NORTH CAROLINA'S INVESTMENT TAX CREDIT IS GONE—NOW WHAT? POTENTIAL SOLUTIONS FOR CURRENT AND PROSPECTIVE SOLAR COMPANIES

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INTRODUCTION

Harnessing the sun's rays to produce energy has been possible since the late 18th century, when the first solar motor was invented.[1] Einstein published papers on the photoelectric effect in the early 1900s, and NASA has used photovoltaic solar panels since the 1950s.[2] However, conventional fuel providers were firmly entrenched in the United States energy market, preventing solar energy from expanding to public sales.[3] This lasted until federal regulations to improve air and water quality opened the door for renewable energy, including solar.[4] The regulation created large expenses for oil and gas companies that had to undo decades of pollution.[5] This, combined with rising fuel prices, caused the petroleum industry to decline and consolidate.[6] Around the same time, the price of photovoltaic cells began to decrease, making solar power much more financially viable.[7]

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1. ENERGY EFFICIENCY & RENEWABLE ENERGY, DEP'T OF ENERGY, THE HISTORY OF SOLAR 2, https://www1.eere.energy.gov/solar/pdfs/solar_timeline.pdf.

2. *Id.* at 3. NASA put solar panels on satellites orbiting the Earth beginning in 1956, and solar power is the main source of energy for NASA's missions in 2015. Jeffrey Smith, Nat'l Aeronautics & Space Admin., *Greenspace: Leveraging NASA for a Greener Earth* (Deborah Bazar, ed., Sept. 23, 2010), http://www.nasa.gov/centers/ames/greenspace/clean-energy.html.

3. *See, e.g.*, U.S. Energy Info. Admin., *Petroleum Chronology of Events 1970–2000* (May 2002), http://www.eia.gov/pub/oil_gas/petroleum/analysis_publications/chronology/petroleumchronology2000.htm (observing that the U.S. had "decades of ample supplies and growing consumption").

4. *See id.* ("The impact of environmental compliance costs on U.S. refining, increased capital expenditures in response to the requirements of the Clean Air Act Amendments of 1990, modest growth in product demand and volatile crude oil prices caused a wave of joint ventures, mergers, and restructuring of the U.S. petroleum industry during the latter part of the 1990's.").

5. *Id.*

6. *Id.*

7. Nadia Osman, *Solar Continues Massive Drop*, *in* SOLAR BASICS, SOLAR

In the fifteen years since, the solar industry has faced its longest-lasting success yet.[8]

Despite declining oil and gas prices, renewable energy across the United States continues to be financially successful.[9] This is largely because the price of photovoltaic cells continues to drop quickly due to improved technology and efficiency,[10] making low-cost production of solar power possible.[11] In addition, international concern about climate change has convinced governments across the world to maintain and improve renewable energy policies.[12] In the United States, to incentivize investment in solar power, the federal and state governments issue grants, loans, tax subsidies, and other financial incentives.[13]

Recently, North Carolina's renewable energy policies[14] led to national recognition for the state's solar industry growth.[15] In 2007,

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TECHNOLOGY, UNDERSTANDSOLAR.COM (July 20, 2015), http://understandsolar.com/cost-of-solar/.

8. Scott Nyquist, *Lower Oil Prices but More Renewables: What's Going On?* (June 2015), http://www.mckinsey.com/insights/energy_resources_materials/lower_oil_prices_but_more_renewables_whats_going_on.

9. Nyquist, *supra* note 8.

10. ENV'T AMERICA RES. & POL'Y' CTR., STAR POWER: THE GROWING ROLE OF SOLAR POWER IN AMERICA 4 (Nov. 2014), http://www.environmentamerica.org/sites/environment/files/reports/EA_Star_Power.pdf.

11. Phone interview with Jen Williams, Senior Associate, Investments, Sol Systems (Nov. 24, 2015); Edgar Meza, *IRENA: PV Prices Have Declined 80% Since 2008*, PV MAG. (Sept. 11, 2014), http://www.pv-magazine.com/news/details/beitrag/irena—pv-prices-have-declined-80-since-2008_100016383/#axzz3uOyv4GgJ.

12. For instance, 195 countries signed the Paris Agreement in 2015. U. N. FRAMEWORK CONVENTION ON CLIMATE CHANGE, *Adoption of the Paris Agreement: Proposal by the President*, 2, U.N. Doc. FCCC/CP/2015/L.9/Rev. 1 (Dec. 12, 2015), http://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf ("[a]cknowledging the need to promote universal access to sustainable energy in developing countries, in particular in Africa, through the enhanced deployment of renewable energy"); ROBERT J. BRULLE, JASON CARMICHAEL & J. CRAIG JENKINS, SHIFTING PUBLIC OPINION ON CLIMATE CHANGE: AN EMPIRICAL ASSESSMENT OF FACTORS INFLUENCING CONCERN OVER CLIMATE CHANGE IN THE U.S., 2002–2010 8 (Feb. 3, 2012), http://www.pages.drexel.edu/~brullerj/02-12ClimateChange Opinion.Fulltext.pdf (noting that public opinion is important in encouraging market success).

13. N.C. Clean Energy Technology Center, N.C. State Univ., *Database of State Incentives for Renewables and Efficiency*, DSIRE (2015), http://programs.dsireusa.org/system/program (providing a list of federal and state incentives, searchable by state or category).

14. *Capital Tonight: Renewable Energy in NC* (Time Warner Cable News broadcast Mar. 30, 2015, 9:39PM), http://www.twcnews.com/nc/north-carolina/politics/2015/03/30/capital-tonight-march-30—renewable-energy-in-nc.html (Community Roundtable interview with Tom Swanson, Pew Charitable Trusts, John Morrison, Strata Solar, and Betsy McCorkle, N.C. Sustainable Energy Assoc.) [hereinafter Time Warner Cable News Interview].

15. LUCAS BRUN, THE SOLAR ECONOMY: WIDESPREAD BENEFITS FOR NORTH CAROLINA (Feb. 15, 2015), http://www.cggc.duke.edu/pdfs/02152015Duke_CGGC_NCSolar

North Carolina implemented a Renewable Energy and Energy Efficiency Portfolio Standard (REPS),[16] the first in the Southeastern U.S.[17] This supplemented one of the country's most generous tax subsidy bills, North Carolina's investment tax credit (the state ITC), which allowed a 35% tax credit to individual and corporate taxpayers that "constructed, purchased, or leased renewable energy property."[18] Of several renewable power sources included in "renewable energy property," the ITC had the strongest effect on the solar industry.[19] The state ITC exceeded most other states' solar tax subsidies,[20] and it supplemented a 30% federal renewable energy tax credit (the federal ITC).[21] Local solar companies and advocacy groups lauded the state ITC for dramatically expanding solar investments in North Carolina.[22]

North Carolina solar companies consist of utility-scale, commercial, and residential solar installations.[23] All three types of companies consider the state ITC one of the most important

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EnergyReport.pdf.

16. *See* N.C.G.S. § 62-133.8.

17. N.C. Utilities Comm'n, *North Carolina Utilities Commission Adopts Final Rules Implementing Session Law 2007-397* (Feb. 29, 2008), http://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=c1d0eb36-9979-4627-9a7a-566aa9385dba (press release by the N.C. Utilities Commission).

18. N.C.G.S. § 105-129.16A(a). *See generally* AM. COUNCIL ON RENEWABLE ENERGY (ACORE), RENEWABLE ENERGY IN THE 50 STATES (Sept. 2012), http://acore.org/files/pdfs/states/2012-50statereport-lowres.pdf [hereinafter ACORE Report] (evaluating each state's renewable energy tax credits and other incentives).

19. §§ 105-129.15(7)(e); Time Warner News Interview, *supra* note14.

20. *See generally* ACORE Report, *supra* note18; *see also id.* at 32 (a couple of states had tax credits exceeding North Carolina's, including Florida, which offers a corporate-only 75% tax credit). Of twenty-two states offering ITCs, five only offer a corporate tax credit, and two offer only a personal tax credit. *Id.* at 14, 32, 54, 82, 86, 92, 110 (AL, FL, ND, OK, and RI offer the corporate tax credit; MA and WV offer the personal tax credit). Several other states have tax incentives such has property or sales tax exemptions, some have tax credits for renewable energy other than solar, and some have similarly structured tax deductions. *Id.* at 42, 70, 74 (NV exempts corporate renewable energy systems from property and sales and use taxes; NJ offers a tax credit for wind energy investment; IN has a solar tax deduction). In North Carolina's tax subsidy bill, the list of applicable renewable energy properties was also broad, including biomass, geothermal, hydroelectric, solar energy, and wind equipment. N.C.G.S. § 105-129.15(7).

21. 26 U.S.C. § 25D (individual tax credit); 26 U.S.C. § 48 (commercial tax credit).

22. Time Warner Cable News Interview, *supra* note 14 (Swanson also attributes the success of North Carolina's solar industry to its infrastructure, research institutions, and "ability to attract innovative startup companies").

23. REC Solar, *Market Segments*, http://www.recgroup.com/en/aboutsolar/solar-markets/ (last visited Mar. 11, 2016). Commercial installations can include large-scale industrial facilities. *Id.*

contributions to the solar industry.[24] Utility-scale solar projects are more common in North Carolina, since residential and commercial markets are severely hampered by the state's restriction against third-party sales.[25] Third-party sales, where a solar developer installs solar panels on a consumer-owned building and sells the consumer the power generated from those panels, are the most effective and popular method for selling residential solar power across the country.[26] They allow residential customers to install solar panels without paying installment and operation costs.[27] However, with the restriction in place, residential consumers have to purchase their solar energy systems outright rather than paying for only the energy generated. Residential and commercial installations are generally smaller solar arrays on business or residential property.[28] To sell residential or commercial solar installations, solar companies have to convince customers to make large investments. North Carolina companies do so primarily by touting savings from the state ITC, federal ITC, and reduced electricity consumption.[29]

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24. Josh Birch, *No Solar Farm Tax Credits in New State Budget Hurt Business, Towns*, WNCT NEWS (Oct. 12, 2015), http://wnct.com/2015/10/12/no-solar-farm-tax-credits-in-new-state-budget-hurt-business-towns/ [hereinafter WNCT NEWS Interview].

25. Lauren Shwisberg, Energy Collective, *Utility Scale Solar Energy: North Carolina's Emergent Success* (Feb. 27, 2014), http://www.theenergycollective.com/cleanenergyleadership institute/346491/utility-scale-solar-energy-north-carolinas-emergent-success. The projects are small (under 5 megawatts) because of the North Carolina Utilities Commission (NCUC) restrictions for standard PPAs. *Id.* Discussed further *infra* section II.B.1.

26. Solar Energy Industries Assoc., *Third-Party Solar Financing*, http://www.seia.org/policy/finance-tax/third-party-financing (last visited Mar. 11, 2016).

27. KATHARINE KOLLINS, BETHANY SPEER & KARLYNN CORY, DUKE UNIV. & NAT'L RENEWABLE ENERGY LABORATORY, SOLAR PV PROJECT FINANCING: REGULATORY AND LEGISLATIVE CHALLENGES FOR THIRD-PARTY PPA SYSTEM OWNERS(Feb. 2010), http://www.nrel.gov/docs/fy10osti/46723.pdf.

28. U.S. Energy Information Admin., *Solar Explained: Photovoltaics and Electricity* (Oct. 26, 2015), http://www.eia.gov/Energyexplained/index.cfm?page=solar_photovoltaics; U.S. Energy Information Admin., *Solar Explained: Solar Thermal Collectors* (Oct. 26, 2015), http://www.eia.gov/Energyexplained/index.cfm?page=solar_thermal_collectors. These installations are almost always photovoltaic, although some are solar thermal. Both photovoltaic and solar thermal systems can be installed on a residence, but photovoltaic can generate power to be distributed back to the grid, while solar thermal only generates heating and cooling for the residence. *Id.*

29. *See, e.g.*, Yes! Solar Solutions, *Solar Instant Cash Rebate*, http://www.yessolarsolutionsnc.com/nc-home-solar/tax-credits/ (last visited Mar. 11, 2016) (noting that the state income tax credit expires December 31, and offering a rebate to encourage installations in early 2016); *see also* Southern Energy Management, *Residential Solar FAQ*, http://southern-energy.com/home-solar/community-solar-programs/residential-solar-faq/ (last visited Mar. 11, 2016`) (noting the savings from the federal ITC in response to the question "How much does it cost?", having deleted additional information about the North Carolina tax credit).

In utility-scale projects, on the other hand, a developer usually constructs a large array of photovoltaic or concentrated solar power solar panels[30] and sells the generated power back to the local utility. Qualifying solar farms are guaranteed that the utility will buy their power,[31] but solar farms require substantial up-front capital investments.[32] The state ITC motivated national investors to elect North Carolina projects because the tax savings created a larger return on investment than other states' incentives.[33] As John Morrison of Strata Solar put it, the state and federal ITCs "level[] the playing field," allowing solar companies to compete with utilities in a "highly regulated and highly subsidized industry."[34] Especially in North Carolina, where the utility company Duke Energy enjoys monopoly power,[35] incentives like the state ITC are necessary to attract investors from out of state and encourage in-state investment and consumption.[36]

In recent years, these incentives have been successful. Between 2009 and 2013, North Carolina brought in $2.1 billion in private solar investment, including $1.2 billion in 2013 alone.[37] But despite this influx in solar investment, political support for the ITC and other renewable energy programs has fluctuated. Across the country, utility companies and fossil fuel interests have pushed back against restrictions on conventional energy sources and incentives for alternative energy.[38] In North Carolina, after a shift in political climate[39] and aggressive lobbying by Duke Energy,[40] the state ITC was

30. STONE & ASSOC., BLUEGREEN ALLIANCE FOUNDATION, OVERVIEW OF THE SOLAR ENERGY INDUSTRY AND SUPPLY CHAIN 9 (Jan. 2011), http://www.thecemc.org/body/Solar-Overview-for-BGA-Final-Jan-2011.pdf.

