

# **Investment Principles and Opportunities for the North Carolina Clean Energy Fund**

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## Disclaimer

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# Executive Summary

This report outlines investment principles for the North Carolina Clean Energy Fund (NCCEF) and evaluates the extent to which selected investment opportunities align with these principles. NCCEF is a not-for-profit financial institution that operates on the “green bank” model successfully pioneered in other states, including Connecticut, New York, and Michigan. Green banks are financial organizations that use market-based approaches to drive investment in clean energy, energy efficiency, and other sustainable sectors.

With the assistance of the Coalition for Green Capital (CGC), a national green bank advocacy group, NCCEF was incorporated as a non-profit organization in October 2020. It has a six-member board of directors but has not secured initial funding or hired employees at this time. Once funded and staffed, NCCEF will seek to identify unserved and underserved clean energy opportunities and work with a variety of stakeholders to structure finance solutions to bring those opportunities to fruition.

The report is divided into two sections. The first section recommends a set of investment principles to help NCCEF evaluate early investment opportunities.<sup>1</sup> Although the principles may remain relevant over time, they are intended to guide NCCEF’s earliest efforts. These recommendations were informed by interviews with executives at existing U.S. green banks and by conversations with North Carolina policy makers, clean energy professionals, and other interested stakeholders (for a full list of interviewees, see [Appendix A. Methodology](#)). The principles are summarized in Table 1 below.

**Table 1: Investment Principles for the North Carolina Clean Energy Fund**

Principles	Details
<b>Low-Hanging Fruit &amp; Easy Wins</b>	Initial investments should be straightforward – priority should be placed on investments which require low effort and light administrative load. NCCEF should adopt existing green bank program models and products.
<b>Profitability &amp; Stability</b>	Initial investments should be low-risk and profitable. NCCEF should prioritize building organizational strength over solving specific problems.
<b>Scalability &amp; Network</b>	Initial investments should be replicable. NCCEF should prioritize investments which help to build a network of trusted partners.
<b>Momentum &amp; Future Funding</b>	Initial investments should raise the profile of the organization. NCCEF should consider the extent to which an investment may help to unlock future funding.

The first section also includes a selection of best practices that green bank executives shared from their start-up phases. These include: Issuing an open request for proposals (RFP), establishing

<sup>1</sup> The term “investment opportunities” is used loosely in this report; it refers to both financial investments and non-financial activities which require NCCEF to invest time and resources.

quality control procedures for partner contractors, investing early in internal technology platforms, and building a team with a diverse skill set.

The second section presents three case studies on possible investment areas for NCCEF: Commercial and industrial, community solar, and municipal partnerships. Case study topics were selected at the request of the NCCEF board, which has identified over 20 potential “focus options” for 2021. Each case study reviews existing green bank efforts in the sector and evaluates the extent to which one “featured opportunity” for the N.C. market aligns with the principles above. Table 2 below summarizes the case study findings.

**Table 2: Case Study Sectors and Featured Opportunities**

Sector	Featured Opportunity	Alignment with Principles
<b>Commercial &amp; Industrial</b>	Expand third-party solar ownership	High
<b>Community Solar</b>	Offer no cost subscriptions for LMI customers	Low
<b>Municipal Partnerships</b>	Net-zero new construction multifamily lending	Medium

A key assumption underlying this report is that NCCEF will receive start-up funding in 2021 and hire 2-3 key employees. No assumption is made about the source of NCCEF’s funds. In February 2021, however, the Clean Energy and Sustainability Accelerator Act (H.R.806) was introduced in the U.S. Congress.<sup>1</sup> Among other things, the act would create a \$100 billion financing organization – the Accelerator – to act as a national green bank.<sup>2</sup> The Accelerator would invest directly in qualifying projects but also provide funds and technical assistance to sub-national green banks. Though NCCEF is seeking funding from a variety of sources, it is preparing itself to quickly deploy capital should the Accelerator come to fruition. This report is meant to help NCCEF focus its near-term efforts, evaluate potential opportunities, and move swiftly with any capital it receives.

<sup>2</sup> The “American Jobs Plan”, [announced March 31](#), also calls for \$27 billion for a Clean Energy and Sustainability Accelerator.

## Issue Background

### Climate Change, Clean Energy, and Capital Investment

Broad scientific consensus confirms that climate change poses an immediate threat to human life, healthy communities, and critical infrastructure. According to the UN's Intergovernmental Panel on Climate Change, the United States must be carbon neutral no later than 2050 in order to do its part in limiting global temperature rise to 1.5° Celsius and averting the worst effects of climate change.<sup>ii</sup> Achieving carbon neutrality requires a suite of policies across a range of sectors, from transportation to electricity production to agriculture and industry. Though each sector poses its own unique challenges, nearly every climate solution requires major capital investments. Put simply: Reducing emissions is expensive.

The IPCC estimates that limiting global temperature rise to 1.5° Celsius would require \$2.4 trillion of global annual investment for the next 15 years.<sup>iii</sup> In the United States, that translates to approximately \$300 billion a year over the next 15 years.<sup>iv</sup> While U.S. clean energy investment has increased in recent years, a large gap remains: In 2020, the United States invested just \$50 billion in the clean energy sphere, leaving an annual investment gap of roughly \$250 billion.<sup>v</sup>

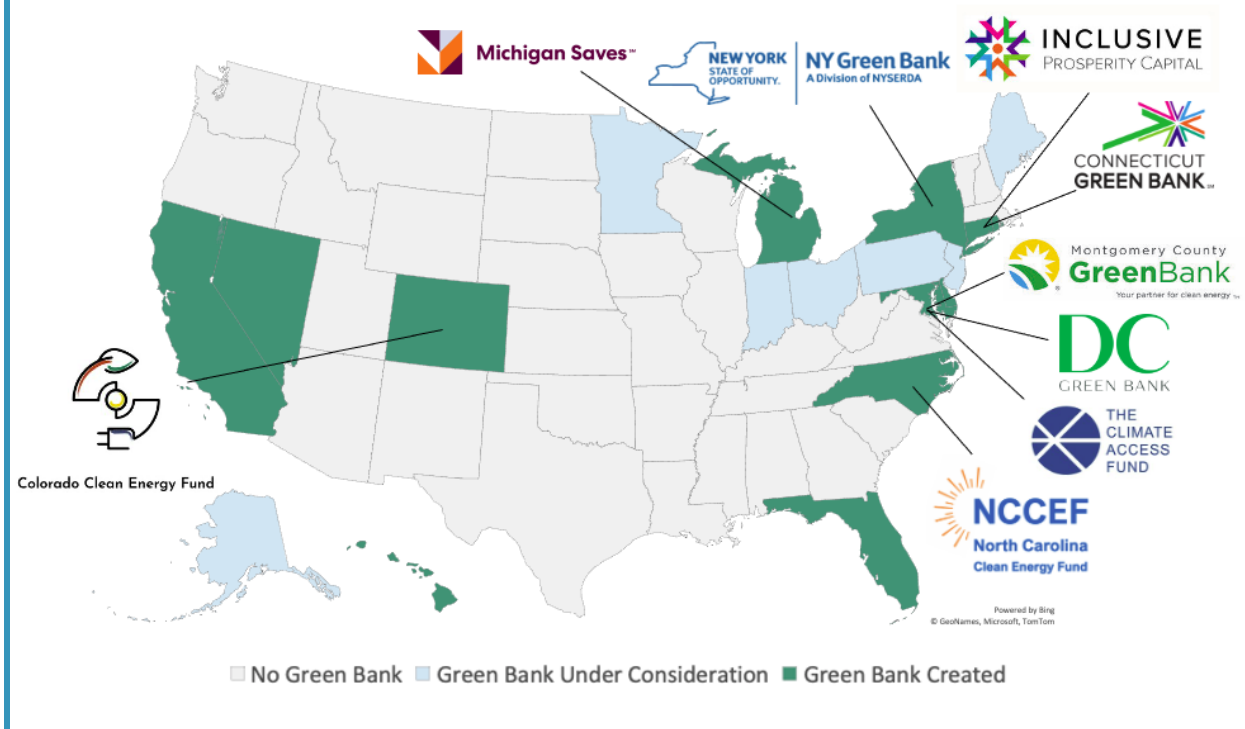
Green banks are an emerging solution to insufficient clean energy investment. Alternatively known as clean energy funds, green banks are financial organizations designed to facilitate investment into energy efficiency, clean energy, or other sustainable sectors. Unlike traditional banks, green banks do not take deposits. Rather, they design, administer, and offer financial products which help to overcome investment barriers and fill the gaps where traditional financial institutions cannot or do not participate.

