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# An Industry on the Precipice of Change: Maintaining Solar Energy's Competitive Advantage in North Carolina After the Expiration of Investment Tax Credits

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**An Industry on the Precipice of Change: Maintaining Solar Energy’s Competitive Advantage in North Carolina After the Expiration of the Investment Tax Credits\***

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INTRODUCTION

North Carolina’s solar industry has experienced rocket-fueled growth over the past few years, propelling the state from solar

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obscurity in 2009 to a national leader by 2013.<sup>1</sup> The dramatic price drop of solar panels combined with rich domestic incentives has transformed this once peripheral technology into a valuable addition to our state's energy production mix.<sup>2</sup> North Carolina's abundant sunshine<sup>3</sup> provides the state with a free, domestic fuel source that can be converted into valuable electrical capacity without producing harmful byproducts such as carbon dioxide, methane, coal ash, hydraulic fracturing fluid, or nuclear waste.<sup>4</sup> In addition to its environmental benefits, the solar industry delivers much-needed jobs, investment opportunities, and tax revenue to the North Carolina economy,<sup>5</sup> while moving the state closer to achieving its goal of energy independence.<sup>6</sup>

However, investment in the solar industry is predicted to drop significantly if the state's 35% Renewable Energy Investment Tax Credit ("ITC") is allowed to expire at the end of 2015.<sup>7</sup> This effect will be amplified a year later when the Federal Investment Tax Credit is scheduled to step down from 30% to 10%.<sup>8</sup> The combination of

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1. See THE PEW CHARITABLE TRUSTS, CLEAN ECONOMY RISING: SOLAR SHINES IN NORTH CAROLINA 2, 4–5 (2014) [hereinafter PEW REPORT], available at <http://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2014/10/solar-shines-in-north-carolina> (at the bottom of the summary page there is a link to download the full report).

2. See *id.* at 2–3.

3. See *Days of Sunshine Per Year in North Carolina*, CURRENT RESULTS: WEATHER & SCIENCE FACTS, <http://www.currentresults.com/Weather/North-Carolina/annual-days-of-sunshine.php> (last visited Aug. 24, 2015) (showing that all areas of the state experience, on average, over 200 sunny and partially sunny days per year).

4. See *Benefits of Renewable Energy Use*, UNION OF CONCERNED SCIENTISTS, [http://www.ucsusa.org/clean\\_energy/our-energy-choices/renewable-energy/public-benefits-of-renewable.html#.VN4\\_GVOS33o](http://www.ucsusa.org/clean_energy/our-energy-choices/renewable-energy/public-benefits-of-renewable.html#.VN4_GVOS33o) (last visited Aug. 24, 2015).

5. See PEW REPORT, *supra* note 1, at 7 (showing that private investment in North Carolina solar projects totaled \$2.1 billion from 2009 to 2013 and is projected to add another \$7.8 billion over the next decade); RTI INT'L, ECONOMIC IMPACT ANALYSIS OF CLEAN ENERGY DEVELOPMENT IN NORTH CAROLINA—2014 UPDATE 2-1 (2014) [hereinafter RTI REPORT], available at [http://www.rti.org/pubs/ncsea\\_2013\\_update\\_final.pdf](http://www.rti.org/pubs/ncsea_2013_update_final.pdf) (reporting that North Carolina's renewable energy industry has provided over \$2.6 billion in direct investment, 37,100 full-time jobs, and \$232 million in state and local tax revenue); Chris Mooney, *Solar Energy is Playing Surprisingly Well in Conservative Parts of the U.S.*, WASH. POST (Feb. 13, 2015), <http://www.washingtonpost.com/news/energy-environment/wp/2015/02/13/why-solar-energy-is-playing-well-in-conservative-parts-of-the-u-s/> (noting that solar jobs rose 80% in North Carolina from 2013 to 2014).

6. See H. SELECT COMM. ON ENERGY INDEPENDENCE AND ALTERNATIVE FUELS, 2011 N.C. GENERAL ASSEMB., AUTHORIZATION LETTER 1–2 (Sept. 9, 2011), <http://www.ncleg.net/gascripts/DocumentSites/browseDocSite.asp?nID=162&sFolderName=\General>.

7. See PEW REPORT, *supra* note 1, at 3–4 (showing that new investment in solar projects in North Carolina is projected to drop by over \$800 million in 2016).

8. See *id.* (showing that new investment in solar projects in North Carolina is projected to decrease by almost 50% in 2017).

these two credits, adding up to 65% of the cost of a project, has provided the state's nascent solar industry with a much-needed capital infusion to jumpstart development.<sup>9</sup> While this ITC-fueled expansion has been a critical first step to getting the solar industry off the ground, the true success of these tax policies will depend on the industry's ability to survive on its own merits once the tax credits expire.

In order to remain viable after the ITC, solar developers operating in the state will need to gain access to large amounts of low-cost capital to replace the funding they will lose from the tax credits. A typical five-megawatt utility-scale solar project, or solar farm, costs around \$5 million to develop and construct.<sup>10</sup> Due to this high upfront capital requirement, low-cost financing is essential to the industry's competitiveness.<sup>11</sup> Fortunately, the ITC has allowed developers in the state to build up substantial portfolios of solar projects<sup>12</sup> with equity and future cash flows that can be leveraged to finance further development.<sup>13</sup> However, in order to monetize the tax credits that made these projects possible, most developers employed a financing arrangement called a "partnership flip."<sup>14</sup> This business model involves partnering with a lending institution (commonly referred to as the tax equity investor) with enough tax liability to utilize the tax credits and depreciation benefits.<sup>15</sup> The lender then finances a portion

9. See MICHAEL MENDELSON, TRAVIS LOWDER & BRENDAN CANAVAN, NAT'L RENEWABLE ENERGY LAB., U.S. DEP'T OF ENERGY, UTILITY-SCALE CONCENTRATING SOLAR POWER AND PHOTOVOLTAIC PROJECTS: A TECHNOLOGY AND MARKET OVERVIEW 1 (2012), available at <http://www.seia.org/research-resources/utility-scale-concentrating-solar-power-photovoltaic-projects-technology-market>.

10. See Jeff Hampton, *Currituck County Solar Farm to be Built by End of 2015*, THE VIRGINIAN-PILOT (June 17, 2014), <http://hamptonroads.com/2014/06/currituck-county-solar-farm-be-built-end-2015>. According to Betsy McCorkle of the North Carolina Sustainable Energy Association, a typical solar farm costs around \$1 million per megawatt. *Id.*

11. See LUKAS BRUN, THE SOLAR ECONOMY: WIDESPREAD BENEFITS FOR NORTH CAROLINA 20, 26 (2015), available at [http://www.cggc.duke.edu/pdfs/02152015Duke\\_CGGC\\_NCSolarEnergyReport.pdf](http://www.cggc.duke.edu/pdfs/02152015Duke_CGGC_NCSolarEnergyReport.pdf).

12. See *id.* at 19 tbl.6.

13. See *id.* at 21 ("Private developer solar projects can be used to recapitalize the developer's balance sheet by selling an equity or debt position in projects, thus allowing the developer to commission more projects.").

14. See Travis Lowder, *How Could Securitization Debt Fit with Tax Equity in the Solar Financial Landscape? Pt. I*, NAT'L RENEWABLE ENERGY LABORATORY, U.S. DEPARTMENT OF ENERGY (Oct. 4, 2013, 11:42 PM), <https://financere.nrel.gov/finance/content/how-could-securitization-debt-fit-tax-equity-solar-financial-landscape-pt-I>.

15. *Id.* In addition to the ITC, the federal tax code provides for accelerated and bonus depreciation which allows full depreciation of the asset over the first five years of its life. MICHAEL MENDELSON & CLAIRE KREYCIK, NAT'L RENEWABLE ENERGY LAB., U.S. DEP'T OF ENERGY, FEDERAL AND STATE STRUCTURES TO SUPPORT FINANCING

of the project in return for a majority ownership stake that allows it to claim the tax benefits.<sup>16</sup> It takes five years for those tax benefits to fully vest, after which majority ownership usually reverts back to the developer.<sup>17</sup> Until a solar farm reaches that five-year flip point, it can be very challenging for developers to leverage its value.<sup>18</sup> However, after the tax benefits have accrued to the tax equity investor and the developer regains ownership of the project, future cash flows can more easily be securitized and sold to investors or used as collateral for low-cost loans to finance new projects.<sup>19</sup> If North Carolina's ITC program is allowed to expire before developers have a chance to fortify their balance sheets in this way, the resulting difficulty in obtaining low-cost capital will likely make many projects too expensive and cause a steep drop-off in development.<sup>20</sup>

Since 2013 was such a landmark investment year for North Carolina's utility-scale solar industry,<sup>21</sup> the state should extend its ITC through 2018 and give the industry a chance to recapture the economic benefits from the projects that went on line in 2013. At that point, developers will be better positioned to access low-cost capital markets to replace the funding they will lose from the ITC's expiration.<sup>22</sup> While a wholesale extension of the state's ITC for three more years would be ideal for the industry, legislators may be inclined to pass a more limited extension. One option is for the state to gradually reduce the tax credits, which would give the industry a better chance to adapt. Another option, which would ensure that the communities most affected by the recession capture the economic

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UTILITY-SCALE SOLAR PROJECTS AND THE BUSINESS MODELS DESIGNED TO UTILIZE THEM 11–12 (2012) [hereinafter NREL REPORT 1], available at <http://www.nrel.gov/docs/fy12osti/48685.pdf>.

16. See Lowder, *supra* note 14.

17. See *infra* Section II.A.2.

18. See Lowder, *supra* note 14. Securitizing a project before the tax benefits have accrued can result in the tax equity investor losing all unvested tax credits. *Id.* Additionally, loans taken against the developer's interest in a project have the potential to lead to foreclosure which could result in an untrusted party taking over the management of the tax equity investments. *Id.* Because of the many uncertainties involved, risk-averse tax equity investors usually place significant limits on the developer's ability to execute such transactions. *Id.*

19. See BRUN, *supra* note 11, at 20–22.

20. See PEW REPORT, *supra* note 1, at 4; 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/> (explaining how an abrupt change in tax credits can cause a boom-bust cycle in solar, as such change did to the wind industry).

21. See PEW REPORT, *supra* note 1, at 4.

22. See *infra* Part II.

benefits generated by the ITC extension, is to limit the ITC extension to tier one counties.<sup>23</sup>

In addition to extending the ITC, the state should take steps to modify its regulatory policy to ensure that the residential and commercial segments of the solar industry can prosper as well.<sup>24</sup> Improving the net-metering program and allowing third-party sales are the two most important steps the state can take to give the businesses and citizens of North Carolina a choice of how their power is produced and a chance to lower their monthly bills. These policy changes will also help the North Carolina solar industry achieve the self-sustainability it needs to continue to stimulate economic growth and help the state meet its energy demands with a clean, domestic fuel source.

The analysis proceeds in three parts. Part I provides an overview of some of the technological, market, and policy trends affecting the solar industry in North Carolina. Part II advocates extending the state's ITC through 2018 to improve the long-term competitiveness of the solar industry and provide economic benefits to the state. Part III explores additional policy changes that the state can implement to expand residential and commercial solar adoption and increase competition in the heavily regulated electricity market. This Comment concludes that North Carolina's solar industry will be well-situated to stand on its own without the ITC if the tax credits are phased out in a logical fashion and unnecessary regulatory barriers are removed.

## I. INDUSTRY OVERVIEW

The solar industry is divided into three main segments: residential, commercial, and utility-scale.<sup>25</sup> Residential solar refers to what people typically think of as rooftop solar, and it usually involves a small system capable of powering a single home.<sup>26</sup> In North Carolina, residential systems can be connected to the power grid through a system called net-metering. This system allows the owner to buy back-up power when the sun is not shining and get credit for

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23. The North Carolina Department of Commerce classifies counties into three tiers, with tier one designations reserved for the most economically depressed. *See infra* Section II.B.

