

**NORTH CAROLINA UTILITIES COMMISSION – PUBLIC STAFF'S
PRESENTATION ON SOLAR FACILITIES REGULATION UNDER NCGS
CHAPTER 62**



Robert B. Josey – Staff Attorney,
Legal Division

Evan D. Lawrence – Engineer,
Electric Section, Energy Division

SOLAR'S NC LEGISLATIVE HISTORY

Senate Bill 3, 2007

- Established the Renewable Energy and Energy Efficiency Portfolio Standard
- Allowed Solar Facilities to register as new renewable energy facilities, which would allow the facilities to create and sell Renewable Energy Certificates (RECs) for each MWh of energy generated.
- This along with state and federal tax credits helped get the solar energy industry off the ground in North Carolina

HISTORY CONTINUED

House Bill 589, 2017

- Created a Competitive Procurement for Renewable Energy
 - Requiring Duke Energy to acquire 2,660 MW of renewable energy
 - At this time Duke has acquired approximately 2,000 MW of projects over two tranches of bidding
 - The remaining approximately 660 MWs of energy will be bidding into Tranche 3 this spring
- Other Solar Programs
 - Green Source Advantage
 - Solar Rebate Program
 - Solar Leasing Program
 - Community Solar Program

HISTORY CONTINUED

House Bill 951, 2021

- Requires the Utilities Commission to take all reasonable steps to achieve a seventy percent (70%) reduction in emissions of carbon dioxide (CO₂) emitted in the State from 2005 levels by 2030 and carbon neutrality by 2050.
- Create a plan by the end of 2022 to achieve these goals.
- To the extent the Commission selects solar as part of the generation profile in the Carbon Plan 45% of the MW shall be supplied through Power Purchase Agreements with 3rd Parties and 55% shall be owned by Duke Energy.

GENERATING FACILITY APPROVAL PROCESS

3 main types of generating facility approvals

1) Report of Proposed Construction (ROPC)

- Informational filing required for facilities smaller than 2MW
 - Only reviewed if larger than 1.5MW
- Exempt from certificate requirement under NCGS 62-110.1(g)

2) Certificate For Public Convenience And Necessity (CPCN) by CPRE Program Participant, Qualifying Cogenerator, or Small Power Producer

- Commission Rule R8-64, required for 2MWs and over

3) CPCN for a Merchant Generating Facility

- Commission Rule R8-63, required for 2MWs and over

ROPC REQUIREMENTS

Commission Rule R8-65

Requirements:

- Owner information
- Type and source of the power or fuel
- Description of the building
- Generating Capacity
- Owner's plan for sale of the electricity and projected annual sales in kWh
- Service life
- If the owner intends to earn RECs
- Cost of the facility

UTILITY SCALE SOLAR APPLICATION REQUIREMENTS

Applicant business information

- Name, Principals, officers, most recent annual report to stockholders, and information on the company's other generating facilities in SERC's region

Information on the Facility itself

- Type of fuel, expected service life, size, expected construction and operation dates, estimated cost
- Map/aerial photo of the site showing all major roads and equipment
- A list of all federal, state, and local approvals needed for the site and status
- Description of the transmission facilities that the facility will interconnect to

ADDITIONAL APPLICATION REQUIREMENTS

Description of the Need for the facility under NCGS 62-110.1

- Only for merchant plants under R8-62
- Requires a Commission hearing

General plan for sale of the electricity

Annual Sales

Whether the applicant intends to produce RECs

State Clearinghouse Review for compliance with the Environmental Policy Act

CERTIFICATE

Subject to revocation if:

- Any of the federal, state, or local permits are not obtained or are revoked
- Required reports or fees are not filed or paid
- NCUC concludes that the applicant provided inaccurate or misleading material information

Any other Conditions the Commission deems necessary

Annual Progress Reports until completion of construction

Renewal every 3 (R8-64) or 5 years (R8-63)

Notification if certificate holder plans to sell transfer or assign facility

ACTIVE SOLAR CPCNS BY YEAR ISSUED

	2 MW - 5 MW	5 MW - 25 MW	25 MW - 50 MW	50 MW +	Grand Total (by year)
2009	0	1	0	0	1
2010	1	0	0	0	1
2011	9	1	0	0	10
2012	75	4	0	0	79
2013	77	10	0	1	88
2014	179	16	3	1	199
2015	133	28	6	13	180
2016	175	9	10	19	213
2017	10	3	6	7	26
2018	8	9	2	8	27
2019	3	4	4	3	14
2020	4	9	3	5	21
2021	2	2	2	4	10
Grand Total (by size)	676	96	36	61	869

