

Proposal for Renewable Energy Planning Services

RESPONSE TO THE BUNCOMBE COUNTY &
CITY OF ASHEVILLE, NC REQUEST FOR PROPOSAL

August 10, 2018

Prepared for:

Buncombe County Office of Sustainability

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Buncombe County Office of Sustainability
Attn: Mr. Jeremiah P. LeRoy
200 College Street, 4th Floor
Asheville, NC 28801
jeremiah.leroy@buncombecounty.org

Dear Mr. LeRoy,

On behalf of The Cadmus Group LLC (Cadmus), I am pleased to submit this proposal to Buncombe County. Cadmus is an employee-owned technical and strategic consultancy with 35 years of experience serving clients in the areas of energy, transportation, and environment. Cadmus leverages exceptional expertise across a staff of more than 600 scientific, engineering and policy professionals located in a dozen offices across the US. Cadmus is a leader in the development of stakeholder- and data-driven municipal energy planning efforts, and supports governments across the country and around the world in developing and analyzing next-generation energy policies and strategies to promote clean energy market development. Cadmus' expertise includes the capabilities of Meister Consultants Group, which was acquired in 2017 and is now a part of the Cadmus Group.

Cadmus' extensive experience with municipal governments and state agencies nationwide on renewable energy makes us uniquely suited to work within the regulatory policy and planning context of North Carolina and Buncombe County, and enable us to effectively respond to all five services for this RFP – (1) Energy Policy Analysis and Support; (2) Assessment and Identification of Renewable Energy and Energy Storage Opportunities; (3) Quantitative Assessment of Financial and Economic Impacts of any Developed Plans; (4) Development of Community Partnerships; and (5) Stakeholder Engagement. We bring a knowledge of national best practices and work with local officials and stakeholders to develop solutions tailored to their economic, political and social contexts. We are excited for the potential opportunity to support Buncombe County's development of a renewable energy plan and to help the County reach its ambitious renewable energy targets.

For this proposal, Cadmus is proud to partner with Jennifer Weiss, Senior Policy Associate in the Climate and Energy Program of the Duke University Nicholas Institute for Environmental Policy Solutions. Ms. Weiss has extensive experience in local energy and environmental policy, participating in regulatory proceedings, and engaging stakeholders in North Carolina, including Buncombe County and the City of Asheville. Through her expertise and guidance, Ms. Weiss will ensure that our recommendations regarding national best practices are fully reflective of the local context, and that we are conducting stakeholder outreach in a manner that is in line with the norms of the community.

I will serve as the primary point of contact for this proposal. Please feel free to contact me if you have any questions about this proposal, and thank you for your consideration. Please note we did not include a price proposal or budget as it was not specifically required in the RFP. We would be happy to submit a detailed price proposal and budget upon request.

Sincerely,



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SECTION 1 BASIC QUALIFICATIONS

The Cadmus Group LLC (Cadmus) is pleased to submit this response to Buncombe County's Request for Proposals (RFP) to provide renewable energy planning services in Buncombe County and develop a customized and achievable Renewable Energy Plan for the County and for its own operations.

Understanding of the Project

Buncombe County, North Carolina, has undertaken a significant step within the past year to improve its energy profile and carbon footprint by passing a resolution requiring the County to utilize 100 percent renewable energy for its operations by 2030, and 100 percent renewable energy for the entire county by 2042. Having completed this initial step towards increasing the County's utilization of renewable energy, the County seeks to formally establish a plan to achieve both targets. Specifically, the County requires that the plan provide them with an understanding of county-wide (including county and city government operations) energy use and related technical solutions, as well as the barriers, legal implications, and potential financial models that may be necessary or helpful in achieving renewable energy penetration. The County will need to ensure alignment among key stakeholders (e.g. policy makers, regulators, local businesses and residents) on the vision for the renewable energy plan, as well as produce a robust energy plan that considers best practices from around the country as well as the local context. These elements will allow Buncombe County to meet the needs of its constituents, and plan policy and capital budgets, and achieve its renewable energy targets.

Cadmus' Qualifications

The Cadmus Group LLC (Cadmus) is a multi-disciplinary consultancy committed to helping clients find innovative solutions that create social and economic value now and for future generations. Our firm has been on the forefront of local-level energy and climate planning in the US, providing municipal clients with a diverse range of expertise on clean energy and climate change planning, policy and strategy development, strategic communications, geospatial analysis, and stakeholder and community engagement. To date, Cadmus has worked with over one hundred local governments across the U.S. (including multiple jurisdictions in North Carolina) and provided clean energy technical assistance and training to over five thousand municipal staff and officials. We understand the evolving landscape of policies for local-level energy planning, and bring deep familiarity with best practices and emerging innovations from sustainability-leading cities in the U.S. and globally.

Cadmus has deep experience with each of the critical components of this project: local energy policy analysis and planning, identification of renewable energy and energy storage opportunities, quantitative assessment of financial and economic impacts of any developed plans, and stakeholder engagement and development of community partnerships. Cadmus seeks to utilize this expertise in its support of Buncombe County and the City of Asheville. Our experience in each of these areas is detailed below, and specific project descriptions are included in the Examples of Work section of the proposal.

In terms of regional experience, Cadmus is working to conduct a critical infrastructure solar PV and resiliency feasibility study for the North Carolina National Guard, and a rest area solar PV and EV charging station feasibility study for the North Carolina Department of Transportation. Cadmus has also provided one-on-one technical assistance to more than a dozen rural electric cooperatives, a number of which are located in North Carolina or southern Appalachia, to develop residential energy efficiency programs that expand access to affordable energy. Through the SolSmart Designation program, Cadmus staff recently delivered a first responder safety and solar PV training in Asheville, and our technical assistance team has supported Asheville, Orange County, and Carrboro in achieving designation. In addition, Cadmus often

coordinates with a local partner on our community-level energy planning work to ensure that we are conducting stakeholder outreach in a manner that is in line with the norms of the community, that we are attentive to the unique needs and preferences of the community we are working with, and that our recommendations regarding national best practices are fully reflective of local context. Cadmus has staff located in Buncombe county, and for this project, Cadmus will partner with Jennifer Weiss, Senior Policy Associate in the Climate and Energy Program of the Duke University Nicholas Institute for Environmental Policy Solutions. Ms. Weiss has extensive knowledge of North Carolina and Buncombe County energy policy and context, and is also experienced in the regulatory process and stakeholder engagement. Ms. Weiss will assume an advisory role to Cadmus for this project and specifically will support us in the following ways: advising on the development of a stakeholder engagement plan, and attending and supporting key stakeholder events; and reviewing and providing input on all deliverables, with a focus on ensuring the deliverables are appropriate for the North Carolina and Buncombe County context. Ms. Weiss' full qualifications are included in the Staff Qualifications section of the proposal.

1. Local Energy Analysis and Planning:

Cadmus has developed nationally recognized expertise and thought leadership in the evaluation of renewable energy policy, strategy, and procurement, and combines this strong technical expertise with proven engagement techniques to develop comprehensive policies, programs, and strategies. Cadmus provides clients with expert knowledge on national trends and best practices in clean energy development, which are tailored to the relevant local context. Our work demonstrates an interdisciplinary approach to energy planning at the local level that combines program and policy design, stakeholder and community engagement cost-benefit and economic impact assessments, energy procurement, and implementation support.

Cadmus' approach to local renewable planning is documented in our *Pathways to 100*¹ report that orients cities to assessing their energy policy landscape, and provides a set of policy options and recommendations that are tailored to each city's individual context. Cadmus has put this approach into practice in its work with King County, Washington, where we developed a renewable energy transition plan and identify pathways for the county to meet its goal of 90% renewable electricity community-wide by 2030, and with the City of Bloomfield, Iowa, where we are currently supporting the City's community planning process to achieve 100% energy independence by 2030. In addition, Cadmus worked with a group of 8 cities and counties in Virginia to develop a collective renewable energy action plans based on the Pathways to 100 framework. From a more regulatory perspective, Cadmus has supported clients such as the California Energy Commission, New York State Energy Research and Development Authority (NYSERDA), the Hawaiian Electric Company, the Massachusetts Department of Energy Resources, and the World Bank in the design and implementation of renewable energy development programs. Moreover, Cadmus is frequently called on by networks of cities such as the Urban Sustainability Directors Network, Carbon Neutral Cities Alliance, and Innovation Network for Communities, and foundations to provide best practices guidance on several municipal energy policy and strategy topics related to renewable energy.

2. Renewable Energy Resource Potential

Cadmus has developed experience in identifying renewable energy and energy storage opportunities at the municipal level. We have conducted quantitative geographic analyses of solar PV site feasibility for regions throughout the US, with developed models for states including Washington, Oregon, Idaho, Montana, Colorado and Washington DC. These GIS based analyses draw from physical land cover datasets,

¹http://www.mc-group.com/wp-content/uploads/2017/08/MCG_Innovations-in-City-Clean-Energy-and-Equity-Planning.pdf

tax and property parcel maps, and utility incentive regions to locate optimal siting zones for development of small-scale community shared solar projects in terms of practicality and cost-effectiveness. Additionally, we have assessed and mapped the total renewable energy potential for the Merrimack Valley Planning Commission, and for Contra Costa County. These analyses included a parcel-level technical and economic resource assessment of solar, wind, biomass, and biogas opportunities, and calculation of subtotals for each major zoning category and other specific locations. We also included an opportunities and constraints analysis to assess the desirability of developing each type of renewable in specific locations, and conducted a zoning review to identify and reduce project development barriers. In addition, Cadmus has organized numerous region-wide collaborative procurements for solar PV, solar hot water, air source heat pumps, and electric vehicles, to offer a substantial reduction in costs for the participating communities.

3. Scenario-Based Energy Modelling (Quantitative assessment of financial and economic impacts of any developed RE plans)

Cadmus regularly supports its community-level planning exercises with custom quantitative models and tools that are used to assess the financial and economic impacts of programs and policies of interest. Cadmus staff have developed models of state and regional power mixes for public and private sector clients in Virginia, Iowa, and Washington State, as well as energy efficiency and renewable energy cost-benefit and rate impact models for dozens of utility and government clients nationwide and internationally, including several in North Carolina. These tools are used to inform planning and tracking of new energy policies and programs. Cadmus' in-house models assess the energy and financial implications of a range of energy programs, and the Team's quantitative analysts are experienced in building customizable tools that fit the unique needs of its clients.

4. Stakeholder Engagement and Development of Community Partnerships

The staff proposed for this project include a team of trained mediators and facilitators. Our team combines content expertise with comprehensive stakeholder engagement services to collaboratively gather input and develop strategies, policies, and programs. Cadmus has used its Impact-Oriented Dialogue process, an approach that combines content expertise with facilitation services to help move a group from vision to action while ensuring all key voices are represented in the process, to support dozens of US communities in identifying and acting towards their collective goals. This is especially true of the Team's work on local energy planning processes. The Team's approach to these processes centers on collaboration with energy and environmental stakeholders, local energy utilities, government staff, and interested citizens.

Cadmus' prior work in local renewable energy planning in Washington State and Iowa have been accompanied by robust engagement of key stakeholders, including local utilities that would be impacted by any resulting programs. Cadmus is also currently conducting structured stakeholder outreach across each community in the state of Hawaii, engaging citizens and key stakeholders (including the state's utilities) in a two-year effort to evaluate policy and regulatory options for the state's utility business model. Cadmus is also currently working with eight Midwestern cities (through the Urban Sustainability Directors Network) on increasing electric vehicle deployment, and is successfully facilitating workshops with policy, utility, industry, advocacy, philanthropic, and equity-focused stakeholders. As mentioned above, Cadmus also frequently works with a local partner for stakeholder engagement and community outreach projects to ensure that we properly understand and incorporate the local context in our work.

By leveraging this depth and breadth of expertise, the Project Team will enable Buncombe County to better assess the technical, economic, and policy barriers related to increasing the market share of renewable energy.

SECTION 2 STAFF QUALIFICATIONS

The staff proposed for this project are outlined in the table and are followed by brief biographies and for core team members below. Full CVs are included in Appendix A, and references for the core team members are included in Appendix B.

Table 1. Summary of Core Project Team and Roles

Team Member	Title and Organization	Project Role / Expertise	Leading Tasks	Supporting Tasks
Chad Laurent	Principal, Cadmus	Project Principal, Oversight & Quality Assurance		1, 2, 3, 4, 5 ,6
Paul Faeth	Principal, Cadmus	Strategic Advisor, Best Practices Reviewer	4, 5	2, 3, 6
Kalee Whitehouse	Senior Analyst, Cadmus	Project Manager, Energy Program and Policy Analyst	1, 2, 3, 4, 5 ,6	
Ryan Cook	Senior Associate, Cadmus	Deputy Project Manager, Energy Modeling & Analysis Lead, Local Government Energy Planning Expert	3, 6	1, 2, 4, 5
Julie Curti	Associate, Cadmus	Stakeholder Engagement and Facilitation Lead	2	6
Jennifer Weiss	Senior Policy Associate, Duke University	Local Policy Expert and Stakeholder Engagement Partner		1, 2, 3, 4, 5 ,6

Table 2. Summary of Supporting Project Team and Roles

Team Member	Title and Organization	Project Role / Expertise	Leading Tasks	Supporting Tasks
Tyler Orcutt	Senior Analyst, Cadmus	Energy Program and Policy Analyst		3, 4, 5
Graham Stevens	Specialist, Cadmus	Energy Modeling Analyst		4, 5
Arielle Magliulo	Fellow, Cadmus	Energy Program and Policy Analyst		1, 2, 3, 4, 5 ,6

3.1 Core Staff Overview

Chad Laurent (Principal) Mr. Laurent specializes in renewable energy law, policy, and project development and works from Cadmus’ Boston office. On this project, Mr. Laurent will serve as Project Principal and will be responsible for oversight and quality assurance. Mr. Laurent leads the firm’s clean energy market development practice. He is a nationally recognized expert in renewable energy market development strategies. Since 2010 he has overseen multiple US Department of Energy SunShot Initiative projects on behalf of Cadmus, is currently working with the EPA Green Power Partnership Program, and has worked on developing renewable energy procurement strategies for clients since 2003. He frequently works with corporate, university, non-profit, and municipal clients to develop renewable energy supply, and

procurement strategies. Mr. Laurent has developed renewable energy policies, and power purchase agreement toolkits and procurement policies both in the US and internationally, and is an on-call legal and policy expert for the Clean Energy Solutions Center. He recently supported Vietnam with their first solar net metering policy, and is the lead author for the Pathways to 100, and Pathways to EV (forthcoming) reports. He holds a Juris Doctor from Suffolk University Law School where he was a Rappaport Honors Fellow in Law and Public Policy (in collaboration with the Rappaport Institute at Harvard University), and a B.S. from the University of Michigan. He is a professionally trained mediator, facilitator, and is admitted to the Massachusetts Bar.