31. This guarantee comes from the federal Public Utility Regulatory Policies Act (PURPA), 16 U.S.C. §§ 2601–2645, discussed *infra* Section I.B.

32. *Id.*

33. Time Warner Cable News Interview, *supra* note 14, discussed further, *infra* Section III.

34. *Id.Id.* (around 12:45).

35. *See* N.C. UTILITIES COMM'N, NORTH CAROLINA'S PUBLIC UTILITY INFRASTRUCTURE & REGULATORY CLIMATE 18 (Jul. 2015), http://www.ncuc.commerce.state.nc.us/overview/Overview.pdf (demonstrating that Duke Energy is the only energy provider in its service areas).

36. Time Warner Cable News Interview, *supra* note 14.

37. PEW CHARITABLE TRUSTS, CLEAN ECONOMY RISING: SOLAR SHINES IN NORTH CAROLINA 3, 5 (Oct. 2014), http://www.pewtrusts.org/~/media/assets/2014/10/clean-energy-north-carolina-policy-brief-for-web.pdf?la=en.

38. *See, e.g.*, Americans for Prosperity, *State Budget Sunsets 'Renewable Energy Tax Credit'* (Sept. 15, 2015), http://site.americansforprosperity.org/nc-jobs-agenda/2015/09/15/state-budget-sunsets-renewable-energy-tax-credit/. Americans for Prosperity is a conservative political advocacy group, discussed in Section III, *infra*.

39. The Republican party had not been in control of North Carolina for decades, until in

removed from the state budget for 2016.[41]

This Note analyzes the impact of the state ITC's expiration and suggests potential solutions for solar companies left in the lurch. For an insider perspective, I interviewed founders of renewable energy companies to discover how federal, state, and private incentives have affected their business strategies.[42] To supplement these discussions, the author also consulted academics working in renewable energy policy and others with extensive experience in solar and renewable energy industries.[43] Their responses are included throughout this Note.

Part I of this Note discusses the utility of current government policies and incentives still in existence. Because these existing policies and incentives may not sufficiently compensate for the loss of the state ITC, Part II suggests topics and methods of policy advocacy that will help sustain the solar industry in North Carolina over the long term. Until this policy change occurs, Part III offers viable private resources for consumer and project financing, based on examples from the local community, out-of-state models, and advice from industry experts. Finally, the author concludes that inconsistent

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2012 when they took control of the Governor's seat, House, and Senate. Kim Severson, *G.O.P.'s Full Control in Long-Moderate North Carolina May Leave Lasting Stamp*, NYTIMES.COM (Dec. 11, 2012), http://www.nytimes.com/2012/12/12/us/politics/gop-to-take-control-in-long-moderate-north-carolina.html. They quickly began changing state policy, abandoning progressive regulations and implementing conservative ones. *Id.*

40. ENV'T N.C., BLOCKING THE SUN 18 (Oct. 2015), http://environmentnorthcarolina.org/sites/environment/files/reports/NC_BlockingtheSun_scrn.pdf.

41. John Downey, *N.C. Killing Tax Credits, but Renewable Power Mandates Remain*, CHARLOTTE BUS. J. (Sept. 15, 2015), http://www.bizjournals.com/charlotte/blog/energy/2015/09/n-c-kills-tax-credits-but-mandates-for-renewable.html.

42. *See, e.g.*, interview with Rachel Burton, Co-Founder, Piedmont Biofuels (Nov. 11, 2015). Ms. Burton highlighted the differences between solar companies and other renewable energy, clarifying that the state ITC affects the solar industry much more than biofuels. The local and national biofuel industry is impacted more by EPA regulations, which have recently been inconsistent and harmful for biofuel companies. *Id.* I also interviewed Cullen Morris and Latham Grimes, who co-founded Cooperative Solar, an independent contractor that helps developers find viable sites for solar farms. They both previously worked at Strata Solar, a utility-scale solar farm developer that began in 2010 and quickly grew into an internationally recognized leader in solar energy. Interview with Cullen Morris, President, Cooperative Solar, and Latham Grimes, Co-owner, Cooperative Solar, Development and Strategic Advisor, Strata Solar (Dec. 8, 2015). Kathy Miller, co-founder of Yes! Solar Solutions, installs residential solar systems and lobbies for solar policy. Interview with Kathy Miller, Vice President, Yes! Solar Solutions (Dec. 17, 2015).

43. *See* interview with Charles Adair, Program Manager, Duke Carbon Offsets Initiative (Nov. 30, 2015); phone interview with Williams, *supra* note 11; interview with Ryke Longest, Clinical Professor of Law and Director, Environmental Law and Policy Clinic, Duke University School of Law (Dec. 3, 2015).

regulatory policy has put the state's solar industry on rocky terrain; companies must creatively piece together available government incentives and private solutions while advocating for better state policy that will eventually give the industry solid footing.

I. GOVERNMENT INCENTIVES AND POLICIES

Amid national growth in the solar industry, North Carolina has recently ascended national solar power rankings.[44] In 2014, North Carolina installed 397 megawatts of solar capacity, reaching almost a gigawatt total and ranking second in the nation for the year.[45] Since its implementation of a Renewable Portfolio Standard in 2007, the state has generated billions of dollars in revenue through solar investment, creating thousands of jobs.[46] The state's solar energy policies, along with growth in the innovative Research Triangle have drawn large corporations such as Apple, Google, and Facebook to the state.[47] Now, these corporations contribute to the state's energy grid: one of Apple's two solar farms is among the largest in the state, and the company intends to install a third.[48]

However, political leaders in the state have been trending away from supporting renewable energy. This is partly due to conservative lobbying by powerful organizations and individuals,[49] but it is also a reaction to the solar industry's success. Many state leaders, including Governor Pat McCrory, believe that the solar industry has been doing so well that it can stand on its own without tax credits or other state government incentives.[50] To this end, in September, the state House

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44. *See, e.g.*, Solar Energy Industries Assoc., *2014 Top 10 Solar States* (2015), http://www.seia.org/sites/default/files/resources/Top%2010%20Solar%20States%202014%201pager.pdf.

45. Solar Energy Industries Assoc., *North Carolina Leads South, 2nd in Nation in Newe Solar Installations* (Mar. 12, 2015), http://www.seia.org/news/north-carolina-leads-south-2nd-nation-new-solar-installations.

46. CLEAN ECONOMY RISING, *supra* note 37, at 5, 7.

47. Letter from Apple, Inc., Google, Inc., and Facebook, Inc., to Phil Berger, President Pro Tempore, N.C. Senate, and Tim Moore, Speaker, N.C. House of Representatives (May 27, 2015),http://c.ymcdn.com/sites/energync.site-ym.com/resource/resmgr/legislative/TechNet_NC_H322_Letter.pdf (noting that all three companies "have chosen to locate in North Carolina in part because [of] the state's existing energy policies").

48. DUKE CTR. ON GLOBALIZATION, GOVERNANCE & COMPETITIVENESS, THE SOLAR ECONOMY: WIDESPREAD BENEFITS FOR NORTH CAROLINA 31 (Feb. 2015), http://www.cggc.duke.edu/pdfs/02152015duke_cggc_ncsolarenergyreport.pdf.

49. John Aloysius Farrell, *Koch's Web of Influence*, CTR. FOR PUB. INTEGRITY (Apr. 6, 2011, 6:00AM), http://www.publicintegrity.org/2011/04/06/3936/kochs-web-influence; BLOCKING THE SUN, *supra* note 40, at 13–14.

50. *North Carolina Tax Credit Expanded for One Year*, ABC NEWS (Apr. 30, 2015),

and Senate agreed to cut the state ITC from the 2016 budget, quelling hopes it would be extended.[51] This affects all renewable energy properties, but it affects the solar industry the most. According to those in the industry, solar companies have relied heavily on the state ITC to bring down costs.[52] The abrupt removal of the state ITC caused uncertainty about the future of North Carolina's solar industry and concern that other state policies may be next on the chopping block.

Historically, such uncertainty leads to unstable energy markets. For example, the federal Production Tax Credit (PTC) repeatedly expired and was renewed, each time creating a boom-bust cycle in the wind energy industry.[53] The resulting uncertainty slowed investment in wind energy and prevented the industry's growth.[54] The wind industry's struggle with the PTC exemplifies a common trend in renewable energy incentives: the haphazard, unpredictable nature of government support undermines the ultimate goal of creating a viable, stable solar energy industry.

Still, despite the regression and unpredictability of renewable energy policy in the state, some federal and state government resources are still available to solar companies in North Carolina. These include tax incentives, grants, loan guarantees, and other subsidized financing options.[55] This section notes the few that are

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http://abc11.com/politics/north-carolina-solar-tax-credit-expanded-for-1-year/689093/. Governor Pat McCrory extended North Carolina's 35% tax subsidy only through 2016 by signing Senate Bill 372, declining to extend the subsidy further because the solar industry in North Carolina is "on its way to becoming independent." *Id.*

51. *See generally* North Carolina General Assembly, An Act to Make Base Budget Appropriations for Current Operations of State Departments, Institutions, and Agencies, and for Other Purposes (2015 Appropriations Act), House Bill 97 (Feb. 24, 2015), http://www.ncleg.net/Sessions/2015/budget/2015/H97-PCCS30420-LRxfr-6.pdf%20his%20reasoning.html.

52. *See, e.g.*, phone interview with Williams, *supra* note 11 (stressing the impact of the subsidy on state-level and national investors in solar project financing); phone interview with Burton (clarifying that state subsidies affect biodiesel and other renewable energy industries less than the solar industry; biodiesel industry success has lately been frustrated by inconsistent EPA regulations).

53. RYAN WISER, MARK BOLINGER, & GALEN BARBOSE, LAWRENCE BERKELEY NAT'L LAB., USING THE FEDERAL PRODUCTION TAX CREDIT TO BUILD A DURABLE MARKET FOR WIND POWER IN THE UNITED STATES 5 (Nov. 2007), https://emp.lbl.gov/sites/all/files/report-lbnl-63583.pdf.

54. *Id.*

55. N.C. Clean Energy Tech. Ctr., N.C. State Univ., *Database of State Incentives for Renewables and Efficiency: US (Federal)*, DSIRE (Dec. 2015), http://programs.dsireusa.org/system/program?state=US& (listing twenty-eight federal incentive programs for renewable energy, although not all are applicable to solar companies).

most helpful to solar companies.[56]

A. Federal Government Policies and Incentives

Generally, the federal government puts sunset provisions in its incentives and policies,[57] making their renewal subject to congressional votes. Also, in many cases, federal incentives only apply to certain geographic areas, certain types of consumers, or certain technologies. The short-term nature and narrow focus of many of these incentives do not sufficiently support a stable renewable energy market, instead providing only piecemeal support. However, on December 18, 2015, the 2016 federal budget extended several renewable energy policies,[58] creating stable renewable energy policy at the federal level. Among these, the PTC was extended for several years, phasing out gradually and providing the wind industry with a much-needed sense of predictability.[59] It seems Congress learned from its mistakes in the wind industry, and has laid the groundwork for steady renewable energy industry growth over the next several years.

1. Tax Incentives

Like the PTC for wind companies, solar companies depend heavily on the federal ITC.[60] If the state and federal ITC had both expired, it could have sent North Carolina's solar industry into a boom-and-bust cycle.[61] Fortunately, although the North Carolina ITC

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56. Note that many federal incentives are targeted at certain subsets of solar companies, markets, or technology, e.g. residential installations, rural communities, or innovative and untested technologies.

57. Chris Mooney, *A Short History of Sunsets*, LEGAL AFF. (Jan./Feb. 2004), http://www.legalaffairs.org/issues/January-February-2004/story_mooney_janfeb04.msp.

58. Stephen Lacey, *Congress Passes Tax Credits for Solar and Wind: 'Sausage-Making at Its Most Intense'* (Dec. 18, 2015), http://www.greentechmedia.com/articles/read/breaking-house-passes-1.1-trillion-spending-bill-with-renewable-energy-tax.

59. Am. Wind Energy Assoc., *Wind Energy Gains Predictability from Tax Credits' Multi-Year Extension* (Dec. 16, 2015), http://www.awea.org/MediaCenter/pressrelease.aspx?ItemNumber=8250.