ACTIVE SOLAR CPCN CAPACITY (MW) BY YEAR ISSUED

	2 MW - 5 MW	5 MW - 25 MW	25 MW - 50 MW	50 MW +	Grand Total (by year)
2009	0	18	0	0	18
2010	5	0	0	0	5
2011	43	20	0	0	63
2012	348	63	0	0	411
2013	369	162	0	74	606
2014	867	184	123	80	1,254
2015	649	420	278	930	2,278
2016	845	158	390	1,428	2,821
2017	43	26	251	473	792
2018	37	157	70	622	886
2019	13	45	135	181	374
2020	17	140	135	374	666
2021	10	31	76	297	414
Grand Total (by size)	3,247	1,424	1,458	4,460	10,589

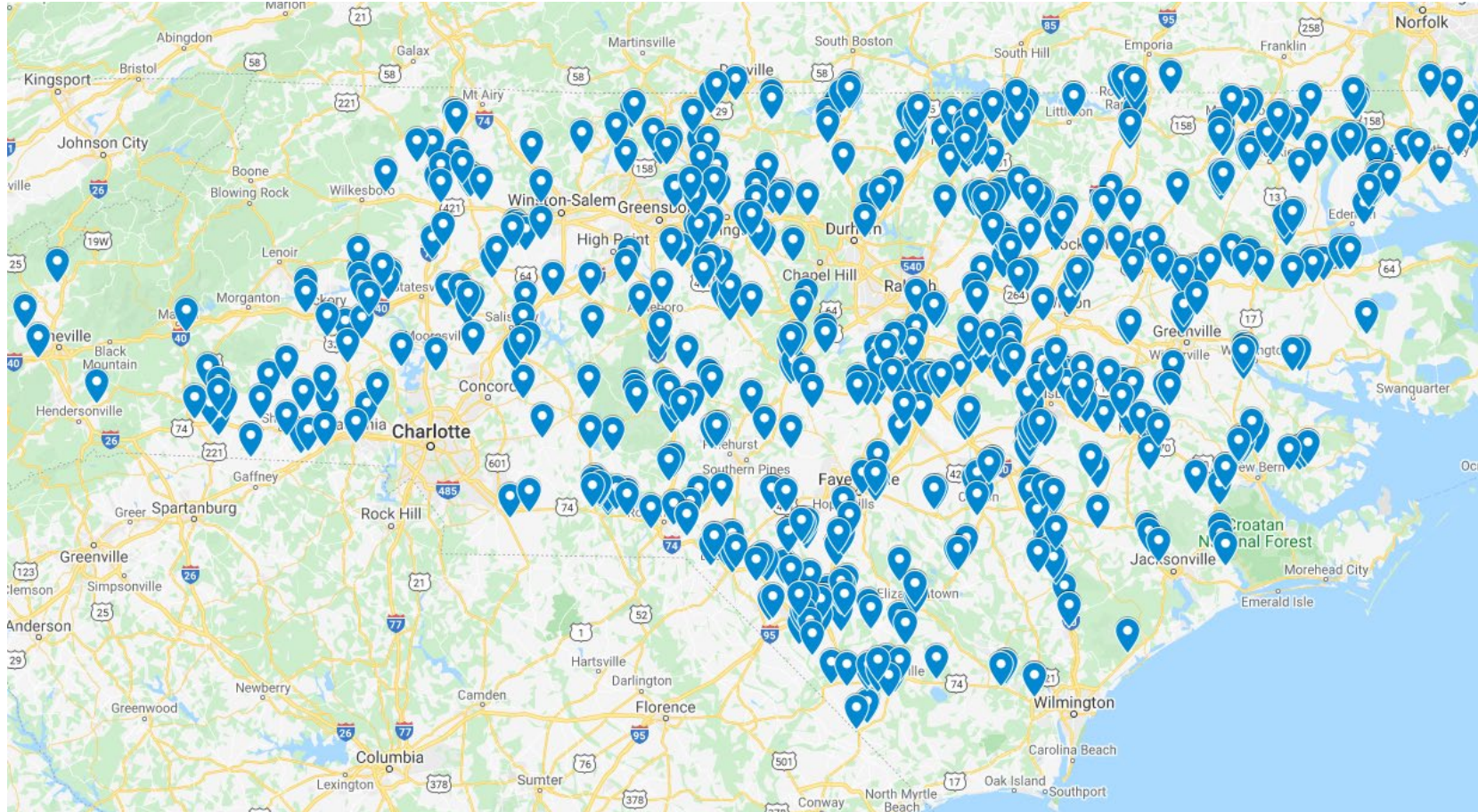
