RTI International Annual Report

State Fiscal Year 2022–2023 Report of Program Activities, Objectives and Accomplishments, and Itemized Expenditures and Fund Sources

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REPORT SUMMARY

- For the 2022–2023 fiscal year (FY), RTI received a recurring State appropriation of $1,500,000 ($800,000 recurring, $700,000 non-recurring) to invest in clean energy research and development and match U.S. Department of Energy research and development funds. To meet state requirements for utilization of these funds, and to even go beyond those requirements as good stewards of the state investment made in us, RTI has committed to:

- This past fiscal year, RTI utilized the full $1,500,000 of the State's investment in this program, allowing RTI to attract **$12,751,216** in direct matching federal energy research funds.

- Thus, **for every $1 in State FY 2022-2023 funds utilized by RTI, North Carolina attracted $8.5 in direct matching federal investment** to support its economy.

- When considering industry co-investment in FY 2022-2023 DOE projects and its corresponding additional federal funds leverage, **North Carolina attracted $16,426,644 million in total new technology investment** (from both industry and federal sources) to support its economy or **$10.95 for every $1 in State funds** utilized by RTI in FY 2022-2023.

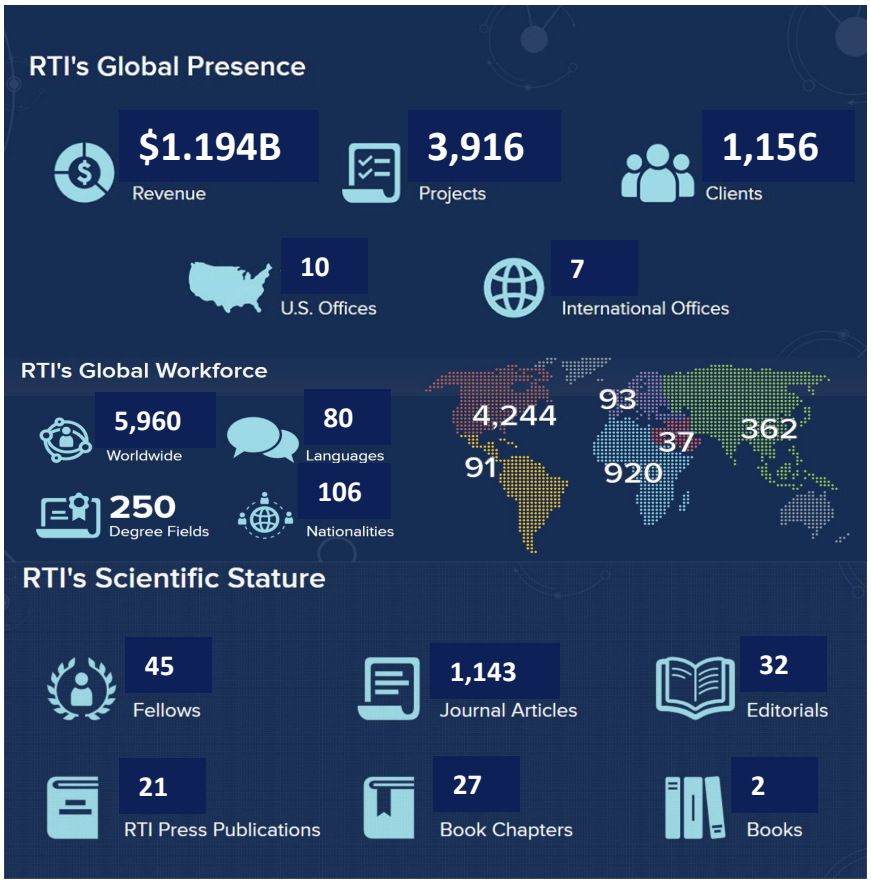
- Regarding the FY2023-2024 state appropriation, RTI anticipates utilizing the entire State investment to match federal energy research investment for a return of at least $4 in corresponding federal investment for every $1 in State funds utilized by RTI in FY2023-2024

ABOUT RTI

RTI International is an independent, nonprofit research institute dedicated to improving the human condition. We combine scientific rigor and technical expertise in social and laboratory sciences, engineering, and international development to deliver solutions to the critical needs of clients worldwide.