60. Interview with Miller, *supra* note 42.

61. Kirin D. Walsh, *An Industry on the Precipice of Change: Maintaining Solar Energy's Competitive Advantage in North Carolina After the Expiration of the Investment Tax Credits*, 93 N.C. L. REV. 1935 (2015), *available at* http://nclawreview.org/documents/93/6/Walsh.pdf (citing Camilo Patrignani, *A Solar CEO Wants to End the Investment Tax Credit. Why?*, CLEAN TECHNICA (Jan. 13, 2015), http://cleantechnica.com/2015/01/13/a-solar-ceo-wants-to-end-the-investment-tax-credit-why/); Jason P. Brown, Federal Reserve Bank of Kansas City, *The Cycles of Wind Power Development*, 3 MAIN STREET ECONOMIST 1 (2013), https://www.kansascityfed.org/publicat/mse/MSE_0313.pdf.

expired, the federal ITC has been renewed; the 30% credit will remain in place until 2019 for solar producers, followed by a gradual reduction to 10% in 2022.[62] Like the state ITC, the federal ITC helps local utility-scale companies solicit private investors who can better take advantage of the tax savings,[63] and it lowers prices for residential consumers.[64] This buoys the local solar industry and will help cushion the blow felt by companies that had been relying on the state ITC.[65] The several-year extension of the credit came as a happy surprise to many people in the solar industry, and it will help provide stability in the North Carolina market despite the removal of the state ITC and unpredictability of other federal incentives.[66]

Similarly, the Modified Accelerated Cost-Recovery System (MACRS) provides stability because, unlike other incentives, it does not expire.[67] MACRS allows solar companies and investors to generate tax savings by claiming higher than normal depreciation deductions for renewable energy property.[68] Normally, property depreciates based on its initial value and expected useful life.[69] As a

62. N.C. Clean Energy Tech. Ctr., N.C. State Univ., *Business Energy Investment Tax Credit*, DSIRE (Dec. 21, 2015), http://programs.dsireusa.org/system/program/detail/658.. *See also* N.C. Clean Energy Tech. Ctr., N.C. State Univ., *Residential Renewable Energy Tax Credit*, DSIRE (Dec. 21, 2015), http://programs.dsireusa.org/system/program/detail/1235 (the database splits incentives based on applicable recipients, thus separating the ITC into its corporate and personal tax credit components). This extension applies to both 26 U.S.C. § 25D (individual tax credit) and 26 U.S.C. § 48 (commercial tax credit).

63. Discussed in more detail *infra*, Section IV.A.

64. Interview with Miller, *supra* note 42.

65. *Id.* For instance, a project relying on the state and federal ITCs would have been expecting a 65% tax credit to reduce the project's costs (30% federal + 35% state). If the federal ITC had been phased out rather than extended, this credit would have dropped to 10%, less than a sixth of the original savings. Now, with a 30% tax credit, the project saves just under half of what it would have saved with the federal and state ITCs combined.

66. *See, e.g.*, interview with Miller, *supra* note 42 (noting her surprise on Dec. 17 that the ITC would likely be extended the following day); SARA RAFALSON, *2016: Get it Done*, SOURCE: SOL PROJECT FIN J. (Nov. 17, 2015), http://www.solsystems.com/blog/2015/11/17/2016-get-it-done/ (expecting the ITC to drop to 10% in 2017 as scheduled). The several-year extension relieves uncertainty and will help keep the industry consistent, both nationally and in North Carolina, over the next few years. See discussion of boom-bust cycles, *suprasupra*, note 53 and accompanying text.

67. 26 U.S.C § 168(e)(3)(B)(vi)(I) (referencing § 48(a)(3)). The statute can of course be edited, but an expiration date is not expressly included. *Id. Compare id. with* § 168(k) (bonus depreciation expires in 2020, first tapering down to 40% in 2018 and 30% in 2019).

68. *Id.*; N.C. Clean Energy Tech. Ctr., N.C. State Univ., *Modified Accelerated Cost-Recovery System*, DSIRE (Dec. 21, 2015), http://programs.dsireusa.org/system/program/detail/676.

69. Straight-line depreciation, for example, calculates yearly depreciation based on the equation $(Initial\ Value)/(Expected\ Useful\ Life)$. So, a $5 million property with an expected

practicality, the IRS calculates depreciation deductions based on property classifications rather than actual expected useful life.[70] Under MACRS, solar energy properties are classified as five-year properties,[71] meaning they depreciate fully in five years, irrespective of their actual useful life. On top of this, the Economic Stimulus Act of 2008 created bonus depreciation, which allows solar properties—among others—a 50% deduction of the initial value in the first year before continuing as normal.[72] Like the ITC, MACRS is useful for utility-scale companies because its tax savings are valuable to large investors with a healthy "tax appetite."[73] Residential and commercial consumers also see tax savings using MACRS, meaning it is one of few federal policies to universally benefit solar companies.

2. Grant Programs

In contrast, federal grants generally only target small, rural projects designed to stimulate an otherwise stagnant economy.[74] These projects occur frequently in North Carolina, by converting abandoned tobacco farms and other unused land into solar farms that employ the local community.[75] Solar developers can apply for these grants to begin projects, but some are only available to potential consumers, such as local or tribal governments.[76] For instance, the

useful life of 5 years would depreciate at $1 million per year.

70. *See generally* § 168.

71. § 168(e)(3)(B)(vi). This simply means the property depreciates over an expected life of five years.

72. § 168(k); N.C. Clean Energy Tech. Ctr., N.C. State Univ., *Modified Accelerated Cost-Recovery System*, DSIRE (Dec. 21, 2015), http://programs.dsireusa.org/system/program/ detail/676.

73. A tax appetite is an ability to save a significant amount of money through tax incentives like the ITC or MACRS. Discussed in more detail *infra*, Section IV.A.

74. See Appendix A for a list of federal grants available to North Carolina solar companies, most of which target rural, agricultural, and tribal markets.

75. Sammy Fretwell, *Some Farmers Growing Profit with New Row Crop: Solar Panels*, RALEIGH NEWS & OBSERVER (Nov. 11, 2012) (reproduced by N.C. Clean Energy Tech. Ctr., N.C. State Univ., *Some Farmers Growing Profit with New Row Crop: Solar Panels*, https://nccleantech.ncsu.edu/some-farmers-growing-profit-with-new-row-crop-solar-panels/).

76. Applicants may receive grants for at most 25% of the project's costs, combined with a loan guarantee for another 50%. U.S. Dep't of Agriculture, *Rural Energy for America Program – Renewable Energy and Energy Efficiency* 1 (Mar. 2015), http://www.rd.usda.gov/files/RD_FactSheet_RBS_REAP_RE_EE.pdf [hereinafter *REAP Fact Sheet*]. If the applicant only applies for a loan guarantee, and not a grant, it can cover up to 75% of the costs. *Id.* at 2. The grants and loan guarantees are targeted at small projects, under $20,000, but are available up to $25 million. N.C. Clean Energy Tech. Ctr., N.C. State Univ., *USDA – Rural Energy for America Program (REAP) Grants*, DSIRE (Aug. 25, 2015), http://programs.dsireusa.org/system/program/detail/917.

U.S. Department of Agriculture's Rural Energy for America Program offers grants to agricultural producers and rural small businesses to make energy efficient improvements.[77] Similarly, the Rural Utilities Service offers High Energy Cost Grants designed to lower rural household energy costs. These are available only in rural areas with household energy costs of at least 275% of the national average,[78] and to facilities that serve the local community.[79] In fact, projects for the primary benefit of a single household or business are ineligible.[80] Other grants are also available for similar solar projects in underserved or overburdened rural communities,[81] meaning federal grants are useful in narrowly defined markets for certain solar developers.

3. Loan Programs

While grants target certain communities, the federal loan guarantee program targets innovative technologies.[82] The Department of Energy (DOE) provides loan guarantees through the Loan Programs Office (LPO) for new or innovative renewable energy technology, designed to encourage companies that might otherwise struggle to secure financing.[83] An eligible project must "employ[] new or significantly improved technology"[84] and will generally be a large

77. N.C. Clean Energy Tech. Ctr., N.C. State Univ., *USDA – Rural Energy for America Program (REAP) Grants*, DSIRE (Aug. 25, 2015), http://programs.dsireusa.org/system/program/detail/917. For agricultural producers, at least 50% of the business' gross income must come from agricultural operation. *REAP Fact Sheet*, *supra* note 76, at 1.

78. Rural Development, U.S. Dep't of Agriculture, *High Energy Cost Grants* (2015), http://www.rd.usda.gov/programs-services/high-energy-cost-grants (last visited Mar.Mar. 11, 2016). Either the energy provider (i.e. the solar company) or the community it plans to serve can apply for the grant. *Id.*

79. *Id.*

80. U.S. DEP'T OF AGRICULTURE, APPLICATION GUIDE: HIGH ENERGY COST GRANT PROGRAM: 2015 NOTICE OF SOLICITATION OF APPLICATIONS 19 (2015), http://www.rd.usda.gov/files/UEP_HECG_AppGuide_2015.pdf. These grants range from $50,000 to $3 million. *See id.* at 4. Grant proposals are evaluated on a case-by-case basis by a panel. *Id.* at 21.

81. *See generally* N.C. Clean Energy Tech. Ctr., N.C. State Univ., *Programs: North Carolina* (2015), http://programs.dsireusa.org/system/program?state=NC (select ProgramType: Grant Programs).

82. Appendix B contains a full list of federal loan programs available to North Carolina solar companies.

83. 42 USC § 16511 et seq.; N.C. Clean Energy Technology Center, N.C. State Univ., *U.S. Department of Energy – Loan Guarantee Program*, DSIRE (Nov. 12, 2015), http://programs.dsireusa.org/system/program/detail/3071.

84. Solicitation by Loan Programs Office, Dep't of Energy, Loan Guarantee Solicitation Announcement, Sol. No. DE-SOL-0007514, OMB Control No. 1910-4135, at 2 (Jul. 3, 2014), http://energy.gov/sites/prod/files/2015/12/f27/DOE-LPO_REEE_Solicitation_03-Jun-2014.pdf;

project.[85] Application fees for the loan guarantee exceed $50,000,[86] and availability varies depending on the DOE's yearly solicitation requirements and case-by-case evaluations.[87] Although these loans can provide a huge head start to an innovative new company, they are hard to obtain, and therefore do not provide reliable support for solar companies.

Similarly, other federal loan programs target residential consumers. For example, energy efficient mortgages allow solar purchasers to add the full cost of solar installations to their home mortgages.[88] The mortgage program applies to purchases of energy efficient homes and energy efficiency upgrades.[89] Like the energy efficient mortgages, the PowerSaver loan program finances solar photovoltaic system installations and energy efficient home purchases.[90] PACE Financing, a similar program, allows homeowners to borrow from their local government to finance energy efficient home improvements such as solar panel installations.[91] However, this

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Energy Policy Act of 2005, P.L. No. 109-58 § 1703, 119 Stat. 594, 1121–22 (Aug. 2005) (codified at 42 U.S.C. § 16513), *available at* https://www.gpo.gov/fdsys/pkg/PLAW-109publ58/pdf/PLAW-109publ58.pdf.

85. LOAN PROGRAMS OFFICE, DEP'T OF ENERGY, POWERING NEW MARKETS: UTILITY-SCALE PHOTOVOLTAIC SOLAR 6 (Feb. 2015), http://www.energy.gov/sites/prod/files/2015/02/f19/DOE_LPO_Utility-Scale_PV_Solar_Markets_February2015.pdf (discussing the § 1703 loans' predecessor, § 1705 loans); LOAN PROGRAMS OFFICE, DEP'T OF ENERGY, LPO FINANCIAL PERFORMANCE 3 (Nov. 2014), http://www.energy.gov/sites/prod/files/2014/11/f19/DOE-LPO-Financial%20Performance%20November%202014.pdf (touting the projects' innovation and size).

86. LOAN PROGRAMS OFFICE, LPO FINANCIAL PERFORMANCE, *supra* note 84 at 7–8.

87. Dep't of Energy, *Guide to Federal Financing for Energy Efficiency and Clean Energy Deployment* 8–9 (Sept. 2014), http://energy.gov/sites/prod/files/2014/10/f18/Federal%20Financing%20Guide%2009%2026%2014.pdf (identifying five "catalytic technology areas" in 2014, none of which specifically included innovations in solar technology). The loan guarantee rates also vary based on the project's credit rating. Dep't of Energy, *Credit-Based Interest Rate Spread for Title XVII*, http://energy.gov/sites/prod/files/2015/04/f21/Credit-Based_Interest_Rate_Spread_7.9.14.pdf (last visited Dec. 25, 2015); N.C. Clean Energy Technology Center, N.C. State Univ., *U.S. Department of Energy – Loan Guarantee Program*, DSIRE (Nov. 12, 2015), http://programs.dsireusa.org/system/program/detail/3071.

88. N.C. Clean Energy Technology Ceneter, N.C. State Univ., *Energy-Efficient Mortgages*, DSIRE (Jun. 24, 2015), http://programs.dsireusa.org/system/program/detail/742; Residential Energy Servs. Network, *Frequently Asked Questions; About Energy Efficient Mortgages* (2015), http://www.resnet.us/professional/ratings/faq_mortgage.

89. *Id*.

90. Nat'l Renewable Energy Laboratory, Dep't of Energy, *Financing Home Energy and Renewable Energy Improvements with FHA PowerSaver Loans*, http://www.nrel.gov/docs/fy14osti/61936.pdf (last visited Dec. 26, 2015).

91. Nat'l Renewable Energy Laboratory, Dep't of Energy, *Property Assessed Clean Energy Financing of Renewables and Efficiency* (Jul. 2010), http://www.nrel.gov/docs/fy10osti/47097.pdf. The PACE program was updated in 2015 to be more enticing for mortgage lenders. Ed

program is administered at the local level, and currently no North Carolina communities offer it.[92]

Other than the federal ITC and MACRS program, the above federal incentives are only useful to certain solar companies, or in particular markets, or for a limited time. This hodgepodge of narrowly focused or short-term incentives creates niche markets rather than stimulating the industry as a whole.[93]

B. State Government Policies and Incentives

Although North Carolina incentives apply to most or all in-state companies, they include sunset provisions creating the same uncertainty that plagues federal incentives. Still, the state's recent national recognition in the solar industry came from several years of policy decisions that stimulated the renewable energy industry.[94] North Carolina leaders saw the benefits of the solar industry in their state: Senator Richard Burr said at the Conservative Clean Energy Summit, "When I look at North Carolina's great pace of solar deployment right now, I look at 6,000+ jobs."[95] The following policies and incentives resulted from a legislature that, like Senator Burr, saw investment in solar energy policy as a "cost-effective formula."[96] Currently, the legislature does not uniformly believe this investment is worth continuing,[97] but for now, the following options are available.

