

# The Future of Brightfields in North Carolina

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## I. Introduction

Navassa, North Carolina, located just east of Wilmington, is a small town with a population of less than 2,000 and a history of environmental degradation.<sup>1</sup> Most recently, its residents are facing the aftereffects of a closed wood treatment plant that mixed creosote into soil, resulting in soil contamination eighty-eight feet deep.<sup>2</sup> The Environmental Protection Agency (“EPA”) lists creosote as a probable human carcinogen that can irritate the respiratory tract and blister or peel the skin,<sup>3</sup> and the area has been classified as a brownfield.<sup>4</sup> Navassa is also home to other brownfield sites that are part of its legacy as a hard-working industrial town, including a shuttered fertilizer plant and a meatpacking plant.<sup>5</sup> In total, there are more than 475 contaminated acres in Navassa.<sup>6</sup> A \$5 billion settlement reached by the Department of Justice will pay for the site cleanup, but residents are left wondering what will come next to support a community that has long relied on polluting industrial plants for its livelihood.<sup>7</sup> One possible avenue for communities like Navassa is exploring brightfields—a former brownfield that has been repurposed for solar energy production—as a redevelopment option.

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<sup>1</sup> Martha Waggoner, *Residents of Tainted Town Wary of Government Aid*, THE CHARLOTTE POST (Oct. 14, 2015), <http://www.thecharlottepost.com/news/2015/10/14/local/residents-of-tainted-town-wary-of-government-aid/>.

<sup>2</sup> Chris Pleasance, *North Carolina’s Contaminated Town: Former Rice Farmers Struggle to Survive on Poisoned Land After Decades of Abuse by Irresponsible Companies*, THE DAILY MAIL (Oct. 10, 2015), <http://www.dailymail.co.uk/news/article-3267787/North-Carolina-s-contaminated-town-Former-rice-farmers-struggle-survive-poisoned-land-decades-abuse-corporations.html>.

<sup>3</sup> Waggoner, *supra* note 1.

<sup>4</sup> *Brownfield Overview and Definition*, U.S. ENVTL. PROT. AGENCY, <http://www2.epa.gov/brownfields/brownfield-overview-and-definition> (last updated Oct. 21, 2015).

<sup>5</sup> U.S. ENVTL. PROT. AGENCY, ESTECH GENERAL CHEMICALS SITE GENERAL FACT SHEET (2010), [http://www.townofnavassa.org/assets/EPA\\_Estech\\_General\\_Fact\\_Sheet\\_0510.pdf](http://www.townofnavassa.org/assets/EPA_Estech_General_Fact_Sheet_0510.pdf).

<sup>6</sup> Ken Little, *Navassa Waste Sites Closer to Cleanup*, STAR NEWS ONLINE, (Mar. 31, 2010), <http://www.starnewsonline.com/article/20100331/articles/100339941?p=2&tc=pg>.

<sup>7</sup> Waggoner, *supra* note 1.

This paper will explore brightfields as a reuse alternative by giving a brief history of brownfields and brightfields nationally, providing an overview of the current state of brownfield redevelopment and solar production in North Carolina, and concluding that the state is well-poised to transform contaminated sites into brightfields.

## **II. National Approach to Brownfield Redevelopment**

A brownfield is an underdeveloped or abandoned property, the reuse of which is complicated by the presence or perceived presence of hazardous contamination.<sup>8</sup> Brownfields can have many detrimental economic, health, and environmental effects, exposing surrounding communities to hazardous substances, reducing property values, and keeping potentially productive land idle. The 2002 Small Business Liability Relief and Brownfields Revitalization Act (“Brownfields Act”) initiated EPA programs to promote the redevelopment of brownfields through grants, revolving loans, and educational support.<sup>9</sup> The Brownfields Act is part of the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”) passed in 1980,<sup>10</sup> which allows EPA to assign strict joint and several liability to parties responsible for hazardous contamination.<sup>11</sup> CERCLA’s Superfund finances the cleanup of approximately 2,000 of the most dangerous abandoned or uncontrolled hazardous waste sites in the country, which are listed on the National Priorities List.<sup>12</sup> The remaining contaminated sites that are not Superfund sites are referred to as brownfields, and EPA has programs under the Brownfields Act to help innocent landowners purchase and redevelop brownfield property.