In 1958, the idea of Research Triangle Park (RTP) was born with the guidance and support of government, education, and business in North Carolina. Located in the rolling hills of the Piedmont, the Research Triangle is defined by outstanding universities in the Triangle's three cities: North Carolina State University in Raleigh, Duke University and North Carolina Central University in Durham, and the University of North Carolina at Chapel Hill. RTI was the original anchor tenant in RTP.

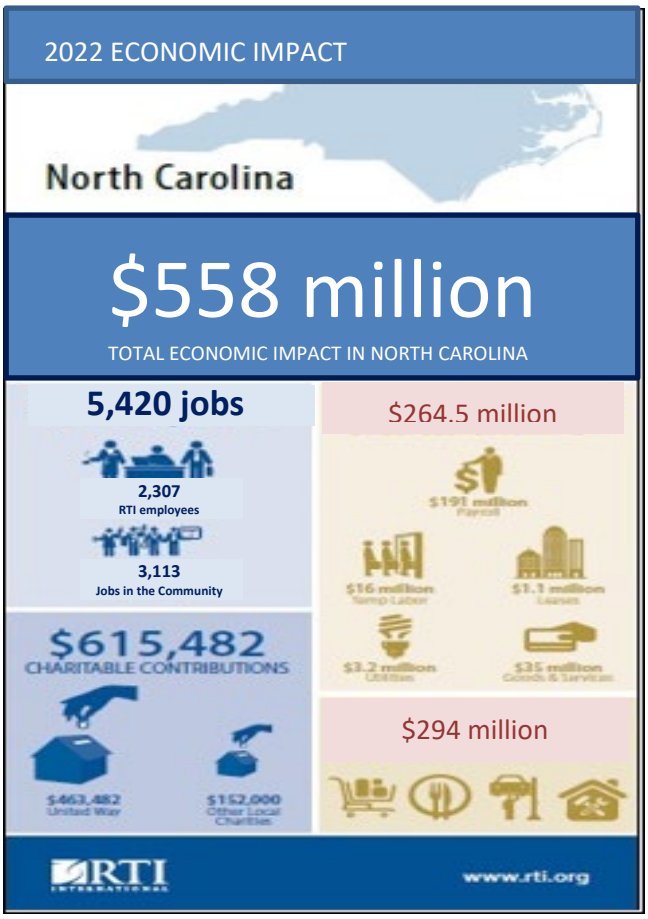
Since our founding, we've grown into one of the world's leading research institutes by remaining focused on our mission to improve the human condition by turning knowledge into practice. Our activities both mirror and support national priorities and policies as well as diverse commercial, industrial, and academic endeavors.



As our mission affirms, we are dedicated to improving the human condition by turning knowledge into practice through cutting-edge study and analysis in health and pharmaceuticals, education and training, surveys and statistics, advanced technology, international development, economic and social policy, energy and the environment, and laboratory and chemistry services.

We are proud of our scientific stature and our reputation for innovation. By continuing to conduct impartial, reliable, multidisciplinary research and by helping to develop and broker new technologies for our clients, we seek to be the world's preferred resource for turning knowledge into practice.

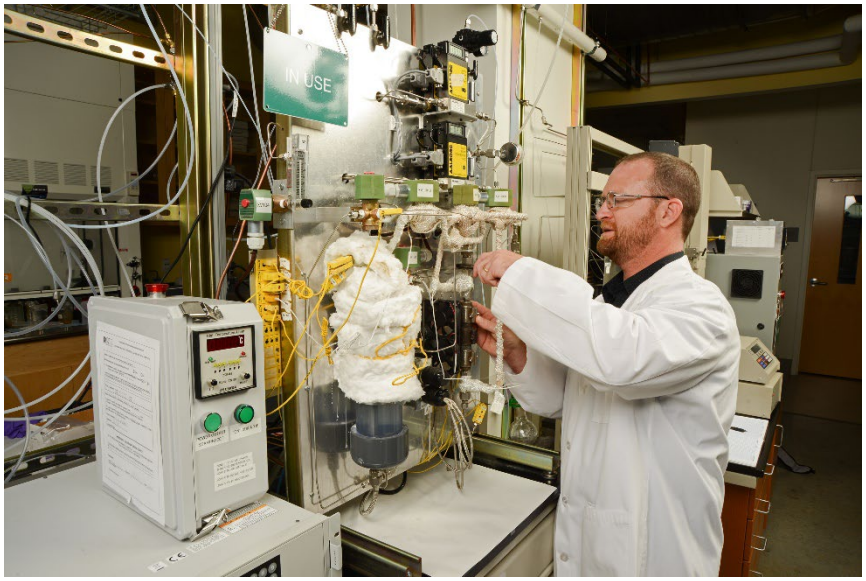
At RTI, we are also proud of the contributions to and economic impacts in our home State of North Carolina and in the communities in which our employees live and work. The estimated economic impact of RTI in the State of North Carolina in 2022 exceeded half a billion dollars, as did also the total contributions to local and state charitable organizations.