Golding, Fed. Housing Admin., *Guidance for Use of FHA Financing on Homes with Existing PACE Liens and Flexible Underwriting through Energy Department's Home Energy Score* (Aug. 24, 2015), http://portal.hud.gov/hudportal/documents/huddoc?id=FTDO.pdf.

92. Nat'l Renewable Energy Laboratory, Dep't of Energy, *Local Option – Property Assessed Clean Energy (PACE) Financing* (Sept. 18, 2015), http://programs.dsireusa.org/system/program/detail/3647.

93. For example, the U.S. Department of Energy offers a grant specifically to tribal governments. N.C. Clean Energy Technology Center, N.C. State Univ., *Tribal Energy Program Grant*, DSIRE (July 31, 2015), http://programs.dsireusa.org/system/program/detail/918. Also, Qualified Energy Conservation Bonds are available to local governments to fund local renewable energy projects. Dep't of Energy, *Qualified Energy Conservation Bonds*, http://energy.gov/eere/slsc/qualified-energy-conservation-bonds (last visited Dec. 26, 2015). New Clean Renewable Energy Bonds are available to government entities, electric cooperatives, and public utilities. Dep't of Energy, *Clean Renewable Energy Bonds (CREBs)* (2015), http://energy.gov/savings/clean-renewable-energy-bonds-crebs (last visited Dec. 26, 2015).

94. Time Warner News Interview, *supra* note 13.

95. Scaling Green, *Conservative Speakers at Clean Energy Summit Tout Virtues of Clean Energy* (Nov. 13, 2015), http://scalinggreen.tigercomm.us/2015/11/speakers-conservative-clean-energy-summit-tout-virtues-clean-energy/.

96. *Id.*

97. Kim Severson, *G.O.P.'s Full Control in Long-Moderate North Carolina May Leave Lasting Stamp*, NYTIMES.COM (Dec. 11, 2012), http://www.nytimes.com/2012/12/12/us/politics/gop-to-take-control-in-long-moderate-north-carolina.html.

1. Renewable Energy Policies

North Carolina's Renewable Energy and Energy Efficiency Portfolio Standard (REPS),[98] the first of its kind in the Southeastern United States, spurred a dramatic expansion of North Carolina's solar industry.[99] The REPS requires utility companies in North Carolina to use renewable energy sources to generate a percent of their power.[100] This helps the solar industry, because utilities can meet their requirements by purchasing power, Solar Renewable Energy Certificates (SRECs), carbon offset credits,[101] or equipment from renewable energy facilities and developers.[102] In theory, North Carolina solar companies could sell SRECs to Duke Energy,[103] but the market is almost nonexistent. The REPS requirements are fairly low, [104] and utilities are not subject to fines for failing to meet them, so solar companies struggle to set low enough prices to successfully sell SRECs.[105]

Despite this limitation, companies may be able to sell SRECs in niche markets. For example, there is a small voluntary market, where

98. Renewable Energy and Energy Efficiency Portfolio Standard (REPS), N.C.G.S. § 62-133.8.

99. N.C. Utilities Comm'n, *Renewable Energy and Energy Efficiency Portfolio Standard (REPS)* (2015) http://www.ncuc.commerce.state.nc.us/reps/reps.htm (last visited Dec. 21, 2015).

100. *Id.* The REPS and the market for RECs are buoyed by the federal PURPA, mandating that utilities purchase power from renewable energy companies. *See infra* notes 96–98 and accompanying text.

101. Carbon offsets are similar to RECs but represent a reduction in emissions rather than generation of renewable energy. Nat'l Resources Defense Council, Buying Carbon Offsets: What You Need to Know (Jan. 15, 2014), http://www.nrdc.org/globalwarming/offsets.asp (explaining that GHG-producing companies can buy carbon offset credits from "projects that avoid or capture GHG emissions").

102. N.C. Utilities Comm'n, *supra* note 87. Utilities purchase equipment to create their own facilities to generate renewable energy.

103. North Carolina's SREC market is oversaturated, but some solar producers can sell SRECs by registering in the Pennsylvania market. SRECTrade, *North Carolina* (2015), http://www.srectrade.com/srec_markets/north_carolina.

104. The REPS in North Carolina requires a gradual increase of renewable power generation, capping at 12.5% in 2021, where other states require much more: California mandates 50% renewable by 2030 and Hawaii's goal is 100% by 2045. N.C. Clean Energy Technology Center & U.S. Dep't of Energy, *Renewable Portfolio Standard Policies* (Oct. 2015), http://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2015/11/Renewable-Portfolio-Standards.pdf.

105. Only a few solar companies have successfully sold SRECs to local utilities, and those transactions were behind closed doors. SRECTrade, *Where is the NC SREC Market?* (Aug. 31, 2010), https://www.srectrade.com/blog/srec-markets/north-carolina/exploring-nc-srecs. This is why the PURPA-enforced sale of energy by solar farms is such a common method of solar energy production and sale. *See infra*, note 99 and accompanying text.

companies purchase SRECs in order to say they are "going green."[106] In addition, NC GreenPower, a local nonprofit, will pay for SRECs based on a bidding process.[107] Companies can also sell SRECs in Pennsylvania by building solar farms outside Duke Energy territory (served by Dominion or the Tennessee Valley Authority).[108] While companies may not want to use SREC sales as a main source of income, these limited options may help a struggling company make ends meet.[109]

More commonly, utility-scale companies sell solar power directly to Duke Energy, since the utility is required to purchase renewable energy under the Public Utility Regulatory Policies Act of 1978 (PURPA).[110] PURPA, a federal statute, is administered by the North Carolina Utilities Commission (NCUC)[111] to benefit qualifying facilities (QFs).[112] A QF is a power production facility or a cogeneration facility, producing electricity and thermal energy.[113] "With limited exceptions, QFs generally have the option of selling to a utility either at the utility's avoided cost or at a negotiated rate."[114] Usually, larger solar facilities opt for negotiated rates, and QFs choose avoided cost. Avoided cost is "the incremental cost to an electric utility of electric energy or capacity or both which, but for the purchase from the [QF], such utility would generate itself or purchase from another source."[115]

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106. *See* PLATTS, PLATTS SPECIAL REPORT: RENEWABLE ENERGY CERTIFICATES 5 (Apr. 2012), http://www.platts.com/im.platts.content/insightanalysis/industrysolutionpapers/ recspecial report1112.pdf.

107. N.C. GreenPower, *Become a Generator* (2015), https://www.ncgreenpower.org/ become-a-generator/. Dep't of Energy, *Energy Incentive Programs: North Carolina* (Jul. 2015), http://energy.gov/eere/femp/energy-incentive-programs-north-carolina; N.C. GreenPower, *Request for Proposals: Verifiable Carbon Offsets Generated in North Carolina, South Carolina or Virginia*, https://www.ncgreenpower.org/documents/NCGP_CarbonRollingRFP_09.pdf (last visited Dec. 25, 2015).

108. SRECTrade, *North Carolina* (2015), http://www.srectrade.com/srec_markets/north _carolina.

109. Interview with Longest.

110. 16 U.S.C. §§ 2601–2645.

111. 16 U.S.C. § 2621(a); N.C. Utilities Comm'n, *Welcome to the North Carolina Utilities Commission*, http://www.ncuc.commerce.state.nc.us/ (last visited Dec. 27, 2015).

112. 18 C.F.R. § 304. However, utilities can be relieved from purchasing obligations. 18 C.F.R. § 309–311.

113. Fed. Energy Regulatory Comm'n, *What is a Qualifying Facility?* (Feb. 3, 2012), http://www.ferc.gov/industries/electric/gen-info/qual-fac/what-is.asp.

114. Fed. Energy Regulatory Comm'n, *What are the Benefits of QF Status?* (Feb. 3, 2012), http://www.ferc.gov/industries/electric/gen-info/qual-fac/benefits.asp.

115. 18 C.F.R. § 292.101(b)(6).

Certain QFs can take advantage of a standard Power Purchase Agreement (PPA), using a toolkit written by Duke Energy.[116] As required by the NCUC, QFs must be 5 megawatts or smaller to be eligible for this standard PPA.[117] This helps QFs by avoiding legal fees and transaction costs, but it also prevents them from negotiating for more preferable terms.[118] Conversely, larger renewable energy facilities can bid and negotiate with Duke Energy for better rates, but they will likely incur legal and other transactional costs in doing so.[119] To avoid these extra costs, most of North Carolina's utility-scale facilities are currently less than 5 megawatts.[120] While PURPA is still in place, QFs will have a buyer for any solar energy produced, but this forced market is potentially unsustainable if Duke Energy succeeds in convincing the NCUC to lower the maximum size of a QF.[121] For now, however, this is the most common and effective method for utility-scale solar companies to operate in North Carolina.

2. Tax Incentives

Although North Carolina solar companies can no longer apply for the state ITC,[122] two state property tax incentives still apply to solar installments. First, property taxes for solar heating systems can only be levied to the extent that would apply to conventional

116. Duke Energy Progress, *NC Standard Option Toolkit* (2015), https://www.progress-energy.com/carolinas/business/renewable-energy/sell/nc-sell-all-toolkit.page?; Duke Energy Progress, LLC, Terms and Conditions for the Purchase of Electric Power (Aug. 1, 2015), http://www.duke-energy.com/pdfs/C2-NC-Terms-and-Conditions-dep.pdf.

117. DUKE ENERGY PROGRESS, LLC, PURCHASED POWER SCHEDULE PP-1 (Mar. 1, 2016), https://www.duke-energy.com/pdfs/C1-NC-Schedule-CSP-dep.pdf.

118. http://www.duke-energy.com/pdfs/C2-NC-Terms-and-Conditions-dep.pdf.

119. DUKE ENERGY PROGRESS, LLC, COGENERATION AND SMALL POWER PRODUCER SCHEDULE CSP-29B 2 (Aug. 1, 2015), http://www.duke-energy.com/pdfs/C1-NC-Schedule-CSP-dep.pdf (listing alternative options for "Non-Eligible Qualifying Facilities").

120. *Supra* note 24.

121. Herman K. Trabish, *Duke Buying $500M of North Carolina Solar to Mixed Reviews* (Sept. 18, 2014), http://www.greentechmedia.com/articles/read/Duke-Buying-500M-of-North-Carolina-Solar-to-Mixed-Reviews. Duke Energy asked the NCUC to decrease the maximum size of a QF from 5 megawatts to 100 kilowatts, although the current maximum is already significantly below the PURPA maximum of 80 megawatts. 16 U.S.C § 796(17)(A)(ii). This request was rejected in 2015, but Duke Energy will likely continue to push for modifications. *See* N.C. Utilities Comm'n, Petition for Approval of Revisions to Generator Interconnection Standards, Docket No. E-100, SUB-101, at 4 (May 15, 2015), https://www.progress-energy.com/assets/www/docs/company/NC-Interconnection-Standard.pdf.

122. Eligible projects must have already filed an application for the delayed sunset. N.C. Dep't of Revenue, *NC-478EX: Application for Delayed Sunset of the Tax Credit for Renewable Energy Property* (2015), http://www.dor.state.nc.us/downloads/nc478ex.pdf.

systems.[123] This does not necessarily save money, but it ensures the switch will not incur extra property taxes. Second, solar energy systems are excludable from property taxes.[124] Residential systems for personal use only are 100% excludable,[125] and systems designed to generate income are 80% excludable.[126] Combined with federal tax incentives, these property tax exclusions can present substantial savings to solar power consumers, which helps residential solar companies convince consumers to invest in solar energy systems. Still, they do not save nearly as much money as the state ITC[127] and are thus not an effective replacement. Also, they only apply to a small subset of consumers; since most solar companies in North Carolina operate at the utility scale, this is unhelpful to a majority of the state's solar industry.

C. Local Government Policies and Incentives

While city and county governments have fewer resources—their budgets are allocated by the state—they are eligible for federal and state loans and grants, which they distribute to local residents and companies.[128] North Carolina loan programs are mostly sponsored by utility cooperatives or membership corporations taking advantage of federal grants or loan guarantees,[129] but the state also authorizes city governments to issue loans to solar companies or individuals to install

123. N.C.G.S. § 105-277.

124. Property Classified and Excluded from the Tax Base, N.C.G.S. § 105-275(45).

125. Memorandum to Cnty Assessors from David B. Baker, Director, Local Government Division, N.C. Dep't of Revenue (Feb. 15, 2011), http://www.dornc.com/taxes/property/memos/solar_energy.pdf (clarifying that residential PV systems not used to generate income are entirely exempt from property taxes).

126. § 105-275(45). This encompasses any sales back to Duke Energy, and therefore applies to most residential installations.

127. The taxes on an installed solar array, for example, will only be about 1% of the total cost of installing the project. *See* JUSTIN BARNES ET AL., N.C. SOLAR CTR., MEISTER CONSULTANTS GRP., INC., PROPERTY TAXES AND SOLAR PV SYSTEMS: POLICIES, PRACTICES, AND ISSUES 27, tbl. 3 (Jul. 2013), *available at* https://nccleantech.ncsu.edu/wp-content/uploads/Property-Taxes-and-Solar-PV-Systems-2013.pdf (property taxes in 2013 ranged from 0.49–1.54% of the cost of installing a PV system).