24. *See infra* Part III.

25. *Market Segments*, REC SOLAR, <http://www.recgroup.com/en/aboutsolar/solar-markets/> (last visited Aug. 24, 2015).

26. *See* Jessica Toothman & Scott Aldous, *How Solar Cells Work: Solar Powering a House*, HOW STUFF WORKS, <http://science.howstuffworks.com/environmental/energy/solar-cell5.htm> (last visited Aug. 24, 2015).

excess power produced that goes unused.<sup>27</sup> Commercial solar installations are larger systems used by businesses onsite or nearby to power their operations.<sup>28</sup> For example, Apple currently has two twenty-megawatt solar farms powering its data center in North Carolina, and it is currently building a third.<sup>29</sup> While residential and commercial systems are beginning to gain popularity, North Carolina's solar industry consists primarily of utility-scale installations.<sup>30</sup> Utility-scale solar farms are typically built and owned by a developer who then sells the electricity produced directly to a utility company at the wholesale rate.<sup>31</sup>

By several different metrics, the solar industry is currently thriving in North Carolina. In 2014, North Carolina ranked second in the nation for new solar capacity added.<sup>32</sup> In 2013, the state ranked third in the nation for new installations and private investment, fourth in total solar capacity, fifth in total number of homes powered by solar, and tenth in solar energy related jobs.<sup>33</sup> According to a recent study, North Carolina received \$1.2 billion of private investment in solar energy in 2013 alone, almost triple what it received in 2012.<sup>34</sup> Investment figures vary widely between different reporting organizations.<sup>35</sup> However, the increased volume of solar capacity

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27. See *Net Metering*, DSIRE, U.S. DEPARTMENT OF ENERGY & N.C. CLEAN ENERGY TECH. CENTER, <http://programs.dsireusa.org/system/program/detail/1246> (last updated Sept. 4, 2014).

28. See SOLAR ENERGY INDUS. ASS'N, *SOLAR MEANS BUSINESS 2013: TOP U.S. COMMERCIAL SOLAR USERS 3* (2013), available at <http://www.seia.org/research-resources/solar-means-business-2013-top-us-commercial-solar-users>.

29. Katie Fehrenbacher, *Apple to Build a 3rd Massive Solar Panel Farm in North Carolina*, GIGAOM (July 8, 2014), <https://gigaom.com/2014/07/08/apple-to-build-a-3rd-massive-solar-panel-farm-in-north-carolina/>.

30. See Lauren Shwisberg, *Utility Scale Solar Energy: North Carolina's Emergent Success*, ENERGY COLLECTIVE (Feb. 27, 2014), <http://theenergycollective.com/cleanenergyleadershipinstitute/346491/utility-scale-solar-energy-north-carolinas-emergent-success> (explaining how a poor net-metering policy and prohibition on third-party financing has hampered North Carolina's residential solar market).

31. See *Utility-Scale Solar Power*, SOLAR ENERGY INDUSTRIES ASS'N, <http://www.seia.org/policy/power-plant-development/utility-scale-solar-power> (last visited Aug. 24, 2015).

32. *North Carolina Leads South, 2nd in Nation in New Solar Installations*, SOLAR ENERGY INDUSTRIES ASS'N (Mar. 12, 2015), <http://www.seia.org/news/north-carolina-leads-south-2nd-nation-new-solar-installations>.

33. See PEW REPORT, *supra* note 1, at 7.

34. *Id.* at 4.

35. There is a discrepancy between the \$1.2 billion in solar investment in 2013 reported by PEW and the approximately \$650 million in investment reported by RTI International. See *id.*; RTI INT'L, *ECONOMIC AND RATE IMPACT ANALYSIS OF CLEAN ENERGY DEVELOPMENT IN NORTH CAROLINA—2015 UPDATE 2-2* (Feb. 2015) [hereinafter RTI REPORT 2015], available at [http://c.ymcdn.com/sites/www.energync.org/resource/resmgr/Resources\\_Page/RTI\\_2015.pdf](http://c.ymcdn.com/sites/www.energync.org/resource/resmgr/Resources_Page/RTI_2015.pdf). This discrepancy may be explainable by

added in 2013 is more important to this analysis than the exact dollar amount of investment because the former figure directly corresponds to the quantity of projects that will reach the partnership-flip point in 2018.<sup>36</sup> To illustrate this in terms of capacity, North Carolina added only 132 megawatts of solar energy in 2012,<sup>37</sup> whereas it added 335 megawatts in 2013.<sup>38</sup> 2014 was an even bigger year with almost 400 megawatts added.<sup>39</sup> This meteoric jump in utility-scale solar development can be attributed to falling costs, favorable policies, and the increasing capabilities of solar developers operating in the state. One such company, Chapel Hill-based Strata Solar, is already responsible for over \$1 billion worth of investment in North Carolina since beginning its operations in 2009 and is on pace to reach the \$2 billion benchmark by 2016.<sup>40</sup> While this home-grown industry is currently experiencing an upsurge in growth, it is also bracing itself for some fundamental changes.<sup>41</sup> The expiration of the state ITC and the step-down of the federal ITC will require a transformation of the current solar business model into something resembling that of a more mature industry.<sup>42</sup> To better understand how policy changes can help facilitate this transformation, a cursory examination of the industry's history and its many moving parts is in order.

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a difference in reporting methodology between reporting the investment in the year of the outlay as opposed to the year that the project is placed in service. Additionally, the RTI figure does not include the funding that came from the monetization of ITC and depreciation benefits. *See* RTI REPORT 2015 at 1–4.

36. *See* MICHAEL MENDELSON ET AL., NAT'L RENEWABLE ENERGY LAB., U.S. DEPT OF ENERGY, THE IMPACT OF FINANCIAL STRUCTURE ON THE COST OF SOLAR ENERGY 7 (2012) [hereinafter NREL REPORT 2], *available at* <http://www.nrel.gov/docs/fy12osti/53086.pdf> (explaining that projects are structured to reach the flip point after the five-year ITC recapture period has expired).

37. SOLAR ENERGY INDUS. ASS'N, U.S. SOLAR MARKET INSIGHT: 2012 YEAR IN REVIEW 8 fig.2.4 (2012), *available at* <http://www.seia.org/research-resources/us-solar-market-insight-2012-year-review>.

38. *See* PEW REPORT, *supra* note 1, at 5.

39. *See* SOLAR ENERGY INDUSTRIES ASS'N, *supra* note 32.

40. Press Release, Strata Solar, Strata Solar Celebrates \$1 Billion of Investment in North Carolina (Oct. 14, 2014), <http://www.stratasolar.com/2014/10/14/vpo-press-release-strata-solar-celebrates-1-billion-of-investment-in-north-carolina/>.

41. John Downey, *N.C. House To See Bill Soon Extending Solar Tax Credits*, CHARLOTTE BUS. J. (Mar. 11, 2015, 1:54 PM), <http://m.bizjournals.com/charlotte/blog/energy/2015/03/n-c-house-to-see-bill-soon-extending-solar-tax.html?page=all&r=full> (“Ending the solar tax credit would essentially pull the rug out from a new, but promising, industry—jeopardizing the future of current projects and deterring countless potential new investors from doing business in our state.”).

42. Once the industry loses the ITC as a major source of funding, it will need to look to capital markets and lending institutions to finance its continued operations.

*A. Photovoltaic Solar Technology*

Around the turn of the twentieth century, Nikola Tesla and Albert Einstein began to experiment with photovoltaics (“PV”), technology that uses photo-reactive elements such as silicon to convert sunlight directly into electricity.<sup>43</sup> This research eventually led to Einstein winning the Nobel Prize.<sup>44</sup> In the 1950s, PV found an enthusiast in NASA, which began utilizing the technology to power its satellites and other spacecraft.<sup>45</sup> Aside from the space program and some consumer electronics applications, PV did not become practical for terrestrial power generation until the 1990s, when Germany, Japan, and California began to promote rooftop solar.<sup>46</sup> However, development was negligible in North Carolina until recent years. Motivated by the rapid decline in the price of solar panels combined with key policy drivers, installed PV capacity in North Carolina has grown exponentially since 2007.<sup>47</sup> This trend is expected to continue globally, and solar has the potential to be the world’s number one fuel source by the year 2050.<sup>48</sup>

*B. The Public Utility Regulatory Policy Act*

While the solar energy boom only began in the last several years, it has its roots in the energy crisis of the 1970s.<sup>49</sup> In an effort to reduce America’s dependence on foreign fuel, promote alternative energy sources, and diversify the electric power industry to avoid future crises, Congress enacted the Public Utilities Regulatory Policies Act (“PURPA”)<sup>50</sup> in 1978.<sup>51</sup> This law benefits renewables by allowing independent power producers to own and operate electricity generation plants. Additionally, the law requires regulated utilities to purchase power from independent producers if they can produce it

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43. Gil Knier, *How Do Photovoltaics Work?*, NASA, <http://science.nasa.gov/science-news/science-at-nasa/2002/solarcells/> (last visited Aug. 24, 2015).

44. *160 Years of Photovoltaic Technology*, SUNLIGHTELECTRIC, <http://www.sunlightelectric.com/pvhistory.php> (last visited Aug. 24, 2014).

45. *Id.*

46. *Id.*

47. Ivan Urlaub & Ralph Thompson, *Solar Eclipse*, PROF. ENGINEER, Fall 2014, at 22.

48. Press Release, Int’l Energy Agency, *How Solar Energy Could be the Largest Source of Electricity by Mid-Century* (Sept. 29, 2014), <http://www.iea.org/newsroomandevents/pressreleases/2014/september/how-solar-energy-could-be-the-largest-source-of-electricity-by-mid-century.html>.

49. *See Energy Crisis (1970s)*, HISTORY.COM, <http://www.history.com/topics/energy-crisis> (last visited Aug. 24, 2014).

50. 16 U.S.C. §§ 2601–2645 (2012).

51. *Id.*

more cheaply than the utility's "avoided cost."<sup>52</sup> In practice, this means that utility-scale solar projects are only viable if they can produce electricity more cheaply than the utility can when using its cheapest form of production.<sup>53</sup>

The Federal Energy Regulatory Commission ("FERC") has interpreted PURPA as mostly ignoring the non-price benefits of renewable energy.<sup>54</sup> None of the negative environmental externalities associated with traditional fossil fuel power generation<sup>55</sup> can be included in the avoided cost calculations unless they are actual costs the utility would have to pay for the pollution it generates.<sup>56</sup> Since utilities are not generally required to pay for the harm caused to the public welfare by the contaminants routinely released into the environment, those costs are not included in the avoided cost rate.<sup>57</sup> As a result, renewable power sources that do not emit any pollution, including solar, are undervalued under PURPA, and it is left up to the states to even the playing field.

While PURPA is a federal statute, state utility regulatory agencies have the primary responsibility for its administration.<sup>58</sup> The North Carolina Utility Commission ("NCUC") determines, on a

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52. *Public Utility Regulatory Policy Act (PURPA)*, UNION OF CONCERNED SCIENTISTS, [http://www.ucsusa.org/clean\\_energy/smart-energy-solutions/strengthen-policy/public-utility-regulatory.html#.VJ2-bsLpA](http://www.ucsusa.org/clean_energy/smart-energy-solutions/strengthen-policy/public-utility-regulatory.html#.VJ2-bsLpA) (last visited Aug. 24, 2014).