ENERGY RESEARCH AT RTI

RTI's innovative energy research is geared toward solving national and global concerns by developing efficient, economic, and sustainable energy solutions. Our scientists and engineers address challenges across the power, chemical, petroleum, gas processing, and transportation industries to produce novel technologies from ideation to pilot scale to commercialized systems. Our team's expertise includes biomass conversion to products and fuels, carbon capture and utilization, natural gas conversion and utilization, industrial water and reuse, syngas and clean coal processing, and other advanced energy applications.

We partner with the largest energy and chemical companies in the world and leverage our state and federal support to enter new R&D areas, build new technology platforms, and build a technology base for future commercialization of new energy technologies. RTI is unique in North Carolina, with a world class reputation in the energy sector.



RTI develops advanced technologies for energy applications from concept to large scale demonstration, with a focus on applied research. Our state-of-the-art facilities and laboratories are equipped to provide high-quality R&D for process technology licensors, gas processing companies, oil refiners, chemical manufacturers, clean-fuels developers, electric power generators, catalyst manufacturers, and other commercial clients, as well as for the U.S. Department of Energy (DOE), Department of Defense, and other government agencies. Our capabilities range from lab- and bench-scale experiments to pilot plants and large-scale pre-commercial demonstration plants.

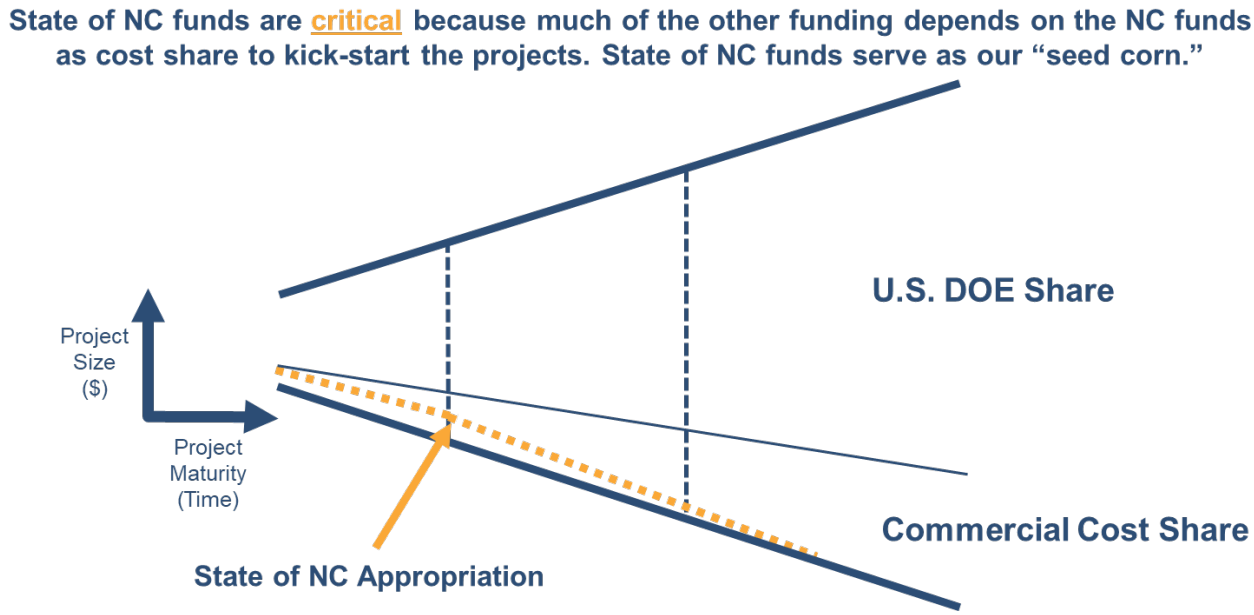
Our energy R&D programs are focused into seven primary areas, all of which are important for the production and utilization of clean, secure, and safe domestic energy in our state and in our nation:

- Carbon Capture and Utilization
- Biomass to Biofuels and Sustainable Products
- Renewable Energy and Energy Storage
- Natural Gas Processing and Conversion
- Clean Coal and Syngas Processing
- Industrial Water Treatment
- Solid State Lighting and Emerging Technologies

IMPORTANCE AND VALUE OF THE GRANTS APPROPRIATED TO RTI IN THE STATE BUDGET

North Carolina State Funding as an Investment in Energy Technology Development

RTI develops advanced energy technologies mainly under funding from the U.S. DOE. These federal research awards require a cost share or match from non-federal sources, typically 5% to 20%, depending on the funding program. RTI's first priority is to develop partnerships with industry that can attract this cost share match from the private sector, and RTI has a successful track record for building these industry alliances. However, the development of new technologies often makes it difficult to attract such cost share requirements until the technologies are sufficiently proven to attract private sector investment (often referred to as the "Valley of Death" for R&D programs). State matching funds allow RTI to cover this early cost share gap and to demonstrate the viability of new technologies – and then attract private sector investment as they mature. As projects are further advanced, industry often picks up the full funding load for U.S. DOE cost share requirements.



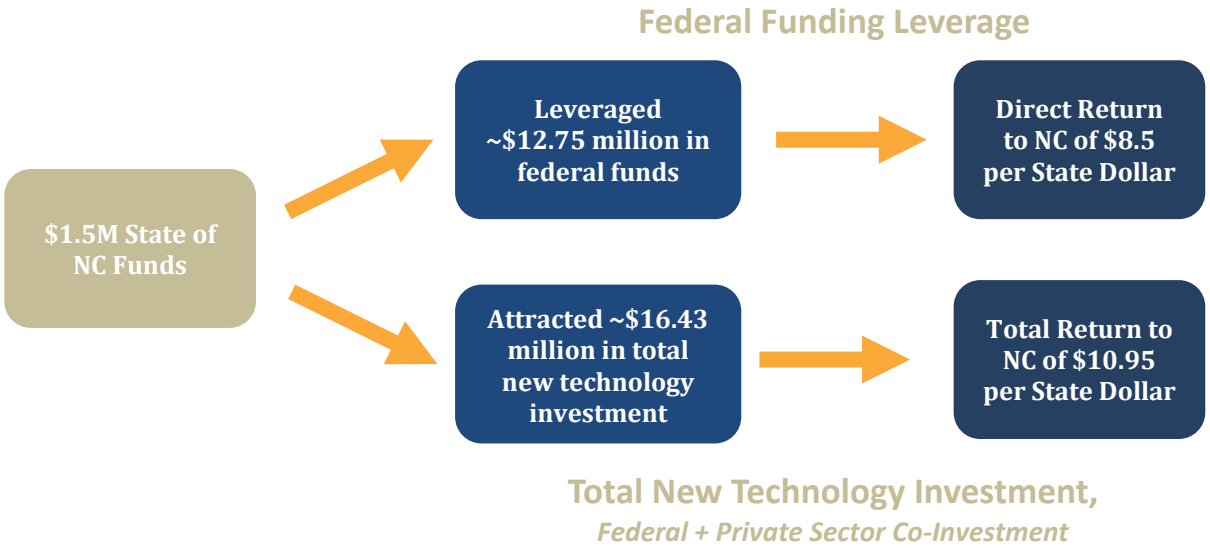
The State Budget approved by the legislature for Fiscal Year (FY) 2022–2023 included an $800,000 recurring grant to assist RTI in winning federal energy research grants that require cost share or match, plus a $700,000 non-recurring grant to provide the cost share required to support an increase in federal grants focused on clean energy and innovation. The goal of this grant is to help RTI advance energy research in North Carolina and create jobs in this important and growing part of the state's economy. The key points of how RTI utilized the grant and benefits to the State can be summarized as follows:

- Together with U.S. DOE funding and in partnerships with leading industrial companies, RTI is leveraging these state funds to build a pipeline of innovative technologies addressing the energy challenges of our state and of our nation.

