 Planning Department, has been very positive, and Nash County looks forward to
9 more solar projects to benefit the community.

10 **Q. What is the purpose of your testimony?**

11 A. The purpose of my testimony is to provide my expert opinion on the potential
12 impacts, if any, of the proposed Apex Solar farm on human health and the
13 environment.

14 **Q. Please describe the proposed facility for which Apex Solar, LLC seeks an**
15 **Amended CPCN.**

16 A. The proposed facility is a 30-MW facility that is described in detail in the
17 application for an Amended Certificate of Public Convenience and Necessity
18 ("CPCN") filed in this docket on September 16, 2019, along with the high
19 resolution site plan filed on September 13, 2019 (the "Facility"). The Facility will
20 be located on the west side of Plainsville Church Road, approximately 0.5 miles
21 west of the intersection with East Stage Coach Trail, Lawndale, Cleveland
22 County, North Carolina. The total acreage of the underlying tracts is 475 acres.
23 The solar panels will be located on 321 acres and the area of disturbance will

1 include 357 acres. It is my understanding that Apex Solar plans to sell the
2 electricity to Duke Energy Carolinas, LLC.

3 The Facility will consist of PV modules, commonly known as solar
4 panels, mounted on metal racks. The racks are supported by metal piles that are
5 driven into the ground to minimize soil disturbance. The solar panels do not
6 contain any radioactive material, hazardous chemicals, or other material that
7 could potentially cause harm to the environment or the surrounding community.
8 The solar panels are non-combustible. They are safe and create no site emissions,
9 odor, or dust. A solar facility is a low impact, passive use of the land.
10 The Facility will be surrounded by chain link fencing and landscaped buffers.

11 It is anticipated that the Facility will be placed in service in November
12 2021.

13 **Q. How do solar farms, such as the Apex Solar farm, operate?**

14 A. Solar farms convert sunlight into electricity that is sold to the local electric utility
15 and delivered for use by electricity consumers near the solar facility. The sunlight
16 is absorbed by the photovoltaic cells in the thousands of solar modules installed in
17 the field. About fifteen percent of the energy in that sunlight is converted to
18 direct current (DC) electricity, which flows through a combination of other solar
19 modules and wiring into an inverter that converts the DC electricity to grid-
20 synced alternating current (AC) electricity. The DC voltage is limited to 1,000
21 volts. A system of this capacity has large inverters spread around the field (*i.e.*,
22 arrays) of solar modules. The output of these inverters is at a much lower voltage
23 than the local utility distribution wires that it will feed into, so the energy passes

1 through a transformer to increase the voltage from the volts coming out of the
2 inverter up to the volts of the local distribution line. Before connecting to the
3 utility line, the energy passes through an energy meter and is then sold to the local
4 electric utility.

5 **Q. How do solar farms affect the surrounding properties and the environment?**

6 A. Solar facilities like the one proposed here do not present any harm to the
7 surrounding properties or the environment. Solar farms do not release any
8 substance into the air, water, or soil at or near the solar farm site. They are widely
9 supported by leading environmental organizations. The power the solar farms
10 generate offsets power production from existing fossil fueled generators that
11 release pollutants into the environment. Solar facilities such as the one proposed
12 here are both safe and environmentally friendly.

13 The proposed Facility will not emit odor or generate dust (as even uses
14 such as farming can do). There is no permanent on-site parking or loading areas
15 proposed, as this is an unmanned facility with no enclosed structures. Sound
16 during operation of the Facility will be indistinguishable from ambient
17 background noise at the property lines. The proposed Facility will connect to and
18 serve the existing power grid. Power distribution lines will be located
19 underground, where practical, except for interconnection of the facility to the
20 power grid.

21 Solar farms are safe, non-hazardous, unobtrusive, environmentally friendly,
22 and advance
23 the public necessity of providing renewable sourcing of electricity.

1 Because solar farms are unpaved, they have beneficial stormwater and
2 ground water recharging effects.

3 Solar technology like that proposed for the Facility is not new, as solar
4 panels have been in operation for more than fifty years in the United States. All
5 electric components will have an Underwriters Laboratories (UL) listing and the
6 installation will comply with the edition of the National Electrical Code in effect at
7 the time of construction.