53. *See id.* The cheapest form of fossil fuel power generation is currently natural gas. *See id.*

54. Brief for Respondent, Fed. Energy Regulatory Comm'n at 16–19, *Xcel Energy Servs., Inc., v. Fed. Energy Regulatory Comm'n*, 407 F.3d 1242 (D.C. Cir. 2005) (No. 04-1182). Neither the statute nor the regulations contemplate the source of the energy that the utility is required to purchase under PURPA when determining the avoided cost rate. *Id.* Instead, the rate is determined solely based on the costs that the utility would incur if it had to build a new generating facility and produce the power itself. *Id.*

55. In the case of energy production, negative environmental externalities are the effects of the byproducts, such as carbon dioxide, coal ash, and other pollution, that are released into the environment as a result of power generation. They are called externalities because the harm is borne by the public, in the form of reduced public health, recreation opportunities, etc., instead of by the energy producer. One potential way for policy makers to force energy producers to internalize these byproducts is to tax them for the pollution they release. However, the United States currently uses a command-and-control technique that requires power producers to use technology to reduce the amount of pollution released into the environment. This technique, as currently employed, still allows a large amount of pollution to be released into the environment unabated. *ECON 101: Negative Externality*, CROMULENT ECONS. BLOG, <http://www.env-econ.net/negative-externality.html> (last visited Aug. 24, 2015).

56. CAROLYN ELEFANT, THE LAW OFFICES OF CAROLYN ELEFANT, REVIVING PURPA'S PURPOSE 32 (2011), available at <http://www.recycled-energy.com/images/uploads/Reviving-PURPA.pdf>.

57. *Id.*

58. *Id.* at 11.

biennial basis, the avoided cost rate that each utility is required to pay developers for solar electricity.<sup>59</sup> In addition to setting the rates, the NCUC requires the utilities to offer a standard fifteen-year Power Purchase Agreement (“PPA”) to solar energy generating facilities with capacities under five megawatts.<sup>60</sup> This standard PPA requirement has been instrumental in shaping North Carolina’s solar industry, with the vast majority of solar farms in the state coming in just under the five-megawatt mark.<sup>61</sup> Solar developers benefit from the standard PPA because it removes the need to negotiate favorable terms with utilities that have much higher bargaining power, thereby reducing transaction costs and negotiation difficulties.<sup>62</sup> The renewable fifteen-year term of the standard PPA also provides developers with a predictable, long-term revenue stream that is of paramount importance for securing financing.<sup>63</sup> While FERC only requires states to offer standard PPAs for projects of 100 kilowatts or less, the NCUC’s decision to increase the size limit to five megawatts has provided much-needed predictability to the state’s solar industry.<sup>64</sup>

### C. Renewable Portfolio Standards

In an effort to encourage renewable energy development, North Carolina became the first state in the Southeast to enact a Renewable Energy and Energy Efficiency Portfolio Standard (“REPS”) in 2007.<sup>65</sup> The REPS law promotes renewable energy in two ways: (1) it requires utilities to procure a certain percentage of the energy they sell from renewable sources; and (2) it compensates developers for

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59. *Id.* at 45.

60. Biennial Determination of Avoided Cost Rates for Elec. Util. Purchases from Qualifying Facilities, No. E-100, Sub 140, at 7 (N.C. Utils. Comm’n, Dec. 31, 2014) (order setting avoided cost input parameters).

61. See *NC’s New Solar Trend: 5-Megawatt Solar Farms*, STRATA SOLAR, <http://www.stratasolar.com/2012/03/26/ncs-new-solar-trend-5-megawatt-solar-farms/> (last visited Aug. 24, 2015); see also Alfonso Michael Fucci, N.C. Sustainable Energy Ass’n, *Harvesting the Sun in North Carolina: A Survey of Solar PV Trends, Policies, and Potential 3* (2014) (on file with the North Carolina Law Review).

62. See Herman K. Trabish, *Solar Advocates Protest Proposals to Limit North Carolina Solar Supports*, UTILITY DIVE (July 15, 2014), <http://www.utilitydive.com/news/solar-advocates-protest-proposals-to-limit-north-carolina-solar-supports/286443/> (stating that no developer has been able to negotiate a PPA with Duke Energy for a solar farm over five megawatts without large corporate backers such as Apple or Sun Edison).

63. ELEFANT, *supra* note 56, at 3.

64. *Id.* at 7.

65. *Renewable Energy and Energy Efficiency Portfolio Standard (REPS)*, N.C. UTIL. COMMISSION, <http://www.ncuc.commerce.state.nc.us/reps/reps.htm> (last visited Aug. 24, 2015).

the environmental benefits of the renewable energy they produce.<sup>66</sup> In North Carolina, the REPS requirement increases incrementally until 2021, when regulated utilities must obtain a modest 12.5% of their retail sales from renewable sources.<sup>67</sup> The law specifies a wide range of renewable sources that qualify for meeting the requirement, including solar, wind, hydro, geothermal, and biomass such as animal waste and landfill methane.<sup>68</sup> It also creates a small “carve out” for solar, requiring 0.2% of the state’s energy to come from solar technology by 2018.<sup>69</sup> While notable for being the only state in the Southeast with a REPS law, North Carolina falls shy of many other states whose REPS requirements go as high as 40% or who have sizable solar carve outs.<sup>70</sup>

As required by law, the NCUC has established a system for tracking Renewable Energy Certificates (“RECs”) for the purposes of verifying compliance with the REPS and creating a market where RECs can be bought, sold, and retired.<sup>71</sup> One REC is intended to represent all the environmental benefits generated by one megawatt-hour of electricity produced from a renewable source.<sup>72</sup> Utilities can purchase the RECs bundled together with renewable electricity, or they can purchase them unbundled from renewable energy producers or other utilities. In the alternative, they can generate RECs from any renewable energy they produce themselves.<sup>73</sup> The NCUC gives the utilities credit towards meeting their REPS requirements for every REC they retire.<sup>74</sup> In order to make progress towards the mandate, the state’s predominant utility company, Duke Energy, has recently

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66. *Renewable Energy and Energy Efficiency Portfolio Standard*, DSIRE, U.S. DEPARTMENT OF ENERGY & N.C. CLEAN ENERGY TECH. CENTER, <http://programs.dsireusa.org/system/program/detail/2660> (last updated Feb. 3, 2015).

67. N.C. GEN. STAT. § 62-133.8(b)(1) (2013).

68. *Id.* § 62-133.8(a)(8).

69. *Id.* § 62-133.8(d).

70. Thirty-seven states and Washington, D.C. have renewable portfolio standards or goals. For example, Hawaii requires 40% by 2030; California requires 33% by 2020; New York requires 29% by 2015; Oregon and Nevada require 25% by 2025; New Jersey requires 20% by 2020 and has a 4% solar carve out. *Renewable Portfolio Standard Policies*, DSIRE, U.S. DEPARTMENT OF ENERGY & N.C. CLEAN ENERGY TECH. CENTER (Mar. 2015), <http://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2014/11/Renewable-Portfolio-Standards.pdf>.

71. N.C. GEN. STAT. § 62-133.8(k).

72. *North Carolina Renewable Energy and Energy Efficiency Portfolio Standard*, *supra* note 66.

73. *Id.*

74. *Id.*

commissioned several very large solar farms in the state.<sup>75</sup> One such project currently under construction in Duplin County is set to be the largest solar farm east of the Mississippi River once it is completed.<sup>76</sup>

In addition to helping state regulatory agencies track REPS compliance, RECs also provide a method for compensating renewable energy producers for the environmental benefits of the energy they produce where PURPA's avoided-cost methodology fails to do so.<sup>77</sup> The price that developers receive for their RECs is driven by market dynamics.<sup>78</sup> The higher the REPS requirements are, the more demand there will be for RECs, and, therefore, the higher the price of RECs will be.<sup>79</sup> Conversely, as the utilities get closer to meeting their REPS requirements, the price of RECs can drop dramatically.<sup>80</sup> In effect, state legislatures can try to decide how much they value renewable energy by how high they set their REPS. While RECs can provide a valuable stream of income to renewable energy producers, their price volatility and diminishing returns make them a somewhat unreliable driver of renewable energy development if they are not properly monitored and updated.<sup>81</sup> Without some future adjustments to the REPS, the REC market in North Carolina will eventually become saturated and its effectiveness will begin to diminish.<sup>82</sup>

#### D. Investment Tax Credits

By and large, the most important policy mechanism driving the surge in solar development in North Carolina and the rest of the country is the ITC.<sup>83</sup> The state and federal tax credits provided much needed upfront capital to the fledgling solar industry at a time when

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75. *Duke Energy Commits \$500 Million to North Carolina Solar Power Expansion*, DUKE ENERGY (Sept. 25, 2014), <http://www.duke-energy.com/news/releases/2014091501.asp>.

76. *Id.*

77. *See supra* notes 65–76 and accompanying text.

78. PLATTS, RENEWABLE ENERGY CERTIFICATES 6–7 (Apr. 2012), available at <http://www.platts.com/IM.Platts.Content/InsightAnalysis/IndustrySolutionPapers/RECSpecialReport1112.pdf>.

79. *Id.* at 7.

80. *Id.*

81. *See id.*

82. *See id.* (describing how decreased demand in California REC markets has already begun to diminish the utilities' impetus for entering into favorable PPAs with solar developers).

83. *The Case for the Solar Investment Tax Credit*, SUSTAINABLE ENERGY INDUSTRIES ASS'N, <http://www.seia.org/research-resources/case-solar-investment-tax-credit-itc> (last visited Aug. 24, 2015).

its risk profile was completely unknown to lenders and investors.<sup>84</sup> This infusion of funds has given developers a chance to build their reputations among lenders by providing solid data and track records of their performance that the banks can use to calculate risk.<sup>85</sup> Increased risk awareness brings down the cost of capital, thereby increasing solar's competitiveness in the market.<sup>86</sup> The ITC has also helped the industry reduce costs by allowing developers to build larger projects and take advantage of the resulting economies of scale.<sup>87</sup> Additionally, the increased demand created by U.S. tax incentives can be partially credited with motivating the upsurge in Chinese solar panel manufacturing that ultimately led to the steep drop-off in panel prices.<sup>88</sup> Finally, and most importantly to this analysis, the ITC has allowed developers to build portfolios of revenue-producing assets that will be instrumental in providing equity and collateral to finance new projects once the tax credits expire.<sup>89</sup>

While the ITC has been extremely effective at spurring new solar development, the tax credits greatly complicate the development process. This complication is a result of the complex transactions that developers must execute to monetize the credits.<sup>90</sup> For starters, the vast majority of solar developers have nowhere near enough tax liability to take advantage of the tax credits on their own.<sup>91</sup> In order to turn the credits into cash, developers must find a large lending institution willing to front them the money in return for the tax credit that the lender will apply against its own tax bill.<sup>92</sup> Due to the limited size of the national tax equity market, federal tax equity investors can

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84. James Bickford, *Why are Institutional Investors Still Hesitating on Solar?*, GREENTECH SOLAR (Oct. 7, 2014), <http://www.greentechmedia.com/articles/read/Why-Are-Institutional-Investors-Still-Hesitating-on-Solar>.

85. *See id.*

86. *Id.*

87. *See* MENDELSON ET AL., *supra* note 9, at 1.

88. China went from a negligible presence in both the wind turbine and solar panel manufacturing industries to being the global leader in both by 2010. Jonas Nahm & Edward S. Steinfeld, *The Role of Innovative Manufacturing in High-Tech Product Development: Evidence from China's Renewable Energy Sector*, in MIT PRESS, PRODUCTION IN THE INNOVATION ECONOMY 139, 139 (Richard M. Locke & Rachel L. Wellhausen eds., 2014). While this massive ramp up in renewable energy component production coincides with China's ramp up in high-tech manufacturing generally, *id.*, the huge increase in demand caused by the United States' tax credits likely played a large role as well.