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<sup>8</sup> *Brownfield Overview and Definition*, U.S. ENVTL. PROT. AGENCY, <http://www2.epa.gov/brownfields/brownfield-overview-and-definition> (last updated Oct. 21, 2015).

<sup>9</sup> *Id.*

<sup>10</sup> *Summary of the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)*, U.S. ENVTL. PROT. AGENCY, <http://www2.epa.gov/laws-regulations/summary-comprehensive-environmental-response-compensation-and-liability-act> (last updated Oct. 13, 2015).

<sup>11</sup> 42 U.S.C. § 9607 (2010).

<sup>12</sup> *Learn about Superfund*, U.S. ENVTL. PROT. AGENCY, <http://www2.epa.gov/superfund/learn-about-superfund> (last updated Dec. 9, 2015).

Since 2006, EPA has completed approximately 100,000 brownfield cleanups and made over 900,000 acres ready for use throughout the United States through its grants, loans, and support programs.<sup>13</sup> These programs have provided significant economic benefits, raising residential property values by 5.1–12.8% once a nearby brownfield was assessed and cleaned up and leveraging 7.3 jobs per \$100,000 of EPA Brownfields funds expended.<sup>14</sup>

In addition to the direct benefit of effectively removing or containing hazardous substances on the site, there can be substantial ancillary environmental benefits as well. Many redeveloped brownfield sites are in higher population density areas and have greater location efficiency, resulting in a 32–57% reduction in vehicle miles traveled when a brownfield is developed versus developing a greenfield (a previously undeveloped site).<sup>15</sup> This results in a reduction of pollution from vehicle emissions, as redeveloped urban brownfields require fewer commuting miles due to many brownfields' locations in city centers or on the urban periphery. Additionally, redeveloped brownfield sites show an estimated 47–62% reduction of stormwater runoff.<sup>16</sup> EPA grants also aim to build communities consistent with the Partnership for Sustainable Communities initiative, which aims to develop communities that are economically prosperous and follow good environmental practices.<sup>17</sup>

### **III. Brightfields as an Alternative**

Although EPA's Brownfields program has achieved successes, there are still many sites that need additional financial incentives for redevelopment to be viable, particularly in locations

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<sup>13</sup> *Brownfields Program Accomplishments and Benefits*, U.S. ENVTL. PROT. AGENCY, <http://www2.epa.gov/brownfields/brownfields-program-accomplishments-and-benefits> (last updated Nov. 5, 2015).

<sup>14</sup> *Id.*

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*

<sup>17</sup> *Types of Brownfields Grant Funding*, U.S. ENVTL. PROT. AGENCY, <http://www2.epa.gov/brownfields/types-brownfields-grant-funding#tab-3> (last updated Oct. 21, 2015).

outside of urban areas.<sup>18</sup> An emerging alternative solution to make land reuse economically feasible is developing solar energy installations—brightfields—on vacant, underutilized contaminated land.<sup>19</sup> The Department of Energy (“DOE”) uses the term brightfield to describe reusing brownfields for solar photovoltaic (“PV”) energy production.<sup>20</sup> Utility scale solar farms have become profitable in many parts of the country and can be used as a financial supplement to fund cleaning up contaminated land on which they are located. This is an especially promising alternative in rural areas because it productively uses contaminated land, brings high-tech solar manufacturing jobs and other employment opportunities to rural communities, and is not dependent on financing tools that rely on high population density, such as tax increment financing.<sup>21</sup>

Compared to other types of renewable energy, solar PV energy is well suited for brownfields because it requires little maintenance and does not need to significantly penetrate the ground, which reduces exposure to potentially harmful chemicals, thus reducing the extent that a site needs to be cleaned up while still being usable.<sup>22</sup> Solar energy production has also increased nationally with more than 20,000 Megawatts (“MW”) of cumulative solar electric capacity in operation, enough to power more than four million average American homes.<sup>23</sup> Production is projected to add an additional 20,000 MW of solar capacity over the next two years, making the technology more affordable and accessible than ever before.<sup>24</sup>

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<sup>18</sup> David Morley, *Recycling Land for Solar Energy Development*, AM. PLANNING ASS’N (2012), <https://www.planning.org/research/solar/briefingpapers/pdf/recyclingland.pdf>.