Paul Faeth (Principal) Mr. Faeth works on issues related to energy, water, and climate change, domestically and internationally from Cadmus' North Carolina Satellite Office. Mr. Faeth has over 35 years of experience in environmental research, economic and policy analysis, and outreach, particularly in developing innovative policies that promote sustainable energy development and water resource use. A recent example of his work includes solar PV feasibility studies in North Carolina. Prior to joining Cadmus, Mr. Faeth was director for Energy, Water, and Climate for CNA's Institute for Public Research, where he managed a program that explored the policy synergies among these themes. Before joining CNA, Mr. Faeth was president of Global Water Challenge, a coalition of 24 stakeholders including corporations, nongovernmental organizations, foundations, universities, and health agencies working together to promote and invest in safe drinking water and sanitation for the poor in developing countries. Mr. Faeth worked for 18 years at the World Resources Institute (WRI), the world's top-rated environmental think tank, where he led the Institute's Economics Program and then became its executive vice president and managing director, leading programs, strategic development, and operations. Mr. Faeth's policy research at WRI included topics such as water quality, agriculture, climate change, and trade. He also worked at the International Institute for Environment and Development, where he put together the world's first carbon offset project between a coal-fired power plant in Connecticut and an agroforestry program in Guatemala, and the Economic Research Service of the U.S. Department of Agriculture, where he was an economic policy modeling specialist. Mr. Faeth has a Master's in Engineering from Dartmouth College, and an B.S. from the University of Florida.

Kalee Whitehouse (Senior Analyst) Ms. Whitehouse works from Cadmus' Boston office will serve as the Project Manager for this project, and has experience in renewable energy, climate mitigation policies and strategic planning. Ms. Whitehouse has supported the U.S. DOE SunShot Initiative's SolSmart program by providing one-on-one technical assistance to municipal governments to fulfill designation criteria in the areas of zoning, permitting and community engagement. Through this program and the NY Sun PV Trainers Network, Ms. Whitehouse has presented to local governments, and regional non-profits on local solar policy and solar PV soft costs. She also supports research projects on energy efficiency and resiliency in the commercial building sector and has supported content development for workshops and study tours focused on renewable energy and climate. Previously, she worked in corporate sustainability at Cone Communications helping to identify potential nonprofit partnerships that would support CSR strategies around clean water. Ms. Whitehouse also held a fellowship with The Nature Conservancy of MA, supporting policy research on green infrastructure and stormwater management. Ms. Whitehouse received her MBA and MPP in 2015 from the Heller School at Brandeis University. With a focus in social entrepreneurship and impact management—her studies focused on strategic planning, financial analysis and evaluating the environmental implications for federal and state policies. She holds a B.A. from the University of Vermont.

Ryan Cook (Senior Associate) Mr. Cook works from Cadmus' the Portland Oregon office and will use his extensive experience in policies enabling local energy transitions, with a focus on supporting decision-

makers, to serve as deputy project manager and expert on energy modelling and municipal energy planning. He uses with a combination of energy policy expertise and critical quantitative tools and methodologies. Mr. Cook specializes in public policy planning processes that blend intensive stakeholder engagement and input, qualitative policy research of opportunities and barriers, and robust quantitative analysis of potential outcomes. He has developed local government energy plans with communities as large as King County, Washington (population 2.1 million), and as small as the town of Benham, Kentucky (population 500) and City of Bloomfield, Iowa (population 2,400), and he has expertise in areas that include state and local energy policy, energy efficiency impact analysis and cost-benefit analysis, municipal energy procurement, and community-based energy outreach and engagement programs. Mr. Cook's utility consulting work has included clients in North Carolina, Tennessee, Kentucky and Arkansas, and he has worked closely with regional planning agencies in Missouri and Indiana. In addition to his work with Cadmus, he has held positions with the San Francisco Public Utilities Commission and the White House Council on Environmental Quality. Ryan holds a Master in City Planning Degree from the Massachusetts Institute of Technology and a B.A. from Reed College.

Julie Curti (Associate) Ms. Curti works from Cadmus' Boston office on stakeholder engagement and clean energy strategy, policy and planning in the public and non-profit sectors, and will lead the stakeholder engagement process for this project. Ms. Curti has facilitated stakeholder working groups, including an effort in Massachusetts to develop policy solutions that increase access to clean and efficient energy for low- and moderate-income residents. She also co-facilitated a dialogue for public sector leaders in the City of Cambridge, MA, to develop a long-term renewable electricity supply strategy. Ms. Curti supported strategic planning for the City of San Francisco's Environment Department, helping the department's staff and stakeholders define their goals, strategies, and actions in clean energy, energy efficiency, zero waste, and other priority areas. Prior to joining Cadmus, Ms. Curti worked on MIT's New England Climate Adaptation Project, researching how to build readiness for climate change at the local level and organizing interactive public workshops in coastal communities to help initiate climate adaptation planning. Ms. Curti also served as the Associate Director of the USDA's Partnership Center in Washington, DC. She provided technical assistance to community organizations to increase participation in food security programs for low-income individuals and families. She is a certified mediator and holds a Master in City Planning Degree from the Massachusetts Institute of Technology, and B.A. from the University of Wisconsin.

Jennifer Weiss (Senior Policy Associate) At Duke University as a senior policy associate in the Climate and Energy Program of the Nicholas Institute, Ms. Weiss engages relevant decision makers in the private and public energy sectors, provides information and research on a variety of intersecting renewable energy investment and conservation practices, conducts market research, explores financing mechanisms for renewable energy, and analyzes the impact of new energy policies, mandates, and programs on new and existing energy projects. Ms. Weiss will be a subcontractor-advisor for local context and issues, as much of her work experience and relevant knowledge are specific to North Carolina, including Buncombe County and the City of Asheville. In her position at Duke, she participated in the North Carolina Leadership Forum, where she provided local stakeholders with information about North Carolina's current and future energy needs. She is also a Member of Asheville/Buncombe County Energy Innovation Task Force Programs Working Group, where she participated as a North Carolina EE regulatory and policy expert to advise and educate the EITF group on Duke Energy's energy efficiency programs. Moreover, Ms. Weiss is a founding member and co-lead for multiple North Carolina Energy Efficiency Working Groups and collaborations including NC On-Bill Working Group, Multifamily EE working group, and the EE Policy Stakeholder group.

Prior to her work at Duke University, Ms. Weiss was an energy efficiency policy manager for the Southern Alliance for Clean Energy, a senior finance analyst for the Environmental Finance Center at the University of North Carolina at Chapel Hill, a carbon offset analyst for the Duke Carbon Offset Initiative at Duke University, and a Climate Corps Public Sector Fellow at the Environmental Defense Fund. Ms. Weiss holds a master's degree in environmental management from Duke University's Nicholas School of the Environment, a master's degree in business administration from the University of Michigan, and a bachelor's degree from the University of California at San Diego.

SECTION 3 PROJECT APPROACH

The following section describes the Cadmus team's approach to accomplishing the tasks laid out by Buncombe County in its RFP. The Project Team will focus on **lessons learned and best practices** from prior policy efforts both nationally and internationally, including **key economic and non-energy tradeoffs** that different policy pathways hold for the County, its residents, utilities, and other stakeholders.

TASK 1 SCOPING, & COMMUNITY ADVISORY INTAKE

Subtask 1.1 Project Scoping Meeting

At the outset of the project, the team will first conduct a **scoping call with Buncombe County and the City of Asheville** to further hone the scope of the project together and to better understand the Department's vision, objectives, and constraints. The scoping call will include the County's preferences on key aspects of the project, such as the process for community feedback (described below), as well as the core components of the benchmarking tool (described in Task 3). In addition, the Project Team will discuss logistical items such as project schedule, the timing of regular check-ins, and the degree of stakeholder participation desired by the County in this project. The Project Team will provide a summary memo following the meeting to capture key takeaways.

Subtask 1.2 Initial Research

Second, the team will **undertake preliminary background research** on the current energy context in Buncombe County. This will involve collecting data on past and active programs, energy consumption and supply, and information on pending programs/initiative to inform the benchmarking process.

Subtask 1.3 Initial Stakeholder Outreach

Third, per the County's guidance, the Project Team will **set up a feedback process (suggested as a Community Advisory Group)**. The Project Team will work with the County to determine the best way to gain local feedback as part of the scoping call. One option discussed in the proposal for illustrative purposes is working with the County to identify a Community Advisory Group, or a small group (3-5) of key stakeholders who would provide input on core deliverables. Note that a broader group of stakeholders can still be invited to participate in stakeholder meetings. The scoping call will allow for the Project Team to understand the County's preferences around engaging which stakeholders and in what manner. For instance, the County may prefer to engage its own councilors on the Community Advisory Group or separately through additional interviews. The Project Team will adapt the engagement model per the initial scoping discussion with the County.

As part of this initial outreach, the Project Team will **conduct individual "intake interviews" with each selected key stakeholder or advisory group member**. The intake interviews will focus on understanding

directly from key stakeholders what their priorities, concerns, and preferences are for renewable energy implementation. The individualized nature of the interviews will allow for insights to be shared that might not otherwise be discussed at a meeting with additional stakeholders. These conversations can serve to build initial stakeholder support as well as demonstrate inclusion by inviting stakeholders to interview who may not be strong supporters of the renewable energy plan. It can allow stakeholders to air their concerns in a format that will not detract from a larger group discussion. Overall, the intake interviews will inform the development of the kickoff event or first community meeting.

After completing the above steps, Cadmus will provide the County with an inception memo to document the primary objectives of the scoping call and community advisory group intake interviews.

Task 1 Deliverables:

- Initial kick-off call with City
- Invitations to Advisory Group members
- Initial in-take interviews with Advisory Group members
- Inception memo

TASK 2 COMMUNITY LAUNCH & VISIONING

Following this initial preparatory research, the team will publicly launch the project with a pair of workshops held in Buncombe County. The first session will be an internal discussion between the Project Team, County representatives, and the stakeholder advisory committee, and the second will be a public meeting open to all interested community members and stakeholders.

Subtask 2.1 Small Group Meeting

In this first session, the Project Team will **meet with Buncombe County and the City of Asheville, and selected stakeholders** (potentially Community Advisory Group and others). This meeting would involve reviewing the agenda for the broader stakeholder meeting and to solicit detailed feedback from the County and City on discussion topics in advance of the larger meeting. The small group would discuss topics likely to be raised by attendees at the broader meeting and strategize as to how to frame the conversation most productively. Holding this meeting in advance of the public workshop will allow the Project Team to review material with the advisory group before making a full public presentation, and will allow for a more detailed discussion as a small group.

Subtask 2.2 Launch Meeting with Invited Stakeholders

Later in the day (likely in the evening to allow for greater community attendance), the County, City, and Project Team would hold an **launch meeting with invited stakeholders and** with the Buncombe County and City of Asheville staff and Community Advisory Group.² This professionally-facilitated workshop will seek to identify different community perspectives on municipal energy goals and priority, and to discuss the community's specific needs, challenges, and goals for the project. Holding this stakeholder meeting at the outset of the project will ensure the team can best align tasks with goals. Discussion questions and

² It is anticipated that Buncombe County will work closely with the Team to identify and invite relevant stakeholders to participate in the kickoff meeting. In addition, the Project Team will rely on the County to provide meeting space, A/V equipment, coffee and snacks, and other relevant expenses associated with the stakeholder meeting.

presentation topics will be developed with the Buncombe County and the City of Asheville in advance of the meeting.

Visioning. At the stakeholder workshop, a group visioning exercise will guide the process for establishing a community-wide vision for achieving the County’s Renewable Energy Targets. Preliminarily, discussion topics will include:

☉ **Priorities: What are the group’s key drivers and priorities for renewable energy implementation?**

Communities are motivated to transition to 100 percent renewable energy utilization for a variety of reasons. Identifying which one or more of these are key drivers is a critical step in determining the most effective path for implementation of renewable energy for the community. For instance, a few potential priorities may include reducing energy costs, reducing GHG emissions, and strengthening local economic development.

☉ **Collective Vision of Success: What tangible changes would be evident in our community if the County were successful in achieving its 100 percent renewable energy goals?**

This might include increased financial strength (e.g. average reduction in energy bills for households and businesses), greater resilience (fewer power outages during storms), and economic or other co-benefits (local energy jobs).

☉ **Obstacles: What have been obstacles to implantation of renewable energy thus far? What would mitigate these obstacles?**

This may include policy constraints, stakeholder opposition, or other challenges. Clarifying these upfront allows the community and Project Team to learn from past pitfalls and focus efforts on moving forward.

Following this round of stakeholder engagement, the Project Team will prepare a memo that discusses and summarizes the topics discussed in these meetings, and will use these outputs to inform later tasks.

Task 2 Deliverables:

- Small group meeting with County and Advisory Committee
- Open community visioning meeting
- Meeting summary memo

TASK 3 POLICY & STRATEGY OPTIONS

Subtask 3.1 Compilation of Policy Options

Based on the initial community visioning workshop with Buncombe County and the City of Asheville, as well as Cadmus’ prior work with municipal governments nationwide, the Project Team will compile a **list of strategy options** that were either directly identified by County and City staff and other relevant stakeholders or are based on best practices that could align with the County’s goals.

Based on its *Pathways to 100* report and prior local energy planning projects, Cadmus has developed a preliminary list of more than two dozen actions that may be included in such a roster of potential policy actions across multiple technologies. Cadmus will revise this list based on stakeholder feedback and the County and City’s interests to develop a custom set of policy options for evaluation in this effort. In addition, as one of the key partners in the U.S. Department of Energy SolSmart Designation Program (and having previously worked on numerous SunShot Initiative projects since 2010), Cadmus is involved in the latest research and actions available to local governments looking to promote solar PV.

Subtask 3.2 Barriers and Opportunities Assessment

For each policy or program option of interest, the team will **conduct desk research** to evaluate relevant barriers and opportunities, consulting regional installation databases, integrated resource plans, and other independent studies where available. Considerations for the barriers and opportunities research may include the type and scale of each action and strategy, and county cost-effectiveness and general effectiveness (low to high) and feasibility of the policy options. We may also consider scenarios such as base and aggressive local government action scenarios, a voluntary action scenario, a carbon price scenario, and a 100 percent clean energy scenario. This work will be **done in consultation with the project advisory group** to provide additional insights related to key barriers, potential existing gaps, and opportunities for continued renewable energy penetration. The Project Team will coordinate with the County to conduct any necessary outreach to key stakeholders, and will utilize the deep local knowledge of its project partner Jennifer Weiss (and other local stakeholders as identified by the County) to ensure that local policy issues are fully reflected in the assessment of barriers and opportunities.

Subtask 3.3 Policy and Strategy Analysis Matrix

Additionally, the Project Team will build a **policy and strategy analysis matrix** which will be used to assess the strength of each option against several criteria. In past similar projects, such criteria have included local impact, feasibility, cost to city, overall cost, and equity considerations. The specific criteria used to evaluate strategies will be tailored based on the community workshop. The matrix will help consolidate information on which strategies align with the community's goals.