89. *See infra* Section II.C.

90. *See infra* Section II.A.2.

91. NREL REPORT 1, *supra* note 15, at 22.

92. *Id.*

charge high premiums to monetize the credits.<sup>93</sup> The costs are even higher for monetizing North Carolina state tax credits due to the much smaller size of the state's tax equity market.<sup>94</sup>

In addition to the high rates that banks charge to monetize the tax credits, the ITC also keeps transaction costs high due to the complex deal structures and due diligence that the tax equity investors require before funding a deal.<sup>95</sup> For tax investors to realize the full value of the state and federal credits, they must maintain ownership of the project for at least five years after it is placed in service.<sup>96</sup> In practice, this means project developers must weave together multiple single-purpose entities with complicated ownership structures that allow the tax benefits and other revenue streams to be funneled to the tax investor for at least the first five years of the project.<sup>97</sup> In order to manage the risk associated with this tax structure, the tax investors require extensive due diligence to ensure that their investments are safe. In North Carolina, the complexity is magnified because both state and federal tax equity investors are usually involved in the deal.<sup>98</sup> All of the legal costs associated with structuring and executing a tax equity financing deal are borne by the developer and can subtract significantly from the value of the tax credits.

Even with the costs associated with the ITC, however, it has been a net positive for the solar industry and the state of North Carolina. It has created a business-friendly environment in the state that has helped solar transform from a hobbyist's curiosity to an economically viable, clean, domestic power source. The industry it created brings thousands of jobs and billions of dollars in private investment to the state.<sup>99</sup> Other beneficiaries of the state's renewable energy policies

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93. *See id.* (explaining that the cost of monetizing the tax credits uses up a large portion of their value).

94. Fucci, *supra* note 61, at 13.

95. Liz Hoffman, *Tax Equity Financing Lures Corporations to Renewables*, LAW360 (Mar. 6, 2012), <http://www.law360.com/articles/294066/tax-equity-financing-lures-corporations-to-renewables>.

96. N.C. GEN. STAT. § 105-129.16A(a) (2013) (“[Credits] must be taken in five equal installments beginning with the taxable year in which the property is placed in service.”); INTERNAL REVENUE SERV., DEP’T OF THE TREASURY, DRAFT FORM, INSTRUCTIONS FOR I.R.S. FORM 3468 (2013) (explaining that the I.R.S. will recapture any unvested portion of the tax credit if investment property is disposed of before the end of the five-year term).

97. *See infra* Section II.A.2.

98. *See* Joshua Herlands, *Solar in North Carolina: Tax Equity Strategies*, BREAKING ENERGY (Oct. 9, 2012, 9:30 AM), <http://breakingenergy.com/2012/10/09/solar-in-north-carolina-tax-equity-strategies/>.

99. PEW REPORT, *supra* note 1, at 4–5.

include ratepayers who pay less to power their homes and businesses<sup>100</sup> and rural communities that receive the vast majority of the investment from solar projects.<sup>101</sup> North Carolina's favorable renewable energy policies have also brought tech companies like Apple to the state because they are able to power their data centers with solar energy.<sup>102</sup> Perhaps surprisingly, the state tax credits have even resulted in a net increase in state and local tax revenue, with \$1.93 in tax revenue created for every dollar spent on the credits.<sup>103</sup> In order to retain all of the benefits that these incentives have bestowed upon the state, North Carolina will have to wind down its ITC program in a logical fashion.

#### *E. Tax Equity Financing Structures*

To understand how the expiration of the ITC will affect the solar industry in North Carolina, it is helpful to understand the different financing structures companies can use to take advantage of the tax credits and the effects those structures have on the solar development cycle and cost of energy. Fortunately, the U.S. Department of Energy's National Renewable Energy Laboratory ("NREL") has studied this topic extensively and released a series of reports documenting the results of its analysis.<sup>104</sup> The NREL analyzed three typical solar financing structures: single-owner balance sheet financing, partnership-flip structures, and sale-leaseback structures.<sup>105</sup> The choice of which financing method to use will depend on the business needs of the developer and the comfort level of the tax investor with each of the different structures.<sup>106</sup>

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100. Press Release, N.C. Sustainable Energy Ass'n, Report Shows Rural Areas Benefiting Significantly from North Carolina Clean Energy Development (Feb. 23, 2015), [http://energync.site-ym.com/resource/resmgr/Press\\_Releases/2015\\_RTI\\_Study\\_Release\\_FINAL.pdf](http://energync.site-ym.com/resource/resmgr/Press_Releases/2015_RTI_Study_Release_FINAL.pdf) (estimating that North Carolina's renewable energy policies will save the state \$651 million in electricity costs by 2029).

101. *See id.* (reporting that 75% of the \$2.6 billion invested in renewable energy in the state since 2008 has gone to rural areas).

102. *See supra* text accompanying note 29.

103. RTI INT'L, THE ECONOMIC IMPACT OF CLEAN ENERGY DEVELOPMENT IN NORTH CAROLINA: SUMMARY FINDINGS (2014), available at [http://www.energync.org/resource/resmgr/Resources\\_Page/NCSEA\\_econimpact2014summary.pdf](http://www.energync.org/resource/resmgr/Resources_Page/NCSEA_econimpact2014summary.pdf).

104. *See, e.g.*, NREL REPORT 1, *supra* note 15 (demonstrating the type of reports NREL has released); NREL REPORT 2, *supra* note 36 (same).

105. NREL REPORT 1, *supra* note 15, at 23.

106. NREL REPORT 2, *supra* note 36, at 27.

### 1. Single-Owner Balance Sheet Financing

Balance sheet financing is the simplest and most cost-effective structure for financing utility-scale solar projects,<sup>107</sup> but it is only available to entities with extremely healthy tax appetites such as utility companies and very large developers.<sup>108</sup> In a balance sheet financing structure, a single entity finances, builds, and maintains the system.<sup>109</sup> If the entity is a utility company, it sells the electricity directly to retail customers and utilizes the tax benefits against its own tax liability.<sup>110</sup> Transactional simplicity makes these financing structures very economical, but due to a lack of tax liability, very few developers can currently take advantage of them.<sup>111</sup>

### 2. Partnership-Flip Structure

The most common form of utility-scale solar financing is the so-called partnership-flip arrangement.<sup>112</sup> Typically, the developer partners with a large investment bank that provides an equity investment in return for a 99% ownership interest that allows them to receive the majority of the tax benefits.<sup>113</sup> The developer provides the rest of the financing for the project (typically around half), but retains only a 1% ownership interest until the flip point, at which time the developer becomes the majority owner.<sup>114</sup> The flip point can happen as soon as all of the tax benefits have accrued, which occurs five years after the project is placed in service.<sup>115</sup> After majority ownership reverts back to the developer, the developer usually has the option to buy the tax equity investor out of the project completely.<sup>116</sup> This complicated structure is useful for taking advantage of tax credits, but it adds significant transactional costs to a project and can make it difficult to leverage the project's full value for the first several years of its existence.

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107. *Id.* at 21 tbl.5.

108. NREL REPORT 1, *supra* note 15, at 24–27.

109. *Id.* at 24 fig.13.

110. *Id.*

111. *Id.* at 24–27.

112. LEE J. PETERSON, REZNICK GRP., PRIMARY TAX EQUITY FINANCE STRUCTURES COMMON TO THE U.S. DOMESTIC SOLAR ENERGY INDUSTRY: JUNE 2012 at 1 (2012), available at [http://apps.americanbar.org/dch/thedl.cfm?filename=/NR250100/sitesofinterest\\_files/reznick\\_white\\_paper.pdf](http://apps.americanbar.org/dch/thedl.cfm?filename=/NR250100/sitesofinterest_files/reznick_white_paper.pdf).

113. In addition to tax credits, the federal accelerated depreciation program allows investors to obtain further tax deductions. NREL REPORT 2, *supra* note 36, at 6–7.

114. *Id.* at 7.

115. *Id.*

116. *See* Lowder, *supra* note 14.

### 3. Sale-Leaseback & Inverted Lease Structures

In the sale-leaseback structure, the tax equity investor purchases the project from the developer and then leases it back to the developer.<sup>117</sup> The tax investor/lessor receives the tax benefits and lease payments, and the developer/lessee receives the purchase price plus any excess cash flow after operating costs and lease payments are covered.<sup>118</sup> Inverted leases work the same as sale-leasebacks, except the developer has the option to buy the project back after the five-year tax benefit recapture period.<sup>119</sup> According to the 2012 NREL report, lease structures are typically the most expensive way to monetize tax credits.<sup>120</sup>

#### F. Levelized Cost of Energy

Levelized Cost of Energy (“LCOE”) is a valuable metric for comparing the cost of energy produced by different technologies and can be a useful factor for determining a project’s viability.<sup>121</sup> LCOE is calculated by dividing the total cost of a project over its entire life cycle (with all future costs discounted to present value) by the total amount of energy it will produce.<sup>122</sup> Because of the different costs, incentive structures, and solar resources across the country, LCOE for PV varies between different areas and among different developers.<sup>123</sup> Currently, the LCOE for solar is held artificially low because of the ITC, and the challenge for policy makers and the solar industry is to keep it low once the ITC goes away.

The costs that go into a solar project can be divided into hardware costs and non-hardware “soft costs.”<sup>124</sup> Hardware costs include the price of solar panels, inverters, and racking equipment, whereas soft costs encompass everything else—including legal fees, financing costs, and developer profit.<sup>125</sup> While the price of solar panels has dropped precipitously over the past several years, a recent trade

117. NREL REPORT 2, *supra* note 36, at 9.

118. *Id.*

119. NREL REPORT 1, *supra* note 15, at 30.

120. NREL REPORT 2, *supra* note 36, at 21 tbl.5.

121. U.S. ENERGY INFO. ADMIN., LEVELIZED COST AND LEVELIZED AVOIDED COST OF NEW GENERATION RESOURCES IN THE ANNUAL ENERGY OUTLOOK 2014 at 1 (2014), available at [http://www.eia.gov/forecasts/aeo/electricity\\_generation.cfm](http://www.eia.gov/forecasts/aeo/electricity_generation.cfm).

122. *Id.*

123. *Id.*

124. See SUNSHOT INITIATIVE, U.S. DEP’T OF ENERGY, TACKLING CHALLENGES IN SOLAR: 2014 PORTFOLIO 95 (2014), available at [http://energy.gov/sites/prod/files/2014/08/f18/2014\\_SunShot\\_Initiative\\_Portfolio8.13.14.pdf](http://energy.gov/sites/prod/files/2014/08/f18/2014_SunShot_Initiative_Portfolio8.13.14.pdf).

125. *See id.*

war with China has likely put an end to any additional near-term gains in hardware cost reduction.<sup>126</sup> This leaves the majority of cost reduction possibilities squarely in the arena of soft costs, and with the end of the ITC, lowering the cost of capital will be of the utmost importance.

## II. NORTH CAROLINA SHOULD EXTEND ITS SOLAR ITC THROUGH 2018

Legislatures face the challenge of knowing when and how to wind down tax incentives for emergent industries. In 2009, when North Carolina's solar ITC was extended to December 31, 2015,<sup>127</sup> the legislature had no way of knowing what the industry would look like in six years. Now, with the sunset date quickly approaching, there is enough data to evaluate the wisdom of letting the tax credits expire on that date. According to a recent study, investment in North Carolina's solar industry is projected to drop by \$900 million in 2016 if the credits are allowed to expire completely, a 53% decrease from the year before.<sup>128</sup> Investment is projected to decrease by almost \$400 million more in 2017 following the expiration of the federal tax credits.<sup>129</sup> One can easily predict that with such a large drop in investment, there will be a corresponding drop in jobs and tax revenue associated with solar energy.<sup>130</sup> This dramatic decline in investment can be attributed to the industry abruptly losing a valuable source of upfront capital, which will make many projects economically infeasible. However, North Carolina can mitigate these losses if it extends its tax credits by three short years.