- The state funding helps RTI to initiate development of at least three to five additional energy technology projects per year. This past year, a total of thirteen development projects have benefited from the state funding.

- Based on the great success of the initial funding ($500,000 annual allocation), the annual allocation was raised in FY 2016 to $800,000 and made recurring.

- This fiscal year RTI utilized the full $1,500,000 of the state's funding to attract $12,751,216 in direct matching federal energy research investment. Thus, **for every $1 in State FY 2022-2023 funds utilized by RTI, North Carolina attracted $8.5 in direct matching federal investment** to support its economy.



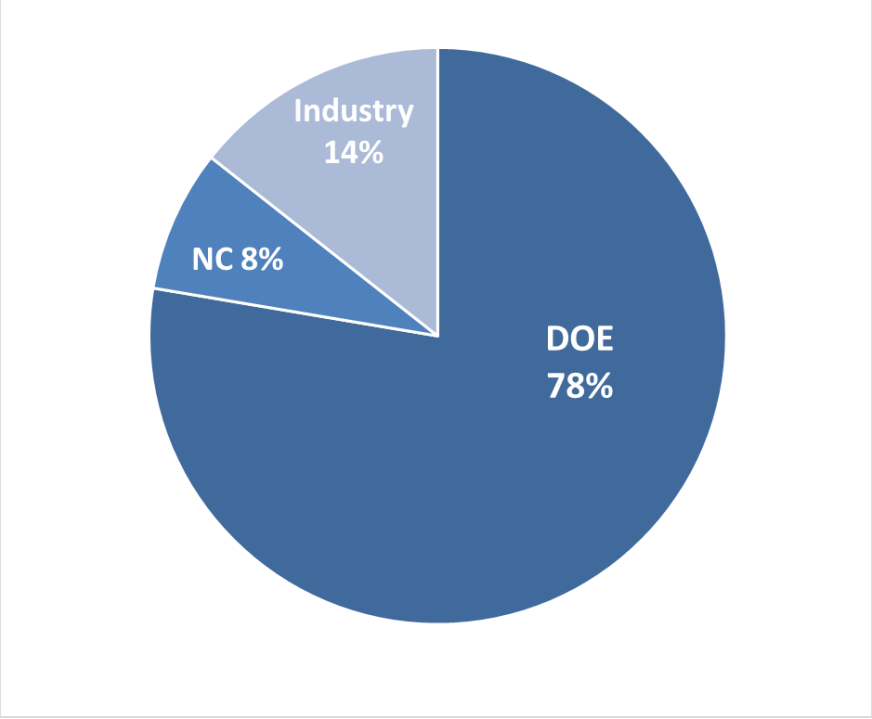
Total FY2021-FY2022 RTI Total Energy Funding Breakdown

- When considering industry co-investment in these FY 2022-2023 projects and its corresponding additional matching federal investment, North Carolina attracted **$16,426,644 million in total new technology investment** to support its economy or **$10.95 for every $1 in state funds utilized by RTI in FY 2022-2023**.

- Since 2010, the State of North Carolina has **cumulatively invested slightly over $10.2 million** to help RTI attract federal and private funding for energy technology development in North Carolina. This **total state funding to date has leveraged $59.6 million in direct matching federal energy investment (return of $5.84 for every $1 of state funding)**.

- Since 2010, **private industry has cumulatively invested an additional $16.4 million** in cash and in-kind services to the RTI energy projects supported with state funding, and **these industry investments have enabled the leveraging of $39.9 million in additional matching federal energy investment**.

- If one considers this additional private sector investment in RTI energy projects and the resulting combined (state plus industry) matching federal energy investment that has been leveraged, **North Carolina's funding of RTI energy research has helped attract over $116 million in total new technology investment** to aid NC's economy, including investments made by the federal government, industry, and RTI for a **total return of $11.4 for every $1 of state funding**.



Cumulative Leveraging of FY2011-FY2023 RTI State Energy Funding

- Investment in new technologies leads to increased economic competitiveness. It creates high-paying jobs, typically attracting talent from outside of the state and resulting in significant economic input to the state of North Carolina. Since North Carolina began investing in RTI's energy research in FY 2010-2011, RTI has created or supported approximately 70 or more high-tech jobs associated with this research.