Task 3 Deliverables:

- Analysis matrix and summary of research findings on potential pathways well-suited for Buncombe County
- Interviews with additional stakeholders as needed

TASK 4 IMPACT ASSESSMENT

In Task 4, the Project Team will identify the likely energy and financial impacts of a set of programs of interest to the County by developing a dual baseline of projected power mixes in Buncombe County and the City of Asheville, as well as a range of scenarios that reflect high concentrations of renewable energy and their associated costs. The outputs from the Task 3 Barriers and Opportunities analysis will be useful as inputs in this work.

Subtask 4.1 Develop Baseline Power Mix Projection and Model

The Project Team would first conduct research on the City and County's current mix of electric power sources and will develop a **baseline projection** of how the County's electricity mix is expected to change over time based on planned generating plant closures and additions, the North Carolina Renewable Energy and Energy Efficiency Portfolio Standard, and other relevant requirements. This baseline projection would purposefully make minimal departures from these published plans, and would demonstrate the County's current and expected future power mix in the absence of additional state or local policy action.

Cadmus, in conjunction with Buncombe County, would seek to engage utilities in this process to ensure that baseline projected power mixes are reasonable and appropriate.

Subtask 4.2 Develop High-Renewable Energy Power Mix Projections

Based on Task 3 Analysis, the Project Team would then work with the County, City, and advisory group to select a range of policy options for further quantitative assessment. The project team expects to bundle these selected policy options into one or several packages could demonstrate different policy approach (for example, a scenario that emphasizes in-county generation and one that emphasizes partnership with utilities to expand renewable energy purchasing programs). Cadmus expects to develop up to four distinct policy modelling scenarios in collaboration with the County and City.

For each scenario, the Project Team will draw upon Task 3 outputs, a review of available literature and prior programs, and original analysis to identify the expected impact that a given policy could have on the energy mix of city and county operations as well as the county-wide energy mix. In addition, Cadmus would provide estimates of the costs of each selected policy option to the County, as well as an estimate of local county economic impacts. Cadmus will also discuss the potential impacts of various policy options on power prices.

Cadmus would then develop a wedge analysis which displayed the results of this energy impact assessment and which discussed the contribution that each specific action within a policy scenario would have in bringing Buncombe County and Asheville towards their renewable energy goals. Cadmus would then provide an analysis memo which discussed the results of this analysis, and which characterizes the expected energy, financial, and economic impacts of each policy and scenario.

Task 4 Deliverables:

- Analysis memo summarizing (1) Buncombe County's current energy mix and expected baseline power mix forecast, (2) policy actions and scenarios selected for quantitative impact assessment, (3) expected energy, financial, and economic impacts of various policy actions and scenarios, and (4) wedge analysis demonstrating progress towards 100% renewable energy goal of each policy scenario.

TASK 5 SITE IDENTIFICATION FOR RENEWABLE ENERGY AND ENERGY STORAGE

Task 5 consists of identifying potential renewable resource project sites in Buncombe County. In this task, Cadmus will conduct an analysis of the renewable resources physically available in Buncombe County and assess the sites' eligibility for applicable incentives (e.g. tax incentives). Identification of such sites will enable Cadmus to determine the available renewable resources in the County, and will assist the County in achieving its renewable energy goals. Technologies considered include solar, wind, biomass, and biogas energy generation, at commercial to utility scale. We will recommend minimum sizes to be assessed for each technology, and will weigh the County's input.

Subtask 5.1 Collect Mapping Data

Through conversation with the County and stakeholders, a review of the County and City tax data and other available GIS sources such as the County's GIS website,³ Cadmus will develop a short list of high-interest sites for large-scale renewable energy development or for energy storage facilities Cadmus estimates this short list will include roughly 15-20 potential high-interest sites.

³ <https://gis.buncombecounty.org/buncomap/>

Subtask 5.2 Feasibility Study

Following the collection of Buncombe County’s mapping data and identification of high interest sites, Cadmus will then conduct a remote initial feasibility study of these sites to determine viability for project development, and to identify any immediate concerns. Cadmus will first conduct an initial desktop fatal flaws study to determine whether any of the proposed sites present an immediate fatal flaw for renewable energy or energy storage installation. Then, using the list of sites that pass the fatal flaws process, Cadmus uses industry-standard tools such as Helioscope and PVSYST (e.g. for solar PV) to create preliminary array layouts and accompanying preliminary system economics, based on relevant local costs, available incentives, and the regulatory climate in Buncombe County. Cadmus brings expertise in feasibility assessments for multiple technologies, including, but not limited to solar PV. Cadmus will summarize the results of the mapping data and feasibility study in a written summary report to the County.

Task 5 Deliverables:

- A Feasibility Study of the identified high interest sites to determine possible locations for renewable energy and/or energy storage.
- A summary memo of the results of the feasibility study

TASK 6 RENEWABLE ENERGY PLAN

Subtask 6.1 Second Round of Community Workshops

At this point, the Project Team will hold a second round of community engagement to present and discuss the preliminary findings of Task 3, 4, and 5 work, and to solicit stakeholder input on specific potential policy and program options. Using a similar approach as the first set of meetings, this would involve an **internal meeting with the County, City, and Community Advisory Group**, followed by a **second meeting with select stakeholders**. These meetings will be structured to allow for both detailed presentation and detailed feedback from participants.

The overarching objective is to be able to identify and select sets of policy options that hold broad appeal to the community and that are well-aligned with stakeholder perspectives. At these meetings, the Project Team will:

- ⦿ **Present the findings of work done to date under Tasks 3, 4, and 5**, including details on Buncombe’s energy supply and consumption trends, and information on a range of policies and strategies potentially suitable for Buncombe.
- ⦿ **Structured facilitation of community views and feedback**, including both large group discussion and breakout groups, designed to solicit stakeholder views on the policies and strategies presented by the Project Team.

Subtask 6.2 Buncombe Renewable Energy Plan

Based on the outcomes of the above research tasks and stakeholder feedback, the Project Team (with the advice and review of the local Community Advisory Group) will develop a roadmap for Buncombe County’s 100 percent utilization of renewable energy for government operations by 2030 and for the entire county by 2042. This plan will use the conclusions of the policy research and community planning process to identify actions of broad interest in Buncombe, and utilize the results of the impact assessment and

feasibility study to identify the projected energy impacts, costs, and savings of these actions. The process for input on the plan will have the following major steps:

- ⦿ **High-level plan:** The Project Team will select the strategies from the matrix that appear to align with local goals. For each strategy selected, the team will identify key steps in execution and produce a summary document that outlines the major strategies and associated action steps.
- ⦿ **Input from City and Community Advisory Group:** The Project Team will share the high-level summary document with the Community Advisory Group to ensure that the overall direction aligns with local needs and challenges. Additionally, this step will also build community support for the renewable energy implementation plan.
- ⦿ **Full action plan:** The Team will make final adjustments to the presentation and facilitation plan based on input from the Community Advisory Group and compile a full action-plan for Buncombe's transition to utilizing 100 percent renewable energy with two levels of information. The top level will summarize high-level steps needed to create the environment to move forward with increasing renewable energy sources (e.g. establishing an on-going commitment from a broadened Community Advisory Group, passing additional local legislation). The detailed level will provide action-steps for the selected strategies such as directed guidance on engaging residents, securing funding, and adjusting program policies.

Upon review of the action plan by the Buncombe County and the City of Asheville and key stakeholders, the Project Team will address any feedback and develop a final deliverable. The project will conclude with a presentation (either in-person or remote) to present the final results and recommendations.

Task 6 Deliverables:

- Small group meeting with city and Advisory Group
- Large group public forum
- Draft and Final Renewable Energy Plan for Buncombe County
- Final Presentation of results and recommendations

SECTION 4 EXAMPLES OF WORK

The Project Team has developed a range of policy analyses, barriers and opportunity assessments, scenario analyses, and public-facing materials for a range of cities, public agencies, and non-profits. The following examples have been selected to showcase analyses, programs, and work products developed by the Project Team that illustrate the wide range of capabilities and experiences that will be deployed in this project and which are of similar scope and size to those requested by Buncombe County. Additional project detail or client references are available upon request.

Pathways to 100 Report Assistance to Leading US Cities, Kresge Foundation and USDN

Cadmus developed an energy primer on transforming city energy systems, published by the Kresge Foundation and Urban Sustainability Directors Network in May 2017. This primer presents a menu of approaches cities can pursue alone or in collaboration with key stakeholder partners to transform local energy systems. It also describes how the options available to cities vary based on state-level regulatory and policy actions and utility ownership models.

http://www.mc-group.com/wp-content/uploads/2017/08/MCG-Pathways-to-100_Energy-Supply-Transformation-Primer-for-Cities.pdf

Energy Transition Planning, King County, Washington

Cadmus developed and energy transition plan for King County, which included an analysis and recommendation for achieving the county's 2030 energy targets. Cadmus combined in-depth policy research, scenario modelling on the regional power mix, and engagement of key stakeholders to identify distinct sets of strategies that the county could pursue to meet its long-term energy goals. The plan is finalized, and publication is forthcoming, likely on the King County website. PDF copy available upon request.

Community Energy Independence Process, Guidebook, and Toolkit, City of Bloomfield, Iowa

Cadmus is supporting the City of Bloomfield, Iowa, in creating an energy independence planning process and the concurrent development of a community-wide energy independence process guidebook and toolkit that other communities can use as a template for their own energy independence processes. The guidebook and toolkit are being designed to emphasize green infrastructure, integrated solutions best practices, and expanded energy efficiency programming. Cadmus is combining in-depth policy research, scenario modelling on the regional power mix, and active and inclusive engagement of all community stakeholders to create a shared understanding of goals, develop local capabilities, and identify appropriate strategies and procedures that Bloomfield and the greater community can pursue to achieve their energy independence goals.

Solarize Asheville, City of Asheville, North Carolina

As a member of the U.S. Department of Energy Solar Outreach Partnership (SolarOPs) team, Cadmus provided technical assistance to support the Blue Ridge Sustainability Institute's effort to develop and implement a Solarize campaign in the City of Asheville, North Carolina. Specifically, Cadmus provided guidance in drafting and issuing a Solarize Program installer/contractor RFP, and in creating structure and design of the Asheville Solarize program. Cadmus reviewed installer/contractor proposals and offered advice on the selection and terms of contract(s), provided recommendations on the program database and website development, and advised the Project Director on solar policy, practices, equipment, regulations, financing, and incentives. Cadmus also participated in educational workshops and events.

https://icma.org/sites/default/files/307438_Sunshot%20Solar%20Outreach%20Partnership%20Case%20Study_Solarize%20Asheville%20NC.pdf

Critical Infrastructure Solar PV and Resiliency Feasibility Study, North Carolina National Guard

Partnering with the Environmental Defense Fund, Cadmus has been working with the North Carolina National Guard (the Guard) since 2017 to analyze the feasibility of solar PV installations at six of the Guard's facilities across the state, all within Duke Energy's service area. Cadmus is evaluating each site both for the technical feasibility of solar PV, but for energy storage applicability as a part of a vision for resiliency. As part of the study, Cadmus has conducted an initial desktop fatal flaws study to determine whether any proposed sites present an immediate fatal flaw for a renewable energy installation. Using the list of sites that pass the fatal flaws process, Cadmus used industry-standard tools such as Helioscope and PVSYST to create preliminary array layouts and accompanying preliminary system economics, based on relevant local costs, available incentives, and the regulatory climate in Duke Energy's service area. Cadmus developed a custom and detailed economic modeling tool, incorporating the Guard's priorities, North Carolina's regulatory requirements, Duke Energy's current and projected electricity rates, and industry-standard financial inputs to accurately and holistically provide financial projections for each of the Guard's prospective sites. Cadmus will use this technical and economic analysis to recommend applicable sites for the development of solar PV and solar+storage.

Rest Area Solar PV and EV Charging Station Feasibility Study, *North Carolina Department of Transportation*

Partnering with the Environmental Defense Fund, Cadmus began working with the North Carolina Department of Transportation (DOT) in July 2018 to analyze the feasibility of solar PV installations and electric vehicle charging stations at six rest stops throughout the state. As part of the study, Cadmus will conduct an initial desktop fatal flaws study to determine whether any proposed sites present an immediate fatal flaw for a renewable energy installation. Using the list of sites that pass the fatal flaws process, Cadmus will use industry-standard tools such as Helioscope and PVSYST to create preliminary array layouts and accompanying preliminary system economics, based on relevant local costs, available incentives, and the regulatory climate in Duke Energy's service area. Cadmus will incorporate EV requirements and DOT's priorities into our custom economic modeling tool, that currently includes North Carolina's regulatory requirements, Duke Energy's current and projected electricity rates, and industry-standard financial inputs to accurately and holistically provide financial projections. Cadmus will use this technical and economic analysis to recommend applicable sites for the development of solar PV and electric vehicle infrastructure.

Energy Innovation Task Force Programs Working Group, *Buncombe County, City of Asheville and Duke Energy*

The Energy Innovation Task Force researches and recommends energy efficiency and demand side management in Buncombe County, and seeks input from all relevant stakeholders in its process to create recommendations. The Project Team's North Carolina Energy Policy Advisor Jennifer Weiss participated in the EITF as a regulatory and policy expert to advise and educate the EITF group on Duke Energy's energy efficiency programs.

Energy Policy Specialist, *Duke University (Sanford School) North Carolina Leadership Forum*

The Project Team's North Carolina Energy Policy Advisor Jennifer Weiss provided a group of 37 participants – including members of the General Assembly, state and local officials, leaders of non-profit and philanthropic organizations, and business leaders from across the political spectrum - with information about North Carolina's current and future energy needs.

Founding Member and Co-Lead, *various North Carolina Energy Efficiency Working Groups*

The Project Team's North Carolina Energy Policy Advisor Jennifer Weiss founded and co-leads several NC Energy Efficiency working groups and collaborations, which include, for example: The NC On-Bill Working Group, which is a collaborative partnership between Appalachian Voices, the Environmental Defense Fund, the Southern Environmental Law Center, the Environmental Finance Center at UNC-Chapel Hill and the Southeastern Energy Efficiency Alliance to work with North Carolina electric member cooperatives and community stakeholders to provide education and support resources to establish on-bill financing programs for their members and expand access to energy efficiency across North Carolina; and the Multifamily Energy Efficiency Working Group, which works to gain an understanding of barriers and potential solutions that exist to improve the programs and policies that allow for energy efficient investments in multifamily buildings.

Energy Efficiency Financing Program Analysis, *Various Rural Electric Cooperatives*

Cadmus has collaborated with more than a dozen utilities in North Carolina, southern Appalachia, and the broader southeast to conduct financial analysis and program design support for on-bill financing programs that aim to increase access to residential energy efficiency retrofits. Utilities and stakeholders that

Cadmus has supported include Roanoke Electric Cooperative (NC), Lumbee River Electric Membership Corporation (NC), Appalachian Electric Cooperative (TN), and the Mountain Association for Community Economic Development (KY).