The ITC financing model forces solar developers to let the ownership of their projects go temporarily to the tax investor, only

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126. See *How the New Solar Tariffs Will Affect the Solar Industry*, SEEKING ALPHA (Dec. 22, 2014, 8:41 AM), <http://seekingalpha.com/article/2772185-how-the-new-solar-tariffs-will-affect-the-solar-industry> (explaining how the U.S. Department of Commerce has put high tariffs on solar panels from China and Taiwan to protect American manufacturers).

127. Act of Aug. 28, 2009, ch. 548, sec. 2, § 105-129.16A(e), 2009 N.C. Sess. Laws 1488.

128. PEW REPORT, *supra* note 1, at 4.

129. *Id.*

130. Since the majority of solar jobs are in development and construction instead of operations and maintenance, a drop in investment would result in a loss of jobs. See Peter Philips, *Environmental and Economic Benefits of Building Solar in California: Quality Careers—Cleaner Lives*, UC BERKELEY LAB. CENTER (Nov. 10, 2014), <http://laborcenter.berkeley.edu/environmental-and-economic-benefits-of-building-solar-in-california-quality-careers-cleaner-lives/> (explaining that, over a five year period, California's solar industry created 10,200 construction jobs, 1,600 business related jobs, and only 136 operations and maintenance jobs).

realizing majority ownership five years later once the tax benefits have fully vested.<sup>131</sup> This process ties up valuable, revenue-producing assets and can make it difficult for developers to leverage them to finance new projects. By the end of 2015, when the state ITC is set to expire, projects completed in 2010 will have just begun to revert back to the developers. Unfortunately, in 2010 the industry was still in its infancy, with less than \$200 million invested in the state.<sup>132</sup> Investment continued to stay low until 2013, when it rose dramatically.<sup>133</sup> In fact, investment in North Carolina's renewable energy industry in 2013 nearly equaled the total investment from the previous six years combined.<sup>134</sup> 2014 was an even bigger year,<sup>135</sup> and this upward trend is expected to continue into 2015.<sup>136</sup> However, the full benefit of this investment will not vest in the developers until at least 2018, when they begin to regain ownership of the numerous projects that went on line in 2013.<sup>137</sup>

A. *Lowering the Cost of Capital for North Carolina's Utility-Scale Solar Industry*

Extending some semblance of the state's solar ITC through 2018 will give the industry a chance to mature, allowing for greater access to low-cost capital markets. Initially, it will allow the industry to maintain its growth trend for a few more years.<sup>138</sup> Then, in 2018, the 335 megawatts of solar farms that were installed in 2013 will begin reverting back to the developers who built them.<sup>139</sup> Each year after 2018, even more solar farms will reach the ownership flip point, adding plentiful revenue-producing assets to industry balance sheets.<sup>140</sup> In a post-ITC world, having a substantial balance sheet with healthy cash flows will be crucial to bringing capital costs down. It will

131. See *supra* text accompanying note 96.

132. PEW REPORT, *supra* note 1, at 4.

133. *Id.*

134. John Downey, *Report: NC Clean-Energy Investment in 2013 Nearly Equals Total for Previous Six Years*, CHARLOTTE BUS. J. (Apr. 14, 2014, 4:58 PM), <http://www.bizjournals.com/charlotte/blog/energy/2014/04/report-nc-clean-energy-investment-in-2013-nearly.html>.

135. See SOLAR ENERGY INDUSTRIES ASS'N, *supra* note 32.

136. PEW REPORT, *supra* note 1, at 4.

137. Until a project's ownership reverts from the tax equity investor back to the developer, the project's value will be difficult for the developer to leverage in order to finance new projects. See *infra* text accompanying notes 142–79.

138. If growth continues at its current rate, the state could see well over \$2 billion in investment for every year that the ITC is extended. See PEW REPORT, *supra* note 1, at 4.

139. Over 335 megawatts of solar were installed in North Carolina in 2013. *Id.* at 5.

140. This trend would continue through 2023 when the last solar farms financed with the ITC would finally reach the flip point.

give developers more equity to invest in new projects, allow them to leverage that equity with low-interest loans, and provide ample opportunities for securitization.<sup>141</sup>

### 1. Debt Financing

After the ITC disappears, a large portion of the financing for new solar projects will need to come from new sources. Debt financing is an appealing option because of its ability to reduce the Levelized Cost of Energy (“LCOE”) of a project.<sup>142</sup> Assume, for example, that a solar developer has \$1 million to invest and it costs \$1 million to build a new solar farm. Also assume that, for it to be a worthwhile investment, the developer needs to make a 10% annual return on his or her investment. If the developer invests the entire \$1 million to complete the project, he will need to make \$100,000 in profit every year, adding a substantial amount to the LCOE. And if the cost of the project is higher than the revenue it produces, the project will not be economical to build.<sup>143</sup>

Instead, assume that the developer only invests \$250,000 in the project and finances the other \$750,000 with a 5% interest loan. In order to make the desired 10% return on his equity investment, the developer only needs to make \$25,000 (10% of \$250,000) per year to cover the return on equity, plus \$37,500 (5% of \$750,000) per year to cover the interest on the loan, for a total of \$62,500 per year. Compared with the \$100,000 annual return that would be required if the developer financed the project with 100% equity, that is a savings of \$37,500 per year which reduces the LCOE of the project. While this is an oversimplified example with hypothetical inputs, it shows how debt, or “leverage,” can bring down the cost of solar energy. The more low-cost debt a developer can add to the equation, the cheaper the project’s LCOE will be.<sup>144</sup> Unfortunately, securing low-interest loans can be difficult for solar developers “without sizeable balance sheets and a strong history of development experience.”<sup>145</sup>

The development experience required to obtain these helpful, low-interest loans can be more readily achieved if the state ITC is

141. See *infra* Sections II.A.1–3.

142. NREL REPORT 2, *supra* note 36, at iv (“[F]inancial structures that include project-level debt generally yield a lower levelized cost of energy (LCOE) compared to those that rely purely on equity capital . . . .”). As discussed earlier in this Comment, LCOE is one metric used to determine the economic viability of a renewable energy source. See *supra* Section I.F.

143. See *supra* Section I.C–D.

144. See NREL REPORT 2, *supra* note 36, at iv.

145. *Id.*

extended through 2018. Such an extension will greatly improve the industry's ability to meet the three main requirements of loan underwriting: credit, collateral, and capacity to repay.<sup>146</sup> It will give developers more time to build relationships with lenders and build up their track records of performance. It will also give developers a chance to amass large swaths of now majority-owned solar farms to use as collateral and increased cash flows from those farms to increase their capacity to repay loans.<sup>147</sup>

Solar developers typically obtain a portion of their financing through project-level debt (non-recourse loans secured by the property and cash flows from specific projects).<sup>148</sup> However, giving the industry time to remove the tax equity investors from the projects that were built in 2013 will open up a large portfolio of assets that can be leveraged more easily at the holding company level.<sup>149</sup> Debt procured at the holding company level differs from project level debt in that, instead of being secured by the cash flows from one or two projects, it is secured against the developer's equity interest in a large portfolio of projects and thus can be obtained at a lower rate.<sup>150</sup> However, in order to ensure that a trusted party will continue to manage their investment assets, many tax equity investors limit a developer's ability to leverage its partnership interest in this way due to the risk that the bank will foreclose or exercise its step-in rights.<sup>151</sup> In 2018, once the state's solar developers begin to regain ownership of their projects, these barriers will begin to disappear and the possibilities for raising large amounts of low-cost debt will increase.

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146. See *Will I Qualify for a Commercial Real Estate Loan?*, C-LOANS.COM, <http://www.c-loans.com/will-i-qualify-for-a-commercial-real-estate-loan.html> (last visited Aug. 24, 2015) (explaining the importance of the "three Cs" of loan underwriting).

147. See Marley Urdanick, *Solar Securitization Tackles Tax Equity Challenges*, YALE CENTER FOR BUS. & THE ENV'T (Oct. 20, 2014), <http://cleanenergyfinanceforum.com/2014/10/20/solar-securitization-tackles-tax-equity-challenges/> (explaining that before the five-year flip point "the tax equity investor usually gets a priority equity distribution of [project] cash flows").

148. U.S. P'SHIP FOR RENEWABLE ENERGY FIN., RENEWABLE ENERGY FINANCE FUNDAMENTALS 1, [http://www.camelottech.com/cmfiles/docs/uspref\\_renewable\\_energy\\_finance\\_fundamentals\\_v21.pdf](http://www.camelottech.com/cmfiles/docs/uspref_renewable_energy_finance_fundamentals_v21.pdf) (last visited Aug. 24, 2015) (Version 2.1).

149. See *id.* at 3–5.

150. *Id.* at 5. Step-in rights give the creditor the right to take over the operation of a foreclosed property. See NABARRO LLP, WHAT ARE STEP-IN RIGHTS? (2009), available at <http://www.nabarro.com/downloads/what-are-step-in-rights.pdf>.

151. See Lowder, *supra* note 14.

## 2. Securitization

Another way that developers can raise investment capital is through securitization. The process of securitization transforms future cash flows from solar PPA contracts into standardized, tradable investment instruments.<sup>152</sup> Developers typically house the securitized assets in Special Purpose Vehicles (“SPVs”) such as YieldCos or Master Limited Partnerships (“MLPs”) for their preferential tax treatment and ability to insulate the assets from bankruptcy risk.<sup>153</sup> Issuers then pay an interest rate to the investors based on the rating of the security.<sup>154</sup>

The liquidity provided by securitization<sup>155</sup> has enormous potential to bring down capital costs and allow the industry to fund itself post-ITC.<sup>156</sup> Once developers have a large enough portfolio of projects, they can sell equity positions, or securities, in order to recapitalize their balance sheets and continue the development cycle.<sup>157</sup> This process allows developers to unload their long-term investments to investors and institutions that are structured to handle

152. TRAVIS LOWDER & MICHAEL MENDELSON, NAT’L RENEWABLE ENERGY LAB., U.S. DEP’T OF ENERGY, THE POTENTIAL OF SECURITIZATION IN SOLAR PV FINANCE, at v (2013), <http://www.nrel.gov/docs/fy14osti/60230.pdf> [hereinafter NREL REPORT 3].

153. See Marley Urdanick, *A Deeper Look into Yieldco Structuring*, NAT’L RENEWABLE ENERGY LABORATORY (Sept. 3, 2014, 2:29 PM), <https://financere.nrel.gov/finance/content/deeper-look-yieldco-structuring>. SPV’s are separate legal entities that are out of reach from the developer’s creditors should it go bankrupt. See *id.*

154. However, solar-based securities pose a number of issues in defining key risk metrics necessary to issue ratings, which has made it difficult for ratings agencies to assess the risk involved in such transactions. See *Solar Securitization: A Promising Financing Opportunity for Solar Developers*, PRICEWATERHOUSECOOPERS (Nov. 2013), [http://www.pwc.com/en\\_US/us/technology/publications/cleantech-perspectives/pdfs/pwc-cleantech-perspectives-solar-securitization.pdf](http://www.pwc.com/en_US/us/technology/publications/cleantech-perspectives/pdfs/pwc-cleantech-perspectives-solar-securitization.pdf). Ratings for solar-based securities are based mainly on the performance of the asset, the credit of the utility making the PPA payments, and the strength of the PPA contract itself.