Green banks are not meant to compete with the private sector, nor do they invest in projects where financing is readily available. Instead, green banks work to complement the private sector and “crowd-in” private capital for green investments. Ideally, green banks will cease operations in sectors where they have successfully facilitated sustainable levels of private sector participation.

Since 2011, fifteen green banks have formed across the United States and invested a cumulative \$5.3 billion.<sup>vi</sup> Common U.S. green bank investments include community solar projects, large commercial clean electricity, and public, non-profit, and residential energy efficiency projects. These investments bring a range of benefits including reducing greenhouse gas emissions, lowering consumer energy burdens, catalyzing new markets, and supporting local economic development and job creation.

## U.S. Green Bank Landscape

Green banks are diverse in geographic scope, organizational form, and market focus. Some green banks, such as Connecticut Green Bank and New York Green Bank, are quasi-public organizations. Others, such as Michigan Saves and NCCEF, are private non-profit organizations. To date, all operating U.S. green banks have been capitalized with some level of public funding.



### North Carolina Context

Efforts to launch a N.C. green bank have been several years in the making. In 2018, N.C. Governor Roy Cooper signed Executive Order 80 (EO80), a commitment to address climate change and transition to a clean energy economy.<sup>vii</sup> The order directed the Department of Environmental Quality to create a comprehensive Clean Energy Plan and the Department of Transportation to create a similar Zero Emissions Vehicle Plan. Following a yearlong research, analysis, and stakeholder engagement process, the departments released their respective plans for transforming the state's energy and transportation sectors and meeting the ambitious goals laid out in EO80. Both plans identified the establishment of a green bank or clean energy fund as a top recommendation. In response to these recommendations, NCCEF incorporated as a non-profit organization in October 2020.<sup>3</sup>

NCCEF's ability to secure funding and quickly operationalize has taken on a new urgency as the state's economy reels from the COVID-19 health crisis. North Carolina's clean energy sector has

<sup>3</sup> It is important to note that though NCCEF formed partly in response to these recommendations, it is not a state-sponsored organization.



been an important engine for job growth, employing over 100,000 workers at the end of 2019 and growing 50% faster than overall statewide employment.<sup>viii</sup> As of August 2020, however, North Carolina had lost nearly 19% of its clean energy jobs since the onset of the pandemic, and over 20,000 clean energy workers in the state were unemployed.<sup>ix</sup>

Evidence from existing green banks suggests that, with proper funding, NCCEF could help revitalize the clean energy industry, stimulate job recovery, and support continued job growth. Since 2012, Connecticut’s Green Bank (CGB) has generated over 20,000 direct and indirect job years, while Rhode Island’s Public Infrastructure (RIIB) bank has created and supported over 62,000 jobs in the state.<sup>x</sup> NCCEF would not only help the state meet its ambitious environmental goals but could also spur job growth in a time of urgent need.

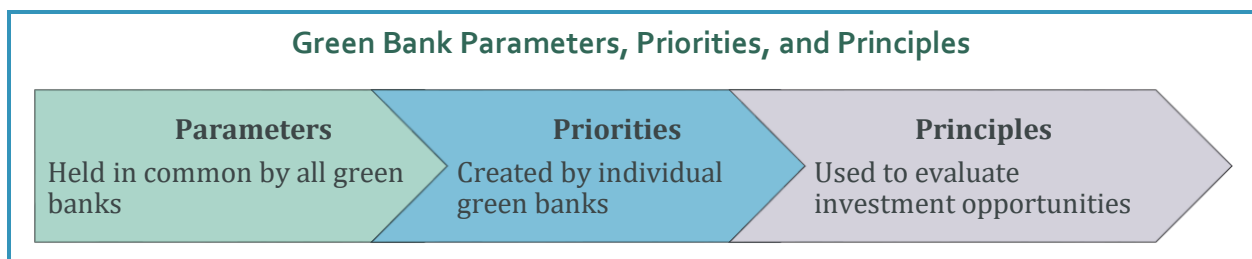
NCCEF is pursuing a range of funding opportunities. In particular, it is hopeful for federal funding. In February 2021, the Clean Energy and Sustainability Accelerator Act (H.R.806) was introduced in the U.S. Congress. Among other things, the act would create a \$100 billion financing organization – the Accelerator – to act as a national green bank. It is estimated that the Accelerator would drive \$463 billion in total investment in four years due to private sector leverage and create four million jobs over the same time period.<sup>xi</sup> The American Jobs Plan, announced March 31, also calls for \$27 billion to establish a Clean Energy and Sustainability Accelerator.<sup>xii</sup> The likelihood of success for either of these proposals is unclear. Nevertheless, NCCEF would like to prepare itself for potential federal funds and create a plan to quickly deploy capital in the N.C. market.

## Investment Principles

### Introduction

All green banks share a similar goal of addressing climate change and accelerating clean energy development. As a result, green banks operate within certain pre-established parameters. Broadly speaking, green bank activities should: Address financing gaps, improve private sector participation, and reduce greenhouse gas emissions or accelerate clean energy development.

Individual green banks also create organizational objectives and priorities which may narrow these broad parameters. NCCEF, for example, prioritizes investments which support “climate resilience” and those which benefit “underserved populations”. Within these broad parameters and organizational objectives, green banks may use various principles to evaluate the attractiveness of different investment opportunities. The principles outlined in this report, which draw on the experience of other green banks, are intended to help NCCEF ensure that its initial investments support its long-term growth and sustainability.





## Low-Hanging Fruit & Easy Wins

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“Early on, we’re trying to pick off the low-hanging fruit. We’re asking: ‘what are the relatively low effort ways for us to be out in the market?’” – Jay Lurie, DC Green Bank CIO

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Newly launched green banks face the same types of challenges as any start-up organization: Staffing, technology, and operations, to name a few. In interviews, green bank executives stressed the importance of being intentional with their first transactions and easing into the market. “Picking your spots early where you can have success getting easy wins on the board is so important,” said Inclusive Prosperity Capital (IPC) CEO Kerry O’Neill.

For their first activities, green banks often seek to adopt proven products from other green banks. IPC, which spun out of the Connecticut Green Bank (CGB), offers other green banks the “easy” decision to adopt CGB’s exiting Smart-E Loan Program.<sup>4</sup> By replicating the existing product in partnership with IPC, green banks will be able – as O’Neill put it – “to stand on others’ shoulders,” and begin to scale quickly and cost-effectively.