Innovations in City Clean Energy & Equity Planning, *The Summit Foundation and The Kresge Foundation* Cadmus (formerly MCG, for this publication) produced a white paper with input from the Innovation Network for Communities (INC). The report summarizes the emerging strategies of city leaders to transform their energy supply to renewable and low-carbon sources, and improve social equity in the process. The purpose of the report is to establish a baseline understanding of the current state of practice in municipal energy supply transformation, and complements Cadmus' *Pathways to 100* report.

http://www.mc-group.com/wp-content/uploads/2017/08/MCG_Innovations-in-City-Clean-Energy-and-Equity-Planning.pdf

Road to Renewable: A Needs Assessment for North American Cities Leading on Energy Supply Transformation Cadmus (formerly MCG, for this publication) produced a report in partnership with the Innovation Network for Communities (INC) and with input from the Carbon Neutral Cities Alliance (CNCA) and the Urban Sustainability Directors Network (USDN) through the support of the Summit Foundation and the Kresge Foundation. This report seeks to illuminate the support needs of North American Cities by identifying the current strategies cities are using to transition to renewable energy, the barriers faced by cities in these planning processes, and the support they need to accelerate, scale, and replicate their efforts.

<https://cadmusgroup.com/wp-content/uploads/2018/07/Road-to-Renewable-A-Needs-Assessment-for-City-Energy-Supply-Transformation-April-2018.pdf?hsCtaTracking=2e880cb5-541a-47d4-b43a-d4b5bb2e4440%7Cd44a8aad-4a98-4500-8553-9692b9cd4cb3>

Northeastern Regional Assessment of Strategic Electrification Cadmus (formerly MCG, for this publication) co-authored this report for Northeast Energy Efficiency Partnerships (NEEP) together with Synapse Energy Economics. The report examines electrification in detail; showing how it can work with efficiency and clean electric supply to drive deep decarbonization. The purpose of the report is to inform the development of regional activities in New York and New England states, and provide a resource to stakeholders across the region as they develop electrification that allows them to base their planning on qualitative and quantitative analysis.

http://neep.org/sites/default/files/Strategic%20Electrification%20Regional%20Assessment.pdf?_hssc=121325015.3.1533759591329&_hstc=121325015.40079330c4053b28e0c5e726dd8e690f.1531744051927.1532025263908.1533759591329.3&_hsfp=1574966616&hsCtaTracking=d1a91494-00ec-4c98-a1ac-c7c7591b93d6%7C1355fdb4-3278-4508-81a9-f07238d52885

Green Ribbon Commission – Commercial Real Estate Working Group Energy Analysis and Real Estate Stakeholder Engagement, *A Better City, Massachusetts*

Cadmus, working in collaboration with local non-profit A Better City (ABC) since 2011, coordinates the Commercial Real Estate Working Group on behalf of the Boston Green Ribbon Commission. The Commission is a group of leaders from Boston's largest commercial and residential property owners, health care organizations, and institutions of higher education that have organized to assist the City in meeting its goal of reducing greenhouse gas emissions 25 percent by 2020. In 2018, Cadmus developed and draft a briefing booklet for the commercial real estate community analyzing the changing policy landscape and emerging opportunities in Massachusetts. The report was released at an energy storage

event for the commercial real estate community in April 2018, for which Cadmus provided content development and speaking support. In addition, Cadmus has advised the Boston Green Ribbon Commission on opportunities for demand management and energy storage under the Massachusetts Energy Efficiency Plans, and has participated in storage policy roundtables for the state of Massachusetts on behalf of the Boston Green Ribbon Commission.

http://www.abettercity.org/assets/images/An_Overview_of_Energy_Storage_Opportunities.pdf

Benham, Kentucky Municipal Power Plan and On-Bill Financing Program Development *Benham Power Board*

Cadmus staff collaborated with the Benham Power Board, Kentuckians for the Commonwealth, and the Mountain Association for Community Economic Develop to develop a municipal energy plan in Benham, Kentucky, a small town in the struggling economic region of Eastern Kentucky. Cadmus staff provided program design support, conducted financial analysis of expected program performance, and participated in a stakeholder-based program planning process. The resulting plan focused on energy improvements in municipal buildings and an on-bill financing program targeting low-income residential energy retrofits, including a discussion of likely funding sources.

Ensuring Equity in Energy Transformation and Innovation, Urban Sustainability Directors Network (USDN)

Cadmus is leading a project with USDN, eight core cities, and 12 additional cities in the U.S. and Canada to build knowledge, tools, and partnerships that will increase equitable access to clean energy for low- and moderate-income households through innovations in local-level program design. Project outputs include a program design guidebook and checklist for local governments, and an inventory and in-depth case studies of best practices. To reflect and apply project findings, Cadmus will organize and facilitate a two-day workshop for core cities and partners to collaboratively develop equity-oriented program solutions.

Technical Assistance and Dissemination of Best Practices for Regional Solar Policy, U.S. Dept. of Energy

Through the U.S. DOE SunShot Program, Project Team members have provided trainings and direct technical assistance to hundreds of municipal, county, and regional government organizations nationwide. Cadmus collaborated as part of the DOE-funded Solar Outreach Partnership, Solar Ready II, and Solar Market Pathways programs, all of which were dedicated to identifying and spreading national best practices in local solar policies and programs. Work included close collaboration with regional planning commissions in Indiana and Missouri, and a stakeholder workshop on local solar policy in Des Moines.

Solar Powering America by Recognizing Communities (SPARC): SolSmart Designation Program, U.S. Department of Energy, International City County Managers Association, The Solar Foundation

Through the Solar Powering America by Recognizing Communities (SPARC) grant, CADMUS has collaboratively developed an innovative and prominent national recognition program called SolSmart that energizes local solar markets and advances soft cost reductions by recognizing community efforts to make communities solar PV friendly. CADMUS led the development of designation criteria by convening and facilitating a Criteria Advisory Committee made up of key stakeholders. CADMUS is assisting in the development of an interactive web portal for the designation, and the design and implementation of special awards for non-local stakeholders. To reach our goal of enabling more than 300 communities across the U.S. to become SolSmart designated, the team provides technical assistance to participant communities via a four-pronged approach: 1) offering one-on-one technical assistance from a team of experienced national experts, 2) deploying full time temporary grant-funded positions embedded in

selected local communities (SolSmart Advisors) to provide more tailored assistance, 3) facilitating peer mentorship and peer learning among participant communities, and 4) creating and curating an online set of technical resources on reducing solar soft costs, including case studies, model solar permitting processes, technical training powerpoints, and videos, and more. CADMUS is providing expertise and project coordination across all SolSmart technical assistance delivery mechanisms.

Solar in Your Community Challenge Project Administration and Training, U.S. Department of Energy

Cadmus is currently working with ICMA to administer the Solar in Your Community Challenge. The Solar in Your Community Challenge is a \$5 million competition amongst over 100 community teams across the country aimed at bringing solar access to underserved communities via innovative community solar models and programs. Cadmus is providing technical review of team applications, review of continuation funding proposals, reviewing and verifying technical assistance, coordinating a series of 10 webinars, and developing a delivering a series of general curriculum materials for participating teams.

In addition, Cadmus planned and executed an in-person training for over 120 participants to accompany the existing technical assistance and education provided as part of the Solar in Your Community Challenge. The purpose of the Solar in Your Community Challenge Training (SYC Training) was to bring together team participants, team coaches, and other solar experts for a 2-day training to educate, empower and connect Solar in Your Community (SYC) Challenge teams. The objectives of the SYC Training included educating, training, and empowering teams with the knowledge, skills and attitude they need to be successful in the challenge; providing opportunities for teams to workshop their projects in group settings with peers, solar experts, and trainers; and building collaborative networks and partnerships between challenge teams that are within similar regions or topical affinity groups to share best practices, trouble-shoot challenges, and further develop strategies to grow the solar market. Cadmus managed and delivered the entire scope of the training including: registration and outreach of the event, participant travel reimbursement, coordination with the event venue to determine functional spaces and audio & visual needs, coordination with solar experts and trainers involved with the Challenge to develop relevant and useful content for the teams, delivery of technical trainings, and the development of a practical agenda for the 2-day event including structured and unstructured networking time as well as engaging and interactive training sessions. Overall, the SYC Training met and exceeded these objectives for participants and trainers within a 6-week timeframe.

Community Energy Strategies Pilot, Massachusetts Clean Energy Center

Cadmus developed and implemented a community dialogue process for 16 communities across Massachusetts to develop community clean energy roadmaps. The process included conducting a series of workshops to engage each community in dialogue to identify and prioritize energy efficiency goals and programs.

<http://www.masscec.com/community-energy-strategies>

APPENDIX A PROJECT TEAM RESUMES



Chad Laurent, Principal

Education and Certifications

Juris Doctor, Suffolk University Law School, Boston

Rappaport Honors Fellow in Law and Public Policy in collaboration with the Rappaport Institute at Harvard University

BS, Natural Resource Ecology and Management, University of Michigan, Ann Arbor

BS, Environmental Policy and Behavior, University of Michigan, Ann Arbor

Lyle E. Craine award for undergraduate achievement in environmental policy

Professional Experience and Qualifications

Chad Laurent, a Cadmus principal, specializes in renewable energy law and policy, sustainable business strategies, and renewable energy project development. Mr. Laurent is a nationally recognized expert in renewable energy market development with 15 years of experience researching and designing voluntary and mandatory green power markets. He has consulted to the U.S. Department of Energy, World Bank, U.N. Agencies, corporate clients, and dozens of municipalities, among other clients. At Meister Consultants Group (MCG), which recently joined Cadmus, Mr. Laurent was the vice president and general counsel and oversaw the firm's legal and financial operations.

Previously, Mr. Laurent was a legal fellow at the Office of the Attorney General for the Commonwealth of Massachusetts, a law and policy fellow for the Executive Office of Energy and Environmental Affairs, and the manager of renewable energy programs at the Massachusetts Energy Consumers Alliance.

Relevant Experience

Analysis Of Renewable Energy Procurement Options In Massachusetts For Inc/Boston Green Ribbon Commission

MCG developed a briefing document outlining the opportunities, barriers, and economics of large scale renewable energy procurement in Massachusetts. The briefing outlined four major pathways organizations can take to procure renewable energy, involving various forms of project development, ownership, and contractual or financial agreements. The report was developed to support ongoing discussions regarding potential collaboration on large scale green power procurement among major public, private, and institutional organizations in the Boston area that participate in the Boston Green Ribbon Commission (GRC). MCG presented the findings at a GRC event in April 2015 attended by more than 50 representatives of GRC members, City of Boston officials, renewable energy procurement specialists, and private sector representatives in the Greater Boston area.

Coordination of Renewable Energy Procurement Prize for the Boston Green Ribbon Commission

MCG worked with the Boston Green Ribbon Commission to coordinate and develop a renewable energy leadership prize. The Green Ribbon Commission Renewable Energy Leadership Prize will award \$100,000 to the team that develops the most compelling strategy for large-scale renewable energy generation procurement from either on-site or off-site sources. The prize is designed to inspire local large commercial, institutional, and public sector (CI&P) energy consumers to implement renewable energy procurement strategies at scale. MCG developed the framework of the prize, the request for proposals, formed and coordinated the expert judging panel and provided technical assistance and feedback throughout the prize process. The award was to be announced in February 2016.

Market Analysis for Corporate Renewable Energy Purchasing For Advanced Energy Economy's Access To Renewables Campaign

MCG conducted a corporate renewable energy purchasing analysis for Advanced Energy Economy (AEE)'s Access to Renewables Campaign. MCG created a policy baseline for large scale renewable energy purchasing options, characterized commercial renewable energy purchasing markets, and estimated the scale of potential impacts of these markets. The results were published in a series of state policy briefings, an internal policy briefing, and presented via a webinar with over 100 attendees.

SolSmart Designation Program U.S. Department of Energy 2015-Present

MCG is working with a national team to develop and implement an innovative and prominent national recognition program called SolSmart that energizes local solar markets and advances soft cost reductions by recognizing community efforts to make communities solar PV friendly. MCG has been centrally involved in both halves of SolSmart, the delivery of solar technical assistance to municipalities and the evaluation of communities for SolSmart designation and recognition. MCG led the development of designation criteria by the convening and facilitation of a Criteria Advisory Committee made up of key stakeholders. MCG is the technical assistance provider for all the Massachusetts communities that have engaged with the program and is helping these communities with a wide range of solar policy questions, including permitting and inspection processes and solar market development in communities with large amounts of multifamily and rental properties. The SolSmart team will enable at least 300 communities across the U.S. to qualify for the SolSmart designation via a three-pronged approach to delivering technical assistance: one on one technical assistance delivery to communities from a team of experienced national experts; the use of SolSmart Advisors to help chosen communities identify and reduce soft cost barriers; and peer mentorship and learning. MCG is providing expertise and project coordination across all three technical assistance delivery mechanisms.

Greenhouse Gas Inventory and Carbon Disclosure Reporting for Unicom Engineering, Inc.

MCG provides greenhouse gas (GHG) management and reporting consulting to UNICOM Engineering, Inc. (UEI), a leading provider of server appliance products and services for storage, security and communications software vendors. MCG has worked with UEI every year from 2009-2014, providing both technical consulting services as well as strategic consulting on emissions measurement, management and disclosure topics. MCG calculates UEI's GHG emissions and prepared responses to questionnaires administered by the Carbon Disclosure Project and the Electronics Industry Citizenship Coalition on behalf of EMC Corporation. In addition to energy and GHG emissions, MCG supported UEI's calculation and disclosure of water and waste impacts. MCG continues to support UEI during the annual disclosure cycle, as well as advise on corporate sustainability, CSR reporting, GHG reduction, and climate change strategies

Professional Memberships and Associations

Bar Admission, Massachusetts Bar

Member, American Bar Association

Law and Policy Expert, Clean Energy Solutions Center

Professionally Trained Mediator, Community Dispute Settlement Center

Advisory Board Member, 100% Renewable and Equitable Cities

Publications

Lead Author. *Pathways to 100: An Energy Supply Transformation Primer for U.S. Cities*. Meister Consultants Group, Energy Foundation, and The Kresge Foundation. March 2017. <http://www.mc-group.com/pathways-to-100/>

Institutional Renewable Energy Procurement: Guidance for Purchasing and Making Associated Environmental Impact Claims. Prepared for the Boston Green Ribbon Commission. October 2016.

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Dillemoth, Baldwin, and Laurent. "Solar Community Engagement Strategies for Planners." Solar Briefing Papers. American Planning Association. 2012.

Ferrey, Laurent, and Ferrey. "FIT in the USA: Constitutional Questions About State-Mandated Renewable Tariffs." *Public Utilities Fortnightly*. June 2010. Preview: May 2010.