155. Securitization provides liquidity by dividing an asset’s value into tradable instruments. In the case of solar farms, the future cash flows from PPA payments give the securities their value. See *supra* note 152.

156. See Peter Kelly-Detwiler, *Trends in the Solar Industry: Capital Costs Drop, While Solar Companies Re-invent Themselves*, FORBES (Dec. 15, 2014), <http://www.forbes.com/sites/peterdetwiler/2014/12/15/trends-in-the-solar-industry-capital-costs-continue-to-drop-while-solar-companies-re-invent-themselves-as-energy-companies/> (“For every 1% point in lower capital costs, you are seeing a reduction of 20-30 cents per watt in project costs.”).

157. See Travis Lowder, *How Could Securitization Debt Fit with Tax Equity in the Solar Financial Landscape? Pt. II*, NAT’L RENEWABLE ENERGY LABORATORY, U.S. DEPARTMENT OF ENERGY (Oct. 4, 2013, 1:42 PM), <https://financere.nrel.gov/finance/content/how-could-securitization-debt-fit-tax-equity-solar-financial-landscape-pt-ii> [hereinafter Lowder Pt. II] (describing how a “critical mass” of solar assets is necessary to support securitization and suggesting that this can be achieved by pooling assets together into a separate SPV).

them, and then allocate the recaptured capital to their core competency, which is developing new projects. Maturing industries often finance operations in this way because it provides access to vast amounts of low-cost capital in global markets.<sup>158</sup>

To make securitization possible, developers need a substantial pool of standardized, cash-producing assets to securitize.<sup>159</sup> Fortunately, North Carolina's standard PPA contract provides some of the requisite uniformity to overcome the hurdle created by lack of standardization,<sup>160</sup> and, at the rate the industry is currently growing, extending the ITC through 2018 should give developers the chance to aggregate enough projects to meet the volume requirements.<sup>161</sup> Even so, some of the smaller developers operating in the state may still need to consolidate their portfolios in order to reach a critical mass capable of securitization.<sup>162</sup>

Another hurdle facing the solar industry is the difficulty of harmonizing the tax equity investors' interests with the securitization process.<sup>163</sup> Problems arise due to the conflicting legal structures required to achieve each of these goals.<sup>164</sup> In order to accomplish a securitization transaction, the developer must first execute a bankruptcy "true sale" of the solar assets into the SPV that will eventually issue the security.<sup>165</sup> This process transfers cash flows from the developer to the SPV and insulates the assets from developer bankruptcy risk.<sup>166</sup> Securitization also requires pledges of first lien security interests in the asset to be transferred to a trustee.<sup>167</sup> Waterfall provisions typically give interest payments to security holders top priority over portfolio cash flows once all trustee expenses are paid.<sup>168</sup> Finally, the developer could be replaced as the servicer of the solar farm by a back-up servicer if certain performance conditions are not met.<sup>169</sup> These features of the securitization process shift the benefits and burdens of ownership away from the tax equity investor and developer and may result in the process being

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158. NREL REPORT 3, *supra* note 152, at v.

159. *See id.*

160. *See supra* text accompanying notes 58–64.

161. *See* NREL REPORT 3, *supra* note 152, at v.

162. *See* Lowder Pt. II, *supra* note 157.

163. *See* NREL REPORT 3, *supra* note 152, at v.

164. *See* Lowder, *supra* note 14.

165. *Id.*

166. *Id.*

167. *Id.*

168. *Id.* A waterfall provision is an agreement that determines the relative priority of different creditors on a project. *See id.*

169. *Id.*

considered a sale for tax purposes.<sup>170</sup> Because ITC rules require the entity claiming the tax credit to own the project, if a securitization transaction is seen as a legal sale it will trigger a recapture by the IRS or state revenue agency of all of the tax benefits that have yet to vest.<sup>171</sup> Due to this substantial risk of loss, tax equity investors usually limit these types of transactions in ways that may effectively block a securitization transaction altogether.<sup>172</sup>

For these reasons, the optimal conditions for executing securitization transactions of solar assets will not occur until after the five-year flip-point.<sup>173</sup> Extending the state ITC through 2018 will give developers a chance to securitize the approximately 600 megawatts of projects that went on line by the end of 2013.<sup>174</sup> If developers can recapitalize their balance sheets before losing the tax credits, they will be in a much better position to maintain their momentum and continue to provide substantial benefits to North Carolina.

### 3. Bond Financing

North Carolina solar developers may use bond financing as another potential securitization method to tap global capital markets. Bonding is the process of securitizing debt and offering it for sale in the form of tradable instruments, similar to equity securities.<sup>175</sup> A solar-backed bond is, effectively, a large loan collateralized by project cash flows and subscribed to by multiple investors.<sup>176</sup> As with equity securitization, bonding requires a healthy portfolio of relatively unencumbered, standardized, cash-producing assets for use as collateral.<sup>177</sup> Its benefits over traditional debt include increased loan size and lower interest rates, both of which add to a project's leverage, and bring down its LCOE.<sup>178</sup> Bond financing is just starting to catch on in the solar industry,<sup>179</sup> and it may be a viable avenue for

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170. *Id.*

171. *Id.*

172. *Id.*

173. *See id.* It may still be possible to securitize solar assets before the flip point occurs but it would require an even more complex, and somewhat unproven, type of transaction that would most likely result in higher transaction costs and, thus, a higher cost of capital. *See* Lowder Pt. II, *supra* note 157.

174. *See* SOLAR ENERGY INDUSTRIES ASS'N, *supra* note 32.

175. NREL REPORT 3, *supra* note 152, at v.

176. *Id.*

177. *Id.*

178. *Solar Securitization*, *supra* note 154, at 1.

179. *See generally* Jennifer Runyon, *Could Utility-Scale Solar Financing with Bonds be the New Normal?*, RENEWABLEENERGYWORLD.COM (July 5, 2013), <http://www.renewableenergyworld.com/rea/news/article/2013/07/could-utility-scale-solar-financing->

financing new projects in North Carolina once the industry has a chance to mature and regain ownership of its solar assets.

*B. Targeting the ITC to Benefit Low-Income Counties*

While a wholesale extension of the state's solar ITC for three more years would be ideal for the industry, the legislature may be more attracted to a targeted extension that provides economic development to the lowest income counties in the state. The N.C. Department of Commerce annually ranks each of the state's one hundred counties and gives them a tier designation from one to three.<sup>180</sup> The forty most economically distressed counties are designated as tier one, the middle forty are tier two, and the twenty most prosperous counties fall into the tier three category.<sup>181</sup> The purpose of these designations is to facilitate programs that encourage economic development in the least affluent parts of the state.<sup>182</sup> Limiting the extension of the ITC to tier one counties would still bridge the funding gap for the solar industry, while also insuring that investment occurs in the areas of the state that need it most.

Utility-scale solar farms are an ideal match for rural areas of North Carolina where, due to cheap, open land and abundant sunshine, tobacco farming once reigned supreme. To begin with, a typical five-megawatt solar farm brings millions of dollars of investment to an area, adding significantly to the county's tax base and requiring very few services and infrastructure in return.<sup>183</sup> In fact, the tax revenue from solar farms is typically two to eight times more than was generated by the prior use of the land. Additionally, some counties in North Carolina have reported that newly constructed solar farms account for the largest increase in tax revenue that they have seen in over ten years.<sup>184</sup> In addition to tax revenue, a solar farm brings roughly \$1 million worth of expenditures to the local community in the form of payroll for local construction workers and purchases of local goods and services.<sup>185</sup> Landowners leasing to solar

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with-bonds-be-the-new-normal (discussing some of the ways bonding has been used to finance solar projects in the United States and around the world).

180. *2015 County Tier Designations*, N.C. DEPARTMENT OF COMMERCE (Nov. 26, 2014), <http://www.nccommerce.com/research-publications/incentive-reports/county-tier-designations>.

181. *Id.*

182. *Id.*

183. Urlaub & Thompson, *supra* note 47, at 24–25.

184. *Id.*

185. John Morrison, Senior Vice-President for Gov't Affairs, Strata Solar, Presentation to N.C. Energy Policy Council: Solar Overview (May 21, 2014), *available at* <http://www.energync>

developers receive more for their land than they do for almost any other use, and they benefit from receiving steady, long-term lease payments for up to forty years, after which the land can revert back to its original use.<sup>186</sup> If the state decides to extend its solar ITC through 2018, even if just for tier one counties, it will ensure that the benefits of this new cash crop continue to grow in rural North Carolina for generations to come.

*C. Lowering the ITC Rate Gradually*

In addition to extending the ITC through 2018, the state should plan and initiate a gradual phase-out of the credit in order to allow the solar industry to avoid the boom-bust cycle that the wind industry experienced when tax credits abruptly expired.<sup>187</sup> The CEO of Greenwood Energy, Camilo Patrignani, has advocated for an extension of the 30% federal ITC, followed by a step-down, and then a complete phase-out of the ITC altogether.<sup>188</sup> While federal legislative gridlock leaves this proposal in doubt on a national level,<sup>189</sup> North Carolina has the opportunity to engineer an ITC phase-out that will give its solar industry a distinct advantage over the rest of the country.

If nothing changes, the combined tax credit that North Carolina developers can currently take advantage of will drop from 65% to 30% on January 1, 2016, when the state ITC expires.<sup>190</sup> A year after the state ITC expires, the federal ITC will drop to 10%.<sup>191</sup> To put this in perspective, in the span of just over one year, developers in the state will lose tax credits worth 55% of the total cost of building a new project. Instead of allowing investment in this job-creating industry to crash, North Carolina can choreograph its ITC phase-out with the scheduled federal ITC phase-out in order to provide the industry with a smooth, gradual landing. While a three-year extension at the current rate would be most beneficial to the industry and the state, a gradual decline in the ITC would be preferable to allowing the tax credits to completely expire at the end of 2015.

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.net/Portals/14/Documents/EnergyPolicyCouncil/05-21-2014%20Long%20Range%20Morrison%20Strata.pdf.

186. Urlaub & Thompson, *supra* note 47, at 25.

187. Patrignani, *supra* note 20.

188. *Id.*

189. *Id.*

190. N.C. GEN. STAT. § 105-129.16A(e) (2013).

191. 26 U.S.C. § 48(a)(2)(A)(2012).

*D. Safe Harbor for Projects Started Before the ITC Expiration Date*

In order to fully smooth out the transition to a post-ITC world, North Carolina should give “safe harbor” to projects that are initiated before the ITC step-down or expiration date. The way the ITC is currently structured, a project must be placed in service (actually producing and selling electricity) before the expiration date in order to qualify for the tax credit.<sup>192</sup> Leaving this rule intact will cause tax-equity investors to be extremely hesitant to invest in projects near the end of the year because they risk losing all, or a substantial portion, of the tax credit they bargained for if a project is not finished on schedule.<sup>193</sup> This problem is exacerbated by the current bottleneck at the interconnection phase of development.<sup>194</sup> However, it can be easily solved by allowing projects to qualify for the tax credits that are in existence in the year that construction began.<sup>195</sup>

*E. Current Legislative Initiative to Extend the ITC in North Carolina*

With so much riding on North Carolina’s Renewable Energy ITC, there has been a recent legislative push to extend the tax credits beyond the current expiration date.<sup>196</sup> Sen. Jeff Tarte (R-Mecklenburg) and two of his colleagues recently introduced a bill in the North Carolina Senate titled the “Energy Investment Act” that would extend the 35% tax credit for five more years for small-scale solar installations (under one megawatt) and two more years for utility-scale installations.<sup>197</sup> A similar push is currently underway in the North Carolina House of Representatives.<sup>198</sup> While falling one year short of the three-year extension for utility-scale solar proposed

192. N.C. GEN. STAT. § 105-129.16A(a).

193. See PEW REPORT, *supra* note 1, at 4 (showing only a small projected increase in PV investment in 2015 compared with the over \$400 million increase in investment that was seen in 2014).