128. *See, e.g.*, § 160A-459.1; 26 USC §§ 54A, 54C (however, the Clean Renewable Energy Bonds have repeatedly been limited and delayed by sequestration).

129. *See* N.C. Clean Energy Technology Center, N.C. State Univ., *Database of State Incentives for Renewables and Efficiency: North Carolina*, DSIRE (Dec. 21, 2015), http://programs.dsireusa.org/system/program?state=NC (last visited Dec. 21, 2015) (apply the filter "ProgramType: Loan Program"). Subsidies given by electric coops or public utilities are also nontaxable income. 26 U.S.C. § 136. A full list of North Carolina's loan programs is available in Appendix C.

solar energy systems.[130] As a small company, it may be worth investigating which cities take part in these loans before establishing a main office.[131] As an established company, it may be feasible to work with local governments to ensure access to the loans. Local governments and small companies both want to provide financial assistance to residential consumers, and local officials are often easily accessible and willing to help. This may be useful particularly in the Research Triangle, which has seen huge growth in new technology companies in the last decade, accompanied by an influx of more affluent residents, who are more likely to purchaser solar energy systems.[132]

Solar companies should also communicate with local zoning boards. A particular district may allow, partially restrict, or completely prohibit solar installations due to aesthetic, noise, storm water, glare, safety, and property value concerns.[133] Restrictions may differ between utility-scale solar farms and residential solar panel installations[134] and between roof-mounted and ground-mounted systems.[135] In a district with restrictions already in place, zoning officials may be willing to make exceptions based on these distinctions, because certain systems might not impact the community in the same way as others, especially if companies demonstrate that they will improve the local community.[136]

In most North Carolina districts, no restrictions exist, but it is still

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130. Program to Finance Energy Improvements, N.C.G.S. § 160A-459.1 (2010).

131. For example, Carrboro has established a loan program for small businesses and nonprofits with fewer than 50 employees. http://townofcarrboro.org/166/1563/WISE-Energy-Efficiency-Loan-Fund.

132. Duke Center on Globalization, Governance & Competitiveness, *North Carolina in the Global Economy* (2015), http://www.ncglobaleconomy.com/information/public.shtml; interview with Morris and Grimes.

133. ADAM LOVELADY, UNIV. OF N.C. SCHOOL OF GOV'T, PLANNING AND ZONING FOR SOLAR IN NORTH CAROLINA 14–16 (2014), *available at* http://sogpubs.unc.edu/electronicversions/pdfs/pandzsolar2014.pdf.

134. *See, e.g.*, BRUNSWICK COUNTY, NORTH CAROLINA, UNIFIED DEVELOPMENT ORDINANCE, Art. 12, p. 18 (2013), *available at* http://www.focussenc.org/wp-content/uploads/2013/06/BrunswickOrdinance.Unified-Development.06.13.pdf (distinguishing between solar collectors, for accessory use, and solar farms, for principal use).

135. Lovelady at 19.

136. For example, "[f]or accessory solar systems, the Town of Navassa requires site plans and elevation drawings to depict the building, the solar equipment, and the property lines. Such plans are administratively approved if they meet the applicable development standards." Lovelady at 20; *see also* Town of Navassa, *Zoning Division* (2009), http://www.townofnavassa.org/zoning.html (last visited Dec. 23, 2015) (information taken from downloaded pdfs of zoning ordinances).

a good idea to work with local zoning officials to establish balanced zoning ordinances and prevent the community from creating restrictions.[137] To this end, the North Carolina Sustainable Energy Association (NC SEA) created a template ordinance for local governments in the state.[138] While it was created in 2013, its regulations are still applicable; NC SEA intended to help balance industry burdens with land use management over the long term.[139] The template provides suggested permit requirements, aesthetic and development restrictions, and guidance for implementation.[140]

On a smaller scale, homeowners associations can also greatly impact solar installation companies' success. They set the standard for acceptable household improvements in a community,[141] so solar companies should work with them to encourage policies that promote solar installations. Like zoning boards, homeowners associations will have specific concerns about aesthetics, property value, and other community needs.[142] Accordingly, the Solar Foundation created model solar guidelines for homeowners associations,[143] allowing solar companies to encourage solar installation in a majority of homes in a

137. Every community has its particular concerns, and solar companies should work to incorporate them to prevent restrictive ordinances. For example, a model ordinance propagated by the Oregon Department of Energy suggests its residents and officials are primarily concerned with protecting wildlife. *See* OREGON DEP'T OF ENERGY, A MODEL ORDINANCE FOR ENERGY PROJECTS 34–35 (Jul. 2005), *available at* http://www.oregon.gov/ENERGY/SITING/docs/ModelEnergyOrdinance.pdf.

138. N.C. Solar Center, N.C. Sustainable Energy Assoc., *Template Solar Energy Development Ordinance for North Carolina* (Dec. 18, 2013), *available at* https://nccleantech.ncsu.edu/wp-content/uploads/Template-Solar-Ordinance_V1.0_12-18-13.pdf. [hereinafter N.C. Solar Center Template] The American Planning Association created several other model zoning ordinances, permitting guides, and other local policies that encourage acceptance of solar energy facilities and installations. Am. Planning Assoc., *PAS Essential Info Packets: Planning and Zoning for Solar Energy: Updated Edition (PAS EIP-30)* (2015), https://www.planning.org/pas/infopackets/eip30.htm (using existing ordinances or state-level templates, including the template ordinance by NC SEA, as models for other states).

139. N.C. Solar Center Template, *supra* note 137, at 1.

140. *See generally* N.C. Solar Center Template, *supra* note, 137.

141. However, note that homeowner's associations cannot create agreements prohibiting solar panel installation. Deed Restrictions and Other Agreements Prohibiting Solar Collectors, N.C.G.S. § 22B-20.

142. *See The Benefits of Going Solar: A Resource for North Carolina Homeowners Associations*, N.C. SOLAR NOW (Feb. 2015), http://ncsolarnow.com/wp-content/uploads/2015/02/benefits-of-solar-in-homeowner-assoc.pdf (addressing potential monetary, environmental, and tax concerns).

143. *See, e.g.*, THE SOLAR FOUNDATION, MODEL SOLAR GUIDELINES: A RESOURCE FOR NORTH CAROLINA HOMEOWNERS' ASSOCIATIONS TO FACILITATE SOLAR PROJECTS (Mar. 2015), http://www.thesolarfoundation.org/wp-content/uploads/2015/03/Model-HOA-Solar-Guidelines_FINAL.pdf.

community. This strategy will help establish a particular company as a neighborhood's main resource, and it can be repeated in several neighborhoods to form a collective sales strategy.[144]

II. POLICY ADVOCACY

As President Obama warned, fast change in the energy industry "is invariably going to create resistance from some fossil fuel interests who want to protect the old, outdated status quo."[145] He gave examples such as "massive lobbying efforts backed by fossil fuel interests, . . . conservative think tanks, [and] the Koch brothers pushing for new laws to roll back renewable energy standards or prevent new clean energy businesses from succeeding."[146] This resistance is well established in North Carolina.

Several state and national organizations have financial incentives to prevent growth in the renewable energy industry.[147] Groups like the American Legislative Exchange Council (ALEC)[148] have been very active in North Carolina,[149] where Duke Energy enjoys a highly regulated monopoly.[150] North Carolina's renewable energy regulations

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144. This strategy is encouraged by Mr. Morris and Mr. Grimes, who stressed that residential solar companies should target niche markets and new, affluent neighborhoods. Interview with Morris and Grimes, *supra* note 42. Yes! Solar Solutions has successfully implemented this strategy by taking part in several Solarize programs and partnering with local nonprofits. Interview with Miller; Yes! Solar Solutions, *Solarize NC* (2015) http://www.yessolarsolutionsnc.com/solarize/ (last visited Dec. 23, 2015).

145. White House, Office of the Press Sec'y, *Remarks by the President at National Clean Energy Summit* (Aug. 25, 2015, 5:12 PM), https://www.whitehouse.gov/the-press-office/2015/08/25/remarks-president-national-clean-energy-summit.

146. *Id.*

147. For a discussion of Strata Policy's leaders, see *infra* note 152 For a discussion of leaders of Americans for Prosperity, *supra* note 38.

148. BLOCKING THE SUN, *supra* note 40, at 18.

149. For instance, in Strata Policy's report encouraging North Carolina to remove its REPS, the authors note that the Republican House Majority Whip, Mike Hager, had support from the ALEC when he proposed a bill to remove the REPS in 2013. RANDY T. SIMMONS, ET AL., RENEWABLE PORTFOLIO STANDARDS: NORTH CAROLINA 5 (Feb. 2015), http://www.strata.org/wp-content/uploads/2015/03/FINAL-RPS-North-Carolina.pdf (citing *Bill to repeal North Carolina's RPS passes House committee*, VOTERS LEGISLATIVE TRANSPARENCY PROJECT (2013), http://vltp.net/bill-to-repeal-north-carolinas-rps-passes-house-committee/). Similar to Strata Policy). ALEC has a page dedicated to refuting claims that it denies climate change and opposes renewable energy regulation.*Position Statement on Renewables and Climate Change*, AM. LEGISLATIVE EXCHANGE COUNCIL (2015), http://www.alec.org/position-statement-renewables-climate-change/.

150. *See REPS: North Carolina's Renewable Energy Portfolio Standard*, CONSERVATIVES FOR CLEAN ENERGY (May 15, 2015), http://www.cleanenergyconservatives.com/reps-2015/ (arguing for continued implementation of the REPS because of the state utility's monopoly power)

encourage competition, which inherently threatens this monopoly power. Duke Energy alone harnesses significant lobbying power in North Carolina, but it is also supported by these national organizations.[151]

These lobbying organizations come armed with research generated by institutions that appear credible but are funded by organizations with significant financial stakes in oil and gas companies, such as Strata Policy of Utah State University.[152] Strata Policy produces reports exclusively opposing renewable energy policies.[153] They also sponsor programs such as the "Koch Scholars," in which students are given $1,000 and "exposed to liberty-based principles."[154] These principles often include pushing for fewer solar

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151. *See, e.g.*, RANDY T. SIMMONS ET AL., STRATA POLICY, RENEWABLE PORTFOLIO STANDARDS: NORTH CAROLINA 15 (Feb. 2015), *available at* http://www.strata.org/wp-content/uploads/2015/03/FINAL-RPS-North-Carolina.pdf; *see also* BLOCKING THE SUN, *supra* note 39, at 18.

152. Strata Policy is unrelated to the local company, Strata Solar. In the section "Common Questions about Renewable Portfolio Standards (RPS)," Strata openly states that they have been criticized by environmental groups as a politically biased, paid-for research team. *Renewable Portfolio Standards*, STRATA POLICY (2014), http://www.strata.org/rps/. Also, their three executive founders have politically conservative backgrounds; the president and director of research, Randy Simmons, is a member of the Governors Privatization Commission Board of Directors, and has written extensively opposing the Endangered Species Act, water conservation laws, and other environmental protection regulations.*Executive Founders*, STRATA POLICY (2014), http://www.strata.org/corporate-team/; Randy T. Simmons, Charles G. Koch Professor of Political Economy, Curriculum Vitae, http://randytsimmons.org/?page_id=9. Similarly, Americans for Prosperity is a national conservative political advocacy group active in North Carolina. *State Budget Sunsets 'Renewable Energy Tax Credit'*, AMERICANS FOR PROSPERITY (Sept. 15, 2015), http://site.americansforprosperity.org/nc-jobs-agenda/2015/09/15/state-budget-sunsets-renewable-energy-tax-credit/. Its executive staff and board of directors have backgrounds working for conservative politicians in Washington, D.C. Four of the five board members also have connections to Koch Industries and other fossil fuel interests. One board member, Mark Holden, is senior vice president, general counsel and corporate secretary of Koch Industries, Inc. *Mark Holden*, AMERICANS FOR PROSPERITY (2015), https://americansforprosperity.org/mark-holden/.

153. The three reports on Strata Policy's website are almost identical. *See* RANDY T. SIMMONS, ET AL., STRATA POLICY, RENEWABLE PORTFOLIO STANDARDS: MICHIGAN 19 (Sept. 2015), *available at* http://www.strata.org/wp-content/uploads/2015/09/Final-Report.pdf ("The results from these analyses paint a clear picture about the effects of RPS."); RANDY T. SIMMONS, ET AL., STRATA POLICY, RENEWABLE PORTFOLIO STANDARDS: NORTH CAROLINA 15 (Feb. 2015), *available at* http://www.strata.org/wp-content/uploads/2015/03/FINAL-RPS-North-Carolina.pdf ("The evidence from these studies paints a clear picture about the effects of RPS."); RANDY T. SIMMONS, ET AL., STRATA POLICY, RENEWABLE PORTFOLIO STANDARDS: KANSAS 14 (Mar. 2015), *available at* http://www.strata.org/wp-content/uploads/2015/03/Final-Report.pdf ("The evidence from these three studies paints a clear picture about the effects of RPS.").

154. *Academic Programs*, STRATA POLICY (2014), http://www.strata.org/academicprograms/. Similarly, the Liberty Fund and the Charles Koch Institute host a conference for

and other renewable energy policies,[155] and they have recently succeeded in North Carolina.[156]

Accordingly, North Carolina solar companies must engage in the political process to prevent Duke Energy and organizations like ALEC and Strata Policy from convincing state regulators to continue to strip away regulations. To compete with such powerful opposition, solar companies seeking political involvement need guidance from the many companies currently involved.[157] To gain access to other players in the solar industry with lobbying experience and connections,[158] new solar companies should join industry associations such as the NC Sustainable Energy Association,[159] the NC Clean Energy Business Alliance,[160] the NC Clean Energy Technology Center,[161] and NC GreenPower.[162] These associations help solar companies advocate for additional state incentives to replace the ITC and improved state regulatory policy to chip away at Duke Energy's monopoly power.