Ferrey, Laurent, and Ferrey. "Fire and Ice: World Renewable Energy and Carbon Control Mechanisms Confront Constitutional Barriers." 20 *Duke Environmental Law & Policy Forum* 125. 2010.

Paul Faeth, Principal

Education and Certifications

MSc, Engineering (Resource Systems and Policy Design), Dartmouth College, 1984

BSc, Agricultural Engineering, Cum Laude, University of Florida, 1981

Project Management Professional Certification (PMP), 2017

Executive Management Course, University of Cambridge, 2004

Professional Experience and Qualifications

Paul Faeth, a Cadmus principal, works on issues related to energy, water, and climate change, domestically and internationally. Mr. Faeth has over 35 years of experience in environmental research, economic and policy analysis, and outreach, particularly in developing innovative policies that promote sustainable energy development and water resource use.

Prior to joining Cadmus, Mr. Faeth was director for Energy, Water, and Climate for CNA's Institute for Public Research, where he managed a program that explored the policy synergies among these themes. Before joining CNA, Mr. Faeth was president of Global Water Challenge, a coalition of 24 stakeholders including corporations, nongovernmental organizations, foundations, universities, and health agencies working together to promote and invest in safe drinking water and sanitation for the poor in developing countries. Mr. Faeth worked for 18 years at the World Resources Institute (WRI), the world's top-rated environmental think tank, where he led the Institute's Economics Program and then became its executive vice president and managing director, leading programs, strategic development, and operations. Mr. Faeth's policy research at WRI included topics such as water quality, agriculture, climate change, and trade. He also worked at the International Institute for Environment and Development, where he put together the world's first carbon offset project between a coal-fired power plant in Connecticut and an agroforestry program in Guatemala, and the Economic Research Service of the U.S. Department of Agriculture, where he was an economic policy modeling specialist.

Recent Research Experience

- **Energy Efficiency, Renewable Energy and Mission Resilience at North Carolina National Guard Facilities (2017-2018).** This project explores the financial viability of energy efficiency and renewable energy and their potential impacts for the client's mission.
- **Climate Risk Profiles for USAID Missions (2017-2018).** With USAID staff, the project is developing climate risk profiles for 14 countries and regions. Each profile highlights the key issues regarding climate change adaptation and resilience for the given country or region.
- **The Energy-Water Nexus in Georgia (2017-2018).** Using an energy-sector model that Mr. Faeth developed, this project evaluates various energy pathways in Georgia to determine their water resource, carbon dioxide and air emissions, and economic implications. Mr. Faeth works with stakeholders in the public and private sectors to explore policy options.
- **Financing Municipal Water Services in an Era of Water Conservation (2015-2017).** Using the concept of the "Utility of the Future," this project explored the reasons that utilities do not more often consider water reuse and stormwater harvesting as viable economic options for supply. Using a survey of nearly 150 utilities, the project identified key obstacles and developed financial tools to support evaluation.

- **The Potential for Water Stress and Renewable Energy at Installations of the Texas Army National Guard (2016).** This work mapped Texas Army National Guard (TXARNG) facilities against likely water stress under climate change scenarios to identify water vulnerability. CNA also mapped facilities against maps of solar, wind, and geothermal energy potential and, using cost and electricity price factors, ranked TXARNG facilities for their renewable energy potential.
- **The Environmental Impacts of Hydraulic Fracturing (2013–2016).** Mr. Faeth’s team developed methods to identify the most likely locations for well development in the Delaware River Basin if a moratorium were to be lifted and examined the potential impacts to water quality and use, land use, forest fragmentation, air quality, and population exposure using ArcGIS approaches. The work was extended to all of Pennsylvania. Additional analysis looked at the impacts of interstate gas pipelines.
- **Municipal Water Conservation in Texas (2015-2016).** Mr. Faeth developed a policy and program strategy for the Cynthia and George Mitchell Foundation to accelerate water conservation in the state. He interviewed water utility managers, evaluated projections for water consumption in Texas, made alternative projections based on opportunities for water conservation, explored policy and financing options for water conservation, and identified program investment options for the Foundation.
- **Developing a Research Agenda for the Energy, Water, Land and Climate Nexus (2015-2016).** In cooperation with the U.S. Global Change Research Program (USGCRP), CNA prioritized research topics to support development of a chapter on the nexus for the fourth National Climate Assessment. The team used a survey-based Delphi approach and workshop with a community of 65 topical experts to identify and narrow a broad set of research topics down to the 15 considered the highest priority.
- **Water Savings from the Clean Power Plan in Texas (2014-2016).** CNA used an electric power sector model developed by Mr. Faeth to evaluate the impacts of the U.S. Environmental Protection Agency’s Clean Power Plan on water use in the Texas power sector. Results showed that water consumption could drop by 20% to 35% depending on how the rule is implemented.
- **Synergies between Water Consumption and CO₂ Reduction in the Power Sector (2011-2014).** Mr. Faeth developed an electric power sector model that accounts for water withdrawal and consumption to conduct case studies in China, India, France, and Texas. The results found cost savings and positive synergies among water use for cooling, conventional air pollutants, and carbon dioxide mitigation that would also help the electric sector adapt to climate change.
- **Climate Change and Water Security in Developing Countries (2010-2014).** This work explored the connections between water security, the potential for conflict, and climate change in developing countries. In addition to desk studies, CNA developed a game exploring the potential for conflict between China, India, Pakistan, and Bangladesh under scenarios of increasing water stress as well as flooding. The game was played in two iterations—with experts in Washington from agencies, embassies, and think tanks and with retired government officials from the four countries in Kuala Lumpur.

Professional Association Memberships

American Academy for the Advancement of Science

American Water Resources Association

Project Management Institute

Kalee Whitehouse, Senior Analyst

Education and Certifications

Master in Public Policy, Brandeis University, Waltham, Massachusetts

Master of Business Administration, Brandeis University, Waltham, Massachusetts

BA, Anthropology, University of Vermont, Burlington

Professional Experience and Qualifications

Kalee Whitehouse, a Cadmus senior analyst, focuses on renewable energy deployment, finance, and access. Ms. Whitehouse currently supports research projects on energy efficiency and resiliency in the commercial building sector and has supported content development for workshops and study tours focused on renewable energy and climate resilience. Most recently, she contributed to a market analysis for voluntary resilience standards, interviewing experts on climate resilience and working with a team to convene a focus group of commercial property owners. Ms. Whitehouse works with national partners to provide technical assistance to municipal governments to foster the development of local renewable energy markets nationwide and procure renewable energy systems. She has developed and delivered training to local governments and regional nonprofits on local solar policy and solar PV soft costs and is currently helping several municipal governments plan a regional workshop to engage nonprofits, utilities, local businesses, and advocates on equitable access to solar energy.

Previously, Ms. Whitehouse was a corporate sustainability fellow at Cone Communications where she supported the CSR consulting team to identify alignment between private sector initiatives and nonprofit organizations, areas for thought leadership, turnkey events, and employee engagement opportunities to enable private sector clients to create and meet their sustainability goals. She has also conducted market landscape analyses and synthesized topline reports for clients to identify areas of impact for CSR initiatives and strategies. She also gained in-depth knowledge on the UN Guiding Principles for Business and Human Rights, as well as attended training on deck creation and the Global Reporting Initiative. At The Nature Conservancy of Massachusetts, Ms. Whitehouse supported the Director of Government Relations by conducting research and drafting communications about environmental bills, identifying policy barriers to green infrastructure and stormwater management at the state level, and interviewing stakeholders from the Massachusetts Office of Coastal Zone Management, engineering firms, and TNC Global.

Relevant Experience

SolSmart (SPARC), U.S. Department of Energy, 2016–Present. Ms. Whitehouse supports national team to develop and implement an innovative and prominent national recognition program called SolSmart, which energizes local solar markets and advances soft cost reductions by recognizing community efforts to make communities solar PV friendly. The firm has been centrally involved in both halves of SolSmart, the delivery of solar technical assistance to municipalities and the evaluation of communities for SolSmart designation and recognition. As a technical assistance provider, Ms. Whitehouse works with communities to identify barriers in the zoning code, streamline permitting processes and encourage solar market development. She engages with communities one-on-one, providing best practices to reduce soft costs, including developing streamlined permitting processes, amending zoning codes, and engaging community members. She is currently supporting communities in Massachusetts and

Connecticut through SolSmart technical assistance. Ms. Whitehouse also supports SolSmart's outreach efforts by presenting to regional nonprofits and communities about solar soft costs and the SolSmart program. She has also created resources for local government on financing solar.

NY-Sun PV Balance of System Training and Education Program, New York State Energy Research and Development Authority. 2017. MCG is the lead implementer of New York State's training program for municipal executives, town planners, code enforcement and inspection officers, commissioners of public safety, building department plan examiners and other public officials involved in the approval process for a solar PV system. The program also provides on-call technical assistance to answer policy or technical questions from public officials in New York State. Ms. Whitehouse supports the program by responding to requests for technical assistance, presenting at workshops on solar PV and policy. Ms. Whitehouse has provided support to Solarize campaigns in Northern and Central New York, by reviewing installer bids and highlighting key considerations about the strengths and weaknesses of each proposal. Ms. Whitehouse also provides expertise to local governments on solar procurement, RFP and bid review, and has developed resources and tools for municipal procurement support.

Solar in Your Community Challenge. U.S. Department of Energy. 2017. MCG is working as a technical consultant for the Solar in Your Community Challenge. The Challenge engages teams across the U.S. that compete for seed funding and technical assistance to innovative community solar projects and programs that encourage low to moderate (LMI) participation. The teams can access technical assistance through an online marketplace. MCG supports teams in the areas of project development, procurement, financial analysis, strategic planning, outreach and educational resources and best practices. Ms. Whitehouse is a project manager and works with the team to coordinate technical assistance requests, resource development and team outreach and invoicing.

Climate Mitigation and Public Policy, Heller School for Social Policy and Management, 2016. Ms. Whitehouse conducted a policy analysis on state and federal policies related to flooding mitigation. Her analysis examined policies related to property buy-outs, pre-and post-disaster, as well as flood easement programs. Each policy was assessed on its return on investment, risk reduction, incentives for property owners and political feasibility. Her expert advisor was from The Nature Conservancy.

Selected Publications and Presentations

Whitehouse, K., K. Wright, J. Curti, and Y. Torrie. *Sustainable Tenant Fit-Out and Improvement Guide*. Prepared for A Better City. 2017.

Gessesse, E., N. Grady, K. Whitehouse, and J. Crowe, J. *Now Hiring: The Growth of America's Clean Energy & Sustainability Jobs*. Prepared for the Environmental Defense Fund. 2017.

Ryan Cook, Senior Associate

Education and Certifications

B.A., Sociology, Reed College, Portland, Oregon

Master in City Planning, Massachusetts Institute of Technology, Cambridge, Massachusetts

Professional Experience and Qualifications

A senior associate Cadmus, Mr. Cook has extensive experience in energy policy and planning, with a focus on supporting decision-makers with a combination of clean energy policy expertise and critical quantitative tools and methodologies. He specializes in public policy planning processes that blend intensive stakeholder engagement and input, qualitative policy research of opportunities and barriers, and robust quantitative analysis of potential outcomes. Mr. Cook works with a diverse range of domestic and international clients to develop and implement programs that target a transformation in energy markets. In addition to his work with Cadmus, he has held positions with the San Francisco Public Utilities Commission and White House Council on Environmental Quality.

Areas of Expertise

- State and utility renewable energy and energy efficiency program design (with specific expertise in solar energy, energy efficiency, and renewable heating markets and policy).
- Energy modeling and financial analysis (including cost-effectiveness analysis, rate impact analysis, potential studies, and market characterization).
- Community-scale program development.
- Municipal clean energy policy and strategy.
- Application of best practice energy policies to international development.

Relevant Experience

State Policy Framework Design

Led the development of **Rhode Island's Thermal Market Development Strategy**, combining policy and economic research to identify pathways for transformation in state heating consumption.

Oversaw MCG's support of the **New York State Energy Research and Development Authority's Renewable Heating and Cooling Policy Framework**, including assessing technology cost-effectiveness and cost-reduction opportunities, evaluating policy opportunities to decrease technology costs and increase market penetration, and conducting robust industry stakeholder engagement.

Supported the **Hawaii State Energy Office** in a two-year evaluation of **alternative utility ownership and regulatory structures**, and their ability to enable the state to meet its 100% renewable energy targets.

Utility Program Support and Analysis

Developed a proposed **community-based pilot program for air source heat pumps in National Grid's New York State service territory**, including a cost-benefit analysis that evaluated opportunities for fuel-switching.

Conducted **financial assessments or evaluations of on-bill financing programs** under consideration or in implementation by a dozen electric utilities (primarily rural electric cooperatives) in Kentucky, North Carolina, Arkansas, Tennessee, and Missouri.

Collaborated with the National Rural Electric Cooperative Association on the **development of a Community Solar Playbook** resource for cooperative utilities pursuing solar projects, and supported Ouachita Electric Cooperative in Arkansas in the development of a tariff for a community solar program.

Developed **proposed net energy metering and feed-in tariffs for the CleanPowerSF** community choice aggregation program (this work was conducted as an employee of the San Francisco Public Utilities Commission).

Provided **cost-effectiveness and program impact analysis** in the planning or evaluation of utility demand-side management programs for over two dozen utility or state energy efficiency program administrators.

Municipal Goal-Setting and Policy Development

Led the development a **Renewable Energy Transition Plan for King County, Washington**. This analysis included stakeholder engagement, an assessment of barriers and opportunities for various policy approaches, the evaluation of the effectiveness of different policy strategies in changing the King County power mix, and the construction of a policy roadmap for the county in pursuing its goal of 90% renewable energy by 2030.

Leading an **Energy Independent Community Planning Process** in the City of Bloomfield, Iowa. This community-based effort with define pathways for the City to reach its target of 100% energy independence by 2030, with an emphasis on expanded energy efficiency programming and local renewable energy generation.

Collaborated with MCG colleagues to **define municipal pathways for high levels of renewable energy penetration**, contributing to the MCG Pathways to 100 Report and working the Bloomberg Foundation to model specific policy pathways to cities to adopt in meeting Paris climate commitments.

Developed a **clean energy plan** for the town and municipal utility in the Town of **Benham, Kentucky**, focusing on energy efficiency improvements in government and large commercial facilities and the development of an on-bill financing program for residential energy improvements.

Evaluated and supported future program design decisions for the **commercial building benchmarking** initiative in the City of **Cambridge, Massachusetts**.

Community-Level and Project-Level Technical Assistance

Provided **solar energy policy technical assistance to local governments** nationwide through the US DOE Solar Outreach Partnership and Rooftop Solar Challenge, and throughout New York State through the NYSERDA PV Trainers Network. This work includes trainings on solar policy and technical topics for elected officials and key municipal staff (planners, code inspectors, etc.), the development of resources for local solar policies and programs, and custom one-on-one technical assistance for specific municipal solar efforts.