<sup>19</sup> *Id.*

<sup>20</sup> Otto Van Geet, *Taking it from Brown to Green: Renewable Energy on Contaminated Lands*, ENERGY.GOV (Apr. 22, 2009), [http://www.energy.gov/sites/prod/files/2014/05/f15/tap\\_webinar\\_20090422\\_otto.pdf](http://www.energy.gov/sites/prod/files/2014/05/f15/tap_webinar_20090422_otto.pdf).

<sup>21</sup> *Id.*

<sup>22</sup> *Brightfields Initiative*, WHITE HOUSE INITIATIVE ON GLOB. CLIMATE CHANGE, <http://clinton5.nara.gov/Initiatives/Climate/brightfields.html> (last visited Jan. 4, 2016).

<sup>23</sup> *Solar Industry Data*, SOLAR ENERGY INDUS. ASS’N, <http://www.seia.org/research-resources/solar-industry-data> (last visited Jan. 4, 2016).

<sup>24</sup> *Id.*

Brightfields align with EPA’s objective of redeveloping brownfields in a sustainable way because they advance economic, community, and environmental goals. Economically, solar energy production is a profitable business that would bring much-needed jobs to rural areas. The presence of solar energy facilities can also inspire local schools and community groups to learn about renewable energy and explore science and technology career paths.<sup>25</sup> From an environmental standpoint, producing renewable energy in the form of solar PV energy represents a positive benefit as it takes the place of other forms of energy produced by nonrenewable fossil fuels that produce harmful pollutants.<sup>26</sup> This issue takes on broader implications when viewed in the context of heightened concern over global climate change as reflected in EPA’s Clean Power Plan<sup>27</sup> and the international community’s adoption of the Paris Agreement on climate change.<sup>28</sup>

#### **IV. Brownfields in North Carolina**

North Carolina has tens of thousands of brownfield sites in both rural and urban locations.<sup>29</sup> In an effort to incentivize their revitalization and under the authority of the Brownfields Property Reuse Act, the state has adopted the North Carolina Brownfields Program (“Brownfields Program”). Administered by the North Carolina Division of Waste Management (“DWM”), it allows prospective non-contaminating developers to negotiate an agreement to make that site suitable for reuse, rather than requiring them to clean up the site to expensive regulatory standards.<sup>30</sup> The agreement takes the form of a covenant-not-to-sue: the state agrees to limit the liability of the prospective developer to specific actions deemed essential to make the

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<sup>25</sup> *Why Should My School Go Solar?*, COMMUNITY POWER NETWORK, <http://www.communitypowernetwork.com/node/904> (last visited Jan. 4, 2016).

<sup>26</sup> *Why Renewable Energy?*, GREEN-E, [http://www.green-e.org/learn\\_re\\_why.shtml](http://www.green-e.org/learn_re_why.shtml) (last visited Jan. 4, 2016).

<sup>27</sup> *Clean Power Plan*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/cleanpowerplan>, (last visited Jan. 6, 2016).

<sup>28</sup> *Adoption of the Paris Agreement*, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (Dec. 12, 2015), <http://unfccc.int/resource/docs/2015/cop21/eng/109.pdf>.

<sup>29</sup> *Brownfields Program FAQs*, N.C. DIV. OF WASTE MGMT., <http://portal.ncdenr.org/web/wm/bf/faqs#9> (last visited Jan. 4, 2016).