CPCNS AND ROPC'S ISSUED BY YEAR

Year	Average CPCN Nameplate Capacity	Number of CPCNs
2009	18	1
2010	5	1
2011	6	10
2012	5	79
2013	7	88
2014	7	199
2015	13	180
2016	13	213
2017	30	26
2018	33	27
2019	27	14
2020	30	21
2021	41	10

Year	Number of ROPCs Issued
2009 (and before)	330
2010	328
2011	536
2012	640
2013	672
2014	1,070
2015	2,325
2016	1,067
2017	1,596
2018	4,109
2019	5,769
2020	7,140
2021	10,052
2022 (through 1/4)	104

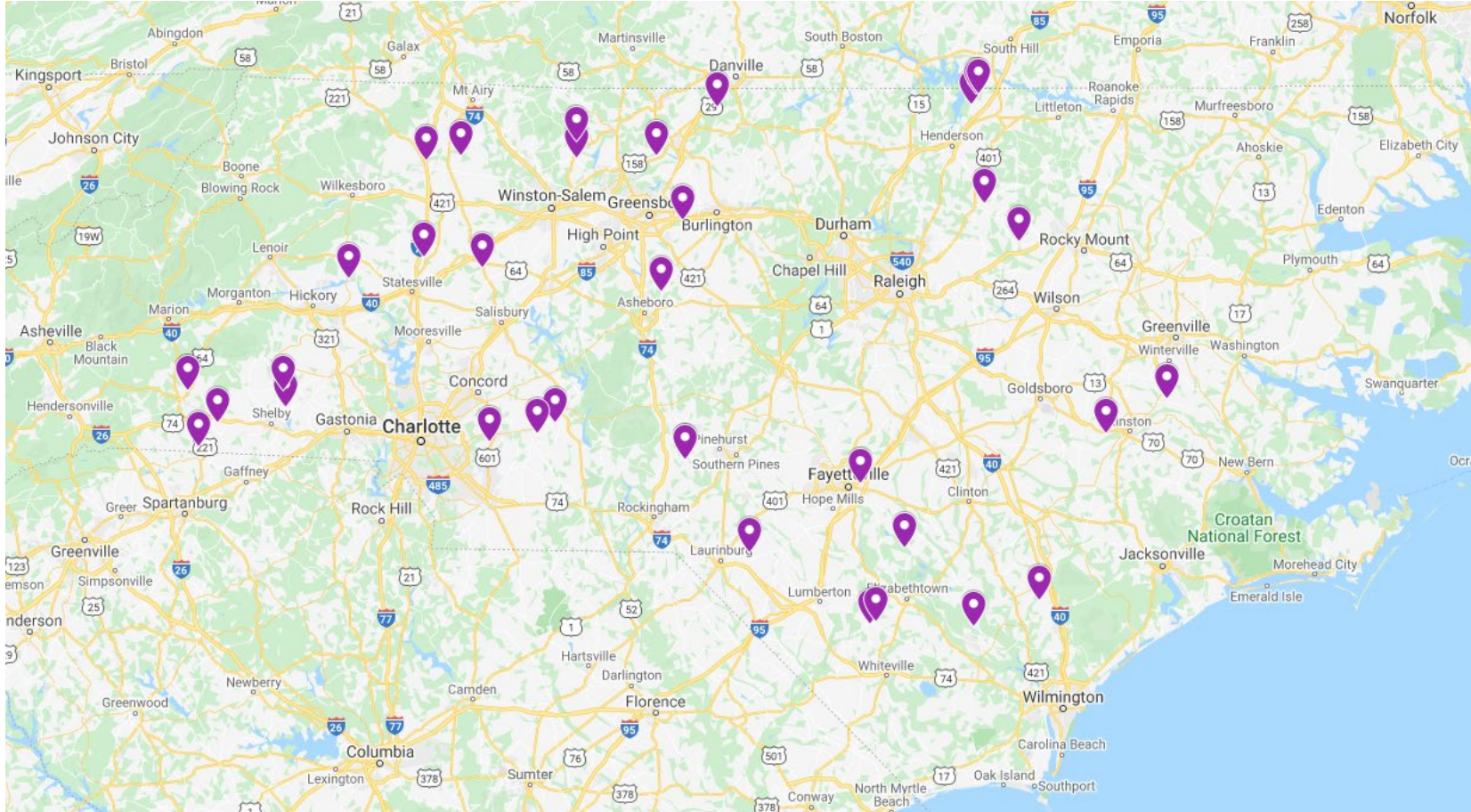
WHERE ARE THEY?

