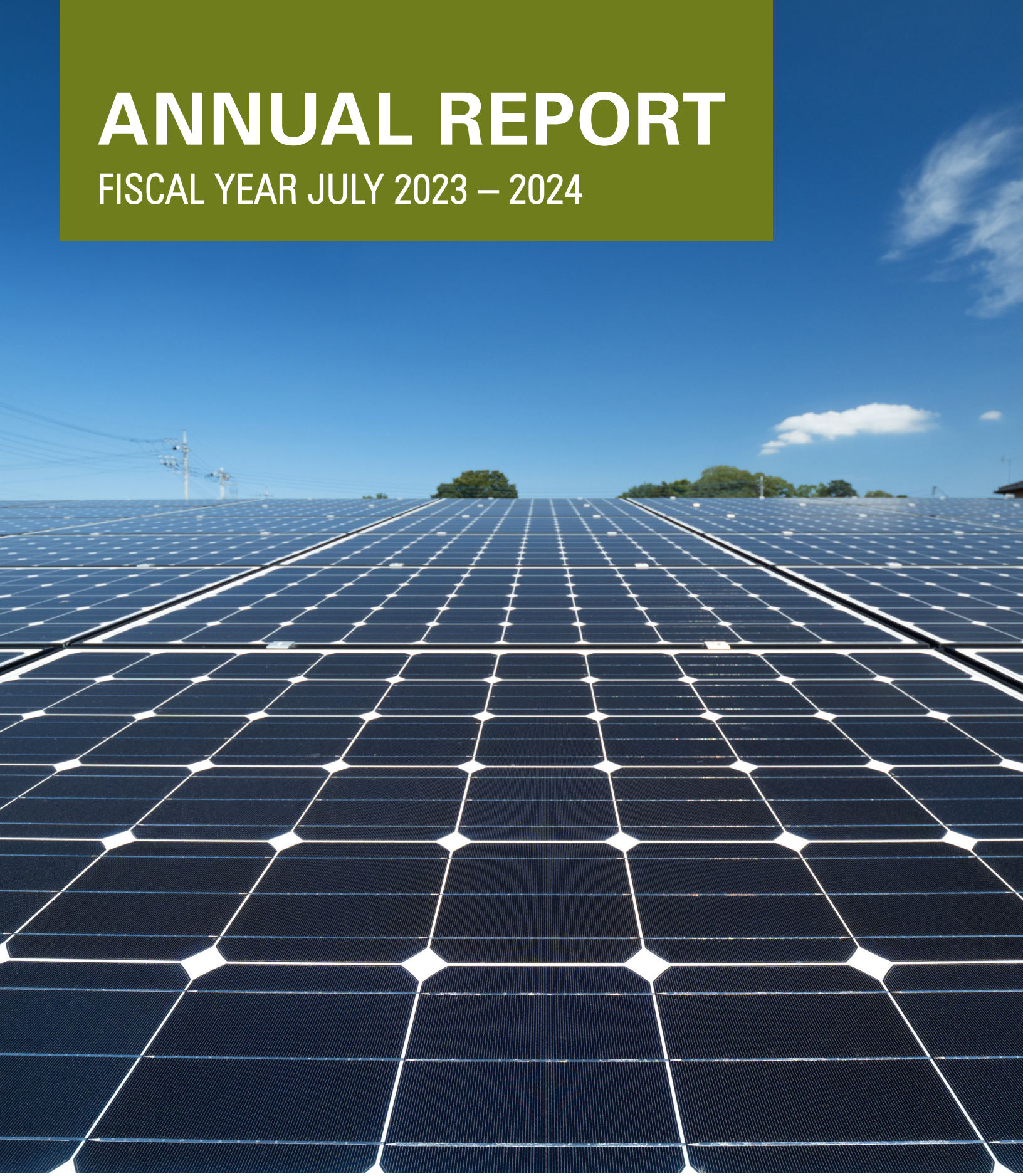
ANNUAL REPORT

FISCAL YEAR JULY 2023 – 2024



NC CLEAN ENERGY TECHNOLOGY CENTER

NC STATE

LETTER FROM THE EXECUTIVE DIRECTOR

The past year has been an exciting time at the North Carolina Clean Energy Technology Center (NCCETC), as so many new initiatives are rolling out from the federal and state governments to support clean energy development and deployment. We have seen significant growth in all our major revenue categories, largely as a result of the Inflation Reduction Act (IRA) of 2022 and the Infrastructure Investment and Jobs Act (IIJA; also known as the Bipartisan Infrastructure Plan) of 2021, which placed emphasis on climate and clean energy investments. The Center's budget increased from $8.8 million to $11 million this fiscal year, and for every dollar of NC state appropriations, the Center leveraged another $8.5 dollars from federal and private sources - a great investment for the state!

Across our technology programs in renewable energy, energy efficiency, and clean transportation, as well as our cross-cutting support programs in energy policy, economic development, and training and workforce development, we have made strives in engaging with stakeholders, policy makers, and industry professionals to serve communities with technical assistance and resources to advance the clean energy transition in North Carolina and throughout the United States.

NCCETC had great success with the annual State Energy Conference and the Sustainable Fleet Technology Conference, two major events with a combined attendance this year of nearly 1500 people. These large events provide a platform for education on new technology and business opportunities across all energy topics that affect our state, as well as serving as an unmatched networking opportunity for energy professionals in our region.

A new round of work was awarded to the Center as the Southeast region lead for the U.S. Department of Energy's Onsite Energy Technical Assistance Partnership (OETAP), and has since become the flagship program of the Center's Clean Power and Industrial Efficiency (CPIE) team. CPIE oversees several other grant projects such as the U.S. Department of Agriculture's Rural Energy for America Program (REAP), Renewable Energy Development Assistance Program (REDA) and Technical Assistance Grant (TAG), and the Environmental Protection Agency's Pollution Prevention (P2) and Lean for Sustainable and Green Manufacturing project. All of these projects allow the CPIE team to help businesses assess opportunities and to implement clean energy solutions through technical assistance partnerships.