While incentives are important for all solar companies, residential and commercial companies face an additional regulatory obstacle: North Carolina's restriction on third-party sales.[163] The

professors to discuss "topics and issues related to liberty and freedom." *Id.*

155. EDISON ELECTRIC INSTITUTE, BOARD OF DIRECTORS AND EXECUTIVES MEETING 61, 68 (Sept. 12–14, 2012), https://www.documentcloud.org/documents/1374670-2012-eei-board-and-chief-executives-meeting.html#document/p48/a191712 (suggesting preventing construction of new power plants to limit competition) (notes added by Washington Post author Joby Warrick regarding Board of Directors Strategic Discussion).

156. *Supra* note 153.

157. For example, Yes! Solar Solutions actively lobbies at the state and federal level, making use of national partners for lobbying power and business opportunities. Interview with Miller *supra* note 42.

158. Interview with Miller *supra* note 42.

159. *See About Us*, N.C. SUSTAINABLE ENERGY ASSOC., http://www.energync.org/?page=AboutUs (last visited Dec. 27, 2015).

160. *See Alliance Membership*, N.C. CLEAN ENERGY BUSINESS ALLIANCE (2014), http://www.ncceba.org/index.php/members.

161. *See Mission & Funding*, https://nccleantech.ncsu.edu/about-ncsc/mission/, N.C. CLEAN ENERGY TECHNOLOGY CENTER, N.C. STATE UNIV. (last visited Dec. 27, 2015).

162. *See Become a Generator*, N.C. GREENPOWER (2015), https://www.ncgreenpower.org/become-a-generator/.

163. Walsh, *supra* note 61 at 1967; *see also, e.g.*, interview with Longest, *supra* note 43; interview with Miller *supra* note 42; interview with Morris and Grimes, *supra* note 42. The restriction in North Carolina, like in many states, was originally designed to ensure that any public utility or organization acting as a public utility could be regulated by the state's Utilities Commission. The statute has been interpreted to apply to renewable energy producers, but it does not explicitly do so. KATHARINE KOLLINS, BETHANY SPEER & KARLYNN CORY, DUKE UNIV. & NAT'L RENEWABLE ENERGY LABORATORY, SOLAR PV PROJECT FINANCING:

restriction comes from the North Carolina Public Utilities Act (PUA), which prevents public utilities from serving overlapping territories.[164] Since Duke Energy serves the majority of North Carolina,[165] renewable energy producers, which are considered public utilities under the PUA, would infringe on this territory.[166] While restrictions on public utilities are common, most states have removed the obstacle by narrowing the definition of a public utility, either limiting it to retail electricity sellers or excluding some or all renewable energy producers.[167] Only five states have not excluded renewable energy producers from the restriction in some way.[168] North Carolina needs to join the rest of the country in allowing third-party sales, which have tremendously increased residential and commercial sales in other states, and would do the same here.[169]

Several organizations have attempted to change or remove the PUA. Most recently, NC WARN provided a rooftop solar array to Faith Community Church, knowing Duke Energy would retaliate, triggering litigation.[170] Currently, NC WARN is requesting a declaratory ruling by the NCUC that it is not a public utility and therefore not restricted from third-party sales.[171] NC WARN argues

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REGULATORY AND LEGISLATIVE CHALLENGES FOR THIRD-PARTY PPA SYSTEM OWNERS (Feb. 2010), http://www.nrel.gov/docs/fy10osti/46723.pdf; North Carolina Public Utilities Act, N.C.G.S. §§ 62-1–62-3 (2013).

164. N.C.G.S. § 62-2.

165. *In Your Area*, DUKE ENERGY, https://www.duke-energy.com/about-us/in-your-area.asp (last visited May 27, 2016).

166. N.C.G.S. § 62-3(23)(a)(1).

167. *See, e.g.*, KATHARINE KOLLINS, BETHANY SPEER & KARLYNN CORY, DUKE UNIV. & NAT'L RENEWABLE ENERGY LABORATORY, SOLAR PV PROJECT FINANCING: REGULATORY AND LEGISLATIVE CHALLENGES FOR THIRD-PARTY PPA SYSTEM OWNERS 8–9 (Feb. 2010), http://www.nrel.gov/docs/fy10osti/46723.pdf.

168. N.C. CLEAN ENERGY TECHNOLOGY CENTER & U.S. DEP'T OF ENERGY, *3rd Party Solar PV Power Purchase Agreement (PPA)* (Jul. 2015), http://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2015/08/3rd-Party-PPA_072015.pdf [hereinafter *Third-Party PPA*].

169. *Third-Party Solar Financing*, SOLAR ENERGY INDUSTRIES ASS'N http://www.seia.org/policy/finance-tax/third-party-financing (last visited Dec. 25, 2015). Note that this assumes net metering will also be allowed for third-party solar energy sales. *See Third-Party PPA*, *supra* note 168 at 15–16 (noting the importance of allowing net metering for third party generators).

170. Duke Energy asked NCUC to fine NC WARN $120,000 for installing the solar array ($1,000 for each day of infraction). Comments of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC in Opposition to NC WARN's Request for Declaratory Ruling, No. SP-100, SUB 31, at 12 (Oct. 30, 2015), http://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=6294577d-4e25-4f7e-aa24-1fc6e31e8eb1

171. Request by NC WARN for a Determination That Its Proposed Activities Would Not Cause It to be Regarded as a Public Utility Pursuant to G.S. 62-3(23), No. SP-100, SUB 31 (Jun. 17, 2015), http://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=c15976c6-93ec-485a-87d9-e926fa7c02c4.

that it is not providing electricity to the public, but only to "self-selected nonprofit organizations."[172] The NCUC will decide whether to allow third-party sales, perhaps only to nonprofits, in 2016.[173] The litigation team then plans to appeal the decision, seeking a court ruling that will force the NCUC to amend the PUA and allow third-party sales.[174]

A legislative solution, the Energy Freedom Act, was proposed in March of 2015.[175] It would allow third party sales by renewable energy producers that meet certain requirements.[176] Specifically, it clarifies the definition of a public utility in the North Carolina Public Utilities Act to read:

> A person who constructs or operates an electric generating facility on a customer's property for the primary purpose of producing electricity, heat, or steam for sale to or for the use by the customer is not a public utility and is not subject to regulation by the utilities commission so long as the facility is sized to supply no more than one hundred twenty-five percent of the average annual energy consumption of the customer at that site.[177]

However, although several large companies supported the proposal, it did not leave committee discussions to reach a vote, and

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172. *Id.*

173. N.C. Utilities Comm'n, No. SP-100, SUB 31, Petition by North Carolina Waste Awareness and Reduction Network for a Declaratory Ruling Regarding Solar Facility Financing Arrangements and Status as a Public Utility, Order Requesting Comments (Sept. 30, 2015), http://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=11074f42-c80d-45d7-8de8-147320996863 (asking for initial comments by Oct. 30, 2015 and reply comments by Nov. 30, 2015). Duke Law professor Ryke Longest is part of the litigation team in this case, and predicts that the Utilities Commission will not allow the sale from NC WARN, and the case will have to be appealed. Interview with Longest, *supra* note 43. It is not in the NCUC's best interest to allow renewable energy producers exemption from the public utility restriction, because "it basically puts [the NCUC] out of a job." *Id.*

174. Interview with Longest, *supra* note 43.

175. *The Energy Freedom Act*, HB 245 (2015), http://www.ncleg.net/Sessions/2015/Bills/House/PDF/H245v0.pdf.

176. *Id.*

177. *Id.* (amending § 62-3(23)(a)(1)). The original definition includes "any person producing, generating or furnishing any of the foregoing services to another person for distribution to or for the public for compensation." N.C.G.S. § 62-3(23)(b). The "foregoing services" refers to a list of several types of energy production, including electricity generation other than for personal use. § 62-3(23)(a)(1). The bill also creates a new section 62-119 to identify requirements for third party-sellers. The Energy Freedom Act, *supra* note 174.

the bill will be reintroduced in 2016.[178]

In the meantime, companies may circumvent the restriction using solar leases, although they could face backlash from utilities.[179] This would be accomplished using a sale-leaseback agreement for residential and commercial solar installations.[180] In a standard sale-leaseback agreement, the solar developer sells a system to the customer, simultaneously signing a lease for the same system.[181] To avoid violating the PUA, companies could tie monthly lease payments to the energy generated by the solar array, thus indirectly compensating the purchaser for the generation of power without actually selling the power to a third party.[182] However, even those suggesting this structure warn that while it is procedurally not a third-party sale, substantively it may be considered production of electricity and "distribution to or for the public for compensation" under the PUA.[183] Still, the statute is not clear or absolute, and until the restriction is lifted, it will continue to severely limit the residential solar market, so a creative sale-leaseback agreement may be worth the effort and risk.

The uncertainty that the outdated PUA creates, combined with short-term state policies and narrow federal policies, immensely weakens North Carolina's solar industry. Although solar energy policies brought in billions of dollars in revenue from investment and tax revenues, state legislators decided to abruptly extinguish the state ITC. Clearly, advocacy is necessary to prevent more drastic cuts and keep some level of consistency in North Carolina's solar policies.

III. PRIVATE SOLUTIONS

The upside to the inconsistent,limited resources provided by state and federal governments is that it inspires solutions by private investors, nonprofits, and grassroots community organizations. This section details existing private solutions in North Carolina, models

178. *Game-Changing Energy Freedom Bill*, N.C. WARN (2015), http://www.ncwarn.org/energy-freedom/.

179. KOLLINS, SPEER & CORY, *supra* note 167 at 17–18.

180. *See, e.g.*, interview with Longest *supra* note 43.

181. MICHAEL MENDELSOHN AND CLAIRE KREYCIK, NAT'L RENEWABLE ENERGY LAB., FEDERAL AND STATE STRUCTURES TO SUPPORT FINANCING UTILITY-SCALE SOLAR PROJECTS AND THE BUSINESS MODELS DESIGNED TO UTILIZE THEM 28 (Apr. 2012), http://www.nrel.gov/docs/fy12osti/48685.pdf.

182. *See* N.C.G.S. § 62-3(23)(b); *see also* interview with Longest *supra* note 43.

183. Interview with Longest.

from out of state that can be implemented here, and advice and expertise from several individuals in the solar industry and renewable energy policy sphere. More than one industry expert advised that in a difficult market, it is particularly important that companies be creative and savvy, and find something unique to offer.[184] However, even with innovative ideas, a solar company needs reliable funding.

A. Private Investment

Private investment varies based on a company's purpose and model. A utility-scale company, for instance, needs funding for large up-front capital costs. Most solar farms in North Carolina need about $5 million to cover construction costs alone.[185] This need is often met using "project finance," which in the solar industry is a method of borrowing from a large investor with a "tax appetite."[186] Project finance can be structured in several different ways, but developers most commonly use the Partnership Flip structure.[187] In a Partnership Flip, a project investor contributes either equity or debt financing in exchange for majority ownership of the project, which allows the solar project to benefit from the federal ITC and other incentives when the developer otherwise might not qualify for them.[188] Once the investor's target return on investment is reached, the ownership ratio

184. Interview with Longest;interview with Morris and Grimes.

185. Jeff Hampton, *Currituck County Solar Farm to be Built by End of 2015*, PILOTONLINE.COM (Jun. 17, 2014), http://www.pilotonline.com/news/local/environment/currituck-county-solar-farm-to-be-built-by-end-of/article_58c95ada-066c-5b18-88a8-66ba5e1e2a94.html. Most solar farms are just under 5 megawatts, and construction costs about $1 million per megawatt. *See id.*

186. MENDELSOHN & KREYCIK, *supra* note 171 at 22, 23 (introducing project finance structures and differentiating between four common types).

187. Travis Lowder, Nat'l Renewable Energy Laboratory, U.S. Dep't of Energy, *How Could Securitization Debt Fit with Tax Equity in the Solar Financial Landscape? Pt. I*, 27 (Oct. 4, 2013, 10:42 AM), https://financere.nrel.gov/finance/content/how-could-securitization-debt-fit-tax-equity-solar-financial-landscape-pt-I. Besides Partnership Flip, there are also Single Owner Finance, various lease structures, and Utility Prepay. Single Owner Finance is, as its name implies, financed by one owner—either the developer or the utility company. MENDELSOHN & KREYCIK, *supra* note 171 at 24. Utilities are best positioned to use this model, since they have strong financial positions, but they rarely employ it. Developers more often make use of Single Owner Finance, but only once they are able to recapitalize by selling equity in existing projects. *Id.* at 26. This is therefore more useful for existing solar developers, rather than new market entrants.