Low-hanging fruit also relates to sectors. It is often easier to address sectors with high emissions than ones with low emissions. In Washington DC, for example, buildings account for over 50% of the city’s total emissions.<sup>xiii</sup> In DC, buildings were thus the low-hanging fruit to be plucked first.

Similar to IPC, DC Green Bank decided to “borrow” its first product – the Commercial Loan for Energy Efficiency and Renewables Program (CLEER) – from the Montgomery County Green Bank (MCGB).<sup>5</sup> CLEER was a proven program which required minimal effort for the DC Green Bank to implement. “[CLEER] is a structure that’s already designed. It’s a way to work with local banks. We said: let’s just take this as one of our products,” said DC Green Bank CIO Jay Lurie.

**Summary:** *NCCEF should seek out low-effort ways to enter the market. It should adopt proven green bank products and, to the extent necessary, tailor them to fit local needs and problems.*

## Profitability & Stability

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“Transactions will have expected financial returns such that the revenues of NYGB on a portfolio basis will be in excess of expected portfolio losses.” – NYGB Key Criteria 1

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Not every green bank transaction must be profitable. NCCEF can, if it chooses, undertake activities which generate no revenue (such as providing zero interest loans) or even cost money (such as providing subsidies). As NYGB’s criteria demonstrates, such losses may be acceptable so long as – on a portfolio basis – revenue is positive.<sup>xiv</sup>

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<sup>4</sup> The Smart-E program is a loan product that provides financing for over 40 home energy improvements.

<sup>5</sup> CLEER is a loan loss reserve fund product. MCGB and DC Green Bank insure partners lenders against borrower defaults in order to expand energy efficiency loan options for C&I properties, non-profits, and multifamily buildings.

At NCCEF's outset, however, profitability should take on added significance: It has no existing revenue to balance out losses. Thus, NCCEF should prioritize low-risk, proven investments which will lead to positive expected financial returns.

NCCEF should not only prioritize profitable investments, but ones which help build stability within the organization. Many interviewees noted that their first transactions were less geared toward solving a specific problem than toward building up the organization's internal capacity.

For Michigan Saves, offering credit enhancements at its outset created more room to focus on internal procedures. At the time, the organization had little capacity to originate or service loans. "The credit enhancement structure was something where we could allow the lenders to do [origination and servicing]. And we could build the program. It allowed us to really focus, stabilize, and grow," said Michigan Saves CEO Mary Templeton.

Local stakeholders also wished to see NCCEF focus on its own profitability and stability. One policy professional neatly summarized a sentiment expressed by several others: "The most important thing is for the green bank to get up and running and be financially solvent. There's plenty of time to invest in . . . any particular sort of topic. Right now, I'd prioritize investment that would lead to growth and profitability and upward trajectory."

**Summary:** *NCCEF should seek out low-risk, proven investments which will lead to positive expected financial returns to cover the cost of operations. It should prioritize organizational stability over solving specific problems.*

## Scalability & Network

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"If you want to scale and have [a significant] level of impact, you have to have standardized approaches to the market." – Kerry O'Neill

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At their outset, green banks face an important trade-off between investing in projects versus offering or administering standardized products. Projects are individual, while products are replicable – they have consistent terms and rely on a robust network of partners.

Offering standardized products and recruiting the necessary partners may require more upfront work than assisting an individual project. Yet interviewees insisted that the initial time investment pays dividends in the future.

More than one interviewee, however, cautioned against the "if you build it, they will come" approach to financing. In other words, simply copying a finance technique – such as creating a loan loss reserve fund – is not enough. To effectively deploy its capital, NCCEF must adopt a holistic financing program which includes, among other things, competent contractor and lending partners, an outreach strategy with clear marketing messages, and easy application processes for customers.

Interviewees strongly valued early efforts to build the network of partners necessary to implement an effective program. Healthy contractor partnerships are especially important. Through their interactions with customers, contractors provide organic marketing for a green bank's products,

reducing costs and lowering administrative load. “Building out our contractor network was essential for us. . . we focused on developing affordable and accessible loan offerings to make it easy for customers to choose high efficiency equipment,” said Templeton.

By investing in individual projects, a green bank may provide the perfect answer to a singular problem. But by offering standardized products, a green bank can create a workable solution to a market problem – scaling its efforts and amplifying its impact.

**Summary:** *NCCEF should seek out standardized products which can be replicated to achieve scale. It should further prioritize products which help to build out a network of strategic partners.*

## Momentum & Future Funding

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“We did press events with the governor, local officials, and community leaders. We had local case studies, customer stories, and invested in outreach in communities to build momentum.” – Mary Templeton

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Interviewees encouraged early activities which can drive media coverage or otherwise build momentum. Projects that may spark media interest include ones with prominent local businesses, important buildings, or other areas noteworthy to the public. DC Green Bank’s first construction loan, for example, was directed to low-income housing, an area of particular concern in DC. “That’s gotten a lot of press . . . That’s a big win in terms of getting the word out there [about DC Green Bank],” said Lurie.

Though interviewees did not specify media coverage as a top priority, they did underscore the significance of raising their organization’s profile to both drive inbound opportunities and define its market role. “You definitely want to identify yourself as a lender early, and not as a subsidy source, because a lot of times the marketplace will try to push you to become a subsidy source,” said Montgomery County Green Bank CEO Thomas Deyo.<sup>6xv</sup>

Early momentum through media coverage can unlock new opportunities and help establish NCCEF as a lender. It may also be important as NCCEF seeks future funding. It is difficult, if not impossible, to know what investments NCCEF could make now which may increase its likelihood to receive funds from a future capital provider. As a North Carolina based organization, however, NCCEF may wish to seek support from the state legislature. Thus, NCCEF should consider the extent to which its initial activities align with state priorities. If NCCEF can demonstrate its ability to effectively leverage capital to meet state goals, it is all the more likely to find success should it seek legislative appropriations or support in the future.

**Summary:** *NCCEF should seek out opportunities which lead to positive press and help define its role in the market. It should keep a line of sight open to future funding opportunities and consider the extent to which its activities may increase its likelihood to receive those funds.*

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<sup>6</sup> Though Deyo was interviewed for this research, this particular quote did not come from the interview.

## Summary

In the world of finance, the investment principles presented here may be considered untraditional. Green banks, however, are not traditional financial institutions. All green banks share a similar mission, and, as a result, come premade with certain shared criteria and operational parameters. The principles here are intended to help NCCEF better navigate within those boundaries.

Although some of the principles will be applicable at any stage of NCCEF's existence, the recommendations above are meant to inform NCCEF's earliest efforts. Furthermore, these principles are difficult to quantify, and, at times, can be at odds with one another: A project may be likely to drive media coverage (positive momentum), but only because it is challenging (not an easy win). The principles, then, should not be viewed as a rigid evaluative framework. Rather, they present salient questions that NCCEF should ask in order to inform its decision making and evaluate its investments to ensure they support long-term growth and sustainability.

A final consideration remains: Depending on the source of its funding, NCCEF's priorities may shift in unexpected ways. After all, rare is the dollar that comes with no strings attached. In the words of Colorado Clean Energy Fund CEO Paul Scharfenberger: "That's just the nature of the color of money."

Different funders may have requirements or priorities of their own, leading NCCEF to focus on a specific technology, population, or sector. Before receiving capitalization funds, NCCEF may wish to avoid investing too much time in any one area. Once funded, it may have to reverse course and abandon – at least temporarily – the work it had already completed.