Supported **more than twenty community-level Solarize group-purchasing campaigns** in six states, through technical assistance programs of the US Department of Energy, New York State Energy Research and Development Authority, and Massachusetts Clean Energy Center; also developed guidance documents and contributed to national policy discussions of the Solarize model.

Provided technical assistance to **more than a dozen communities in the procurement of large-scale solar projects** for municipal use, including support with RFP development, installer selection, and financial analysis; primary author on the primary municipal solar procurement resource of the New York State Energy Research and Development Authority.

Collaborated in the development of a **US DOE solar-friendly city designation program**, SolSmart, and in the development of technical assistance and training protocols to support the program.

Supported efforts of five northeastern US cities to develop **community-based campaigns for renewable heating and cooling group purchasing**, organized through the Carbon Neutral Cities Alliance; work included the identification of high-priority sites for heating conversion using municipal tax assessor databases for use in community campaigns.

International Application of Best Practices

Co-authored a joint USAID-NARUC guidance document for the **regulation of isolated mini-grids in emerging economies**, advising national regulators on approaches to oversee rural electrification efforts.

Developed a **policy cost and cost-effectiveness model for the evaluation of rooftop solar** programs in St. Lucia and Antigua and Barbuda, funded by the World Bank and Clean Energy Solutions Center.

Oversaw the creation of a **project monitoring and evaluation tool** for the Jamaican Ministry of Science, Energy & Technology, funded by the World Bank, which enables the ministry to understand the impacts of potential new generation projects and to track progress towards national energy goals.

Worked with GIZ and local partners to develop a **pilot rooftop solar group purchasing effort** in Delhi, India. Based on the Solarize model, this pilot program is the first application of the model in international contexts.

Energy Policy and Market Research

Worked with Advanced Energy Economy to categorize and characterize **pathways for corporate procurement of renewable energy**, evaluating the size of potential markets and the policy steps needed to enable greater opportunities for corporate purchasing.

On behalf of Advanced Energy Economy, developed projections of the **power mix and employment impacts** of various strategies for compliance with the proposed US EPA Clean Power Plan in the State of Virginia.

Partnered with the Union of Concerned Scientists to develop projections of the cost and impacts of **potential Green Bank programs** in seven northeastern states.

For the National Resources Defense Council, projected the potential market size of a **low-and-moderate-income community solar program** roll-out in New York City, projecting the total energy needs of LMI households and identifying the potential rooftop solar resource in the city.

With the DesignLights Consortium, evaluated the **impact of voluntary industry standards** on the rate of technological improvement in the solid-state lighting market.

Publications

Renewable Heating and Cooling Policy Framework: Options to Advance Industry Growth and Markets in New York. (2017). Albany, NY: New York State Energy Research and Development Authority. Available at: <https://goo.gl/GNf3o6>

Practical Guide to the Regulatory Treatment of Minigrids. (2017). Washington, DC: USAID and National Association of Regulatory Utility Commissioners. With E. Chessin, E. Gessesse, M. Solano-Peralta, Y. Borofsky. Available at: <https://goo.gl/tT9VHS>

Rhode Island Renewable Thermal Market Development Strategy. (2017). Providence, RI: Rhode Island Office of Energy Resources. With J. Koo, N. Veilleux. Available at: <https://goo.gl/hwqDt7>

The Community Solar Playbook. (2016). Washington, DC: National Rural Electric Cooperative Association. With A. Cotter, M. Wilkerson, H. Cano, R. Wasson, K. Lockwood, T. Lawal, J. Crowe, N. Grady, C. Laurent, W. Rickerson. Available at: <https://goo.gl/3CSvRu>

The 50 States of Solar: 2015 Policy Review. (2016). Raleigh, NC: North Carolina Clean Energy Technology Center. With B. Inskeep, E. Case, K. Daniel, A. Proudlove, K. Wright, C. Laurent. Available at: <https://goo.gl/eKzCto>

Opportunities to Increase Corporate Access to Advanced Energy. (2016). Washington, DC: Advanced Energy Economy. With W. Rickerson. Available at: <https://goo.gl/5w5hYi>

Solar Procurement Guidelines for Local Governments in New York State. (2015). Albany, NY: New York State Energy Research and Development Authority. With E. Chessin, A. Belden, C. Laurent, J. Strachan. Available at: <https://goo.gl/USc1M4>

Benchmarking the Solarize Model: A Survey of Campaign Organizers. (2015). Washington, DC: US Department of Energy Solar Outreach Partnership. Available at: <https://goo.gl/GjZygi>

Assessing Virginia's Energy Future: Employment Impacts of Clean Power Plan Compliance Scenarios. (2015). Washington, DC: Advanced Energy Economy. Available at: <https://goo.gl/h9vxyP>

Utility Ownership of Rooftop Solar PV: An Emerging Business Model for Municipal Utilities. (2015). Washington, DC: US Department of Energy Solar Outreach Partnership. With B. Inskeep, K. Daniel, A. Proudlove, K. Wright, C. Laurent. Available at: <https://goo.gl/ymun41>

The Cost of Contentiousness: A Status Report on Offshore Wind in the Eastern United States. (2015). Charlottesville, VA: Virginia Environmental Law Journal. With L. Susskind. Available at: <https://goo.gl/6nrDeK>

Solarize America: How Policy Networks Adopt and Adapt Good Ideas. (2014). Cambridge, MA: Massachusetts Institute of Technology Masters Thesis. Available at: <https://goo.gl/PzrmdD>

Empowering Communities to Overcome Barriers to Multifamily Energy Efficiency. (2013). Cambridge, MA: MIT Energy Efficiency Strategy Project. Available at: <https://goo.gl/zvmXr9>

The Potential for On-Bill Financing in Municipal Utilities. (2012). Boston, MA: Metropolitan Area Planning Council. With O. Kerr. Available at: <https://goo.gl/8vH9ji>

Julie Curti, Associate

Education and Certifications

Master in City Planning, Massachusetts Institute of Technology

BA, Geography and Political Science, University of Wisconsin

MIT Certificate in Environmental Planning and Policy

Certified Mediator in the Commonwealth of Massachusetts

Professional Experience and Qualifications

Ms. Curti works on stakeholder engagement and climate and energy strategy, policy and planning in the public and non-profit sectors. She has planned and facilitated stakeholder working groups around increasing access to affordable and efficient energy for low-income households, developing renewable energy goals, and developing disruptive strategies for reducing plastic pollution in cities. Most recently, she facilitated workshops for stakeholders and county staff to identify priorities and viable policy and programmatic options to help King County, Washington, meet its renewable electricity goals. She has also led the planning and facilitation of a series of public workshops to solicit input into a study of future regulatory and ownership models for energy utilities serving the State of Hawaii. Ms. Curti supported strategic planning for the City of San Francisco's Environment Department, facilitating stakeholder dialogue around equity in the department's work and helping staff to define their goals, strategies, and actions in priority areas.

Areas of Expertise

- Climate and Sustainability Planning
- Climate Change Adaptation and Resilience
- Clean Energy Policy
- Equitable Planning and Policy Design
- Food Policy and Programs
- Economic and Workforce Development
- Facilitation
- Stakeholder and Community Engagement
- Partnership Building
- Strategic Planning
- Project and Program Management

Relevant Experience

Facilitation and Stakeholder Engagement

- **Design and Facilitation of a Funder Convening on U.S. City Renewable Energy Transformation** (*Clients: The Kresge Foundation; Partners: Bloomberg Philanthropies, the Summit Foundation; Rockefeller Brothers' Foundation*). Cadmus is working with a core group of foundations committed to supporting city transitions to renewable energy to design and host a funder

convening on the topic. This intimate, strategic retreat-style event is designed to inspire greater communication and coordination among funders with similar goals and mutually reinforcing funding strategies. Ms. Curti is the project manager for designing the agenda, conducting interviews with prospective attendees, providing supporting research and analysis, and facilitating and documenting outcomes from the event.

- **Evaluation of Utility Ownership and Regulatory Models in Hawaii** (*Client: Hawaii Department of Business, Economic Development, and Tourism*) Working with a team of consultants to support the Hawaiian State Energy Office (within the Department of Business, Economic Development, and Tourism) in evaluating future utility models for the state, a project initiated by the Hawaiian state legislature. Specifically, in the context of Hawaii’s state energy goals of reaching 100% renewable energy penetration by 2045, Cadmus is evaluating viability of different utility ownership and regulatory models for Hawaii, evaluating the economic, social, technical, and infrastructural factors implicated in a shift in utility business models. Cadmus is leading the evaluation of different ownership models (including options for municipal or cooperative ownership and variants on the investor-owned utility model). Ms. Curti is co-leading a robust stakeholder dialogue to solicit input on regulatory and ownership models from a wide variety of Hawaiian energy stakeholders over a two-year period.
- **Ensuring Equity in Energy Transformation and Innovation** (*Client: Urban Sustainability Directors Network (USDN) and the City of Burlington, VT*) Ms. Curti is currently leading a project with USDN and eight cities in the U.S. and Canada to build knowledge, tools, and partnerships that will increase equitable access to clean energy for low- and moderate-income households through innovations in local-level program design. Project outputs include a program design guidebook and checklist for local governments, an inventory of worldwide best practices complemented by in-depth case studies, and convening cities and partners for a workshop to collaboratively develop equity-oriented program solutions. Throughout the project, an equity advisory committee has been convened to advise on project work products and ensure that voices and experiences of low- and moderate-income households are represented in the process. As a parallel effort, Ms. Curti is also leading the facilitation of a newly formed Vermont Renewable Energy Access Coalition created to apply and advance project work products into equitable clean energy programs in Vermont.
- **Energy Supply Transformation Strategies for U.S. Cities and Partners and Equity Framework** (Clients: The Kresge Foundation, Summit Foundation, Energy Foundation; Partners: Innovation Network for Communities (INC), Urban Sustainability Directors Network (USDN), Carbon Neutral Cities Alliance (CNCA)). Pursued action-oriented research with leading U.S. cities to better characterize current strategies used by U.S. municipalities to influence their energy supply, as well as pathways for moving forward towards deep decarbonization. Cadmus developed a primer and map of the energy system frameworks in which cities operate as a resource for stakeholders. Based on interviews with municipal staff, Cadmus created a needs assessment to characterize current municipal energy management practices and to identify resources and infrastructure needed to help move cities successfully towards deep decarbonization. Ms. Curti led the process of developing and incorporating a framework for understanding equity

implications of energy transformation, using an advisory committee of several field experts to help understand equity impacts via the lenses of procedural, distributional, structural, and transgenerational impacts on low-income and minority communities. Pathways recommended as part of the project will incorporate an analysis of the equity implications of different options.

- **Renewable Energy Transition Planning** (*Client: King County in Washington State*) Conducted policy analysis and stakeholder engagement to model potential scenarios for King County to meet its 90% renewable electricity goal by 2030. Ms. Curti led the facilitation of two in-person workshops with county and city staff and a broader group of stakeholders and held one-on-one interviews to define priorities and strategies for meeting the county’s goals. Based on this input, Cadmus conducted a detailed review and analysis of policy and programmatic options for the county to pursue within their direct control, by partnering with utilities, and by pursuing legislative changes at the state level. Top policy results have been modeled under several scenarios to prioritize county actions and investments moving forward.
- **Local Carbon Fund Development** (*Client: City of Cambridge, MA*) The City of Cambridge’s Net Zero Action plan calls for using carbon offsets to reduce all City buildings’ carbon footprint, which account for 80% of the City’s emissions. Cadmus is investigating and implementing program design options for a local carbon offset fund that emphasizes carbon footprint reduction projects in Cambridge, especially for buildings. In Phase I, Cadmus outlined standards for the local carbon fund’s definition, geographic scope, ownership of offsets, lifespan, and project verification mechanisms, and will use quantitative analyses to identify likely local project categories and market size. In Phase II, Cadmus is conducting an economic potential study to establish offset pricing and demand, and develop a feasible program and administrative structure for the fund. Ms. Curti has led the facilitation of stakeholder consultations throughout, adapting the feasibility study based on input received.
- **Affordable Access to Clean and Efficient Energy Working Group** (*Client: MA Department of Energy Resources*) Co-facilitator for a 25-member stakeholder working group to support the governor’s initiative to increase access to clean and efficient energy for low- to moderate-income residents in the state. The working group met five times over the course of six months to discuss key barriers to accessing the state’s clean energy and energy efficiency programs and incentives, and to brainstorm and prioritize a list of actionable solutions for DOER to implement. Ms. Curti co-facilitated the working group meetings, providing content expertise, and supporting analysis of meeting results and preparation for upcoming working group sessions. Final results were analyzed and included in a written report that informs DOER next steps and policy decisions.

Strategic Planning

- **Energy Supply Transformation Strategies for U.S. Cities and Partners** (Clients: The Kresge Foundation, Summit Foundation, Energy Foundation; Partners: Innovation Network for Communities (INC), Urban Sustainability Directors Network (USDN), Carbon Neutral Cities Alliance (CNCA)). Pursued action-oriented research with leading U.S. cities to better characterize current strategies used by U.S. municipalities to influence their energy supply, as well as

pathways for moving forward towards deep decarbonization. Cadmus developed a primer and map of the energy system frameworks in which cities operate as a resource for stakeholders. Based on interviews with municipal staff, Cadmus created a needs assessment to characterize current municipal energy management practices and to identify resources and infrastructure needed to help move cities successfully towards deep decarbonization. Ms. Curti led the process of developing and incorporating a framework for understanding equity implications of energy transformation, using an advisory committee of several field experts to help understand equity impacts via the lenses of procedural, distributional, structural, and transgenerational impacts on low-income and minority communities. Pathways recommended as part of the project will incorporate an analysis of the equity implications of different options.

- **San Francisco Environment Department Strategic Planning** (*Client: City of San Francisco Department of the Environment*). Worked with the City of San Francisco in 2016 to support development of a new strategic plan for the City's Department of the Environment. Cadmus designed and facilitated a series of interviews and workshops to engage staff and stakeholders, evaluated proposed strategies and objectives in collaboration with Department staff, synthesized results into a draft strategic plan, and supported the process of securing approval of the plan from the City's Commission on the Environment. Cadmus also conducted interviews and research to identify global trends and benchmark the city's proposed strategies against leading practices.
- **Organizational Strategic Plan for Efficiency Forward** (*also known as the DesignLights Consortium*) (*Client: Efficiency Forward / DesignLights Consortium*). Cadmus was hired to support strategic planning for the DesignLights Consortium (DLC), a major program of the Northeast Energy Efficiency Partnerships (NEEP) spun off as a new non-profit in January 2017. Cadmus provided advisory services, targeted analysis on operational and strategic issues, market research, and other support services and worked collaboratively to develop an organizational plan presenting the DLC's strategy, structure, financial viability and readiness for independence. This culminated in November 2015 in a unanimous NEEP Board of Directors decision to spin off the DLC into an independent non-profit. Cadmus continues to support the DLC with strategy and program development, including research into international program opportunities.