188. Groobey et al., Wilson Sonsini Goodrich & Rosatti, *Project Finance Primer for Renewable Energy and Clean Tech Projects* 15 (Aug. 2010), https://www.wsgr.com/PDFSearch/ctp_guide.pdf. Developers usually do not qualify for the nonrefundable ITC because their tax liability (often called a tax appetite) is too low. MENDELSOHN & KREYCIK, *supra* note 171 at 22.

flips, giving the developer control and, usually, an option to buy out the investor.[189] Although the removal of the state ITC would probably decrease in-state investors' willingness to use the Partnership Flip structure,[190] most large investors are national companies who could still take advantage of the federal ITC.[191]

However, North Carolina developers already compete for investment with other developers across the country. The state ITC made North Carolina projects more reliable investments by almost doubling investors' tax savings and demonstrating the state government's support of the solar industry, which suggested stability and therefore lower risk.[192] Now, utility-scale companies will have to rely on their reputations and accumulated project portfolios to secure private investment.[193] Thus, the state ITC's expiration eliminates the competitive edge North Carolina's utility-scale solar companies used to have.[194]

For residential solar companies, private investment provides indirect benefits by saving consumers money on solar installations, most often via solar loan products.[195] For example, Dividend Solar, a

189. Lowder, *supra* note 107 at 27–28; Groobey, *supra* note 108 at 16. This is called the flip point. However, the investor may not dispose of the property until five years after the property was placed in service. INTERNAL REVENUE SERV., DEP'T OF THE TREASURY, INSTRUCTIONS FOR FORM 3468, 1 (Feb. 11, 2015), https://www.irs.gov/pub/irs-pdf/i3468.pdf.

190. This is true because "[s]uch investments, and the financial structures that build upon them, are designed to maximize the value of federal, state, local, and utility-based incentives; allocate risk and reward among different funding sources; and allow project participants to focus on core competencies." MENDELSOHN & KREYCIK, *supra* note 171 at 22. Still, the extension of the federal ITC will likely help retain some in-state investment: investors were receiving a 65% tax credit (30% federal and 35% state), and now are only receiving a 30% credit, but this is still preferable to 0%.

191. Phone interview with Williams, *supra* note 10. Ms. Williams also previously worked for Self-Help Credit Union, which finances renewable energy companies in North Carolina. Self-Help Credit Union, *Our Environmental Work* (Aug. 2015), https://www.self-help.org/what-we-do/we-lend/for-the-environment.

192. Off. of the Comptroller of the Currency, *Public Welfare Investments in Solar Energy Facilities Using Renewable Energy Investment Tax Credit* 2 (Jan. 2014), http://www.occ.gov/topics/community-affairs/publications/fact-sheets/fact-sheet-solar-energy-invest-tax-credits-grants.pdf; phone interview with Williams, *supra* note 10.

193. Phone interview with Williams, *supra* note 10. Companies can securitize new loans by offering fully owned solar farms as collateral. Using the common Partnership Flip model, these will only be available to companies already in operation for more than five years. INTERNAL REVENUE SERV., DEP'T OF THE TREASURY, INSTRUCTIONS FOR FORM 3468, 1 (Feb. 11, 2015), https://www.irs.gov/pub/irs-pdf/i3468.pdf.

194. Phone interview with Williams, *supra* note 10 (explaining that national investors can choose from a multitude of projects in many states, and political atmosphere plays a role in assessing investment risk).

195. Interview with Miller (noting that her company does not take out loans for expansion,

national solar investment firm, offers loans through its EmpowerLoan program.[196] In 2015, these were offered through partnerships with North Carolina companies for $0 down, securitized by the solar installation the loan was used to pay for.[197] Many other banks provide similar loans for renewable energy projects, including solar loans.[198] However, most solar loans are conditioned on tax incentives, often specifically on the state ITC,[199] so application processes and eligibility requirements will likely change in 2016.[200]

Because private investment depends on actual and perceived ROI, they depend heavily on state and federal policies and incentives. Thus, for both utility-scale and residential solar companies, private investment is not a substitute for government policy, but a supplement. Without the state ITC, private investment will still be a viable option for solar companies in North Carolina, but investors will be more reluctant, investing fewer dollars and demanding higher interest rates.[201]

B. Community Organizations and Solarize Programs

1. Solarize Programs

Since solar loan rates will likely increase, residential solar companies will need to turn to alternative methods of lowering costs for consumers, such as Solarize programs. The first Solarize program began as a grassroots movement in Oregon and quickly expanded across the country. It helps reduce three barriers that prevent individuals from entering the residential solar market: high upfront costs, dauntingly complex transactions, and low customer inertia.[202]

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preferring to expand incrementally by using existing profits, but it does help consumers find loan financing for solar installations).

196. Dividend Solar, *Home Solar: FAQs* (Aug. 1, 2015), https://www.dividendsolar.com/faqs#empowerloan.

197. *Id.*; Steve Hanley, Sustainable Enterprises Media, *$0 Down Solar Financing for North Carolina Homeowners*, CLEANTECHNICA (Mar. 23, 2015), http://cleantechnica.com/2015/03/23/0-down-solar-financing-for-north-carolina-homeowners/.

198. *See, e.g.*, Admirals Bank, *Admirals Bank's Solar Loans* (2011), https://www.admiralsbank.com/renewable-energy-lending/loan-programs/solar-step-down.

199. *See id.*

200. Interview with Miller.

201. Off. of the Comptroller of the Currency, *Public Welfare Investments in Solar Energy Facilities Using Renewable Energy Investment Tax Credit* 2 (Jan. 2014), http://www.occ.gov/topics/community-affairs/publications/fact-sheets/fact-sheet-solar-energy-invest-tax-credits-grants.pdf.

202. LINDA IRVINE, ALEXANDRA SAWYER & JENNIFER GROVE, NORTHWEST

Although Solarize programs vary greatly, they generally share three characteristics.[203] First, Solarize campaigns pre-select solar contractors in a competitive process to ensure quality and prevent customers from having to independently research solar developers.[204] Second, the campaign uses community outreach to solicit participation, sparking higher customer inertia.[205] Third, the selected solar developer offers a discount for a limited time to lower the costs for consumers in exchange for a guaranteed bulk sale.[206] If a solar developer can establish itself as a reputable contractor to Solarize programs, it can generate a reliable source of income.[207]

For example, Yes! Solar Solutions and Southern Energy Management worked with Duke University's Solarize program, which helped local residents purchase solar panels for a negotiated discount.[208] The Solarize program lowered the retail price of the installation by about 10%, and when combined with the 30% federal ITC and 35% state ITC, customers saved 75% on their solar installations.[209] The university incorporated this program into the Duke Employee Solar Discount Pilot Program, in which Duke employees received a 10-20% discount on home solar installations, saving up to 85%.[210] Because the state ITC expired, these programs may not be offered in 2016.[211] Solarize programs depend on large-

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SUSTAINABLE ENERGY FOR ECON. DEVELOPMENT, THE SOLARIZE GUIDEBOOK: A COMMUNITY GUIDE TO COLLECTIVE PURCHASING OF SOLAR PV SYSTEMS 5 (May 2012), http://www.nrel.gov/docs/fy12osti/54738.pdf (noting that Solarize programs reduce costs through negotiated discounts, ease navigation through complex decisions by distributing the effort among a group of purchasers, and increase inertia because discounts were only offered for a short time).

203. IRVINE, SAWYER & GROVE, *supra* note 190 at 6–7.

204. *Id.*

205. *Id.*

206. *Id.*

207. *See, e.g.*, Yes! Solar Solutions, *Solarize NC* (2015), http://www.yessolarsolutions nc.com/solarize/ (engaging in several Solarize programs to create a recurring source of income); *see also* phone interview with Miller.

208. Solarize N.C., *What is Solarize Duke?*, http://www.solarizenc.org/howitworks?duke (last visited Dec. 27, 2015). Note that this program is no longer in effect. Interview with Adair. Solarize programs are generally one-time occurrences designed to obtain an exclusive discount not otherwise available. *Id.*

209. *Id.*

210. Duke Carbon Offsets Initiative, Duke Univ., *Duke Employee Solar Discount Pilot Program*, http://sustainability.duke.edu/carbon_offsets/solar/ (last visited Dec. 25, 2015). The Solarize program was combined with online educational resources available to Duke employees. Interview with Adair.

211. Interview with Adair (noting the Carbon Offsets program was uncertain whether another Solarize program was feasible without the state ITC).

scale involvement,[212] and without the dramatic savings from the combined state and federal ITCs, consumers are less likely to opt in to the program.[213]

However, solar companies continue to partner with nonprofits to implement Solarize programs throughout the state. For instance, Yes! Solar Solutions has participated in several Solarize programs around North Carolina, and plans to continue to do so.[214] The state ITC's expiration will decrease the effectiveness of Solarize programs, but concentrated purchasing power, combined with the federal ITC, will still drive down prices and spark consumer investment.

2. Established Community Organizations and Methods

Communities also come together to support solar energy projects without established Solarize programs.[215] In a Solar Purchasing Cooperative, for example, a community agrees to install solar panels on their homes at the same time, providing both negotiating power and an incentive for the developer to offer a lower price for the bulk sale.[216] For instance, Interfaith Power & Light began as a collection of Episcopal churches coming together to purchase renewable energy.[217] Because this initial effort was so successful, it has grown into a national non-profit, with a very active North Carolina affiliate.[218] Most recently, it helped install a solar photovoltaic array on the United Church of Chapel Hill.[219] The project asked congregants for donations to fund the project, and then they could take advantage of the federal and state ITC on their investments.[220] Like Solarize programs,

212. *Id.* (noting that lack of resources and information represented a major obstacle to purchasing solar panels, and will still help encourage residential sales); Duke Carbon Offsets Initiative, Duke Univ., *Residential Solar Resources*, http://sustainability.duke.edu/carbon_offsets/solar/Residential%20Solar%20Resources.html (last visited Dec. 25, 2015).

213. Interview with Adair.

214. Yes! Solar Solutions, *Solarize NC* (2015), http://www.yessolarsolutionsnc.com/solarize/; phone interview with Miller.

215. John Duda, *Energy, Democracy, Community*, POPULARRESISTANCE.ORG (Aug. 5, 2015), https://www.popularresistance.org/energy-democracy-community/.

216. *Id.* This is very similar to Solarize programs, but it is not externally structured or organized—the community members form a cooperative organization, making collective decisions about financing methods and developer options.

217. Interfaith Power & Light, *Mission & History* (2015), http://www.interfaithpowerandlight.org/about/mission-history/.

218. N.C. Interfaith Power & Light, *Mission & History* (2015), http://www.ncipl.org/mission-history/.

219. N.C. Interfaith Power & Light, *United Church of Chapel Hill Solar Project* (Nov. 18, 2015), http://www.ncipl.org/solar-ucch/.

220. *Id.*

established Solar Purchasing Cooperatives provide a small-scale opportunity for solar developers to market their products more directly and effectively to residential consumers.

While Solar Purchasing Cooperatives focus mainly on residential solar purchases, many community organizations have recently used their collective bargaining power to create Community Benefits Agreements (CBAs) between community members, local governments, and utility-scale solar developers.[221] CBAs ensure that solar developments do not infringe upon the local community or run afoul of local regulations, while still generating a profit for the solar developer. Although CBAs are generally initiated by community members, prospective developers could approach community organizations to create them.

By approaching community members before issues arise, companies can avoid unnecessary costs and decrease downside risk, which may encourage private investment. Recently, in the Town of Woodland, community members signed a petition successfully preventing the installation of a fourth solar farm outside of the town.[222] The community was not opposed to the solar farms, since it had permitted three others; they simply did not like the location of the proposed fourth.[223] The solar farm developer could have negotiated with the community members to select a different site, and the town may have signed a CBA allowing the solar farm's development rather than signing a petition to prevent it.[224]

Working with local communities offers a small-scale solution for both residential and utility-scale solar developers. This strategy will help motivate consumers to purchase solar energy systems without the state ITC's tax savings, and it may prevent extra costs by avoiding zoning and other local regulatory complications. While this strategy

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221. Marjorie Kelly & Shanna Ratner, *Keeping Wealth Local: Shared Ownership and Wealth Control for Rural Communities*, 36,, Ford Foundation, (2009), http://community-wealth.org/sites/clone.community-wealth.org/files/downloads/report-kelly-ratner09.pdf.

222. *See* Town Board of Woodland, *Solar Farm Projects Located Near Woodland* 2 (Dec. 14, 2015), http://townofwoodlandnc.com/index_htm_files/Solar%20Farm%20Projects%20Located%20Near%20Woodland.pdf.

223. *Id.* at 1.

224. CBAs also encourage use of brownfields (abandoned fields with unknown environmental status). Julian Gross, *Community Benefits Agreements: Making Development Projects Accountable* (2005), http://www.goodjobsfirst.org/sites/default/files/docs/pdf/cba2005final.pdf. On the whole, CBAs ensure a particular community, not just the region, benefits from an investment or development. MEG CALKINS, THE SUSTAINABLE SITES HANDBOOK: A COMPLETE GUIDE TO THE PRINCIPLES, STRATEGIES, AND BEST PRACTICES FOR SUSTAINABLE LANDSCAPES 443 (1st ed. 2012).

will not compensate for the lack of the state ITC, it may still help encourage investment in North Carolina solar projects.

3. Grassroots Organizations and Creative Solutions

Even without established organizations, communities can come together to complete community solar projects. For example, in West Virginia, a group of almost 100 families and businesses in Jefferson County crowdfunded a large solar array on the Shepherdstown Presbyterian church without using tax incentives or other government-backed funds.[225] Instead, they installed demand response controllers on electric water heaters, which Mosaic Power pays homeowners $100 to install, and donated Mosaic's payments to the church project.[226] Future income will, however, rely on state incentives; the church's array will sell SRECs to Pennsylvania utilities.[227] Similarly, in Highland Park, Michigan, a community group crowdfunded solar-powered street lights to replace the traditional lights the local government removed to cut costs.[228] The fundraising goal was met in one month.[229] While these communities started their projects independently, solar developers would benefit from soliciting communities to initiate similar projects.