## Best Practices and Lessons Learned

Interviewees in this research shared common challenges and important lessons learned from their start-up phases. This section briefly highlights several common themes not captured in the investment principles above.

Newly launched green banks can generate "shovel-ready" projects by **issuing an open request for proposals (RFP)**. NCCEF could adopt language from existing green bank RFPs and publish its own with minimal effort. Though an open RFP does not guarantee high-quality submissions, it may still generate inbound opportunities or lead to new partnerships.

If NCCEF does issue an RFP, it must be prepared to **be responsive, have clear timelines, and manage expectations**. If NCCEF is unresponsive to proposals or over-promises, it may damage relationships or prematurely squander opportunities. "There's a really fine line between trying to identify shovel-ready projects and potentially mismanaging people's expectations," said Scharfenberger.

An open RFP may help to build NCCEF's contractor network. While having a strong network is important, green bank executives also mentioned that **maintaining high standards for that network is equally important**. "You want as many contractors as possible to have access to financing. At the same time, if you have bad actors, you have to nip them in the bud," said O'Neill.

NCCEF should closely vet contractors, be prepared to handle complaints, and create a clear framework to respond to contractor misconduct.

**Having the right technology solution** can help NCCEF manage not just its contractors, but all of its partners. Green bank executives recommended investing time upfront to explore various technology platforms and noted the perils of using the wrong platform. Adopting the wrong technology at the outset may lead to a dangerous type of path dependency, where it becomes difficult to switch from one platform that may not suit NCCEF’s needs.

Finally, all interviewees shared a universal challenge that is hardly unique to green banks: Staffing. Though there is no perfect solution to finding the right team, interviewees endorsed **building a team with a diverse set of skills**. “You can’t just have finance folks, or you can’t just have program folks, you need a mix, a cross-functional diverse team. Because these are complex areas,” said O’Neill.

## Case Studies

### Introduction

The following section presents three case studies on potential investment areas for NCCEF. Each case study includes background information on the issue area and provides a review of existing green bank efforts in that area. The case studies further highlight one “featured opportunity” for NCCEF and evaluate how that opportunity aligns with the principles recommended in this report. Finally, each case study features a Q&A section with a relevant stakeholder.<sup>7</sup>

The case studies are not investment recommendations. Rather, they are intended to contextualize broad market challenges and demonstrate how NCCEF might identify potential opportunities and operationalize the principles recommended in this report. The table below summarizes the case study findings.

Case Study Sectors and Featured Opportunities

Sector	Featured Opportunity	Alignment with Principles
<b>Commercial &amp; Industrial<sup>8</sup></b>	Expand third-party solar ownership	High
<b>Community Solar</b>	Offer no cost subscriptions for LMI customers	Low
<b>Municipal Partnerships</b>	Net-zero new construction multifamily lending	Medium

<sup>7</sup> All case study Q&A sections have been edited for clarity.

<sup>8</sup> Includes non-profit buildings.

# Commercial & Industrial Buildings

## Background

Technologies and products which improve building energy efficiency are readily available and financially viable: They are proven to reduce emissions, save building owners money, and increase real estate value.<sup>xvi</sup> Nevertheless, there are a number of barriers which impede cost savings and emissions reductions.

Financing is one barrier. In particular, lenders are often wary of small businesses operating on tight margins, and of new businesses without long operating records. Lenders also prefer, and are sometimes required, to offer secured loans. It is difficult to take a security interest in energy savings products such as insulation, lighting, and windows. Building owners may also be reluctant to offer physical property as collateral to secure an energy efficiency loan. Furthermore, the ongoing pandemic has disrupted cashflow for many retail businesses and office buildings. The tenuous economic recovery will almost certainly lead banks and credit unions to tighten underwriting criteria.

Non-financial barriers also limit implementation of building energy efficiency measures. Building owners may have limited knowledge of energy saving options. Energy efficiency savings may be realized over extended timelines which complicates matters for owners seeking short term profits. There may be split incentives between building owners – who approve energy efficiency projects – and renters or lessors, who pay the utility bills. Finally, energy efficiency improvements can be a hassle, involving complex choices for busy decision makers. As one energy efficiency professional with over 30 years of experience doing N.C. energy audits put it: “The biggest problem is time. The people we do [energy audits for] don’t have the mental bandwidth to make things happen. Even if the payback is weeks, days even.”

NCCEF cannot eliminate all of these barriers. There are, however, proven green bank products which effectively address financing barriers and, in some instances, other non-financial hurdles.

## Existing Green Bank Products

**Commercial Property Assessed Clean Energy (C-PACE):** C-PACE is a financing structure where building owners borrow money for energy efficiency, renewable energy, or other projects and make repayments through an assessment on their property tax bill. Green banks often serve as C-PACE administrators or otherwise work to help implement or expand C-PACE. C-PACE must be enabled by both state and local governments. Though North Carolina has statewide PACE enabling legislation, no municipalities have authorized C-PACE.<sup>9</sup> NCCEF could partner with local

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<sup>9</sup> In March 2021, [Senate Bill 358](#) was introduced in the North Carolina General Assembly. The bill seeks to enable a Commercial Property Assessed Capital Expenditures & Resilience (C-PACE) program at the state level, which would then allow local governments to opt-in and establish programs.

organizations such as the North Carolina Building Performance Association (NCBPA) to advance further legislation.

**Commercial Loan Loss Reserve Fund:** A loan loss reserve fund is a credit enhancement that protects lenders from the risk of borrower default. Loan loss reserve funds are a type of lending insurance. The reserve fund covers a prespecified amount of loan losses for partner lenders, reducing risk and encouraging them to loosen underwriting criteria, lower interest rates, or expand into unfamiliar markets or products. Loan loss reserve funds are one of the primary tools used by green banks and are commonly applied to the commercial market. NCCEF could “copy-paste” the CLEER Financing product offered by both Montgomery County Green Bank and DC Green Bank, or another commercial loan loss reserve fund from a different green bank. These are proven products, which are scalable, and can drive momentum for NCCEF by defining its role in the market.

### Featured Opportunity: Expand Third-Party Solar Ownership

Across the nation, third-party ownership (TPO) is one of the most popular financing methods for non-residential solar applications, accounting for 43% of the non-residential solar market 2019.<sup>xvii</sup> Third-party financing arrangements expand solar access by lowering the upfront costs of installing solar, simplifying the solar savings proposition, and eliminating the need to lend directly to a business or property owner. TPO is especially beneficial to tax exempt organizations, such as non-profits, as it allows tax-equity investors to pass tax-associated savings on to an organization that would otherwise not be able to benefit from solar tax incentives.

The most common third-party ownership models are a solar lease and solar power purchase agreement (PPA). Green banks such as IPC and CGB both offer solar PPAs and oversee the development and asset management of solar systems on qualifying buildings and properties.

Until 2017, third-party ownership was not permitted in North Carolina. House Bill 589 (HB589), passed that year, created a framework for solar leasing (third-party PPAs are still prohibited).<sup>xviii</sup> The framework, however, remains complex. Companies interested in offering solar leases must apply to the N.C. Utilities Commission (NCUC) for a certificate authorizing them as a solar lessor and work with a NCUC-approved lender as well. Due in part to these administrative hurdles, only six companies have registered with the NCUC as lessors.<sup>10xix</sup>

There is a clear opportunity for NCCEF to expand the third-party leasing market. NCCEF could undertake several activities including:

1. Providing technical assistance to solar installers and lenders for their NCUC applications.
2. Providing resources, including consumer protection information, for building or property owners seeking a solar lease.
3. Connecting installers with lenders or investors who can finance installations.