8 From my education and experience, I know that EMF is present wherever
9 electricity is present. For example, EMF is produced by magnets, electric tools,
10 computers, radio and television transmitters, mobile phones, and medical devices.
11 EMF is produced by a variety of natural sources as well as the production and
12 distribution of electrical power. Ordinary household appliances such as televisions
13 and refrigerators produce EMF. EMF strength attenuates rapidly as the distance
14 from the source increases. Solar PV panels produce weaker EMF than many
15 household appliances, such as televisions and refrigerators.

16 Inverters used to convert electricity from DC to AC power, will be located
17 in the interior of the solar facility. Although the inverters inside the solar farm
18 facility produce EMF, the strength of the fields decline rapidly with distance such
19 that EMF measured at the perimeter of the physical facility is generally
20 immeasurable when compared to background EMF.

21 **Q. Have you read the comments filed by Carrie and Gene Daves, Ronald**
22 **Ingram, Dana Donaldson, and Tom and Karen Bess filed in this docket?**

23 A. Yes.

1 **Q. What is your response to their comments?**

2 A. With respect to the specific concern related to safety of the Facility raised in the
3 submission filed by Mr. Ingram, it is my professional and expert opinion that the
4 Facility will have no adverse impact on human health. Because solar farms do
5 not burn fossil fuels, they do not produce the toxic air or greenhouse gas
6 emissions associated with conventional fossil fuel-fired generation technologies.
7 Instead, solar farms like the one proposed here supply clean renewable electricity
8 that is beneficial to neighboring areas, and they do not present any harm to the
9 public health or nearby properties. Solar energy is beneficial as it contributes to
10 the stability and resiliency of the grid by decreasing upward pressure on utility
11 rates by acting as a “hedge” against future increases in fuel costs. Solar energy
12 has a direct impact on reducing emissions and reliance on non-renewable fuel
13 sources.

14 Also, the solar panels that comprise the solar arrays are made primarily of
15 glass, utilizing Thin Film technology. Thin Film solar modules are made by
16 depositing photovoltaic materials into crystalline layers that are bonded in
17 tempered glass.

18 With respect to the specific concern about the decommissioning of the
19 Facility raised in the submission filed by Mr. Ingram, it is my professional and
20 expert opinion that the decommissioning of the Facility will have no adverse
21 impact on human health or the environment. As part of Apex Solar’s application
22 for a Conditional Use Permit submitted to Cleveland County and approved by
23 Cleveland County, Apex Solar provided a decommissioning plan as required by

1 Section 12-160(f) of the Cleveland County Unified Development Ordinance. The
2 decommissioning plan provides that decommissioning will occur upon any of the
3 following conditions: (1) the land lease ends; (2) the Facility does not produce
4 power for a period of twelve months; and (3) the Facility is damaged and will not
5 be repaired or replaced. At a minimum, Apex Solar's lease with the property
6 owners requires Apex Solar to perform the following to decommission the
7 project: (1) remove all non-utility owned equipment, conduits, structures, fencing,
8 and foundations to a depth of at least three feet below grade; (2) remove all
9 graveled areas and access roads unless the property owners request in writing that
10 they remain in place; (3) restore the land to a condition reasonably similar to its
11 condition before development, including replacement of top soil that was
12 removed or eroded; (4) re-vegetate any cleared areas with warm season grasses
13 that are native to the Piedmont region, unless requested in writing by the property
14 owners to not re-vegetate due to plans for agricultural planting.

15 With respect to the specific concerns related to taking farmland out of
16 production raised in the submissions filed by Mr. and Ms. Daves and Ms.
17 Donaldson, it is my professional and expert opinion that solar farms, such as the
18 one proposed here, allow property owners to maintain large areas of land while
19 generating income from the property. At the end of the useful life of the solar
20 farm, the land is easily restored for agricultural purposes.

21 **Q. What is your recommendation with respect to Apex Solar's application for**
22 **an Amended CPCN?**

1 A. It is my recommendation that the Commission issue an order awarding the
2 Amended CPCN for the Facility.

3 **Q. Does this conclude your testimony?**

4 A. Yes.

CERTIFICATE OF SERVICE

I hereby certify that all persons on the docket service list have been served true and accurate copies of the foregoing **DIRECT TESTIMONY** by first class mail deposited in the U.S. mail, postage pre-paid, or by email transmission to all parties of record.

This the 2nd day of July, 2020.

/s/ Karen M. Kemerait
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