In addition, companies should develop unique ways to serve the solar market. For instance, Mr. Morris and Mr. Grimes suggest specializing in operations and maintenance (O&M) of solar sites and equipment.[230] North Carolina has 954 megawatts of solar capacity across the state,[231] and over 3,000 megawatts in development, produced by over 600 solar farm sites.[232] These sites need continued

225. Solar Holler, *Solar Powered Church* (2014), http://www.solarholler.com/shepherds town-presbyterian-church.

226. *Id.* Initial capital was also financed by an individual, Than Hitt, as well as Jefferson Security Bank. *Id.*

227. *Id.* Like North Carolina, West Virginia does not have an SREC market. The state can still sell SRECs to Pennsylvania and Ohio utilities, because they accept out-of-state credits. SRECTrade, *West Virginia* (2015), http://www.srectrade.com/srec_markets/west_virginia.

228. *Soulardarity Streetlight Campaign: Bold Beginnings* (2015), https://www.indiegogo.com /projects/soulardarity-streetlight-campaign-bold-beginnings#/

229. *Id.*

230. Interview with Morris and Grimes (noting that if Cooperative Solar had not been successful, they would have considered entering the O&M industry).

231. ENVIRONMENT NORTH CAROLINA, LIGHTING THE WAY 33, Appx. A (Sept. 2015), *available at* http://environmentnorthcarolina.org/sites/environment/files/reports/NC_Lightingthe way_scrn_2.pdf

232. *See* Solar Energy Industries Assoc., *Major Solar Projects in the United States: Operating, Under Construction, or Under Development* (Sept. 29, 2015), http://www.seia.org/

maintenance to ensure quality performance; solar farms face damage from shorted cells, browning or discoloring, transformer leaks, and more.[233] Firms that provide O&M services would be valuable in North Carolina.[234] By turning to O&M, a company retains usefulness even in otherwise slow years for the industry. Because few established resources exist, solar companies need to think creatively to thrive in the next few years.

CONCLUSION

The state ITC was very beneficial to North Carolina's solar industry, and the market will suffer for its expiration. Opponents of solar energy regulation often argue that state incentives bear unpredictable costs, but this is because cost predictions use myriad methods, creating myriad results.[235] Rather than looking at predictions, legislators should base their decisions on past results. North Carolina has seen economic growth, especially in rural areas, as a direct result of its solar policies. For every dollar spent on the state ITC, North Carolina saw $1.54 in local and state tax revenue.[236] Furthermore, by developing solar farms on abandoned tobacco fields or other open spaces without other economic uses, utility-scale solar companies create markets for rural land. This market creation, combined with out-of-state investment in the projects, has resulted in billions of dollars in state revenue and thousands of new jobs.[237]

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sites/default/files/resources/PUBLIC%20MPL%209-29-2015.pdf (the list includes 578 utility-scale facilities, but it only counts those that are 1 megawatt and larger).

233. Miller Brothers Solar, *Solar Farm Operations and Maintenance Issues* (Apr. 28, 2015), http://millerbrossolar.com/solar-farm-operations-and-maintenance-issues/ (Miller Brothers is an O&M provider in Pennsylvania).

234. There are plenty of tasks to keep an O&M company busy for decades on a single solar farm project. Maureen McHale, *Not All O&M Agreements Are Alike* (2011), http://www.interpv.net/wsr/wsr_view.asp?idx=822&part_code=03&page=1. O&M is often performed by national companies rather than local ones. *See, e.g.*, ESA Renewables, LLC, *New Bern, NC 1.26 MW* (2015), http://esarenewables.com/portfolio/craven-county-nc-1-3mw/.

235. *See, e.g.*, Jeff Adelson, *Giving Away Louisiana: Solar Tax Credit* http://blogs.theadvocate.com/specialreports/2014/12/06/giving-away-louisiana-solar-energy-tax-credit/ (last visited Nov. 23, 2015) (Louisiana cut its generous tax credit from the state budget after costs increased beyond what was expected); C. Joseph Lennihan, *What is the Value of Estimating the Cost of Tax Incentives?* J. MULTISTATE TAX & INCENTIVES 20, 23 (Aug. 2015).

236. Josh Birch, WNCT News, *No Solar Farm Credits in New State Budget Hurt Businesses, Towns* (Oct. 12, 2015), http://wnct.com/2015/10/12/no-solar-farm-tax-credits-in-new-state-budget-hurt-business-towns/ (quoting Brian O'Hara of Strata Solar).

237. *See* RTI INT'L, ECONOMIC IMPACT ANALYSIS OF CLEAN ENERGY DEVELOPMENT IN NORTH CAROLINA—2014 UPDATE 2-12 (Apr. 2014), https://www.rti.org/pubs/ncsea_2013_update_final.pdf.

Moreover, these benefits tend to help low-income areas, and they directly benefit consumers, unlike other tax credits that go to businesses alone.[238]

The expiration of the state ITC reflects a national tendency for inconsistent policy, which will likely continue to plague the solar industry at both the federal and state level.[239] This inconsistency lies in both the nature of policies and incentives offered and the length of time they remain available. When companies can only take advantage of a small loan program in certain rural areas, or a grant program that changes its requirements each year, incentives are not doing their job. The goal of government incentives is to stimulate the solar energy industry as a whole, setting the foundation for a robust, long-term solar market. Instead, narrow, short-term incentives create weak, temporary markets for a handful of small projects.

Unfortunately,[240] this is unlikely to change. Government policy regarding renewable energy has gradually improved since the 1990s, but consistency is not on the horizon. So, while planning for long-term success by advocating for improvement and stability in government policy, companies must devise creative short-term business strategies. Most promisingly, the federal ITC and MACRS program are unique in that they will be available and predictable for several years. For now, North Carolina companies should rely more heavily on these incentives to solicit private investment, supplementing this by working with local governments and community organizations to ensure favorable local zoning and other policies.

By taking advantage of every available resource, finding a niche market, employing creative business strategies, and advocating for more beneficial solar policy, North Carolina solar companies can weather the storm. Eventually, those who realize renewable energy is

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238. *Id*. at 2-4–2-5 (noting that five rural counties saw over $100,000 in renewable energy investment from 2007 to 2013 and "jobs were often created in rural counties that had been hard hit by contraction in the construction industry").

239. Similarly, the EPA's inconsistent biodiesel policy affects biofuel companies' funding, cost structure, and level of public support. *See* phone interview with Burton (mentioning that this especially affects biodiesel companies, since they are new, not well understood, and generally small).

240. This, like the Note as a whole, assumes a positive opinion of solar power, although that is not uniformly the case. *See* Christina Nunez, Nat'l Geographic, *How Green Are Those Solar Panels, Really?* (Nov. 11, 2014), http://news.nationalgeographic.com/news/energy/2014/11/141111-solar-panel-manufacturing-sustainability-ranking/.

worth short-term costs for long-term gain[241] will convince legislators to give the solar industry a large enough umbrella and leave it in place long enough to actually provide market protection.

241. For example, Bill Gates is identifying long-term investors willing to risk a lower short-term return to stimulate the country's renewable energy industry. Breakthrough Energy Coalition, *Introducing the Breakthrough Energy Coalition*, http://www.breakthroughenergycoalition.com/en/index.html (last visited Dec. 27, 2015) (discussing the difference in risk-reward balance between renewable energy projects and other venture capital investments).

Appendix A: Federal Grant Programs[242]

Target Market	**Grant Source**	**Grant Terms**	**Description**
Commercial, Local Government, Agricultural (Non-Residential)	US Dept. of Agriculture	25% of project cost, between $1,500 and $500,000.	Rural Energy for America Program (REAP). Grants to install renewable energy systems, make energy efficiency improvements, reduce consumption. http://www.rurdev.usda.gov/BCP_ReapResEei.html
Agricultural, Rural Small Businesses	US Dept. of Agriculture	Variable, capped at $100,000 in 2015.	Rural Energy for America Program (REAP). Energy Audit and Renewable Energy Development Assistance Program (REDA). http://www.rd.usda.gov/programs-services/rural-energy-america-program-energy-audit-renewable-energy-development-assistance
Tribal Government	US Dept. of Energy	Variable	Tribal Energy Program. 25 U.S.C. § 3501 et seq. http://apps1.eere.energy.gov/tribalenergy/
Commercial, Local Government, Nonprofit, Residential, Tribal Government	US Dept. of Agriculture - Rural Utilities Service	$50,000-$3,000,000	Grant program for rural communities with high home energy costs; must be related to a project to benefit the community. http://www.rd.usda.gov/programs-services/high-energy-cost-grants

242. N.C. Clean Energy Technology Center, N.C. State Univ., *Programs: Federal* (2015), http://programs.dsireusa.org/system/program (after applying the filters State/Territory: Federal and Program Type: Grant Program. Only those grants that apply to solar energy projects were included in this table).

Appendix B: Federal Loan Programs[243]

Target market	**Loan Terms**	**Loan Source**	**Implementation/Description**
Multifamily Residential		Fannie Mae	Green Initiative. Multifamily may be rental or cooperative, with at least 5 units. Extra incentives for Multifamily Affordable Housing. https://www.fanniemae.com/multifamily/green-initiative
Commercial, Farm	Up to 30 years, $25,000,000	US Dept. of Agriculture Rural Development	Loan Guarantee and Grant Funding program. http://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency
Local Government, Electric Coops, Utilities, State Government	Tax credits in lieu of bond interest to lower interest rate	US Internal Revenue Service	Clean Renewable Energy Bonds, 26 USC §§ 54A, 54C. http://www.irs.gov/Tax-Exempt-Bonds
Local Government, Electric Coops, Utilities, State Government	Tax credits in lieu of bond interest to lower interest rate	US Internal Revenue Service	Qualified Energy Conservation Bonds. http://energy.gov/eere/slsc/qualified-energy-conservation-bonds

243. N.C. Clean Energy Technology Center, N.C. State Univ., *Programs: Federal* (2015), http://programs.dsireusa.org/system/program (after applying the filters State/Territory: Federal and Program Type: Loan Program. Only those grants that apply to solar energy projects were included in this table).

Appendix B: Federal Loan Programs (Continued)

Target Market	**Loan Terms**	**Loan Source**	**Implementation/Description**
Renewable Energy Company	§ 1703 of Title XVII of Energy Policy Act (2005 EPAct)	US Department of Energy	Loan guarantee program through Dept. of Energy for high technology risks, to encourage new/improved technologies in energy projects.
Residential	Up to $8,000	Federal Housing Administration, Veterans Affairs	Energy Efficient Mortgage. http://www.resnet.us/ratings/mortgages
Residential	Up to $7,500, $25,000, or $625,000	Federal Housing Administration and US Department of Housing and Urban Development	PowerSaver loan program. http://energy.gov/eere/buildings/powersaver-loans
Residential, Commercial, Farm, Local Government, Nonprofits, Coops, Utilities	20 years, up to the lesser of $250,000,000 or 80% of project costs	US Department of Agriculture Rural Development	Biorefinery, Renewable Chemical, and Biobased Product Manufacturing Assistance Program. http://www.rd.usda.gov/programs-services/biorefinery-assistance-program

Appendix C: North Carolina Loan Programs[244]

Target market	**Loan Terms**	**Loan Source**	**Implementation/Description**
Small Businesses, Nonprofits	3%, 10 yrs	Town of Carrboro General Revenue	Small business/nonprofit must have <50 employees. http://townofcarrboro.org/166/1563/WISE-Energy-Efficiency-Loan-Fund. (City of Carrboro only.)
Local Government	Up to 8%, 20 years	North Carolina	Local Governments can use federal and state grants and loans to give these loans to local residents. NCGS § 160A-459.1. Local governments can also establish loan loss reserve funds. NCGS §§ 153A-455. Loans to residents may also be paid for by levying property taxes. NCGS §160A209(c)(12a).
Residential	6%, 60 months, max $7,000	Lumbee River Electric Membership Corporation	http://www.lumbeeriver.com/content/weatherization-loans.
Residential	6%, 12-120 months, $500-$17,000	Lumbee River Electric Membership Corporation	http://www.lumbeeriver.com/content/weatherization-loans.
Residential	5%, 7 years, max $10,000	Piedmont Electric Membership Corporation	http://www.pemc.coop/energySavings/energyEfficiencyLoanProgram.aspx
Residential	4-6%, 60 months, up to $6,500	Four County Electric Membership Corporation	Comfort Loan Program. http://www.fourcty.org/index.php?p=4&s=29

244. N.C. Clean Energy Technology Center, N.C. State Univ., *Programs: North Carolina* (2015), http://programs.dsireusa.org/system/program (after applying the filters State/Territory: North Carolina and Program Type: Loan Program, only those grants that apply to solar energy projects were included in this table).

Appendix C: North Carolina Loan Programs (Continued)

Target Market	**Loan Terms**	**Loan Source**	**Implementation/Description**
Residential	5%, 60 months	Haywood Electric Membership Corporation	http://www.haywoodemc.com/content/heat-pumpweatherization-loan
Residential	9%, 60 months, $7,500	Union Electric Membership Corporation	Administered through Union Power Cooperative. http://www.union-power.com/mainNav/myHome/heatPumpFinancing.aspx
Residential, Farm, Commercial	5%, tiered repayment terms based on amount of loan.	Tideland Electric Membership Corporation	Weatherization Loan Program. http://www.tidelandemc.com/my-residence/products-services/weatherization-loans
Residential, Small Businesses	6-8%, up to 10 years	Tennessee Valley Authority	Implemented by local, TVA-served utility companies.