The Clean Transportation team has continued to hold clean vehicle demonstration days in areas around the state to introduce the public to the various clean fueling technologies that are becoming available. Additionally, NCCETC staff are providing support to the Eastern Band of Cherokee Indians in their journey to implementing electric school buses. The Team has worked to expand educational outreach efforts in Eastern North Carolina and the Piedmont Triad region, and has been recognized as an apprentice coalition in the Clean Cities and Communities National Network.

Meanwhile, the Policy and Markets team has partnered with several organizations and government agencies to carry out projects that will make the transition to clean energy more accessible for individuals within North Carolina. Our proposal for the Renewable Energy Siting through Technical Engagement and Planning (R-STEP) opportunity was awarded by the U.S. Department of Energy (DOE) in March 2024, which will allow NCCETC to meet with communities and provide technical assistance and educational workshops relating to the siting of utility-scale solar and wind. NCCETC was a key member of the EnergizeNC Coalition, which submitted a proposal in October 2023 to the EPA to develop a state Solar for All program that was awarded in May 2024. NCCETC is working diligently within the coalition to create a detailed work plan to carry out the project. We also joined the National Open Data for Electrification (NODE) Collective in early 2024 as a founding organization, and the collective was publicly launched in March 2024. The Policy Team has led discussions with a variety of Environmental Justice nonprofits to increase outreach and engagement efforts that will ensure NCCETC addresses the needs of all individuals in North Carolina.

Our Training team has reworked the Certificate in Renewable Energy Management (CREM) course into a new Renewable Energy Project Development (REPD) course to allow participants to dive deeper into the components of the renewable energy project development process. The team was also awarded a grant along with NC State's College of Natural Resources to carry out the "Building Sustainable Pathways to Improve Underserved and Underrepresented Worker Access for Renewable Energy Infrastructure in Rural, Southeastern North Carolina" project that will support future clean energy professionals. NCCETC has also seen upgrades in the solar training yard to better prepare for expanded training needs.

Overall, this year has been pivotal in advancing the Center's commitment to creating a sustainable energy economy with our various outreach activities and technical assistance to support clean energy practices and policies. As we reflect on the achievements of this past year, we are looking forward to where these strides will take us in our continuing efforts to provide North Carolinians with an accessible transition to clean energy.

Stephen S. Kalland

MISSION STATEMENT

The NC Clean Energy Technology Center advances a sustainable energy economy by educating, demonstrating and providing support for clean energy technologies, practices, and policies.

PROGRAM AREAS

Renewable Energy

Clean Power & Industrial Efficiency

Clean Transportation

Energy Policy & Markets

Training & Workforce Development

ENERGY AND SUSTAINABILITY SERVICES

NCCETC offers business, industry, government and utilities a suite of services aimed at optimizing sustainability and energy-related objectives:

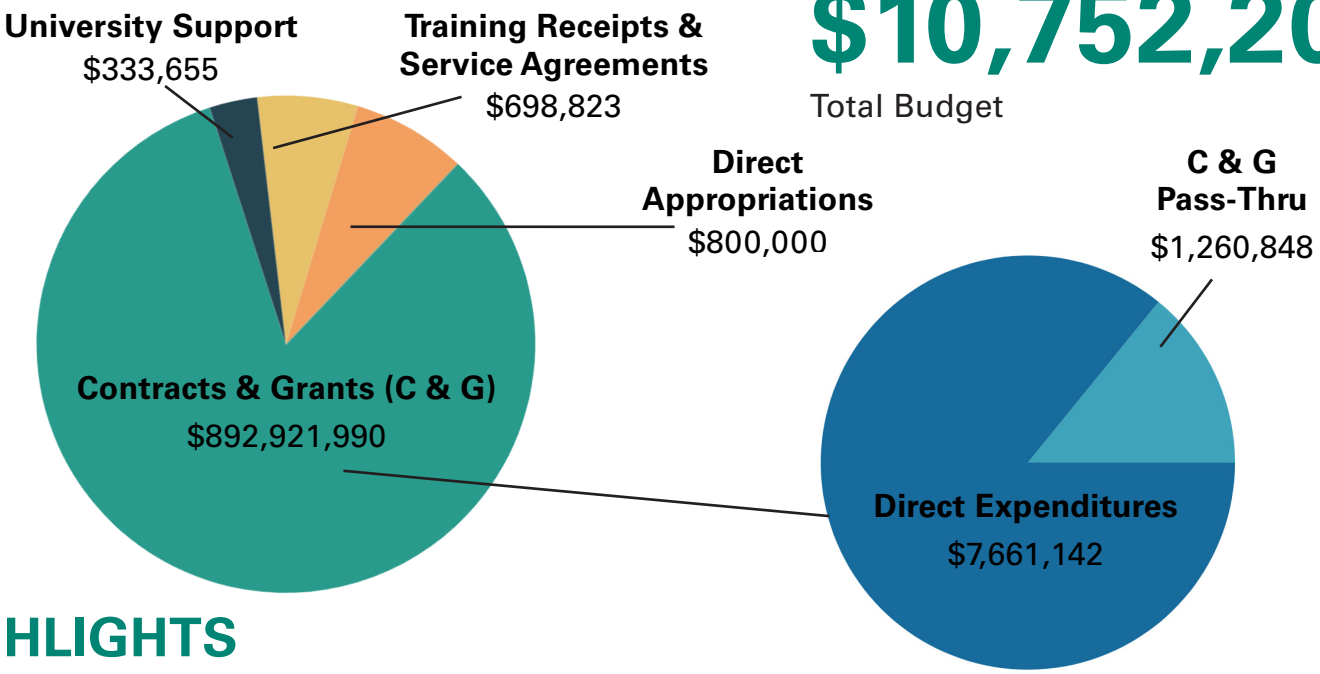
Planning and Guidance

Educational Opportunities, Training and Professional Development

Research and Market Analysis

Technical Assistance

JULY 2023-JUNE 2024 OPERATING BUDGET

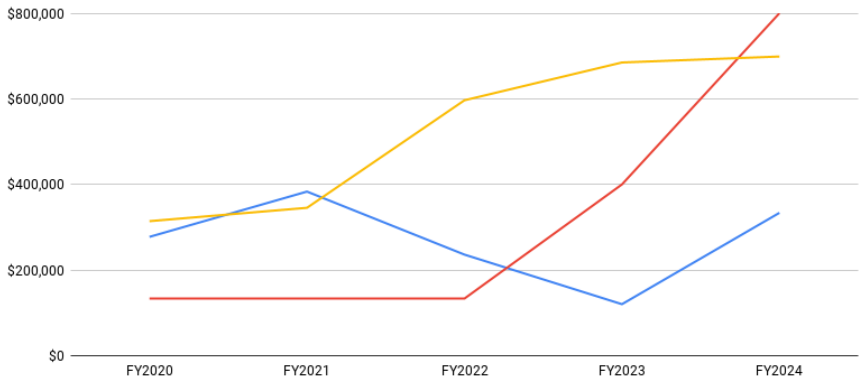


$10,752,201
Total Budget

HIGHLIGHTS

- NCCETC received $800,000 in State Appropriations from the North Carolina General Assembly. For FY2024, NCCETC received $333,655 in university contributions from the NC State College of Engineering and the Office of Research Innovation; University support varies each year.
- Grants and sponsored projects continue to be the largest portion of the Center budget with State Appropriations representing the next increasing portion.
- For FY2024, the NCCETC annual budget consists primarily of grant support from DOE, NCDOT, NCDEQ and Private Sector Entities with approximately 11% of grant funds appropriated to subrecipients to broaden the reach of the Center's mission and core programs.

FY2024 BUDGET – NON-GRANT SOURCES (5-YEAR TRENDS)



	FY2020	FY2021	FY2022	FY2023	FY2024
University Support	$277,507	$383,274	$236,038	$120,209	$333,655
Direct Appropriations	$133,333	$133,333	$133,333	$400,000	$800,000
Service Agreements	$314,172	$345,477	$596,599	$684,861	$698,823

- The 5-year trends of non-grant funding sources illustrate how vital grant funds are for the Center.
- State Appropriations are subject to action by the State Legislature on an annual basis leading the financial strategy of the Center to seek grant funding and engage in Service Agreement work for sustainability.

POLICY & MARKETS

DSIRE & DSIRE INSIGHT

The Database of State Incentives for Renewables and Efficiency (DSIRE), operated by NCCETC, announced the addition of offshore wind targets this year. DSIRE is the most comprehensive publicly available resource on federal, state and utility policies and incentives for renewable energy, efficiency, energy storage, and electric vehicles.

DSIRE®
Database of State Incentives for Renewables & Efficiency
DSIRE Insight

HIGHLIGHTS

Complimentary copies of 50 States Reports were provided to policymakers or regulators in several states, including AR, DE, ME, MT, NC, NJ, NM, OH, PA, RI, SC, TN, UT, and WY, as well as the Federal Energy Regulatory Commission and the U.S. Department of Energy.

The Policy & Markets team released a policy report titled, "50 States of Solar Decommissioning: 2023 Snapshot", which provides a comprehensive landscape of state-by-state solar decommissioning policies. The report will inform solar developers and other stakeholders of potential barriers or processes required before constructing a solar project in a particular state.

The Center offers c**ustomized policy research and analysis services** to clean energy businesses, utilities, advocacy organizations and other industry participants. These services include state comparative policy analysis, research and tracking of pending legislative and regulatory actions and analysis of market opportunities based on policy landscape.