194. See BRUN, *supra* note 11, at 16. Because many developers file applications for projects that they will never end up building, there is currently a large backlog of solar projects in North Carolina waiting for the utility to process their interconnection agreements. See Fucci, *supra* note 61, at 20–21. A project cannot begin producing and selling electricity until interconnection occurs, and in order to qualify for the tax credits the project must be operational before the ITC expiration date. See *id.*

195. See Fucci, *supra* note 61, at 14.

196. John Downey, *Bill to Extend N.C. Renewable-Energy Tax Credits Submitted in the Senate*, CHARLOTTE BUS. J. (Mar. 25, 2015, 4:48 PM), <http://www.bizjournals.com/charlotte/blog/energy/2015/03/bill-to-extend-n-c-renewable-tax-credits-submitted.html?page=all>.

197. See *id.*; see also *Thank Your Senator for Sponsoring Senate Bill 447, The Energy Investment Act*, N.C. SUSTAINABLE ENERGY ASS’N (Apr. 2, 2015), <http://www.energync.org/blogpost/1249845/212685/Thank-Your-Senator-for-Sponsoring-Senate-Bill-447-The-Energy-Investment-Act>.

198. See Downey, *supra* note 196.

in this Comment, the Energy Investment Act would move the utility-scale solar industry much closer to the five-year flip point on a large quantity of projects.<sup>199</sup> Since this bill would extend the tax credits for small-scale installations for five more years, it would also ensure the continued viability of the commercial and residential solar industry until at least 2021. The state the ITC is important for rooftop solar because of reduced economies of scale associated with smaller installations.<sup>200</sup> Furthermore, when the federal ITC drops down to 10% after 2016, the law is written so that individually-owned residential installations will no longer qualify for the credits.<sup>201</sup> The legislature should pass this bill, and it should consider extending the ITC for utility-scale solar for an additional year as well.

Currently, the bill appears to have strong bipartisan support in both chambers.<sup>202</sup> If the legislature succeeds in passing this bill, there is still a chance that it could be vetoed by Gov. Pat McCrory, a longtime executive of Duke Energy,<sup>203</sup> who has expressed an interest in allowing the credits to expire.<sup>204</sup> Governor McCrory, while generally a supporter of solar energy development in the state, appears to believe that the solar industry is already capable of standing on its own.<sup>205</sup> The governor has not provided a clear basis for this belief, and research tends to show otherwise.<sup>206</sup>

### III. MODIFYING THE STATE'S REGULATORY POLICY

Due to inefficiencies created by North Carolina's current regulatory scheme, it is unclear whether residential and commercial solar will continue to be competitive in the state after the expiration of the ITC.<sup>207</sup> Luckily, the legislature has the luxury of surveying the policies of other states to find the best practices for promoting North Carolina's rooftop solar industry. Revamping the net-metering policy and legalizing third-party sales are two proven actions that the state

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199. See *supra* Part II.

200. See Fucci, *supra* note 61, at 11.

201. *Solar Investment Tax Credit (ITC)*, SOLAR ENERGY INDUSTRIES ASS'N, <http://www.seia.org/policy/finance-tax/solar-investment-tax-credit> (last visited Aug. 24, 2015).

202. See Downey, *supra* note 196.

203. Bruce Henderson, *Gov. McCrory: Duke Energy's Coal Ash Record is 'Quite Poor'*, CHARLOTTE OBSERVER (Dec. 7, 2014), <http://www.charlotteobserver.com/news/local/article9242477.html>.

204. See Downey, *supra* note 41.

205. See *id.*

206. See PEW REPORT, *supra* note 1, at 4.

207. See Fucci, *supra* note 61, at 14-15.

can take to ensure that rooftop solar remains economically viable post-ITC.<sup>208</sup>

A. *Improving Net-Metering*

The residential solar industry operates under much different conditions than the utility-scale sector. Instead of competing with traditional power generation on the wholesale market, the electricity is produced by the end user, who competes with utilities at the retail level.<sup>209</sup> However, due to decreased economies of scale and high customer acquisition costs, the increased compensation in the residential market is more than offset by higher installed costs.<sup>210</sup> In order for the economics to pencil out, residential solar producers need to be credited for the electricity they produce during the day while they are at work to offset the electricity they have to purchase at night when they are at home and the sun is not shining.<sup>211</sup> This is what net-metering allows; however, North Carolina's current system fails to fully accomplish this goal.<sup>212</sup>

North Carolina's residential customers have the choice of either selling all of the electricity they produce to a utility at a long-term PPA (wholesale) rate and purchasing back all of the electricity they need at the retail rate or participating in a net-metering program.<sup>213</sup> The state's net-metering program allows participants to use the energy they produce onsite and receive credits for any excess energy they deliver to the grid.<sup>214</sup> At the end of every month, the credits offset electricity purchased from the utility, and any excess credits roll over to the next month.<sup>215</sup> However, on June 1 of every year, the utility zeros out any excess credits that the customer has accrued without compensation.<sup>216</sup>

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208. *See id.* at 2, 4–5.

209. The benefit that residential solar producers receive comes in the form of reduced utility bills.

210. Fucci, *supra* note 61, at 11.

211. *Id.* at 16.

212. *Id.*

213. Investigation of Net Metering, No. E-100, Sub 83, at 1 (N.C. Utils. Comm'n Mar. 31, 2009) (order amending net metering policy).

214. *Net-Metering*, DSIRE, U.S. DEPARTMENT OF ENERGY & N.C. CLEAN ENERGY TECH. CENTER (Sept. 4, 2014), <http://www.charlotteobserver.com/news/local/article9242477.html>.

215. *Id.*

216. JORDAN KERN, UNC INST. FOR THE ENV'T, ANALYSIS OF POTENTIAL POLICY CHANGES ON THE FINANCIAL VIABILITY OF RESIDENTIAL SOLAR PANELS IN NORTH CAROLINA 9, <http://jdkern.web.unc.edu/files/2014/09/Solar-report.pdf>.

The result of this net-metering policy is that residential solar producers go uncompensated for a significant portion of the excess energy they produce.<sup>217</sup> Customers with a typical four-kilowatt system installed in an energy-efficient home will lose an average of 63% of their excess energy generation credits over the life of the system.<sup>218</sup> The main reason for this windfall giveaway to the utilities is the time of year in which the credits are zeroed out.<sup>219</sup> Due to increasing sunshine and the decreasing need to heat or cool a home, the four months leading up to the June 1 reset date is the period of the year when residential systems produce the most excess energy.<sup>220</sup> The excess credits that build up during those months are then lost right before they would be most useful to offset the higher usage required to keep homes cool during the summer months.<sup>221</sup>

Due to North Carolina's inequitable net-metering policy, the majority of the state's residential solar producers are basically forced into the PPA model instead.<sup>222</sup> Under this model, all of the power that the homeowner produces is sold directly to the utility at the wholesale price, and then the utility sells it right back to them at the retail rate.<sup>223</sup> In effect, the utility is allowed to reap most of the financial benefits of the investment made by the homeowner.

In order to avoid these inequitable outcomes, North Carolina's net-metering policy can be fixed in several ways. First, the state can eliminate the credit reset policy altogether and allow net-metering customers to carry their credits forward indefinitely. With a typical residential system, those credits will likely be used up by the end of summer when energy usage peaks.<sup>224</sup> Similarly, a more optimal date could be used for the credits to reset, such as at the end of August when the peak demand period ends. Finally, a policy adopted by the New Jersey legislature is to have the utility compensate customers based on the avoided-cost rate for any excess credits that have accrued at the end of the year.<sup>225</sup> Additionally, the customer gets to

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217. *Id.* at 15 (describing how the credit reset results in some customers only being paid one-third of the official net-metering rate for excess generation).

218. *Id.*

219. *See id.* at 7 fig.4.

220. *Id.*

221. *Id.* (showing June through August as the time of year where four-kilowatt systems generate no excess energy).

222. Fucci, *supra* note 61, at 17.

223. *Solar Securitization*, *supra* note 154.

224. *Id.*

225. N.J. ADMIN. CODE § 14:8-4.3 (2015).

choose the date at which their annual credit accrual period ends.<sup>226</sup> Any one of these changes would likely be sufficient to ensure that North Carolina's net-metering customers are actually compensated for the energy they produce.

Even with the windfall that it receives when the credits are reset, Duke Energy has conveyed an interest in reducing the value of excess generation credits by \$0.06 per kilowatt-hour.<sup>227</sup> In a fixed rate structure, that would bring the price down from \$0.09 to \$0.03 per kilowatt-hour, a price even lower than the wholesale rate the utilities pay utility-scale producers.<sup>228</sup> Duke Energy has argued that, if the credit prices are not reduced, cross-subsidization will force non-net-metering customers to pay higher rates to cover the cost of the grid.<sup>229</sup> This is a claim that has been proliferated by utility companies around the country,<sup>230</sup> but, according to the North Carolina Utility Commission ("NCUC"), Duke has been unable to substantiate it.<sup>231</sup> The reality is that allowing people to produce their own electricity does not fit into Duke's monopolistic business model,<sup>232</sup> and the utility is worried about potential lost profits.<sup>233</sup>

Making these claims publicly can have the effect of deterring customers from installing residential solar systems.<sup>234</sup> If homeowners believe that net-metering rules will change in the near future, they will have a difficult time conducting the cost-benefit analysis needed to properly evaluate their investments.<sup>235</sup> In order to alleviate this problem and reinvigorate customer confidence in rooftop solar, the NCUC should follow California's lead<sup>236</sup> and create a "safe harbor" provision that ensures that a customer's net-metering rules will not be

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226. *Id.*

227. *See* KERN, *supra* note 216, at 8.

228. *Id.*

229. Dan Way, *Duke Energy: Renewable Power Has Poor Subsidizing Wealthy*, CAROLINA J. (Jan. 9, 2014), [http://www.carolinajournal.com/exclusives/display\\_exclusive.html?id=10751](http://www.carolinajournal.com/exclusives/display_exclusive.html?id=10751).

230. NCSEA's Reply at 9–12, Investigation of Net Metering, No. E-100, Sub 83 (N.C. Utils. Comm'n Apr. 4, 2014).

231. Investigation of Net Metering, *supra* note 213, at 5.

232. While it makes sense for there to be only one utility company in a service area because of the redundant infrastructure that would be required in order to have competing utility companies, residential solar is produced by the end user in the location where it is used and therefore does not require redundant infrastructure. For this reason, there is no valid public policy rationale for allowing the utility company to monopolize the power production business at the expense of solar adoption.

233. *See* NCSEA's Reply, *supra* note 230, at 10–11.

234. *Id.* at 13.

235. *See id.*

236. *Id.* at 13–15.

materially altered for the first several years that their system is in service. Much in the way the standard PPA has encouraged utility-scale deployment, this provision would allow residential customers to more accurately assess their investments.

*B. Legalizing Third-Party Sales*

The “third-party sales” financing model has been wildly successful in the residential and commercial solar markets in states where it is allowed.<sup>237</sup> Under this business model, the solar developer finances, builds, and owns the system at the customer’s home or place of business and then executes a PPA to sell the electricity directly to the customer at a long-term, below-market rate.<sup>238</sup> Since the developer provides the investment and handles system maintenance, this financing model makes the economic benefits of solar power accessible to customers who could not otherwise afford the upfront costs.<sup>239</sup> Allowing third-party sales is probably the most effective policy that North Carolina can implement to encourage the adoption of rooftop solar.