Additional Professional Experience

- **MIT Science Impact Collaborative**, *Graduate Research Assistant* (2013 – 2015). Worked with MIT and the Consensus Building Institute on the New England Climate Adaptation Project (NECAP), collaborating with four coastal New England towns to organize public climate adaptation workshops for residents. Ms. Curti reached out to stakeholders to organize the workshops, facilitated the meetings, collected extensive quantitative and qualitative data from the workshops, and analyzed the findings to learn how communities can collaboratively plan for climate change risks. Based on the findings, she wrote a case study for Wells, Maine and co-authored a book chapter on stakeholder engagement outcomes from the project.

- **USDA Partnerships Center**, *Associate Director and Assistant to the Director* (2010 – 2013). Initiated partnerships between U.S. Department of Agriculture (USDA) and community organizations serving low- to moderate-income populations to increase access to healthy, affordable food via USDA programs and resources. As part of First Lady Michelle Obama’s Let’s Move initiative, she co-led a team that engaged over 900 faith and community groups in ending childhood obesity within a generation and build healthier families. As project manager of the Feds Feed Family’s Food Drive for the department, she organized USDA employees in raising 2.77 million pounds of food for food banks and pantries around the country. Ms. Curti regularly provided technical assistance and organized workshops for community organizations to promote participation in USDA’s key programs for ensuring food access for low-income households and access to safe and affordable rural housing. She facilitated discussions between HUD, HHS, and other federal program providers to connect service providers on the ground to resources for their community members.
- **U.S. House of Representatives**, *Legislative Correspondent* (2008 – 2010). Advanced the Congressman’s priorities, meeting with constituents, and tracking legislation. She initiated and implemented a restructure of the office’s correspondence system process, improving office responsiveness to constituent inquiries and lessening the office’s administrative burden.

Selected Publications and Presentations

- Curti, J. and Wright, K. (2017). “Framework for an Equitable Energy Supply Transformation.” Prepared for The Kresge Foundation.
- Crowe, J. and Curti, J. (2017). “Road to Renewable: A Needs Assessment for North American Cities Leading on Energy Supply Transformation.” Prepared for the Summit Foundation and the Kresge Foundation.
- Curti, J. and Wright, K. (2017). “Framework for an Equitable Energy Supply Transformation.” Prepared for the Kresge Foundation.
- Curti, J., Hanley, W., Wright, K., Shyduroff, S, and Torrie, Y. (2017). “The Commercial Net Zero Energy Building Market in Boston.” Prepared for A Better City.
- Whitehouse, K., Wright, K., and Curti, J. (2017). “Sustainable Tenant Fit-out and Improvement Guide.” Prepared for A Better City.
- Wright, K., Whitehouse, K. and Curti, J. (2017). “Voluntary Resilience Standards: An Assessment of the Emerging Market for Resilience in the Built Environment.” Prepared for the Energy, Kresge, and Barr Foundations.
- Plastrik, P., Cleveland, J., Crowe, J., Curti J. and Rickerson, W. (2016). “Leadership by U.S. Cities: Innovations in Climate Action.” Prepared for Bloomberg Philanthropies.
- Wright, K., Curti, J., and Rickerson, W. (2016). “Energy Efficiency in Commercial Real Estate: Overcoming Barriers to Investment in Boston.” Prepared for A Better City.
- Hulet, C., Field, P., and Curti J. (2015). “Why Public Engagement is Necessary to Enhance Local Readiness for Climate Adaptation,” in *Managing Climate Risks in Coastal Communities: Strategies for Engagement, Readiness, and Adaptation*, Anthem Publishing.
- Curti, J. (2015). “Strategies for Equitable Climate Change Adaptation: Lessons from Buy-back and Elevation Programs in Rhode Island.” Master’s Thesis for MIT Master in City Planning degree.

PROFESSIONAL EXPERIENCE

SENIOR POLICY ASSOCIATE, Nicholas Institute for Environmental Policy Solutions, Durham, North Carolina

Engage decision makers in the private and public energy sectors, provide information and research on a variety of intersecting renewable energy and conservation practices, explore financing mechanisms for renewable energy and analyze the impact of energy policies, mandates and programs on new and existing energy programs. 2017 to present

ENERGY EFFICIENCY POLICY MANAGER, Southern Alliance for Clean Energy, Raleigh, North Carolina

Track and participate in energy efficiency regulatory proceedings in North and South Carolina, including integrated resource planning, cost-recovery filings, energy efficiency program pilots and existing program modifications. Collaborate with advocacy organizations, utility regulators, electric utilities and other key energy efficiency stakeholders to provide technical and strategic assistance on issues of importance to the North Carolina energy community. 2015-2017

SENIOR FINANCE ANALYST, Environmental Finance Center, University of North Carolina, Chapel Hill, North Carolina

Provided financial analysis and advisory expertise for environmental and sustainable energy projects. Developed innovative finance models and mechanisms - including revolving loan funds, on bill repayment and loan loss reserves - that can be used by universities, municipalities and other public organizations to encourage the implementation of renewable energy and energy efficiency projects. Coordinated the development of the Southeast Energy Efficiency Finance Network, a collaboration of key energy efficiency stakeholders in the southeast. 2012-2015

CARBON OFFSET ANALYST, Duke Carbon Offset Initiative, Duke University, Durham, North Carolina

Established guidelines and methodology for using small commercial energy efficiency projects as carbon offsets to help Duke University meet its carbon neutrality goal by 2024. 2011-2012

CLIMATE CORPS PUBLIC SECTOR FELLOW, Environmental Defense Fund, Raleigh, North Carolina

Analyzed energy efficiency opportunities for Shaw University in Raleigh, NC. Thoroughly reviewed school's HVAC, lighting and office equipment identifying energy efficiency initiatives of over 16% in annual energy costs. Summer 2011

MARKETING AND EDUCATION CONSULTANT, North Carolina Sustainable Energy Association, Raleigh, North Carolina

Developed extensive marketing and educational materials. Researched and authored summaries of key policies affecting the sustainable energy community in North Carolina. Summer 2010

SYSTEMS AND FINANCIAL CONSULTANT, Clean Energy Durham, Durham, North Carolina

Served on Neighborhood Energy Retrofit Program implementation and planning team, designed to assist over 700 households reduce energy use through targeted retrofits and conservation education. Researched and implemented new project management and fundraising software. 2009-2010

HIBERNIA NATIONAL BANK, New Orleans, Louisiana

SENIOR VICE PRESIDENT. Promoted to direct the Online Business Solutions group, a cross-functional team of 25, in providing key strategy, analysis, development, marketing and support for the bank's internet, intranet and online banking web sites. Contributed to monthly technology steering committee meetings with department heads to strategize new online initiatives; developed and launched innovative and successful web-based banking products. Increased penetration of online banking usage to over 30% of all consumer and small business clients, well above the industry average in 2004. 2003-2004

VICE PRESIDENT/ECOMMERCE MANAGER. Substantially expanded online applications for all banking products through strategic, large-scale marketing programs and by completely redesigning the bank's website to improve client accessibility. Supervised a team of 11 in channel management, product development, business analysis, online marketing and training activities. 1999-2003

(Continued on next page)

M&T BANK CORPORATION, Buffalo, New York

ASSISTANT VICE PRESIDENT CHANNEL MANAGER. Instrumental in the bank's development of commercial web banking operations, launching five new bank services to small business clients. Successfully created and implemented business banking website, online loan application and customer service center. 1998-1999

BANKING OFFICER/SENIOR PRODUCT MANAGER. Planned, coordinated and launched bank's small business credit card, debit card and online banking products. Directed dynamic promotions, advertising campaigns and direct mail initiatives. 1995-1998

OTHER EXPERIENCE

FINANCE STRATEGIES WORKING GROUP, SEE Action Network, U.S. Department of Energy, 2014 - Present

NC GREENPOWER BOARD OF DIRECTORS, Raleigh, NC. 2014 – 2015, 2016 – Present

COMMERCIAL LOAN OFFICER, Peoples Heritage Bank, Rockland, ME, 1993-1995

COMMERCIAL CREDIT ANALYST, Peoples Heritage Bank, Portland, ME, 1991-1993

EDUCATION

MASTER OF ENVIRONMENTAL MANAGEMENT, May 2012

Nicholas School of the Environment, Duke University, Durham, North Carolina

Concentration: Energy and the environment.

Master's project: Energy Education in Wake County Public Schools.

MASTER OF BUSINESS ADMINISTRATION, May 1995

University of Michigan, Ann Arbor, Michigan

Concentration: Entrepreneurship, corporate strategy and finance.

BACHELOR OF ARTS, June 1990

University of California at San Diego, La Jolla, California

Major: Economics. Minors: Philosophy, Mathematics.

PUBLICATIONS

DESIGNING AN EFFECTIVE EMPLOYEE ENERGY EFFICIENCY PROGRAM: A REVIEW OF DUKE CARBON OFFSET INITIATIVE'S ENERGY EFFICIENCY PILOT PROGRAM (MAY 2016).

Authors: Charles Adair, Jennifer Weiss

An evaluation of Duke University's pilot to design a program that helps employees complete energy efficiency home retrofits and track carbon offsets generated from post-retrofit energy savings.

INNOVATIONS IN HOME ENERGY USE: A SOURCEBOOK FOR BEHAVIORAL CHANGE. CHAPTER TITLED "LEVERAGING THE EMPLOYER-EMPLOYEE RELATIONSHIP TO REDUCE GREENHOUSE GAS EMISSIONS AT THE RESIDENTIAL LEVEL."

RTI International Press Book, Jan 2016

Authors: Charles Adair, Jason Elliott, Jennifer Weiss

FINANCING ENERGY EFFICIENCY-BASED CARBON OFFSET PROJECTS AT DUKE UNIVERSITY (JUNE 2014)

Authors: Jennifer Weiss, Tatjana Vujic

This report summarizes and compares seven types of energy efficiency projects that Duke University could consider for carbon offset projects, proposes different financing mechanisms to fund each project type, and suggests ways to reduce the costs of each project type.

THE OPPORTUNITY FOR ENERGY EFFICIENCY FINANCING PROGRAMS IN THE SOUTHEAST (MAY 2014)

Authors: Jennifer Weiss, Timothy Block, Ian Fischer, Steve Morgan

In this report, the authors examine the underlying barriers and drivers of successful efficiency programs, deliberate upon what financing roles are most appropriate for SEEA involvement going forward, and make recommendations about how to best allocate the \$700,000 of remaining DOE funds for use in the financing of energy efficiency programs.

FINANCIAL SOLUTIONS FOR A SUSTAINABLE FUTURE (APRIL 2014).

Authors: Jennifer Weiss, Glenn Barnes, Jenna Koester

An evaluation prepared for NC GreenPower evaluating their current business model and offering recommendations for new business line alternatives to ensure long-term financial sustainability.

RESIDENTIAL ELECTRIC CUSTOMER USAGE AND EXPENDITURE ANALYSIS: TOWN OF EDENTON, NC (MARCH 2014)

Authors: Jennifer Weiss, Yijing Cheng, Jeffrey Hughes.

An analysis of energy usage and expenditures used by the Town of Edenton to target specific residential customers that might benefit from energy efficiency improvements to their homes.

AN ANALYSIS OF A LANDFILL GAS TO ENERGY PROPOSAL TO THE COUNCIL OF INDEPENDENT COLLEGES IN VIRGINIA (JUNE 2013)

Author: Jennifer Weiss.

An economic analysis of a proposal to use electricity generated from landfill gas at six Virginia colleges.

PUGET SOUND CLEAN AIR AGENCY RESIDENTIAL WOOD SMOKE REDUCTION INITIATIVE BURN BAN FINANCIAL ASSISTANCE EX ANTE PROGRAM ASSESSMENT (JUNE 2013)

Authors: Christine E Boyle, Jeffrey Hughes, Jennifer Weiss.

An analysis of program alternatives that the PSCAA and other air quality regulatory agencies can use to reduce wood smoke particulate emissions without increasing the cost burden on low-income and low-wage earning households during burn ban days.

FINANCING CLEAN ENERGY PROJECTS AT SMALL LIBERAL ARTS COLLEGES (MAY 2013)

Authors: Jeffrey Hughes, Jennifer Weiss

This guide outlines the four key steps necessary for investment into sustainable energy projects at small colleges and universities.

Tyler Orcutt, Senior Analyst

Education

BA, Environmental Studies and Sustainability, George Washington University

Concentrations in Geospatial Information Systems (GIS) and Business Administration

Professional Experience and Qualifications

Tyler Orcutt, a senior analyst at Cadmus, is an energy and environmental policy professional with expertise in renewable energy consulting. She manages and coordinates technical consulting work for state renewable energy incentive programs in Massachusetts and Rhode Island, including Rhode Island's Renewable Energy Fund and Renewable Energy Growth Program, MassCEC's Clean Heating and Cooling program, and programs in New York on behalf of NYSERDA. In addition, Ms. Orcutt serves as a technical consultant for independent municipalities and entities in Massachusetts, guiding communities through the mechanical and contractual aspects of the solar procurement process. Ms. Orcutt also utilizes her expertise in GIS to perform quantitative analyses of regional solar potential, assessing the solar production, PV capacity, and land area capacity of areas using various geospatial datasets.

Relevant Experience

Solar Quality Assurance (QA) Services Contract Management

Ms. Orcutt manages multiple state-run incentive programs in New York, Massachusetts, and Rhode Island to facilitate Cadmus' QA services by serving as a liaison between installers, electricians, consumers, and incentive agency representatives to streamline the inspection process and ensure full productivity of the Cadmus team. Technologies range from solar photovoltaic (PV) to geothermal and system size from residential to commercial-scale. Ms. Orcutt participates in weekly communications with both installers and Cadmus' inspectors to debrief technical and administrative concerns. Recent programs include these:

- **MassCEC's Clean Heating and Cooling (CH&C) Programs.** As the project manager of Cadmus' QA services for MassCEC's CH&C programs, Ms. Orcutt works closely with MassCEC and Massachusetts installers to coordinate and report quality findings from program-wide renewable heating and cooling inspections.
- **MassCEC's Solar Loan Program (SLP).** As the deputy project manager of Cadmus' QA services for MassCEC's SLP, Ms. Orcutt works closely with Massachusetts solar installers and solar stakeholders to coordinate and report quality findings from program-wide solar inspections.
- **Rhode Island's Renewable Energy Fund (REF).** As the deputy project manager of Cadmus' QA services for the REF, Ms. Orcutt works closely with Commerce RI and Rhode Island solar stakeholders to provide data on programmatic installation quality, specified minimum technical requirements, and technical training resources.
- **Rhode Island's Renewable Energy Growth (REG) Program.** Serving in the project manager capacity for Cadmus' REG QA services, Ms. Orcutt manages a statistical sample-based quality study to inform programmatic improvements for future tariff years.