- In addition to jobs, RTI estimates that for every dollar in state funds invested in RTI energy research, North Carolina has received substantially more than a dollar back in state and local taxes. Considering the fact that if RTI does not commit any portion of the received State funds in the year they were granted those uncommitted funds are returned to the State, the State cannot lose on this investment in RTI.

- State-supported research at RTI regarding solid-state (LED) lighting has also directly benefited the N.C. State Construction Office, the Department of Environmental and Natural Resources, the Department of Public Health, UNC-Chapel Hill, and N.C. State University and other agencies.

STATE FISCAL YEAR 2022–2023 PROGRAM ACTIVITIES, OBJECTIVES, AND ACCOMPLISHMENTS

In this past state fiscal year, utilization of the full $1,500,000 of the state's RTI energy funds has greatly assisted in building RTI's technology development pipeline, successfully retaining and creating high technology jobs in North Carolina. The use of the state funds succeeded in attracting $12,751,216 in direct matching federal research investment (8.5:1 federal leverage ratio), along with approximately three quarters of a million dollars in corresponding industry cost share and over $3.7 million in additional federal research dollars leveraged by this industry funding (total leverage ratio of 10.95:1). The table below shows the direct leveraging of federal investment associated with the State funding for this past fiscal year.

Project/Proposal	NC Funds	Federal Dollars Leveraged
Condenser Surface Treatment to Prevent Biofouling	$80,000	$261,493
Systems Research- Scalable RC	$117,765	$1,001,491

Integrated Separations to Improve Biocrude Recovery for Biofuels and Bioproducts	$155,248	$691,652
REFUEL Scale-Up	$398,420	$4,250,268
Ammonia for Concentrated Solar Power	$41,552	$201,777
GEN2NAS Solvents for CO2 Capture from NGCC Plants	$168,670	$1,000,000
Carbon Capture Plant FEED	$271,425	$3,680,000
Hydrogen Production from Modular CO2 Assisted Oxy-Blown Gasification of Waste Blends	$116,920	$400,000
Intensified Water-Lean Solvent CO2 Capture System for Cement Flue Gas	$150,000	$1,264,535
Totals Allocated	**$1,500,000**	**$12,751,216**

Leveraging of Federal Investment through State Funding for State FY 2022-2023
Specific projects benefiting from State of NC funds in FY 2023-2023 and the goals of and accomplishments within those projects are highlighted below:

1 . Condenser Surface Treatment to Prevent Biofouling. Using the state of NC fund, RTI was able to finish this project on time and under budget. As consequence of applying RTI technology to prevent biofilm formation using 2-AI coating, the biofilm growth in the condenser was reduced, and therefore, can reduce the mechanical cleaning frequency from 4 times to 3 times per year. The techno-economic analysis showed that the 2-AI coating can reduce the annual loss of power plant due to the biofilm (mechanical cleaning and performance decrease) from 1.48% to 0.86% of total power plant revenue. The results can be used to improve the existing power plant performance and to design a new condenser system using the developed coating. Furthermore, the developed technology can be used to reduce the freshwater consumption and harmful effect on the environment by warm water discharge.

2. Systems Research Scalable RCFP . RTI used state funding to support the final design and procurement of a new engineering-scale biomass conversion system to produce advanced biofuels based on a reactive catalytic biomass pyrolysis technology. Commercial catalysts developed by our partners were successfully transformed for use in our process and activity was verified to allow catalyst scaleup to proceed. A process hazard analysis of the detailed engineering design was completed with recommended changes incorporated into the final design. System fabrication is underway.

3. Integrated Separations to Improve Biocrude Recovery for Biofuels and Bioproducts. RTI used state funding to support a newly awarded project to enhance biomass carbon efficiency during catalytic pyrolysis by (1) improving separation of solids from the vapor product stream, (2) enhancing rapid quenching and collection of pyrolysis vapors, (3) separating out highly oxygenated bioproducts from the liquid intermediates, and (4) upgrading remaining fraction suitable for biofuel production. The initial verification was completed and modifications for integrating separations unit operations into RTI pilot-scale biomass pyrolysis unit were initiated.

4. REFUEL Scale-Up. RTI is leading an effort to develop and demonstrate a Technology Integration Platform (TIP) for next-generation green hydrogen and ammonia production and utilization technologies for three sectors: power generation, fuel, and fertilizer. Funds in this FY were used to develop a bench-scale green NH3 production system in RTI's laboratories.