2-5 MW



WHERE ARE THEY?

25-50 MW

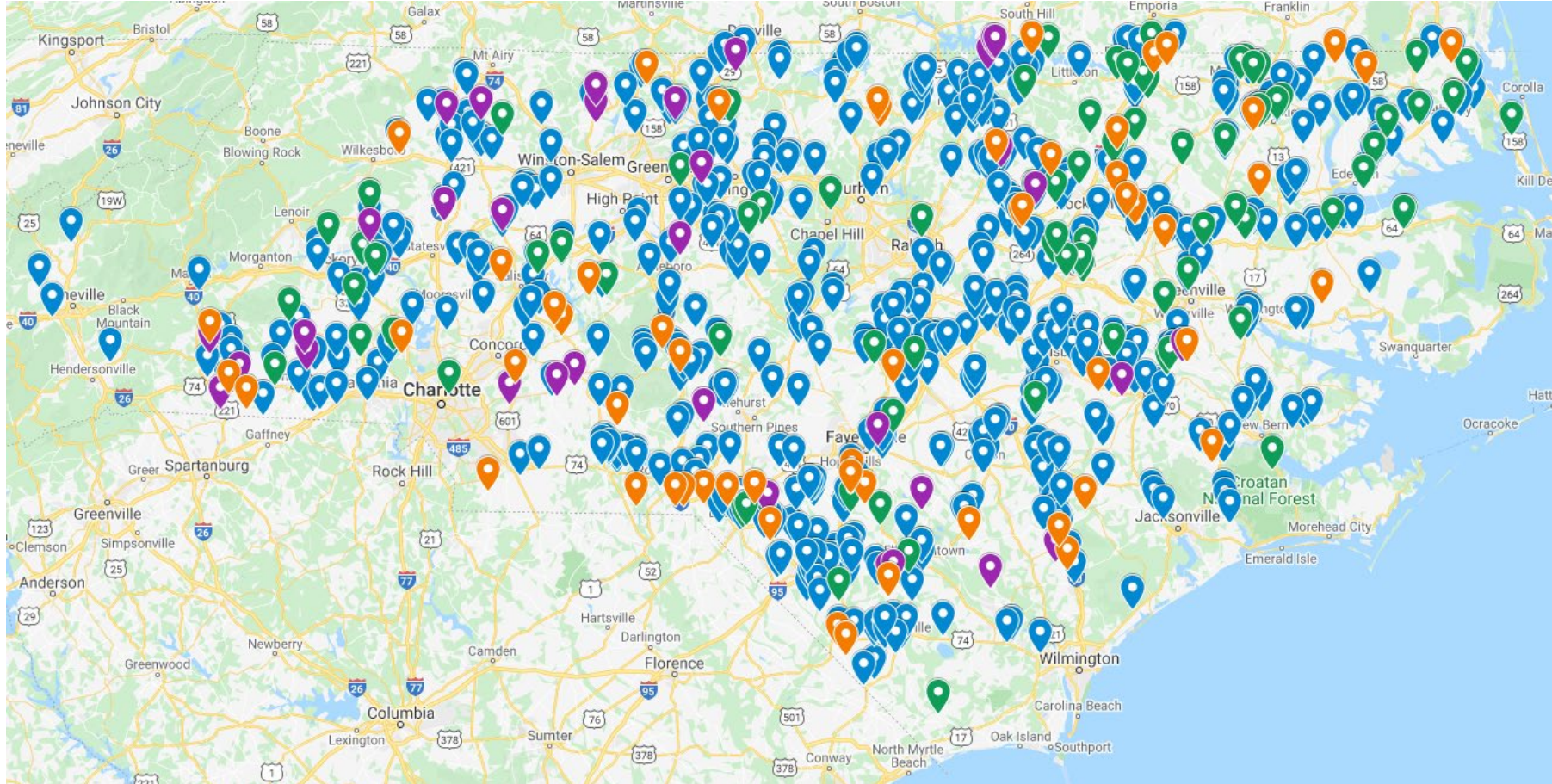


WHERE ARE THEY?