From a reading of the North Carolina Public Utilities Act (“the Act”),<sup>240</sup> it is far from clear that third-party sales of solar electricity are prohibited. However, in a regulated electricity market such as the one in North Carolina, the electric utility is given a monopoly over its service territory.<sup>241</sup> According to the Act, a third-party system owner that sells solar electricity to customers would be classified as a “public

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237. *Third-Party Solar Financing*, SOLAR ENERGY INDUSTRIES ASS’N, <http://www.seia.org/policy/finance-tax/third-party-financing> (last visited Aug. 24, 2014). More than 90% of New Jersey’s new residential solar development since 2013 has come in the form of third-party owned systems. *Id.* In the first quarter of 2014, the percentage of distributed solar generation systems that were third-party owned in New York was over 50%. *Id.* In California, Arizona, and Colorado, the percentage of third-party owned systems ranged from 69% to 81%. *Id.*

238. *Id.*

239. KATHARINE KOLLINS, BETHANY SPEER & KARLYNN CORY, NAT’L RENEWABLE ENERGY LAB., U.S. DEP’T OF ENERGY, SOLAR PV PROJECT FINANCING: REGULATORY AND LEGISLATIVE CHALLENGES FOR THIRD-PARTY PPA SYSTEM OWNERS, at v (2010) [hereinafter NREL REPORT 4], available at <http://www.nrel.gov/docs/fy10osti/46723.pdf>.

240. N.C. GEN. STAT. § 62-1 (2013).

241. See Sarah Battaglia, *What Everyone Should Know About Deregulated Electricity Markets*, ENERGY COLLECTIVE (Jan. 21, 2014), <http://theenergycollective.com/sbattaglia/329006/what-everyone-should-know-about-deregulated-electricity-markets>; *Service Area Map*, DUKE ENERGY, <https://www.duke-energy.com/architects-engineers/servicemap.asp> (last visited Aug. 24, 2015).

utility”<sup>242</sup> and, as such, would run afoul of the utility in whose territory it operated. The NCUC recently made this interpretation of the law clear when it stated that “Chapter 62 of the North Carolina General Statutes prohibits third-party sales of electricity by non-utility solar installers to retail customers.”<sup>243</sup>

Even if the NCUC allowed rooftop solar installers to sell electricity to customers in the utility’s service territory, being subject to a regulatory regime designed for large public utilities would be a burden too great for small businesses to bear.<sup>244</sup> While this type of utility regulation may be needed to ensure that large monopolies provide reliable services at reasonable rates, it is wholly unnecessary in the third-party solar market, where rates and service levels can be negotiated and spelled out in the PPA contract.<sup>245</sup> Since the rates offered would have to be lower than what the utility charges for this business model to be successful, third-party sales would create competition in the state’s electricity market where none currently exists.<sup>246</sup> If potential customers could not obtain satisfactory terms from solar installers, they would have the option of continuing to buy their power from the utility. In other words, the potential for abuse that exists with electric-utility monopolies would not exist in the third-party solar market. However, until the law is changed, state-sanctioned monopoly control of the electricity market will continue to stand in the way of an innovative business practice that has the potential to be very successful in the state.<sup>247</sup>

Fortunately, hope is on the horizon. Legislators in the North Carolina House of Representatives recently introduced House Bill 245 (“H.B. 245”), titled “The Energy Freedom Act,” to legalize third-party sales of solar electricity in the state.<sup>248</sup> A group of ten major

242. See N.C. GEN. STAT. § 62-3(23)(a)(1) (2013) (defining a “public utility” as anyone “owning or operating in this State equipment or facilities for . . . [p]roducing, generating, transmitting, delivering, or furnishing electricity . . . to . . . the public for compensation”).

243. NC GreenPower, No. E-100, Sub 90, at 3 (N.C. Utils. Comm’n Jan. 27, 2015) (order approving pilot programs).

244. See NREL REPORT 4, *supra* note 239, at 7.

245. See *id.* at 4–6.

246. *Third-Party Solar Financing*, *supra* note 237.

247. See *Markets, Market Failure, and Regulation*, NEW ECONOMICS FOUNDATION, 2–3 (2013), available at [http://www.neweconomics.org/page/-/Economics\\_Briefing\\_8.pdf](http://www.neweconomics.org/page/-/Economics_Briefing_8.pdf) (stating that market failures such as imperfect competition or environmental externalities are generally seen as the only legitimate reason for a government to impose regulations).

248. Julia Pyper, *North Carolina Bill Would Launch Opportunity for Third-Party-Owned Solar*, GREENTECH MEDIA (Mar. 17, 2015), <http://www.greentechmedia.com/articles/read/north-carolina-bill-would-launch-opportunity-for-third-party-owned-solar> (last visited Aug. 24, 2015).

companies, including Wal-Mart, Lowe's, Target, and Volvo, has already come out in support of the bill.<sup>249</sup> According to these companies, the bill will “create an even more positive business environment and [will] help [them] continue to create jobs and contribute to an even more robust local economy” by giving them a “choice when selecting energy suppliers and products to meet [their] business and public goals.”<sup>250</sup> Sponsored by Rep. John Szoka,<sup>251</sup> the bill has bipartisan support in the legislature,<sup>252</sup> and it is favored five-to-one by citizens, according to a recent poll.<sup>253</sup> In addition to legalizing third-party sales of solar energy, this bill ensures that third-party-owned systems will be eligible for net-metering.<sup>254</sup> Currently, the NCUC only requires utilities to offer net-metering to “customer[s] that own[] and operate[] . . . solar photovoltaic . . . electric generating facilit[ies].”<sup>255</sup> Since a utility customer who purchases solar electricity from a third-party would neither own nor operate the solar system, he may not qualify for net-metering under the current regime.<sup>256</sup> New Jersey policy makers resolved this problem in a similar fashion to H.B. 245 by allowing customer-generators with solar energy systems on their property or on adjacent property to qualify for net-metering, regardless of who owns the system.<sup>257</sup> By enacting The Energy Freedom Act, North Carolina can join the majority of states that allow their businesses and citizens to choose their energy source and benefit from the reduced electricity costs that third-party sales of solar electricity can provide.

#### CONCLUSION

Encouraging economic development in rural parts of the state is often difficult due to a lack of available infrastructure.<sup>258</sup> Fortunately,

249. *Id.*

250. *Id.*

251. *Id.*

252. *Solar for Sale: New Legislation Could Mean Cleaner, More Affordable Options for Electricity*, STRATA SOLAR (2015), <http://www.stratasolar.com/2015/04/02/solar-for-sale-new-legislation-could-mean-cleaner-more-affordable-options-for-electricity/>.

253. Press Release, NC WARN, Poll Shows Huge Bipartisan Support for Solar Power & Competition in NC (Mar. 25, 2015), *available at* <http://www.ncwarn.org/2015/03/poll-shows-huge-bipartisan-support-for-solar-power-competition-in-nc-news-release-from-nc-warn/>.

254. See Pyper, *supra* note 248.

255. Investigation of Net Metering, *supra* note 213, at 1 (emphasis added).

256. See NREL REPORT 4, *supra* note 239, at vi.

257. *Id.*; N.J. ADMIN. CODE § 14:8-4.1 (2015).

258. See Dan Rickman, *A Brief on When and How Rural Economic Development Should be Done*, 37 J. REGIONAL ANALYSIS & POL'Y 36, 39 (2007).

land, sunshine, and power lines are all a solar farm needs to bring investment and tax revenue to these economically challenged areas. Most farmers can make significantly more money leasing their land to solar developers than they could otherwise make off the land.<sup>259</sup> The money that is invested results in construction and maintenance jobs, and it supports local businesses in the community.<sup>260</sup> The increased local tax revenue can be used to improve schools and infrastructure, which in turn helps attract more businesses to the area.<sup>261</sup> Extending the state's solar ITC for three more years will keep North Carolina's countryside fertile for the propagation of this lucrative crop.

Due to high upfront costs and an unproven track record at the outset, North Carolina's solar industry would have been unable to develop into what it is today without the ITC. Now that the necessary capabilities have been developed, the hardware costs have been reduced, and the workforce has been put in place, the last major challenge on the path to industry self-sufficiency is gaining access to large amounts of low-cost capital.<sup>262</sup> Fortunately, it is possible to pinpoint the year when industry cash flows and access to capital markets will improve.<sup>263</sup> The major expansion of utility-scale solar installations that began in 2013 has produced a large number of valuable assets that will begin reverting back to developers in 2018.<sup>264</sup> Once the industry's equity position is restored, it can be used as collateral to obtain more favorable terms on loans, and once cash flows are freed up, they can be securitized and sold off to investors.<sup>265</sup> As soon as developers have the chance to cash in on the hard work they have put in over the last few years, they will have access to the resources they need to stand on their own without government support.<sup>266</sup> With this transformation towards self-sufficiency so close at hand, it would be a major policy failure to kill the industry's momentum by allowing the tax credits to expire a few years too soon.

While extending the tax credits for a few years should be sufficient to launch the utility-scale solar sector into a self-sustaining orbit, the residential and commercial sectors have an entirely different set of needs.<sup>267</sup> The most important action that legislators

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259. *See supra* Section II.B.

260. *See supra* Section II.B.

261. *See supra* Section II.B.

262. *See supra* Section II.A.

263. *See supra* Section II.A.

264. *See supra* Section II.A.

265. *See supra* Section II.A.

266. *See supra* Section II.A.

267. *See supra* Part III.

can take to ensure the success of rooftop solar is to remove the legal barriers to third-party sales.<sup>268</sup> For businesses and homeowners looking to save money on their electric bills without having to spend thousands of dollars on a solar system, the third-party sales financing model has become the industry standard.<sup>269</sup> States that allow third-party sales have seen a rapid expansion in their rooftop solar markets, while states that prohibit it, like North Carolina, have seen very minimal growth.<sup>270</sup> For a state that is proud to tout its pro-business environment,<sup>271</sup> North Carolina should listen to the business community and its citizens and end the prohibition on this innovative practice.

In order to ensure that homeowners with rooftop solar systems get credited for the full amount of excess energy they generate, a few small changes to the state's net-metering policy are needed.<sup>272</sup> First, the credit reset policy needs to be amended so that the majority of excess credits are not given away to the utility company every year.<sup>273</sup> Second, it should be made clear that net-metering is allowed in combination with a third-party sales arrangement.<sup>274</sup> Finally, when a customer installs a solar system and signs up for net-metering, she should receive a guarantee that the rules will not be materially altered for at least several years.<sup>275</sup> If these common-sense changes are implemented, potential solar adopters can be confident that they are making an informed decision and that they will be fairly compensated for the power they produce.

North Carolina should take action on the recommendations in this Comment to ensure that solar energy will continue to pay large dividends to the citizens of this state. The local businesses and workforce already in place have proven that North Carolina has what it takes to be a national leader in developing its solar resources. Not only does solar energy benefit the economy and the environment; it also gives citizens and businesses the freedom to choose where they get their electricity. This increased competition has the power to bring down energy prices for everyone. Solar energy is very close to being

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268. *See supra* Section III.B.

269. *See supra* Section III.B.

270. *See supra* Section III.B.

271. *See, e.g.*, David Ranii, *North Carolina Falls to No. 3 in Business Climate Ranking*, NEWS & OBSERVER (Raleigh Oct. 20, 2014), <http://www.newsobserver.com/news/business/article10101242.html>.

272. *See supra* Section III.A.

273. *See supra* Section III.A.

274. *See supra* Section III.B.

275. *See supra* Section III.A.

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able to compete with fossil fuels on its own, and its competitiveness is improving every year. By modernizing the state's regulatory regime and winding down the solar tax credits in a logical way, North Carolina can continue to lead the nation in economic and renewable energy development.

KIRIN D. WALSH\*\*

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