<sup>30</sup> *Brownfields Program Background*, N.C. DIV. OF WASTE MGMT., <http://www.ncbrownfields.org/web/wm/bf/program> (last visited Jan. 4, 2016).

property safe for reuse, and the prospective developer agrees to carry out these actions.<sup>31</sup> This makes financing the project much more feasible because it sets a clear, defined plan for cleanup rather than leaving the redeveloped project subject to potentially open-ended liability.<sup>32</sup> The prospective developer must show that the proposed reuse has a “public benefit commensurate with the liability protection provided.”<sup>33</sup> These benefits can include job creation, tax base improvements, improving blighted areas, and community and environmental benefits.<sup>34</sup>

Another initiative addressing the problem of brownfield sites is the Voluntary Cleanup Program (“VCP”), also administered by the DWM. The VCP helps parties who are responsible for hazardous contamination voluntarily clean up the site, making this program distinct from the state’s Brownfields Program.<sup>35</sup> The program emphasizes cleanup, rather than redevelopment and reuse, and lacks a public benefit component, but it nonetheless can restore property value by removing the site’s contamination, making later redevelopment more viable.<sup>36</sup>

The Brownfields Program has 353 finalized projects from all over the state, 170 eligible projects, and twenty projects pending eligibility.<sup>37</sup> In addition to the agreement under the Brownfields Program limiting liability, many of these projects received federal grant money and property tax exclusions.<sup>38</sup> This successful program has helped developers transform blighted property, but there are still many brownfields in the state that remain to be redeveloped or reused.

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<sup>31</sup> N.C. GEN. STAT. § 130A-310.32 to § 130A-310.33 (2013).

<sup>32</sup> *Brownfields Program Background*, *supra* note 29.

<sup>33</sup> § 130A-310.32(a)(3).

<sup>34</sup> *Brownfields Property Application*, N.C. DIV. OF WASTE MGMT., [http://portal.ncdenr.org/c/document\\_library/get\\_file?uuid=d7bfd899-d7a6-4513-bb94-0a013ad60140&groupId=38361](http://portal.ncdenr.org/c/document_library/get_file?uuid=d7bfd899-d7a6-4513-bb94-0a013ad60140&groupId=38361) (last visited Jan. 8, 2016).

<sup>35</sup> *Brownfields Program FAQs*, N.C. DIV. OF WASTE MGMT., <http://portal.ncdenr.org/web/wm/bf/faqs#5> (last visited Jan. 8, 2016).

<sup>36</sup> *Id.*

<sup>37</sup> *Brownfields Program Project Inventory*, N.C. DIV. OF WASTE MGMT., <http://portal.ncdenr.org/web/wm/bf/projectinventory> (last visited Jan. 4, 2016).

<sup>38</sup> *Brownfields Program Tax Incentives*, N.C. DIV. OF WASTE MGMT., <http://portal.ncdenr.org/web/wm/bf/incentivesfaq> (last visited Jan. 8, 2016).

## V. North Carolina as a Leader in Utility Scale Solar Production

North Carolina has approximately 1.04 Gigawatts (“GW”) of solar PV powering the state.<sup>39</sup> It is a national leader in solar energy production, ranking second in installed solar PV capacity in 2014, after California, and fourth nationally in cumulative solar capacity.<sup>40</sup> Utility scale solar power facilities are different from other smaller types of solar facilities because they are larger and more efficient, taking advantage of economies of scale, and the electricity produced is sold to wholesale utility buyers rather than end-use consumers.<sup>41</sup> The vast majority of solar PV in North Carolina comes from utility scale solar with nearly four GW of utility solar under development.<sup>42</sup> The state currently has 150 utility scale operational facilities with a capacity of one MW or more and more than 189 solar companies.<sup>43</sup>

The solar industry has benefited North Carolina’s economy by creating new jobs at a steady rate: in 2014, it was responsible for 19% of full-time equivalent jobs in the state.<sup>44</sup> Between 2007 and 2014, \$2.7 billion was invested in clean energy infrastructure in North Carolina.<sup>45</sup> Solar energy and clean technology are an important part of the state’s economy and will continue to be so in the future.

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<sup>39</sup> *Market Intelligence*, NC SUSTAINABLE ENERGY ASS’N, <http://www.energync.org/?page=MarketIntelligence> (last visited Jan. 6, 2016).

<sup>40</sup> *Solar Industry Data*, SOLAR ENERGY INDUSTRY ASS’N, <http://www.seia.org/research-resources/solar-industry-data> (last visited Jan. 6, 2016).