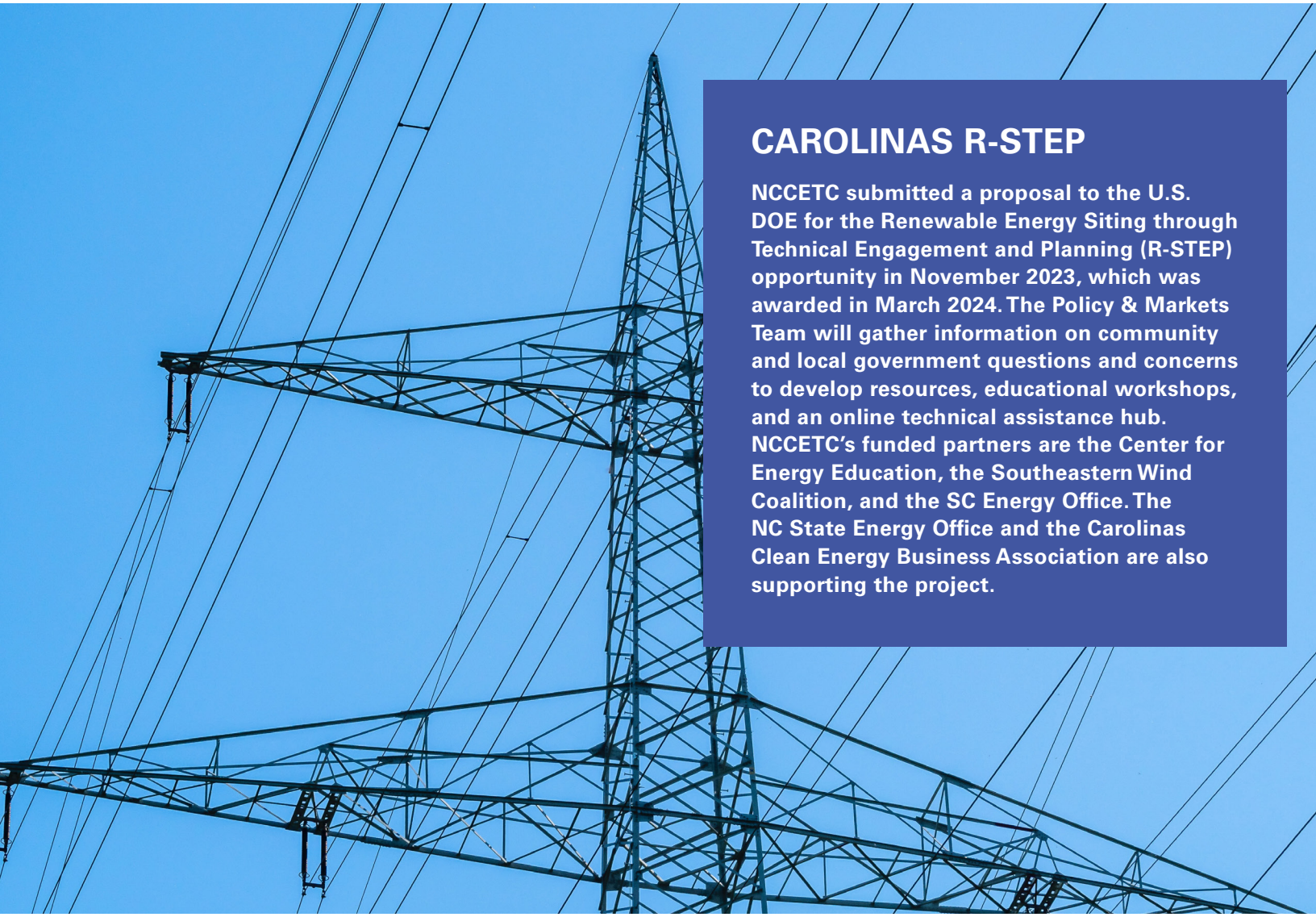
852,199 Total Unique Users to dsireusa.org

1,544 Policies and Incentives Updated on DSIRE

15 50 States Reports Published

SOLAR FOR ALL

In October 2023, the Energize NC Coalition, that NCCETC is a part of along with the NC State Energy Office, NC Clean Energy Fund, and Advanced Energy, submitted a $250 million proposal to the EPA to develop and administer a Solar for All program in North Carolina. The EPA awarded the coalition's proposal in May 2024 with a budget of $156 million. The Policy & Markets Team is currently working with EnergizeNC partners to develop a detailed work plan to carry out the project. NCCETC will lead market transformation, technical assistance, consumer protection, and workforce development elements of the program. The team has also participated in several outreach and informational activities related to the program during January - June 2024.



CAROLINAS R-STEP

NCCETC submitted a proposal to the U.S. DOE for the Renewable Energy Siting through Technical Engagement and Planning (R-STEP) opportunity in November 2023, which was awarded in March 2024. The Policy & Markets Team will gather information on community and local government questions and concerns to develop resources, educational workshops, and an online technical assistance hub. NCCETC's funded partners are the Center for Energy Education, the Southeastern Wind Coalition, and the SC Energy Office. The NC State Energy Office and the Carolinas Clean Energy Business Association are also supporting the project.