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<sup>10</sup> This figure overstates the number of participating lessors. Two of the registered lessors are actually separate entities of the same company, Eagle Solar & Light. Two other registered lessors are financiers who provide capital only to Eagle Solar & Light. The two other registered lessors – Duke Energy Clean Energy Resources and Solfarm Solar Co. – do not appear to have completed any leasing projects.



4. Creating a loan loss reserve fund to create more attractive leasing rates and expand leasing eligibility.
5. Directly lending or co-lending to leasing projects.

### **Spotlight on Solar Leasing: Conversation with Scott Alexander of Eagle Solar & Light**



**Q: Can you tell me a little bit about Eagle Solar & Light?**

*A: ESL is active in NC, AL, and GA in the rooftop C&I space. We were the first company to be approved by the Utilities Commission to offer third party leasing. We've got 17 solar leases, mostly for tax exempt organizations here in North Carolina.*

**Q: How do you finance the leases?**

*A: We initially were funding leases out of our internal capital, but we ran out of tax appetite headroom fairly quickly. We now work with two capital suppliers, who separately were approved by the NCUC as lessors, who have tax equity investors, and they buy our leases. I'd love to have some more capital suppliers. I'd love to have a bunch, so I could shop leases around to get the best financing deal for our clients. But right now, we've got two buyers, and either they're taking the leases or not.*

**Q: How do you approach underwriting?**

*A: We haven't come across anybody we haven't done a lease for, but most of the leases we've done are for pretty big churches. So, the credit risk is pretty low. I mean, you look at a church in downtown Greensboro, it's been there 120 years, is the church going to go away? We're going to do a credit check, but as long as the credit history seems okay, then we don't have sophisticated underwriting. And that could probably be a little bit better.*

**Q: Have you had deals fall through because of a lack of financing?**

*A: Sometimes the lease costs are too high. It comes down to those capital requirements for the tax investors. They want to hit a certain hurdle rate. They're not going to lower that because they'll just put their money elsewhere. So there have been plenty of customers that say it's just not that good of a deal. We always try to make it work, but then it's not always financially viable.*

### **Principles Analysis**

*Low-hanging fruit & easy wins:*

Providing technical assistance and resources would be relatively easy. NCCEF could help an initial contractor and lender through the NCUC application process or even apply as a lender on its own. It could then use the lessons learned to create resources for future partners. Lending, co-lending, or creating a loan loss reserve fund would, of course, be more difficult. However, NCCEF could work with existing green banks to replicate their work and adopt a feasible product with less effort.

*Profitability & stability:*

Providing technical assistance is not necessarily a profitable activity. Offering resources and assistance, however, would help to build relationships and trust with various partners. These partnerships would likely lead to profitable investments should NCCEF decide to finance leases or create a loan loss reserve fund in the future.

### *Scalability & network:*

TPO is a demonstrably scalable solution to help commercial, industrial, and non-profit building owners access the benefits of solar energy. As mentioned above, this activity would help to build fruitful partnerships and expand NCCEF's network.

### *Momentum & future funding:*

Solely providing technical assistance and resources would not help to define NCCEF's role in the market. Insofar as these activities are a bridge to a more robust solar leasing product, then they likely remain worthwhile efforts to undertake.

## Summary

There are clear opportunities for NCCEF to create a product in this sector that is both profitable and scalable – expanding its network and driving positive momentum for the organization. In particular, the TPO market in North Carolina is underdeveloped relative to other states. Furthermore, several of the activities outlined above can be completed without incurring monetary costs. These activities can be undertaken immediately should NCCEF wish to. Further research is necessary to determine how municipal utilities and electric co-ops – who are not regulated by NCUC – treat TPO.

## Community Solar

### Background

A community solar farm or garden is a solar installation whose power is shared by individuals, businesses, and non-profits in the community. Customers either jointly own the solar facility or subscribe to a portion of the facility's output. Owners and subscribers are compensated for their share of the power production and typically receive credit on their electricity bills for the value of that power.

Community solar is an attractive alternative to rooftop solar, where individuals have solar panels physically installed on their roofs. Many people cannot access rooftop solar; they may rent their home, their roof may not be suitable for solar, or upfront costs may be too high. In particular, community solar is seen as a way to expand the economic and environmental benefits of solar energy to low-to-moderate income (LMI) customers. These customers are more likely to be renters or to live in multifamily buildings. They may also not have the upfront capital or the credit profile to install solar panels on their home.

North Carolina has the third most solar power of any state in the country, but the majority of its solar is utility-owned; it is ranked 30th in installed community solar.<sup>xx</sup> The slow community solar growth can be attributed to the state's community solar policies. HB589, passed in 2017, requires Duke Energy to offer 40 megawatts of community solar in North Carolina.<sup>xxi</sup> Yet, to date, Duke has not constructed a community solar facility.

There are two provisions in HB589 which hamper community solar development. First is the provision that the community solar program will "hold harmless" Duke Energy customers who are not community solar subscribers. This provision has been interpreted to mean that Duke cannot

use money from other ratepayers to advance its community solar program. As a result, no funds are available to advertise a community solar program or recruit subscribers. The second restrictive provision is that subscribers will be compensated at the utility's avoided cost rate. A utility's avoided cost is its incremental cost to generate an additional unit of electricity. The avoided cost rate is lower than the retail rate that commercial and residential solar projects receive, and, in other states, community solar subscribers are compensated at much higher rates.<sup>11</sup>

The community solar development that has occurred in North Carolina has been led by electric cooperatives and municipal utilities. North Carolina has 31 electric membership cooperatives (EMCs) and 72 municipal electric utilities which cover one third of the state's population.<sup>xxii</sup> These organizations are often self-regulating and can implement community solar programs without legislative or regulatory action. Approximately 15 separate utilities currently offer community solar programs to their customers.<sup>xxiii</sup>

Despite the community solar development by municipal utilities and electric cooperatives, this research did not reveal a clear community solar market opportunity for NCCEF.<sup>12</sup> Interviewees were pessimistic about the future of community solar without any major policy changes. "The current policy environment is totally unworkable," said one solar developer. Importantly, no one interviewed for this case study cited the availability of low-cost capital as a primary barrier to community solar development.

### Existing Green Bank Products

**Direct lending or co-lending to community solar projects:** Green banks can lend directly to community solar projects or lend in conjunction with tax-equity partners. Loans can differ in size, time frame, and purpose. New York Green Bank (NYGB), for example, offers short-term financing for interconnection payments that developers must pay to utilities well before project construction begins. It also offers long-term financing structures with flexible terms to account for the variable cash flows associated with a community solar project. Both of these solutions are tailored specifically to the New York market.<sup>xxiv</sup>

**Guarantee fund for solar developers:** A guarantee fund is similar to a loan loss reserve fund. Guarantee funds, however, are broader and can cover all types of potential project losses, not just borrower defaults. The Maryland Climate Access Fund (CAF) uses a guarantee fund that offers approximately \$150,000 per 2 MW community solar project.<sup>xxv</sup> The fund is intended to expand access to LMI customers and increase the savings benefits for those households. Similar to NYGB, CAF tailors its products to fit the particular policies and incentives in Maryland.

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<sup>11</sup> Minnesota, for example, applies a "value of solar" rate to community solar projects. The [value of solar formula](#) takes into account a number of variables, such as the environmental benefits of solar, in determining the rate at which community solar subscribers are compensated.

<sup>12</sup> This does not necessarily mean that there are no immediate market opportunities for NCCEF or that low-cost capital would not be helpful in certain instances.