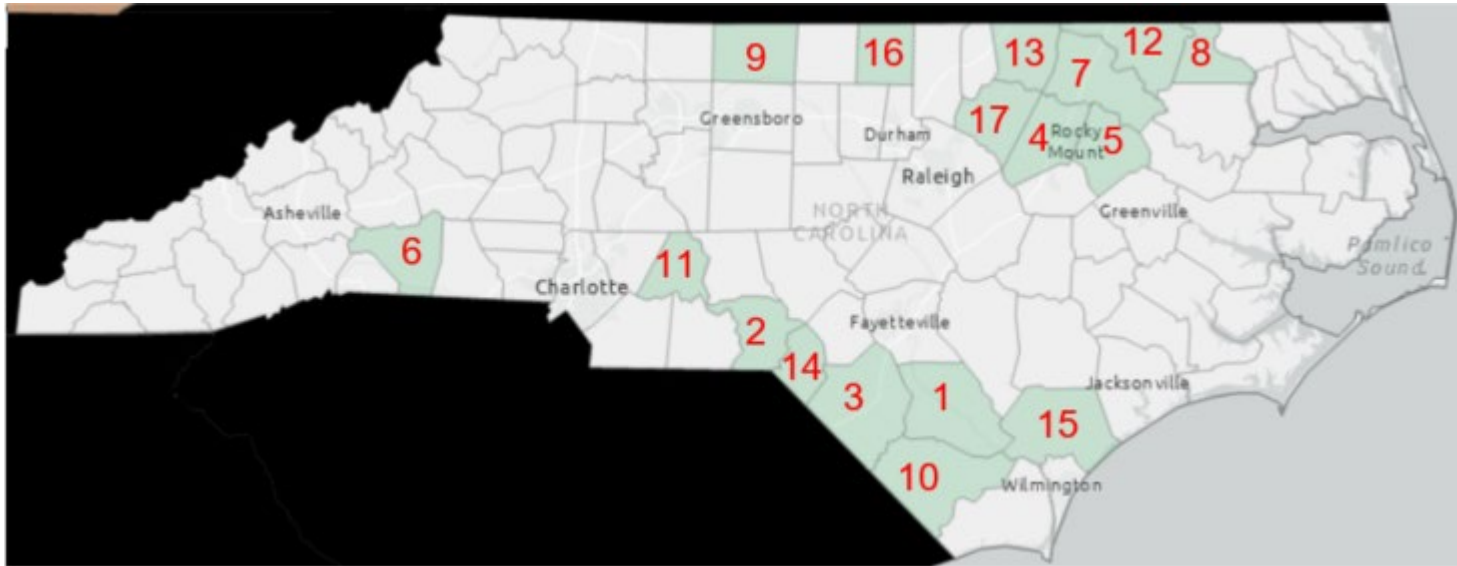
50+ MW



WHERE ARE THEY? ALL FACILITIES



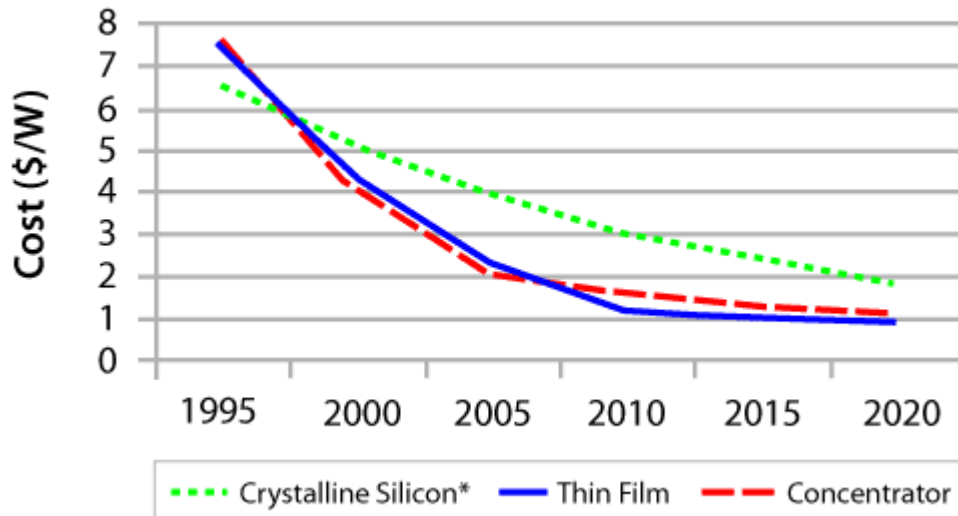
17 counties account for over 49% of all capacity and almost 36% of all facilities