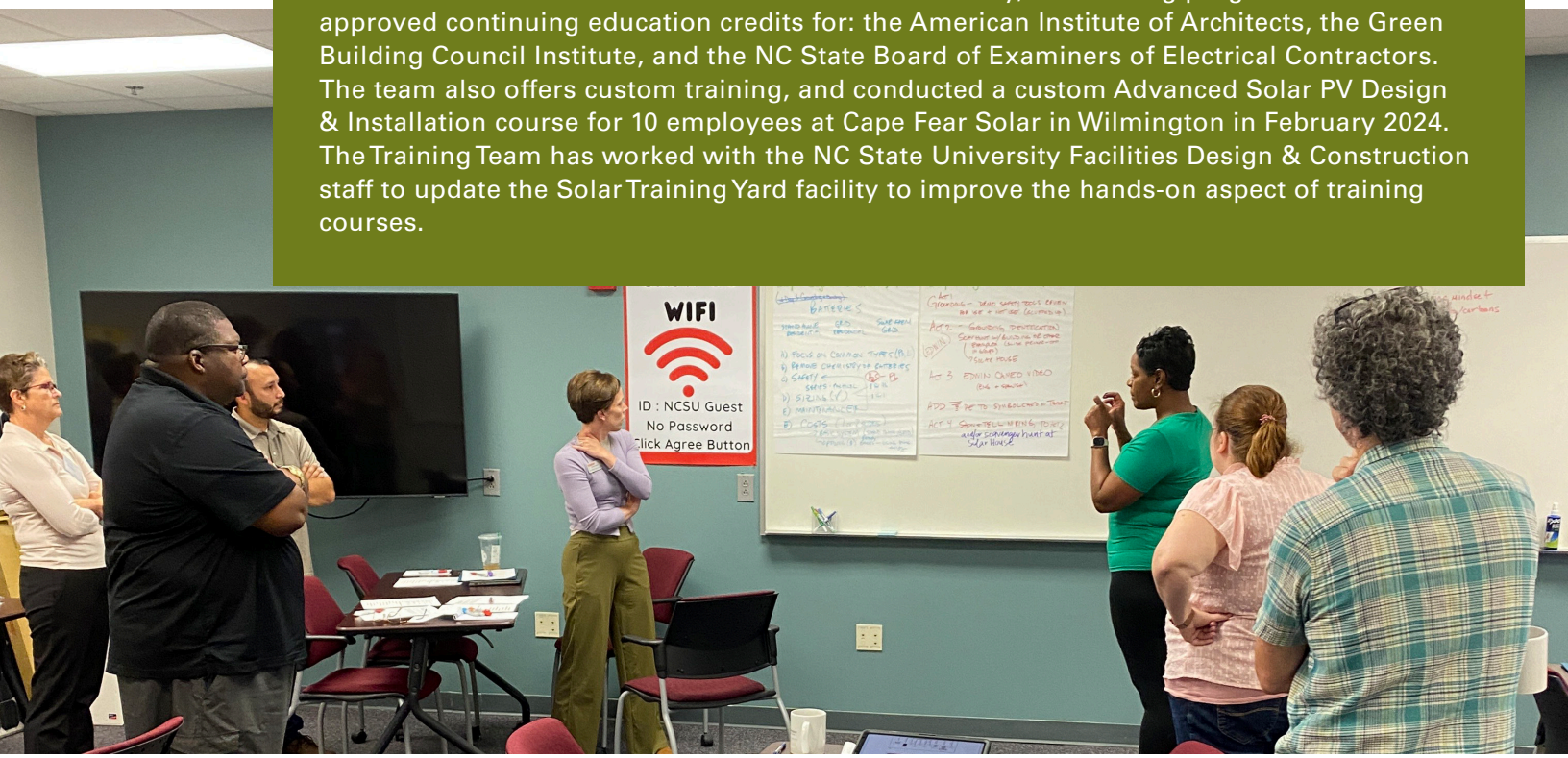
NCCETC JOINS THE NATIONAL OPEN DATA FOR ELECTRIFICATION COLLECTIVE

In early 2024, NCCETC joined the National Open Data for Electrification (NODE) Collective along with Eli, Building Decarbonization Coalition, Rewiring America, and RMI. The NODE Collective was publicly launched in March 2024, and the collective aims to make a well-structured data set of residential electrification incentives publicly available that is maintained over time. The NODE Collective was accepted as a project of LF Energy in April 2024; LF Energy will provide a neutral home for the project and offer support on governance and other areas. The NCCETC Policy & Markets staff have been participating in weekly steering committee and data working group meetings, as well as biweekly membership working group meetings.

TRAINING & WORKFORCE DEVELOPMENT

NCCETC TRAINING PROGRAM

The Training team has continued to host hands-on in-person training courses along with online training offerings to support the growing clean energy workforce. The training program is a North American Board of Certified Professionals (NABCEP) registered Continuing Education and PV Associate Provider, allowing students to sit for the nationally recognized NABCEP PV Associate Exam as well as earn educational credits toward other NABCEP certification and/or recertification. Additionally, the training program offers approved continuing education credits for: the American Institute of Architects, the Green Building Council Institute, and the NC State Board of Examiners of Electrical Contractors. The team also offers custom training, and conducted a custom Advanced Solar PV Design & Installation course for 10 employees at Cape Fear Solar in Wilmington in February 2024. The Training Team has worked with the NC State University Facilities Design & Construction staff to update the Solar Training Yard facility to improve the hands-on aspect of training courses.



NCCETC continues to serve as a BackBone Organization (BBO) for the Renewable Energy Sector and a subawardee within the STEPs4GROWTH project. The Center is also a subawardee within the National Institute of Standards and Technology (NIST) Rapid Assistance for Coronavirus Economic Response (RACER) program. Through this program, the Training team has worked to develop educational modules that center Native communities and their needs. NCCETC and the NC State College of Natural Resources was awarded $1.65 million by the U.S. Department of Labor Employment and Training Administration in response to the "Building Pathways to Infrastructure Jobs Grant Program" call for projects. Through these efforts, the team is working to develop a pipeline of qualified employees while building strong relationships with industry partners, other education and training providers, and individuals invested in the success of the renewable energy industry.

488 Hours of Training Offered

190 Students Trained

15 Training Classes

10 Diploma Graduates

SOLAR WORKFORCE DEVELOPMENT: EMPOWERING MINORITIES IN CLEAN ENERGY

The NCCETC Training team is negotiating a sub-award with Tennessee State University that would support a two year solar education program. The team expects to receive $130,000 and begin working on the project in September 2024. The project, titled Empowering Minorities in Clean Energy: A Solar Workforce Development Initiative for African Americans, Hispanics, and Native Americans, is funded through a new initiative which is a Science and Technology Research Partnership (STRP) between the U.S. DOE Solar Energy Technologies Office (SETO) and the MSI STEM Research & Development Consortium (MSRDC). The program's goal is to promote innovation in solar energy technology research and development for underrepresented groups from Minority Serving Institutions (MSIs). NCCETC will offer two Fundamentals of Solar PV Design and Installation, one Solar Storage, and two Renewable Energy Project Development (REPD) courses over the two-year project period.

EPA SOLAR FOR ALL PROGRAM

NCCETC is part of the EnergizeNC coalition that has been awarded $156 million through the EPA 2023 Solar for All Program. The EPA announced awards for the $7 billion program on April 22, 2024, as part of the $27 billion Greenhouse Gas Reduction Fund. As the project team enters the planning year, the Training team will support this program through leading the vendor registration and consumer protection processes. The goal is to develop and execute a robust and equitable program enabling the rapid deployment of distributed solar and associated battery storage to low-income and disadvantaged communities across the state.

RENEWABLE ENERGY PROJECT DEVELOPMENT COURSE UPDATE

The Training team has revised the former Certificate in Renewable Energy Management (CREM) course and changed the name to Renewable Energy Project Development (REPD) to better align with the modules taught in the course. The course transitioned from a hybrid model consisting of 3 days in person followed by virtual modules, to taking place fully online. Additional modules were added to cover more aspects of the development process. The team also modified the class project to encourage critical thinking when evaluating classmate's projects, reflection on pain points in their personal projects, and additional engagement with classmates. The first course took place on January 8, 2024 to March 8, 2024. Eighteen students attended the first course offering and provided feedback on areas for improvement in the course content. The next course offering is tentatively scheduled for Spring 2025.