### Featured Opportunity: Provide No-Cost Subscriptions for LMI Communities

Many existing community solar programs have dedicated carve outs which reserve a specific amount of the project’s capacity to LMI customers. N.C. utilities with current programs have struggled to attract subscribers for these slots. The dedicated LMI subscriptions are difficult to fill for a number of reasons, perhaps none more prominent than the fact that most N.C. community solar projects offer little financial benefit to the subscriber. Table 3 below summarizes an independent analysis of the financial benefits for seven N.C. community solar projects.<sup>xxvi</sup>

**Table 3: 20 Year Savings for one Community Solar Share for Selected N.C. Utilities**

Project	Type of Program	20 Year Savings	Payback Period
<b>Blue Ridge EMC</b>	Monthly Subscription	-487.92	Never
<b>Brunswick EMC</b>	Upfront Payment	112.89	17 years
<b>Cape Hatteras EMC</b>	Upfront Payment	-134.27	Never
<b>Fayetteville</b>	Monthly Subscription	188.34	1 years
<b>Piedmont EMC</b>	Monthly Subscription	-261.18	Never
<b>Randolph EMC (option 1)</b>	Upfront payment	-178.50	Never
<b>Randolph EMC (option 2)</b>	Monthly Subscription	-371.50	Never

Interviewees for this research were eager to see subsidies directed to LMI communities for community solar subscriptions. Such activity would be especially helpful for programs which require upfront payments to subscribe. With a free subscription to the Cape Hatteras program, for example, a customer would realize \$550 in lifetime savings over 20 years, versus the net loss they would incur if they subscribed regularly.

NCCEF could either provide direct subsidies from its own capital or apply for and administer outside funds for the same purpose. A model for this type of activity already exists. Along with the State Energy Office, the North Carolina Clean Energy Technology Center is administering CARES Act funding to fill community solar spots.<sup>xxvii</sup> Likewise, New York State has a “Solar for All” program that offers free community solar subscriptions to income-eligible participants.<sup>xxviii</sup> However, this program is run by NYGB’s authorizing agency – NYSERDA – and not by NYGB itself; it is unclear if other green banks provide direct subsidies for LMI community solar subscriptions. Though offering no cost subscriptions is the featured opportunity for this case study, it does not align with the principles recommended in this report.

## Community Solar Spotlight: Conversation with Lynn Heller of the MD Climate Access Fund



### **Q: How did CAF get started?**

*A: In 2015, the Maryland legislature passed a community solar law and set aside a certain percentage of the capacity for low to moderate income customers. But the legislation didn't take into account the way solar finance works. And I said, this is a great opportunity, but if we're not intentional about it, it's really not going to do anything – we're not addressing the financing model and not coming up with a scalable model for low-income community solar.*

### **Q: What products does CAF offer?**

*A: Our initial product was a guarantee fund, the idea being it would take away the risk for the developer of serving a low-income household as opposed to a non-low-income household. But the project economics are so tight that the guarantee wasn't enough. So, we said, okay, we'll raise lower cost capital and lower the cost of debt. Now we have these two products and are also experimenting with a community-based ownership model.*

### **Q: What challenges has CAF faced?**

*A: We're always pushing the envelope; we're not doing the easy projects. And developers, they've got a million other projects going on. If left to them, this would not be a top priority. We've realized that to really get things done, we need to play more of a development role. I'm not sure that model would work for state-affiliated green banks which can't be as nimble as we are. We have to push the envelope and dive really deeply into the market.*

### **Q: Are there any lessons learned you can share with NCCEF?**

*A: Be aware of what you're biting off. In terms of solar development, and this is probably true for all for commercial development, it takes forever. So don't be expecting quick wins.*

## Principles Analysis

### *Low-hanging fruit & easy wins:*

Using its own capital to provide subsidies to unsubscribed community solar shares would be relatively easy for NCCEF. It could simply make funds available to utilities who would then pass along money to individual subscribers. This activity, however, would likely not be considered a win.

### *Profitability & stability:*

Though granting money would certainly help LMI customers, it is neither profitable nor sustainable for NCCEF. Grants do not provide returns. Alternatively, NCCEF could apply for and administer grants from outside sources. Such activity would not necessarily be considered a loss. It would, however, be a time-intensive activity to undertake at NCCEF's outset. Grant applications are also speculative. Thus, this path would gamble the time and energy of a lean staff on an uncertain outcome.

### *Scalability & network:*

Granting money for this specific purpose is not scalable. There are a limited number of LMI spots available at existing community solar projects. With the right amount of subsidy, NCCEF could fill

100% of these spots. Furthermore, it is unclear how providing subsidies or administering grants would expand NCCEF's network.

#### *Momentum & future funding:*

Granting money to support community solar subscriptions may lead to some media coverage. A 2020 analysis found that community solar projects are the most frequently profiled type of green bank investment.<sup>xxix</sup> This type of coverage would not, however, raise the profile of NCCEF as an investor. Garnering publicity for its grant-making efforts may actually be detrimental to NCCEF: It could confuse the public about what NCCEF's market role is and contribute to it being seen as a subsidy source rather than an investor. It is unclear how providing subsidies or administering grants would help to unlock future funding.

## Summary

Beyond grant funding, interviewees offered several other ideas as to how NCCEF could accelerate community solar development. Suggestions included creating new arrangements for aggregating community solar projects, designing alternative methods to credit customers, or providing micro-loans to individual subscribers to buy into a project. Investigating the feasibility of these proposals was outside the scope of this research. Furthermore, the technical details of these ideas are less important than the fact that they would all be novel in North Carolina. In other words, NCCEF would undertake a first-of-its-kind financing arrangement. This could not be considered low-hanging fruit.

Community solar is, as one interviewee put it, "a tough nut to crack". As a lean start-up organization looking to move quickly and scale its efforts, NCCEF would do best to let someone else take a crack at the nut. If, in several years, NCCEF is fully staffed and operational, it may well play a transformative role in the community solar market. In the absence of major policy changes, the right opportunity does not seem to be present at this moment.

## Municipal Partnerships

### Background

Over 30 North Carolina municipalities have made public commitments to reduce greenhouse gas emissions or meet clean energy targets.<sup>xxx</sup> Even without public commitments, many more municipalities are motivated to reduce emissions or increase local clean energy production. These activities can improve local air quality, stimulate job growth, and save money on energy costs.

For some energy saving or generating projects, a municipality may have existing funds available in its budget. Other times, the municipality must take on debt. The state of North Carolina takes municipal debt seriously. Any municipality wishing to take on debt must apply to the Local Government Commission (LGC) for approval. The LGC is a part of the Department of State Treasurer and reviews all debt applications to determine the necessity of a project and the most expedient form of financing. It then reviews all projects to ensure the financing meets statutory requirements.<sup>xxxi</sup>

One of these requirements precludes municipalities from taking on unsecured debt. That is, a municipality must offer collateral – typically a physical asset or the promise of future tax payments



– in order to take on new debt. As noted in the prior case study, taking collateral in energy efficiency projects is often difficult.

Beyond the technical difficulty of taking on debt, all municipalities have competing internal priorities. In many cases, a municipality may have an excellent credit rating and access to low-cost capital. What it may lack, however, is staff capacity, technical resources, or the drive to complete energy related projects amidst competing priorities. “We frequently lack funds for energy efficiency projects, but that is an issue of prioritization rather than a lack of financing. If it were prioritized, we could finance [projects] because we have [a] good credit rating,” said one local government sustainability manager.