<sup>41</sup> *Utility-Scale Solar Power*, SOLAR ENERGY INDUSTRY ASS’N, <http://www.seia.org/policy/power-plant-development/utility-scale-solar-power> (last visited Jan. 6, 2016).

<sup>42</sup> Lukas Brun, Danny Hamrick & Jack Daly, *The Solar Economy: Widespread Benefits for North Carolina*, DUKE CENTER ON GLOBALIZATION, GOVERNANCE & COMPETITIVENESS (Feb. 2015), [http://www.cggc.duke.edu/pdfs/02152015Duke\\_CGGC\\_NCSolarEnergyReport.pdf](http://www.cggc.duke.edu/pdfs/02152015Duke_CGGC_NCSolarEnergyReport.pdf).

<sup>43</sup> *North Carolina Solar*, SOLAR ENERGY INDUSTRY ASS’N, <http://www.seia.org/state-solar-policy/north-carolina> (last visited Jan. 6, 2016).

<sup>44</sup> *North Carolina Clean Energy Industry Census: 2014*, N.C. SUSTAINABLE ENERGY ASS’N (Feb. 2015), <http://c.ymcdn.com/sites/www.energync.org/resource/resmgr/Docs/2014census.pdf>.

<sup>45</sup> *Id.*

One major reason that North Carolina is a leader in solar production is the Renewable Energy Portfolio Standards (“REPS”) passed by the North Carolina General Assembly in 2007.<sup>46</sup> These standards set a minimum of how much energy the state’s utilities must source from renewable energy, which is scheduled to be 12.5% in 2021.<sup>47</sup> This has led North Carolina utilities such as Duke Energy to invest in large-scale solar projects. Duke Energy announced in September 2014 that it would commit to investing \$500 million in North Carolina’s solar power expansion by building three solar farms and purchasing the energy from five others, with a total capacity of 278 MW.<sup>48</sup> This commitment to utility solar shows that there are significant incentives to develop solar PV in the state, and the industry is projected to grow over the next several years. In addition to utilities, large corporations like Apple, Ikea, and Verizon have installed sizable solar facilities within the state; Apple’s Data Center Solar Farm in Maiden has a generating capacity of twenty MW, or enough energy to power the equivalent of 2,200 homes.<sup>49</sup> Unfortunately, the 35% state tax credit expired in December 2015, which will no doubt hurt the solar market in the state.<sup>50</sup> The REPS remain active, however, maintaining a growing need and market for solar energy.

## **VI. The Future of Brightfields in North Carolina**

Under North Carolina’s Brownfields Program, brightfield development—reusing contaminated land for solar PV production—presents a solution that would accomplish the program’s goals while simultaneously helping the state meet its renewable energy standards. It

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<sup>46</sup> Jeffery C. Billman, *North Carolina’s Solar Industry is Booming. So Why are State Republicans Threatening to Strangle it?*, INDY WEEK (June 3, 2015), <http://www.indyweek.com/indyweek/north-carolinas-solar-industry-is-booming-so-why-are-state-republicans-threatening-to-strangle-it/Content?oid=4475291>.

<sup>47</sup> N.C. GEN. STAT. § 62-133.8 (2013).

<sup>48</sup> Press Release, Duke Energy, Duke Energy Commits \$500 Million to North Carolina Solar Power Expansion, (Sept. 14, 2014), <http://www.duke-energy.com/news/releases/2014091501.asp>.

<sup>49</sup> *North Carolina Solar*, *supra* note 42.

<sup>50</sup> Ned Barnett, *North Carolina Lets Sun Set on Solar Tax Credit*, THE NEWS & OBSERVER (Oct. 10, 2015, 2:29 PM), <http://www.newsobserver.com/opinion/opn-columns-blogs/ned-barnett/article38700429.html>.

would provide a significant public benefit by bringing jobs to the surrounding communities where brightfields are located, utilizing underused land, and protecting the environment by putting clean energy on the power grid.