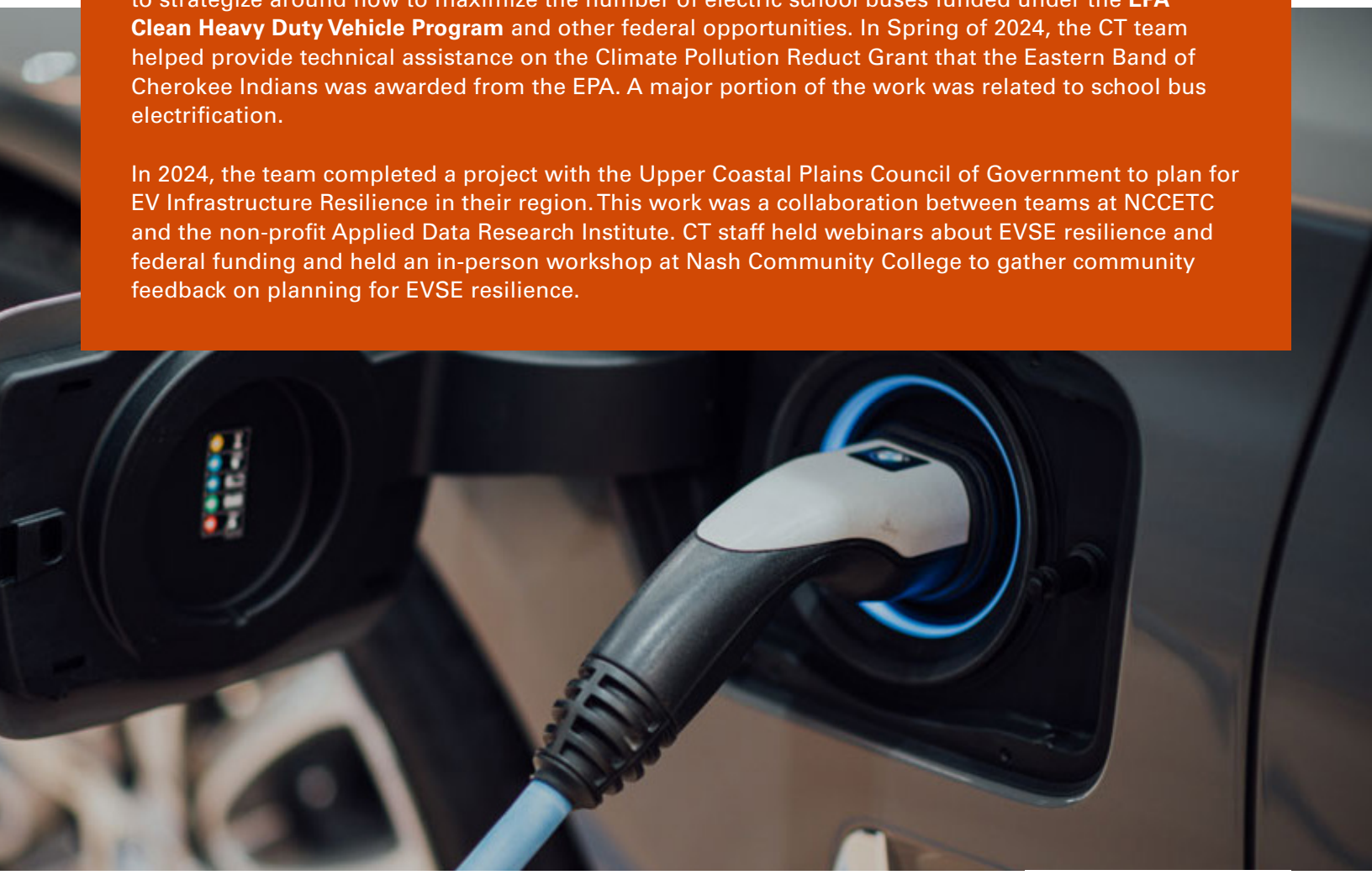
CLEAN TRANSPORTATION

FUNDING PROGRAMS SUPPORT CLEAN VEHICLE TECHNOLOGIES

NCCETC leads the **Clean Fuel Advanced Technology (CFAT) Project**, which provides direct financial assistance for clean transportation projects each year to a variety of public and private entities in North Carolina, focused on reducing transportation-related air pollution emissions.

The Clean Transportation (CT) team also coordinates with state agencies and other stakeholders to strategize around how to maximize the number of electric school buses funded under the **EPA Clean Heavy Duty Vehicle Program** and other federal opportunities. In Spring of 2024, the CT team helped provide technical assistance on the Climate Pollution Reduct Grant that the Eastern Band of Cherokee Indians was awarded from the EPA. A major portion of the work was related to school bus electrification.

In 2024, the team completed a project with the Upper Coastal Plains Council of Government to plan for EV Infrastructure Resilience in their region. This work was a collaboration between teams at NCCETC and the non-profit Applied Data Research Institute. CT staff held webinars about EVSE resilience and federal funding and held an in-person workshop at Nash Community College to gather community feedback on planning for EVSE resilience.



2023 SUSTAINABLE FLEET TECHNOLOGY CONFERENCE & EXPO

SUSTAINABLE FLEET TECHNOLOGY CONFERENCE & EXPO 2023

Over 400 clean transportation professionals attended the 2023 Sustainable Fleet Technology Conference and Expo in Raleigh, NC last August. In its seventh year, the annual conference featured an array of exhibitors that showcased the latest and greatest clean vehicle technologies. The conference offered 12 breakout sessions across three tracks related to Funding and Planning, Vehicle Technologies, and Fueling and Charging Infrastructure. NCCETC hosts the annual conference as part of its mission to advance a sustainable energy economy by educating, demonstrating, and providing support for lean energy technologies, practices, and policies.