NCCEF could play a wide range of roles in helping municipalities meet their sustainability goals or otherwise reduce emissions.

### Existing Green Bank Products

**Third Party Solar Ownership:** Solar PPAs and leases are available to public buildings such as community centers, jails, town halls, and schools. Expanding the TPO market thus has the added benefit of assisting both the private and public sector. NCCEF could adopt existing green bank programs which are geared toward the public sector. CGB’s Solar Marketplace Assistance Program (MAP), for example, assists municipalities that lack resources and experience to procure solar for multiple sites at once.<sup>xxxii</sup>

**On-Bill Financing (OBF):** On-bill financing in a structure that allows customers to pay for energy upgrades through a monthly charge on their utility bill. Utilities typically partner with a third-party lender to provide the upfront capital for energy improvements. Because utility bills have high rates of repayment, this structure creates flexible financial offerings and increases access to more customers. Though any type of utility can offer OBF, green banks often work with municipal utilities to support these programs. Green banks can either provide capital or offer technical assistance and administrative support to help municipal utilities launch OBF programs.

### Featured Opportunity: Municipal Housing Authority Partnerships for Affordable, Net-Zero Housing

Like many states, North Carolina has a pressing need for more affordable housing. In 2018, approximately 30% of all N.C. households were cost burdened – defined as spending more than 30% of annual income on housing costs (including utilities). The issue is especially acute for low-income families: Housing costs are unaffordable for 50% of low-income owners and 60% of low-income renters.<sup>xxxiii</sup> Furthermore, housing stock that is considered affordable is older, more likely to need efficiency upgrades and, as a result, has higher than average utility costs. Older housing is also more likely to have excessive moisture, poor ventilation, and other issues associated with indoor asthma and poor health outcomes.<sup>xxxiv</sup>

Many green banks have products for existing multifamily buildings, several of which – including CLEER, PACE, and Solar PPAs – have been outlined above. There appear to be fewer green bank products for new multifamily development. Several states and municipalities outside of North Carolina, however, are prioritizing net-zero new multifamily construction. Net-zero construction



for multifamily applications has the dual benefit of reducing emissions and increasing high-quality housing stock that can provide long term savings to renters through reduced energy bills.

Individual municipalities and the state of North Carolina already incentive energy efficiency in new multifamily development. To be eligible for tax credits or low-cost loan programs from the North Carolina Housing Finance Agency, for example, developers must achieve ENERGY STAR Certification for new multifamily buildings.<sup>xxxv</sup> Along with ENERGY STAR, LEED is perhaps the most well-known building certification program. Yet both certification standards can leave energy efficiency improvements on the table. ENERGY STAR, for example, guarantees only a 10% efficiency improvement relative to comparable buildings build to code.<sup>xxxvi</sup>

One alternative certification that is growing in popularity is Passive House. Passive House is a high-performance, low energy use design and construction standard that has been well established in Europe and Canada since the 1970s. Interest in the United States has grown rapidly in recent years, as Passive House design has been shown to save up to 85% on heating and cooling costs and up to 60% on total energy use compared to conventional construction.<sup>xxxvii</sup>

A major barrier to Passive House adoption is limited access to financing.<sup>xxxviii</sup> Passive House project financing is commonly constrained by: Upfront cost premiums, limited U.S. data to prove operational savings, an inability by lenders to quantify the value of non-energy benefits such as enhanced resilience and occupant health, and a lack of standard methodology to underwrite to high performance.<sup>xxxix</sup> Passive House also does not have the same level of institutional or policy support as the more widely known building certification programs.

### Green Building Spotlight: Conversation with Michael Kapp, Architect



**Q: What is the market for Passive House in North Carolina like?**

*North Carolina has not seen very much Passive House building at all. There's just a handful of projects throughout the state that have been completed. Where it's really taking off is in New York, Pennsylvania, Oregon, Washington, and California. All of those states are pushing net-zero construction, and that's really where we all need to be in the construction world – either net-zero or net-positive.*

**Q: What are the common applications for Passive House?**

*For multifamily projects it's a slam dunk. That's where it's getting the lion's share of funding, especially in the Northeast. There are municipalities and states that are throwing money at this. It's obvious to them that this can be a big chunk of the energy efficiency puzzle. And one thing that we're seeing in a given multifamily project is that municipalities can offer affordable housing, using the Passive House technique, and charging rent that includes the cost of energy.*

**Q: What are the barriers to implementing passive house?**

*There's a general lack of understanding of energy efficiency when it comes to banking. At the beginning of any movement, there is a premium upfront cost that you end up paying, there are some growing pains. In the Northeast and the Midwest, they have designers, builders, and lenders that are figuring it out. We're not there yet, we're just now starting. But I feel extremely confident it can be done, it's just the will, and perhaps finding the money out there.*

NCCEF could partner with a municipal housing authority looking to pilot Passive House design or otherwise push beyond traditional certification standards and move toward net-zero multifamily building. Opportunities include:

1. Providing technical assistance to create incentives, such as fee waivers or density exemptions, for development that goes above and beyond code requirements.
2. Offering low-cost financing as part of a broader capital stack to cover upfront cost premiums associated with net-zero buildings.

## Principles Analysis

### *Low-hanging fruit & easy wins:*

Though many green banks have products to retrofit multifamily buildings, it is unclear if there is a new construction program model that NCCEF could adopt in full. Piloting a net-zero new construction program with a municipal housing authority would require significant due diligence and could not be considered low-hanging fruit or an easy win.

### *Profitability & stability:*

Detailed financial analysis on Passive House multifamily building is outside of the scope of this research. However, there is growing evidence showing that Passive House can yield substantial savings to both owners and tenants and that lenders in other markets are becoming accustomed to underwriting to energy cost savings.<sup>x1</sup> So long as Passive House lending passes through internal due diligence, it would likely be a profitable investment. Direct lending, even in coordination with other lenders, also provides consistent cash flows (unlike credit enhancement products which have a fee-based revenue structure).

### *Network & scalability:*

This type of market activity would likely begin as a pilot program with one municipal housing authority. Should the pilot prove to be a success, NCCEF could expand the program to additional housing authorities. Further, co-lending for such projects would occur in coordination with both lenders and developers – significantly expanding NCCEF’s network. Though it would be difficult to create a fully standardized product, as each multifamily development is unique, NCCEF could create a lending template that is replicable and scalable.

### *Momentum & future funding:*

Net-zero new construction for multifamily applications would almost certainly garner media attention. It would also help to clearly define NCCEF as a lender.

## Summary

Piloting a net-zero new construction program aligns in part with the investment principles recommended in this report. Conducting investment research, finding the right partnership, and ultimately lending to a relatively novel type of project would be a long and laborious process. However, should the opportunity pass internal due diligence, it would likely be a profitable endeavor, and is one that clearly advances NCCEF’s mission and raises its profile. Would lending to

Passive House projects actually pencil out? Unclear: The Q&A section is illustrative, not evidential. Further research is needed determine the feasibility of such a partnership.

## Conclusion and Further Research

Every day, millions of tons of CO2 emissions are pumped into the atmosphere, warming the planet and portending environmental havoc. Meanwhile, thousands of people contract the novel coronavirus, shuttering businesses, stalling economies, and taking lives. Challenging times demand solutions that work. While green banks have a narrow, modest mandate, they remain a proven entity in boosting investment in critical climate solutions and creating jobs.

By outlining investment principles and applying them to featured opportunities, this research aimed to help NCCEF focus its near-term efforts and move swiftly with any capital it receives.