Technical Assistance to Massachusetts Municipalities

Ms. Orcutt works with Massachusetts municipalities pursuing solar PV projects to provide owner's agent technical assistance consulting services. Her work includes conducting reviews of procurement documents, performing bid evaluations, assessing municipalities' risk associated with solar contracts, and assisting with meetings of prospective developers and local officials. Additionally, Ms. Orcutt develops preliminary economic and production models to quantify the potential capacity of a municipality's site portfolio. This analysis helps to confirm projections from developers' bids, and guides the entity in selecting the most practical and cost-effective sites for development.

Feasibility Analysis for PV Siting

Ms. Orcutt has extensive experience in quantitative geographic analysis of solar PV site feasibility, and has developed models spanning regions throughout the United States, including Washington, Oregon, Idaho, Montana, Colorado, New York, and Washington DC. Her GIS-based analysis draws from physical land cover datasets, tax and property parcel maps, and utility incentive regions to locate optimal siting zones for development of small-scale and community shared solar projects. In addition to site feasibility, she also develops shading analyses and preliminary Helioscope designs to inform economic projections and production estimates for each site portfolio. These analyses help guide entities in identifying focus areas for the implementation of incentive programs and selecting the most practical and cost-effective regions for development of solar PV installations.

Massachusetts System of Assurance of Net Metering Eligibility

As a system administrator for the Massachusetts System of Assurance, Ms. Orcutt reviews applications on a weekly basis, assessing the applications for cap allocation for completeness and relevance by reviewing Interconnection service agreements, non-ministerial permits, one- and three- line diagrams, lease agreements, and other applicable documentation. As a regular administrator on the System of Assurance helpline and administrator email, she provides technical guidance and customer service to various users on a daily basis. Ms. Orcutt guides System of Assurance users through the various stages of the application process, including account creation and management, application and interconnection requirements, payments and fees, and application decision questions and disputes. In addition, Ms. Orcutt regularly applies the administrator's interpretations of System of Assurance guidance materials, such as DPU 11-11-A, and applies these understandings to real-life, real-time situations raised by shareholders. She attends weekly calls and periodic hearings with officials from the Massachusetts Department of Public Utilities to raise concerns from system users and she stays current on legislative developments concerning net metering.

Technical Skills

Ms. Orcutt is proficient in the various technical applications including Helioscope, geographic information systems (ArcGIS, QGIS, PostGIS), and Microsoft Office.

Graham Stevens, Specialist

Education and Certifications

MS, Manufacturing Engineering, University of Rhode Island, Kingston, Rhode Island

BS, Physics, Yale University, New Haven, Connecticut

Professional Experience and Qualifications

Graham Stevens, a specialist with Cadmus, works on renewables and sustainability from multiple perspectives. Mr. Stevens has built benefit-cost and supply curve models, conducted photovoltaics (PV) cost, carbon offset fund, and Solar Ready initiative studies, taught Solar 101 courses for the U.S. Department of Energy, and provided technical assistance for the SolSmart program. He has recently published a book on lean engineering global warming solutions.

Previously, Mr. Stevens was an associate director with Navigant's Energy Practice. He has over 25 years of manufacturing, consulting, and research and development experience, specializing in bringing products from the laboratory into production, with a focus on PV markets, manufacturing processes, due diligence, utility renewable integration, cluster economics and jobs assessments, and scale-up. He teaches design for manufacture and assembly; builds complex cost, market penetration, and investment evaluation models; performs manufacturing and reliability diagnostics; and conducts reverse engineering teardowns. He has also provided consulting expert services in disputes involving renewable power and manufacturing.

Areas of Expertise

- Cost and market penetration modeling
- Due diligence
- Renewables, renewables integration
- Sustainability strategy

Relevant Experience

Strategic Electrification

- **Renewable Heating and Cooling Technical Assistance for NYSERDA (2017-2018).** Excel-based model examines consumer economics and market potential for 2,600-plus reference installations reflecting specific market segments to help NYSERDA develop renewable heating and cooling policy. Built supply curve/marginal abatement cost curve model for New York State that encompasses the following:
 - Commercial R&HC technologies (air source and ground source heat pumps, solar hot water, and heat pump water heaters)
 - Residential to large commercial system sizes
 - 4 areas: upstate, central, New York City, and Long Island
 - New construction and retrofit markets
 - Oil heat, natural gas, and electric resistance counterfactual fuels
- **National Grid Electric Heat Pump Initiative Program Design (2017).** Provided customer adoption analysis through Fischer-Pry modelling for a regulatory filing of an electric heat pump

initiative as part of New York’s “Reforming the Energy Vision.” The analysis predicted heat pump market penetration in part of National Grid’s service territory in New York under a variety of utility and state incentive scenarios.

Sustainable Communities

- **City of Cambridge Local Carbon Offset Fund Feasibility Study (2017-2018).** As part of its net zero sustainability goals, Cambridge Massachusetts, wanted to explore the possibility of creating a local carbon offset fund to assist developers in meeting future net zero building requirements. The study’s feasibility analysis examined international carbon offset fund practices and how they can be applied locally and additionality and verification issues, types of projects, and initial costs. Built a CO₂ marginal abatement cost curve specific to the City of Cambridge, which maps potential CO₂ reduction project economics vs. reduction potential. Following this, the program design phase examined carbon fund demand, building requirement policy, project supply, operational and institutional structure, an implementation plan, and risk mitigation.
- **Maine Forest Economy Growth Initiative (2017-2018).** For a consortium of biomass companies, Innovative Natural Resource Solutions LLC and Cadmus partnered to examine Maine’s biomass supply chain and the sawmill residual market, and to model future policy scenarios to improve residual biomass demand. Created a benefit-cost analysis model to examine these and other scenarios: expansion of the current RPS program and an analysis of REC pricing and/or thermal and economic REC carveouts for biomass, hosting of manufacturing facilities at current biomass plant locations in Maine, the addition of new CHP plants at existing Maine manufacturer sites, and the expansion of public and private institutional use of wood thermal systems. The analysis included benefits and costs for ratepayers and participants, the total resource cost test, and consideration of industry benefits in the form of additional biomass demand and jobs. A Fischer-Pry market penetration model was used to estimate future biomass demand when varying natural gas prices, REC prices, and other key inputs.

Renewables Integration

- **PacifiCorp Distributed Generation Resource Assessment (2014).** Led a case team to conduct a distributed generation resource assessment for long-term planning at PacifiCorp, providing distributed generation supply curves in its service territory for 2014-2034. Assessed the technical potential and market penetration of five distributed generation technologies (wind, PV, small hydro, CHP micro-turbines, and CHP reciprocating turbines) using detailed payback models. The results of the payback analysis were reported, presented, and accepted by PacifiCorp stakeholders.

International Sustainability

- **Clean Energy Solutions Center Emissions Reduction Projections for the Republic of Marshall Islands (2017).** Conducted a greenhouse gas inventory of current emissions and created an Excel model of future emissions. Evaluated several emissions reductions strategies to find reasonable interim goals for the country as it moves to dramatically lower emissions by 2050.

Arielle Magliulo, Sustainability Fellow

Education and Certifications

JD, William S. Richardson School of Law, University of Hawaii

BA, International Relations, Boston University

Professional Experience and Qualifications

Arielle Magliulo, a Sustainability Fellow at Cadmus, focuses on renewable energy law and policy, renewable energy market development, renewable energy procurement, and climate adaptation policy. Ms. Magliulo works to support a diverse range of domestic and international clients to develop and implement programs that encourage the development of renewable energy markets and climate adaptation in cities. She currently supports research projects on utility regulation, the legal requirements and best practices for large scale renewable projects, and municipal climate change adaptation priorities. Ms. Magliulo also supports the development of procurement documents for solar developments. During her time in law school, Ms. Magliulo was a legal intern at Hawaii Public Utilities Commission and a legal fellow at Earthjustice, worked as a research assistant on climate change and environmental law issues at the University of Hawaii Law School, and worked as a program associate in an energy justice project in an Oahu community.

Relevant Experience

State Policy Framework Design

Supported the **Hawaii State Energy Office** for specific tasks in its two-year evaluation of **alternative utility ownership and regulatory structures**, and their ability to enable the state to meet its 100% renewable energy targets.

Supported the **New York State Energy Research and Development Authority's (NYSERDA) Large Scale Renewable** project, including an assessment of the legal requirements and best practices for the land use and decommissioning elements related to LSR.

Supported the design and implementation of a **community engagement project** and supporting research as a program associate of the Energy Justice Working Group at the **University of Hawaii Law School**. Hosted community workshops on Oahu's North Shore to discuss and gain the community's perspective on the state and community's renewable energy future to encourage equity in the renewable energy space.

Renewable Energy Law and Policy Research

Researched and produced an in-depth internal memorandum on certain legal elements of the Public Utilities Regulatory Policies Act (**PURPA**) for the **Hawaii Public Utilities Commission**.

Environmental Law and Policy Research

Supported environmental law plaintiff cases at **Earthjustice** by conducting legal research and document drafting on various environmental legal issues, including research on the legislative history of intervenor

status in Hawaii PUC dockets and the completion of a comprehensive literature review of available community solar guides.

Community-Level Technical Assistance

Supported Cadmus in its provision of solar energy policy technical assistance to the City of Chicago and other local governments through the SolSmart Program, including legal review of procurement documents.

Associations

Bar Admission, Massachusetts Bar

Member, Boston Bar Association

Member, Massachusetts Bar Association

APPENDIX B CORE PROJECT TEAM REFERENCES

Chad Laurent

Client Name	Title/Affiliation	Phone / Email / Address	Associated Project
Philip Haddix	Director, The Solar Foundation	phaddix@solarfound.org	Solar Outreach Partnership, SolSmart
		(202) 469-3743	
		1717 Pennsylvania Avenue NW, Suite 750, Washington, DC 20006	
Tad McGalliard	Director, Research and Policy Team Leader, Strategic Development, ICMA	(202) 962 3563	Solar in Your Community Challenge
		tmcgalliard@ICMA.org	
		777 North Capitol Street, NE, Suite 500, Washington, DC 20002-4201	
Jessica Boehland	Senior Program Officer, The Kresge Foundation	(248) 502-0559	Pathways to 100
		jboehland@kresge.org	
		3215 W. Big Beaver Road Troy, MI 48084	

Paul Faeth

Client Name	Title/Affiliation	Phone / Email / Address	Associated Project
Zach Ambrose	Principal, Ambrose Strategy	(919) 438-2752	Critical Infrastructure Solar PV and Resiliency Feasibility Study (NC National Guard); Rest Area Solar PV and EV Charging Station Feasibility Study (NC DOT)
		zambrose@ambrosestrategy.com	
		5613 Calton Drive Raleigh, NC 27612	
David Kelly	Senior Manager, North Carolina Political Affairs, Environmental Defense Fund	(919) 881-2601	Critical Infrastructure Solar PV and Resiliency Feasibility Study (NC National Guard); Rest Area Solar PV and EV Charging Station Feasibility Study (NC DOT)
		dkelly@edf.org	
		4000 Westchase Blvd., Ste 510 Raleigh, NC 27607	
David Harris, PE	State Roadside Environmental Engineer, Roadside Environmental Unit, North Carolina Department of Transportation	(919) 707-2925	Rest Area Solar PV and EV Charging Station Feasibility Study (NC DOT)
		davidharris@ncdot.gov	
		1 South Wilmington St., Rm 582A Raleigh, NC 27601	

Kalee Whitehouse

Client Name	Title/Affiliation	Phone / Email / Address	Associated Project
Brittany Sellers	Sustainability Project Manager, Office of Sustainability & Energy, City of Orlando	(407) 246-2530	SolSmart: City of Orlando SolSmart Workshop
		Brittany.sellers@cityoforlando.net	
		400 South Orange Avenue, Orlando, FL 32801	
Zach Greene	Program Manager, The Solar Foundation	(202) 866-0895	SolSmart: Advisor Trainings
		Zgreene@solarfound.org	
		1717 Pennsylvania Ave. NW, Suite 750 Washington, D.C. 20006	
Beverly Woods	Executive Director, Northern Middlesex Council of Governments	(978) 454-8021 (ext. 120)	SolSmart: NMCOG Advisor Deployment
		Bwoods@nmcog.org	
		40 Church Street, Suite 200 Lowell, MA 01852	

Ryan Cook

Client Name	Title/Affiliation	Phone / Email / Address	Associated Project
Rachel Brombaugh	Energy Policy and Partnerships Specialist; Office of King County Executive Dow Constantine	(206) 263-9633	County Energy Planning
		Rachel.Brombaugh@kingcounty.gov	
		401 5 th Ave, Ste 800, Seattle, WA 98104	
Curtis Wynn	President and CEO, Roanoke Electric Cooperative	(252) 578-3333	Cooperative Utility Clean Energy Program Design Support
		cwynn@roanokeelectric.com	
		518 Hwy 561 Aulander, NC 27805	
Greg Williams	Executive VP and General Manager, Appalachian Electric Cooperative	(865) 475-2032 ext. 1201	Cooperative Utility Clean Energy Program Design Support
		gwilliams@aecoop.org	
		1109 Hill Drive New Market, TN 37820	

Julie Curti

Client Name	Title/Affiliation	Phone / Email / Address	Associated Project
Jen Green	Sustainability Coordinator, City of Burlington VT	(802) 865-7000	USDN Equity in Energy Transformation and Innovation
		jgreen@burlingtonelectric.com	
		149 Church Street Burlington, VT 05401	
Jessica Boehland	Senior Program Officer, The Kresge Foundation	(248) 502-0559	City Energy Transformation Assessment
		jboehland@kresge.org	
		3215 W. Big Beaver Road Troy, MI 48084	
Seth Federspiel	Net Zero Energy Planner, City of Cambridge	(617) 349-4674	Cambridge Carbon Offset Fund; Cambridge Renewable Energy Purchasing; BEUDO Stakeholder Engagement
		sfederspiel@cambridgema.gov	
		344 Broadway Cambridge, MA 02139	

Jennifer Weiss

Client Name	Title/Affiliation	Phone / Email / Address	Associated Project
Virginia Lacey	Director of Philanthropic Services, Energy Innovation	(415) 799-2176	Energy Innovation Task Force (Ms. Lacey was a Principal at the Rocky Mountain Institute at the time, and lead the project)
		virginia@energyinnovation.org	
		98 Battery Street San Francisco, CA 94111	
Fritz Mayer	Professor of Public Policy, Political Science, and Environment; Associate Dean for Strategy and Policy Innovation at the Sanford School of Public Policy at Duke University	(919) 613-9209	North Carolina Leadership Forum, representing Duke University in the forum's energy discussions
		frederick.mayer@duke.edu	
		Box 90245 Durham, NC 27708	
Cyrus Bhedwar	Policy Director, Southeast Energy Efficiency Alliance	(404) 602-9659	Energy Efficiency Working Groups
		cbhedwar@seealliance.org	
		50 Hurt Plaza, Ste 1250 Atlanta, GA 30303	