2023 SUSTAINABLE FLEET TECHNOLOGY WEBINAR SERIES

The 2023 Sustainable Fleet Technology Webinar Series concluded after bringing together industry experts and top performing fleet managers for 16 webinar sessions over the course of the year. The Sustainable Fleet Technology Webinar Series (SFTWS), now in its ninth year, is offered through a collaborative partnership between NCCETC and NAFA Fleet Management Association (NAFA). The series focuses on sharing real-world use cases and success stories of sustainable fleet operations and strategies. Each webinar session featured in-depth presentations from nationally recognized fleets describing their experience with integrating applications of sustainable fleet technologies and strategies into their fleet as well as the lessons they learned along the way.

CLEAN TRANSPORTATION DEMONSTRATION DAYS AND EV DISPLAYS

The Clean Transportation program at NCCETC hosts Ride & Drive and Vehicle Displays for a variety of audiences to provide an opportunity for attendees to learn more about clean transportation technologies including electric vehicles (EVs) and other alternative fuel vehicles (AFVs), along with dealers and local EV drivers onsite to answer questions about the driving experience behind the wheel of an EV. The Clean Transportation Demo Days have a government fleet audience and were held in April 2023 at the State Highway Patrol Training Facility and the Winston-Salem Fairgrounds.

CLEAN POWER & INDUSTRIAL EFFICIENCY

U.S. DEPARTMENT OF ENERGY SOUTHEAST COMBINED HEAT AND POWER TECHNICAL ASSISTANCE PARTNERSHIP

The U.S. DOE Combined Heat and Power Technical Assistance Partnerships (CHP TAPs) promote and assist in transforming the market for CHP, waste heat to power, and district energy technologies/concepts throughout the United States. NCCETC is the home of the U.S. DOE Southeast CHP TAP which includes eight states: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee, as well as Puerto Rico and the U.S. Virgin Islands. The DOE CHP TAP program was replaced by the Onsite Energy TAP program in 2024. During the five-year Southeast CHP TAP project that ended in december 2023, the CPIE team achieved the following results:

125 Technical Assistance Activities for Specific Sites

555 Megawatts of Combined Heat and Power Identified

2359 MMBTU of Recoverable Thermal Energy Identified

NCCETC AT NC STATE UNIVERSITY SELECTED AS SOUTHEAST LEAD FOR U.S. DOE'S ONSITE TECHNICAL ASSISTANCE PARTNERSHIPS

The U.S. DOE's Industrial Efficiency and Decarbonization Office announced the selection of nine organizations that will establish a network of Onsite Energy Technical Assistance Partnerships (TAPs) to help industrial facilities and other large energy users increase the adoption of onsite energy technologies. NCCETC was selected as one of the awardees and has led the DOE Southeast Onsite Energy TAP since January 2024, in collaboration with team members from the University of Puerto Rico Mayagüez (UPRM) and Tennessee Tech. The award is for $1.5 million over three years, and will support technical assistance on a wide variety on technologies, including battery storage, combined heat and power (CHP), district energy, fuel cells, geothermal, industrial heat pumps, renewable fuels, solar photovoltaics, solar thermal, thermal storage, and wind power. Thus far, NCCETC has succeeded in providing technical assistance to numerous facilities, while supporting them every step of the way towards installing onsite energy technologies.

SUPPORT FOR NORTH CAROLINA BUSINESSES IN THE AGRICULTURAL AND MANUFACTURING SECTORS

The NCCETC was awarded $100,000 from the U.S. Department of Agriculture (USDA) to provide renewable energy technical assistance to agricultural producers and rural small businesses. The project, titled **North Carolina Agricultural and Rural Energy Assistance**, assists eligible agricultural producers and rural small businesses to identify and quantify the potential to add renewable energy resources at their site. The project award is for two years and runs through mid-2025.

NCCETC was also awarded a $111,000 Technical Assistance Grant from the USDA to support agricultural producers and rural small businesses in preparing accuraTe and complete applications for energy efficiency through the USDA's Rural Energy for America Program (REAP). The project is titled **REAP Grant Applicant Technical Assistance for Ag Producers and Rural Small Businesses in North Carolina** and the project award runs three years, through October 2026.