The investment principles – which draw on conversations with experienced green bank executives – are recommendations. NCCEF can and should use them to evaluate opportunities to ensure that its initial investments support long-term success. The case studies and featured opportunities, however, are not intended to be formal investment recommendations. Rather, they illustrate both the market challenges in certain sectors and the potential opportunities for NCCEF.

The scope of research for the case studies was necessarily limited. In interviews, stakeholders identified many clean energy financing gaps beyond those discussed in this report. Most commonly, interviewees wished to see NCCEF provide financing for electric vehicles – busses and schools busses in particular – electric vehicle charging infrastructure, and energy storage demonstration projects. These areas warrant further research and investigation.

# Appendix

## A. Methodology

This research relied primarily on qualitative research methods including semi-structured interviews (individual and group), Web research, and content analysis. The purpose of the interviews was to explore the views, experiences, and beliefs of individuals on specific matters. Interview responses were analyzed individually and also compared against the responses of other interviewees. All interviews were recorded with a third-party software platform (the transcript of any of the interviews is available upon request). The interview transcripts were coded to highlight common themes, viewpoints, and important insights. All interviewees quoted on record gave explicit permission prior to their interview, and further approved of the specific quotes used in this report.

The research also drew on results from a novel survey sent in partnership with the North Carolina Building Performance Association.

## B. List of interviewees (arranged alphabetically)

Scott Alexander – Managing Director, Eagle Solar & Light

Robert Bennet – Environmental Specialist, N.C. Department of Environmental Quality

Ethan Blumenthal – Co-founder and CEO, Good Solar

Lori Collins – Environmental Programs Consultant, N.C. Department of Environmental Quality

Danielle Constantini – Fellow, N.C. Department of Environmental Quality

Reid Conway – Senior Energy Specialist, Utility Savings Initiative

Matthew Davis – Environmental Specialist, N.C. DEQ

Thomas Deyo – CEO, Montgomery County Green Bank

Richard Harkrader – Owner, Carolina Solar Energy

Lynn Heller – Founder and CEO, MD Climate Access Fund

Paula Hemmer – Senior Environmental Engineer, N.C. Department of Environmental Quality

Maye Hickman – Program Analyst, N.C. Department of Environmental Quality

Starlette Hodge – Energy Program Manager, NC Department of Environmental Quality

Aaron Hope – Field Team Lead, Southern Energy Management

Jeff Hughes – Director, UNC Environmental Finance Center (2001-2019)

Michael Kapp – Regional Representative, Passive House Alliance

Rick Larson – Senior Vice President, Natural Capital Investment Fund

Charles Leahy – Owner, Eco-Panels

Bob Leker – Program Consultant, N.C. Department of Environmental Quality

Jay Lurie – CIO, DC Green Bank

Sushma Masemore – State Energy Director, N.C. Department of Environmental Quality

Stu Miller – Co-owner, YES Solar Solutions

Tyler Norris – Senior Director - Development, Cypress Creek Renewables (NCCEF board member)

Kerry O’Neill – CEO, Inclusive Prosperity Capital

Ajulo Othow – Founder and CEO, EnerWealth Solutions (NCCEF board member)

Emmit Owens – Interim Executive Director, Research Triangle Cleantech Cluster

Autumn Proudlove – Senior Policy Program Director, North Carolina Clean Energy Technology Center

John Richardson – Community Resilience Officer, Town of Chapel Hill

David Sarkisian – Policy Analyst, North Carolina Clean Energy Technology Center

Paul Scharfenberger – Executive Director, Colorado Clean Energy Fund

Mary Templeton – Executive Director, Michigan Saves

Dr. Steven Terry – Director, Industrial Assessment Center

Melissa Malkin Weber – Sustainability Director, Self Help Credit Union (NCCEF board member).

## C. Survey

On March 10, 2021 a seven-question Qualtrics survey was sent to approximately 1,200 member contacts of the North Carolina Building Performance Association. The survey received 14 complete responses and an additional 4 partially complete responses. Although respondents offered interesting insights in their responses, the primary purpose of the survey was to find additional interview subjects who could inform the case studies. Eight respondents indicated that they would be willing to be contacted for a follow up interview. Four of these respondents were eventually contacted for interviews. Screenshots of the survey are included below. Full survey results are available upon request.

<p><b>Duke</b>   SANFORD SCHOOL of <b>PUBLIC POLICY</b></p> <p>The North Carolina Clean Energy Fund (NCCEF) is a not-for-profit financial institution that utilizes its capital to catalyze investments in clean energy, energy efficiency, and other green projects in the state. The Fund operates on the "Green Bank" model successfully pioneered in other states, including Connecticut, New York, and Michigan.</p> <p>NCCEF seeks to identify and address stubborn market gaps that are left unaddressed by private sector actors alone.</p> <p>We are seeking your input to better understand where these financing gaps exist. Your responses will help inform NCCEF's products, services, and focus areas in the coming year.</p> <p>Please provide a brief description of your organization (e.g. architect, energy auditor, home builder, product supplier)</p> <input type="text"/>  <p>Have you or your customers experienced any barriers to financing clean energy or energy efficiency projects?</p> <input type="text"/>	<p>What do you perceive as the primary financing barriers in your industry? (Select all that apply)</p> <ul style="list-style-type: none"><li><input type="checkbox"/> High cost of capital (high interest rates)</li><li><input type="checkbox"/> Small number of lenders</li><li><input type="checkbox"/> Lack of lending expertise</li><li><input type="checkbox"/> Inflexible lending terms</li><li><input type="checkbox"/> Complicated or confusing lending terms</li><li><input type="checkbox"/> Complicated processes to apply for lending</li><li><input type="checkbox"/> Lending caps (e.g. lenders unwilling to lend above certain amounts)</li><li><input type="checkbox"/> Strict underwriting criteria</li><li><input type="checkbox"/> Other</li></ul> <input type="text"/> <p>Please provide a brief description of the most common financing challenges that your company or customers encounter.</p> <input type="text"/>
<p><b>Duke</b>   SANFORD SCHOOL of <b>PUBLIC POLICY</b></p> <p>We thank you for your time spent taking this survey. Your response has been recorded.</p>	<p>Are there solutions or changes that would you like to see implemented?</p> <input type="text"/> <p>Is there anything else that you would like to share?</p> <input type="text"/> <p>Would it be okay to follow up with you to speak in greater detail (approximately 20 minutes)?</p> <ul style="list-style-type: none"><li><input type="radio"/> Yes (please include email below)</li></ul> <input type="text"/> <ul style="list-style-type: none"><li><input type="radio"/> No</li></ul> <p style="text-align: right;"><input type="button" value="→"/></p>

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- <sup>ii</sup> Valerie Masson-Delmotte et al., *Summary for Policymakers* (IPCC, 2018), [https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15\\_SPM\\_version\\_report\\_LR.pdf](https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_SPM_version_report_LR.pdf).
- <sup>iii</sup> Ibid
- <sup>iv</sup> Dan Shreve and Wade Schauer, "Deep decarbonisation requires deep pockets " (2019). <http://www.decabonisation.think.woodmac.com/>.
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- <sup>ix</sup> Ibid
- <sup>x</sup> "The Results," Rhode Island Infrastructure Bank 2020, accessed 04/05/2021, <https://www.riib.org/results>.
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- <sup>xv</sup> ACEEE, "Webinar: How to Finance Clean Energy Projects," (YouTube, 04/05/2021 2018). <https://www.youtube.com/watch?v=BaqJ28tTxo0>.
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