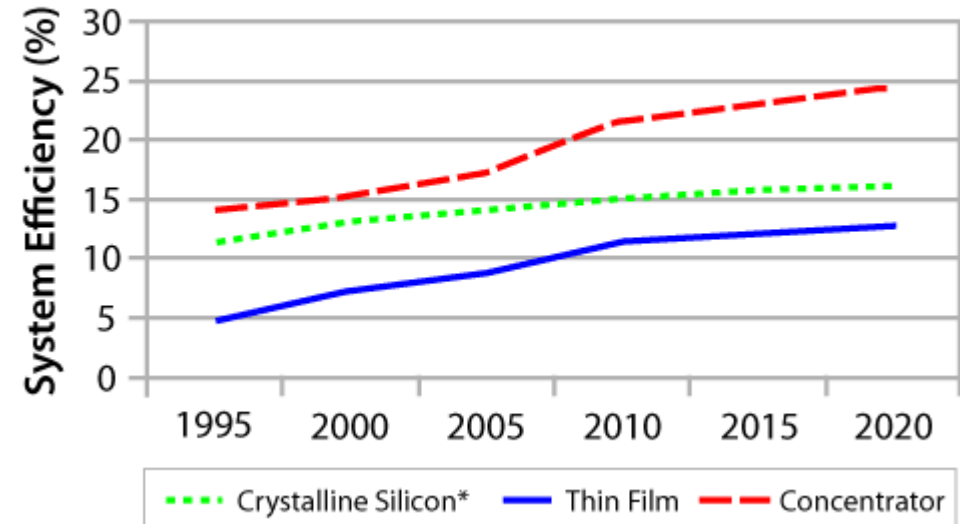
	County	Facilities	Capacity
1	Bladen	18	457
2	Richmond	14	435
3	Robeson	53	424
4	Nash	29	413
5	Edgecombe	14	379
6	Rutherford	14	376
7	Halifax	17	310
8	Hertford	24	296
9	Rockingham	18	275
10	Columbus	24	265
11	Stanly	7	259
12	Northampton	16	246
13	Warren	14	232
14	Scotland	16	229
15	Pender	8	215
16	Person	11	205
17	Franklin	14	204

PV SOLAR SYSTEM COST VS EFFICIENCY

PV System Capital Cost



PV System Efficiency



EXAMPLES OF FACTORS THAT IMPACT PANEL COVERAGE

Panel Efficiency.

- Efficiencies have increased, but higher efficiency panels cost more.

Installer Preference.

- Installer may have deals or experience with certain brands.

Terrain.

- Flat terrain will allow the best output profile.

Shading.

- Hills, trees, and cloud cover will be considered when deciding on equipment.

Inverter and other equipment ratings.

- How well the panels pair with other equipment will influence what is chosen.

Desired Output Profile

- More on next slide

OUTPUT PROFILE

The output profile is energy output compared to the time of day.

More panels=reaching peak output faster in mornings and staying there longer in afternoon.

For example:

- A developer plans for an 80 MW AC facility.
- After factoring in efficiency and conversion losses they would need 95 MW DC of panels.
- Developer completes an economic analysis to factor in equipment costs, and sees that by being able to ramp up to full output faster, and stay there longer, it is cost beneficial to build a 105 MW DC facility

NC DOMINION ENERGY FACILITIES AS EXAMPLES

Facility	County	Capacity	Modules	Acreage	Acres/MW	Modules/MW	Modules/Acre
Fremont	Wayne County	5	21,128	30	6	4,226	710
Mustang Solar	Moore County	5	21,300	30	6	4,260	710
Wakefield Solar	Wake County	5	22,300	30	6	4,460	743
Clipperton	Sampson County	5	56,640	29	6	11,328	1,986
Pikeville	Wayne County	5	56,640	30	6	11,328	1,888
Moorings 2	Lenoir County	5	58,400	36	7	11,680	1,622
Morgans Corner	Pasquotank County	20	81,054	110	6	4,053	737
Pecan Solar	Northampton	74.9	929,100	1,050	14	12,405	885
IS37	Anson County	79	344,056	550	7	4,355	626
Gutenberg Solar	Northampton	79.9	287,430	1,126	14	3,597	255