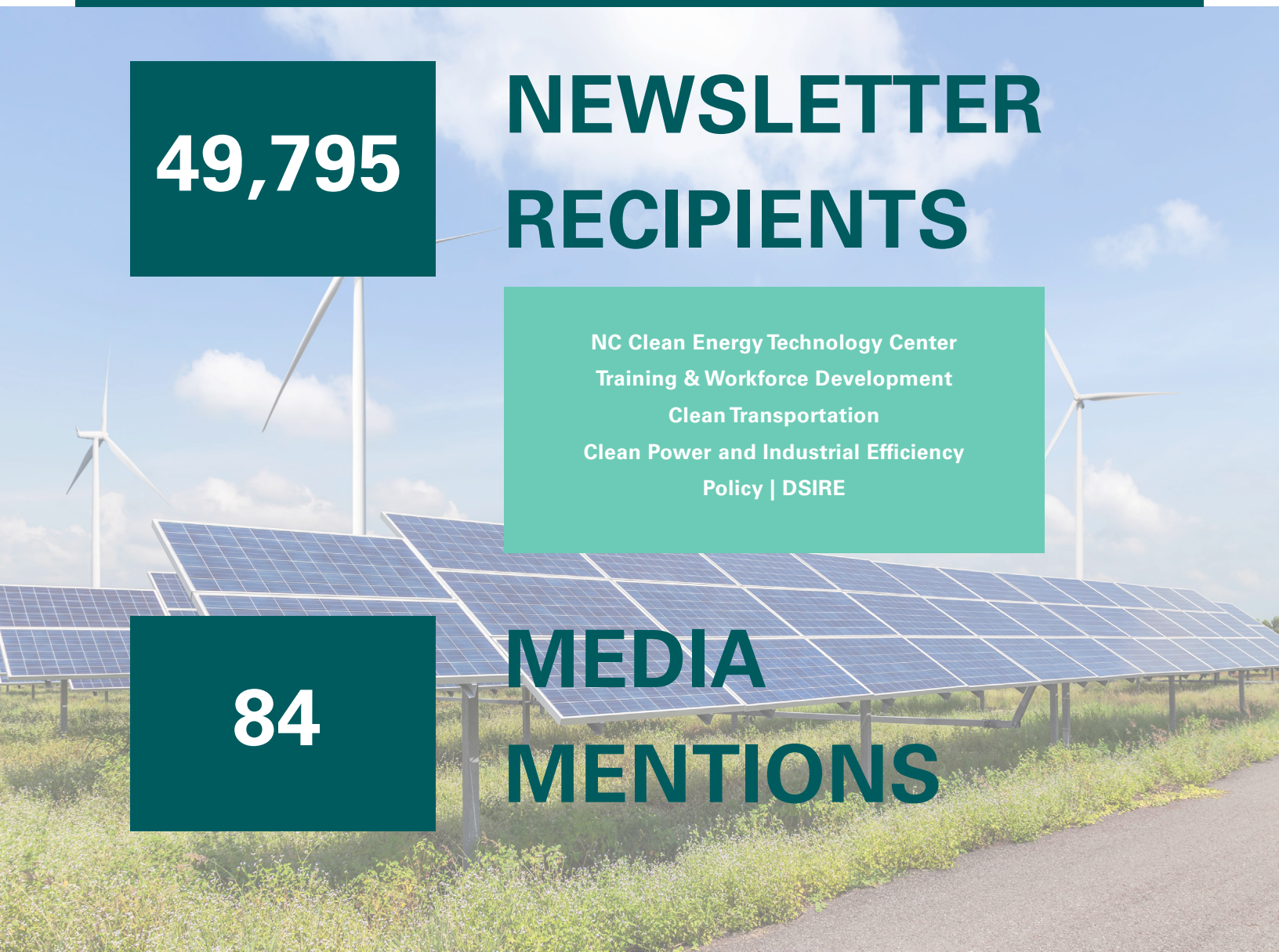
The NCCETC is a subrecipient on a U.S. Environmental Protection Agency project titled Pollution Prevention (P2) and Learn for Sustainable and Green Manufacturing. NCCETC has partnered with East Carolina University and the University of North Carolina at Charlotte to carry out energy audits and case study development for two years, from October 1, 2022 through September 30, 2024.

ENERGY & SUSTAINABILITY SERVICES SUPPORT PUBLIC UTILITIES

NCCETC partnered with the Fayetteville Public Works Commission (FPWC) to develop and host online energy use calculators to enable residential PWC customers to reduce energy consumption and costs. Existing calculators allow customers to estimate their energy and cost savings by purchasing Energy Star clothes washers and dryers, along with dishwashers and lighting products. The calculators also help customers determine the potential cost savings by shifting their appliance operating times to off-peak periods. NCCETC employed the utility's new Whole Home residential service rates to develop an EV Rate Calculator.

COMMUNICATIONS & OUTREACH

2,924		8,277	
6,063		1,151	



49,795

NEWSLETTER RECIPIENTS

NC Clean Energy Technology Center
Training & Workforce Development
Clean Transportation
Clean Power and Industrial Efficiency
Policy | DSIRE

84

MEDIA MENTIONS

2024 STATE ENERGY CONFERENCE OF NORTH CAROLINA

Over 800 clean energy professionals joined NCCETC at the 2024 State Energy Conference (SEC) of North Carolina at the McKimmon Center on NC State University's campus in Raleigh, NC. Attendees from a variety of backgrounds – including state and local governments, non-profit organizations, startups, academia and corporate organizations – joined under the SEC's theme: "Connecting North Carolina's Diverse Energy Economy." Content focused on residential homes, clean transportation, commercial and industrial buildings, government and institutional buildings, renewable energy, utilities and infrastructure, and energy innovation and deployment.

During the two-day event, 30 sessions and four keynote sessions were available to attendees, and a sold out exhibit hall held networking events that showcased a variety of vendors from the energy industry.

In addition, continuing education credits (CECs) were offered to attendees for their participation in sessions. Available CECs included:

- American Institute of Architects (AIA): Learning Units (LUs) and Health, Safety, Wellness (HSWs)
- Leadership in Energy and Environmental Design (LEED): Green Building Certification Inc. (GBCI) Continuing Education (CE)
- North Carolina State Bar: Continuing Legal Education (CLE) credits
- Self-reporting professionals could receive Professional Development Hours (PDHs)

243 Total Hours of Completed Continuing Education Documented by Attendees

31 Of 35 Total Conference Sessions Approved for CECs

344 Certificates of Completion for Continuing Education Credentials Issued

For more information on the conference, visit:
www.NCEnergyConference.com

GET INVOLVED

Achieving a sustainable future requires securing the work done by the Center. Become a Friend of the North Carolina Clean Energy Technology Center and support its mission of advancing clean energy for a sustainable energy economy. Individuals, private firms, and non-profit organizations are invited to support the Center (through the N.C. State Engineering Foundation) and its initiatives.

CONTACT US

Physical Address:
1575 Varsity Drive
North Carolina State University
Raleigh, NC 27606

Mailing Address:
Campus Box 7409
North Carolina State University
Raleigh, NC 27695

www.nccleantech.ncsu.edu
nccleantech@ncsu.edu

NC CLEAN ENERGY TECHNOLOGY CENTER

NC STATE