Reusing idle land for brightfields would take advantage of the well-established solar industry infrastructure that already exists in the state. North Carolina's profitable and growing solar energy production industry, particularly at utility scale, logically couples with brownfield reuse as a way to bring additional financial incentives to reuse projects. Typically, the more contaminated a site is, the more it costs to clean up.<sup>51</sup> That cost can be brought down by reusing contaminated land for solar production because the activity requires minimal penetration into the soil and very little onsite operation and maintenance.<sup>52</sup> It would make idle land productive without heightened risk of exposure to contaminants to the general public and would allow a prospective developer to safely clean up a site and not be liable for complete cleanup.<sup>53</sup> Funding for North Carolina brightfields could be supplemented by North Carolina tax incentives and EPA grants for brownfield redevelopment. These, coupled with the limited liability accorded by the Brownfields Program, would make securing financing more likely. Tax credits for solar production and revenue from selling the generated electricity and the associated Renewable Energy Credits could further incentivize brightfield development.<sup>54</sup>

Brockton Brightfield in Brockton, Massachusetts is an example of a successful brightfield reuse project that could be used as model in North Carolina.<sup>55</sup> The site of the Brockton Gas Works plant that closed in 1963 was classified as a brownfield site due to toxic contamination

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<sup>51</sup> *Id.*

<sup>52</sup> Morley, *supra* note 17.

<sup>53</sup> N.C. GEN. STAT. § 130A-310.32 to § 130A-310.33 (2013).

<sup>54</sup> Morley, *supra* note 17.

<sup>55</sup> Christopher De Sousa & Thierry B. Spies, *Brockton Brightfield, Brockton, Massachusetts: A Sustainable Brownfield Revitalization Best Practice*, U. ILL. INST. ON ENVTL. SCI. AND POL'Y (May 10, 2013), <https://www.uic.edu/orgs/brownfields/research-results/documents/BrocktonBrightfield-finalforposting-May102013.pdf>.

found in the soil.<sup>56</sup> Remediation involved capping the property eighteen inches below the surface, which both limited reuse options and made solar development attractive because the panels would not need to go deeper than that depth into the soil.<sup>57</sup> The environmental benefits of the project have been significant: the 460 kilowatt system produces 580 megawatt-hours annually and reduces annual emissions by 677,000 pounds of carbon dioxide, 1,200 pounds of sulfur oxide, and 315 pounds of nitrogen oxide, all while emitting no noise or odor.<sup>58</sup> The project also generates \$145,000 in annual revenue for the city of Brockton, which owns the system, and is projected to produce profits for ten to thirty years.<sup>59</sup> It has resulted in a positive outcome for the community as a solution to make blighted, abandoned land safe and attract high-tech jobs.<sup>60</sup>

As an aid to identifying prospective candidates for brightfield redevelopment similar to the Brockton site, EPA, in collaboration with DOE, has recently created the RE-Powering America's Land Initiative, which includes an interactive map showing contaminated sites with brightfield reuse potential throughout the United States.<sup>61</sup> It shows many such sites within North Carolina—both large and small—ranging from the coastal plain to the mountains and from urban to rural areas.<sup>62</sup> In addition to the interactive map, the website offers other tools to assist in initial screening of promising brightfield sites. These include an electronic decision tree that takes into account site characteristics, redevelopment considerations, energy load, and policies and financial considerations.<sup>63</sup> With these new tools, coupled with federal and state incentives and

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<sup>56</sup> *Id.*

<sup>57</sup> *Id.*

<sup>58</sup> *Id.*

<sup>59</sup> *Id.*

<sup>60</sup> Robert Hersh, *Promoting Solar Power on Brownfields in Brockton, Massachusetts*, CENTER FOR PUB. ENVTL. OVERSIGHT (Oct. 2010), <http://www.cpeo.org/pubs/Brockton.pdf>.

<sup>61</sup> *RE-Powering Mapping and Screening Tools*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/re-powering/re-powering-mapping-and-screening-tools> (last updated Oct. 8, 2015).

<sup>62</sup> *Id.*

<sup>63</sup> *Id.*

programs, North Carolina is well poised to continue making brownfields a viable reality in the state, offering a positive alternative solution for brownfield reuse.