5. Ammonia for Concentrated Solar Power. RTI continues to support a team of leading universities by developing next-generation ammonia-based energy storage systems for concentrated solar power. As part of its effort **in this FY**, RTI is screening ideal catalysts for high temperature applications.

6. GEN2NAS Solvents for CO2 Capture from NGCC Plants. The project was kicked-off in April 2023. RTI completed 65 formulations during the initial small-scale solvent screening in late July.

7. Carbon Capture Plant FEED. RTI used state funding to secure DOE funding for a front-end engineering design (FEED) study for CO2 capture from a cement plant in New Braunfels, TX using RTI's NAS solvent. The CO2 capture plant will be integrated with the cement plant, and capture 1,600,000 tonnes/year of CO2, with 95% capture efficiency. The FEED study will develop Association for the Advancement of Cost Engineering (AACE) Class 3 cost estimates for the integrated CO2 capture plant with an uncertainty of +/- 15%. Successful implementation of the NAS technology in cement production could address up to 10% of global CO2 emissions.

8. Hydrogen Production from Modular CO2 Assisted Oxy-Blown Gasification of Waste Blends . RTI leveraged state funding to secure $762,245 of U.S. DOE funding to develop a novel process to produce hydrogen from blended feedstock that includes legacy waste coal, forest residues, and organic-rich fraction of municipal solid waste (OFMSW) via carbon dioxide (CO2) assisted oxy-blown gasification as a sub-awardee to Auburn University. The approach is to demonstrate the integration of Auburn's CO2-assisted oxy-blown gasifier with novel, modular technologies for syngas cleanup and conditioning developed at RTI.

9. Intensified Water-Lean Solvent CO2 Capture System for Cement Flue Gas. RTI leveraged $150,000 in state funding to receive $4,500,000 in DOE funds to carry out this project that involves developing two new process intensification technologies for the CO2 absorber to reduce the cost of CO2 capture. In the past year, the project team has progressed the two technologies with lab testing at the bench scale to enable scale up to a pilot scale testing. The team has also completed the detailed design of a 1 t-CO2/day CO2 capture system to evaluate the new technologies at an actual cement plant.

STATE FISCAL YEAR 2022-2023 ITEMIZED EXPENDITURES AND FUND SOURCES

The $1,500,00 in appropriation funds used by RTI were applied to labor costs inclusive of indirect overhead charges. See **Appendix A** for details of the expenditure of RTI state funds for this past fiscal year.

OUTLOOK FOR STATE FISCAL YEAR 2023-2024

For the state fiscal year 2023-2024, RTI plans to continue to utilize State of NC funding to further strengthen its energy program. A significant portion of the funds are anticipated to be used to leverage federal funds for the following technology development projects for which RTI has already received award notices and for which contract negotiations are currently under way:

1 . Condenser Surface Treatment to Prevent Biofouling. While the project has accomplished the TRL 6 Level by designing and building a small pilot system then testing it in a relevant environment conditions, we're in discussion with DOE to secure future funds to progress this technology to higher TRL levels.

2. Systems Research Scalable RCFP . RTI will use state funding to support the installation, commissioning, and operation of a new engineering-scale biomass conversion system to produce advanced biofuels based on a reactive catalytic biomass pyrolysis (RCFP) technology. In the final phase of the project, the RCFP reactor system will be optimized to maintain steady-state hydrodeoxygenation (HDO) catalyst activity and produce enough RCFP biocrude to support extensive upgrading studies. Collectively, these innovative improvements and process integration will support the production of 100 gallons of biofuel blendstock (gasoline and diesel).

3. Integrated Separations to Improve Biocrude Recovery for Biofuels and Bioproducts. The integration of separations with catalytic biomass pyrolysis will seek to enhance biomass conversion efficiency to biofuels and bioproducts. In the second phase of this project, scale-up and integration of a lab-separation process into a 1TPD biomass pyrolysis unit will enhance collection and separation of the biocrude for subsequent bioproduct recovery and upgrading to bio-blendstocks. An engineering partner and equipment provider will support the design and fabrication of separations unit operations.

4. REFUEL Scale-Up. In the next FY, The data generated will be used to design a 1 metric ton per day pilot-plant that can reduce the cost of green ammonia by up to 45% compared to the state-of-the-art.

5. Ammonia for Concentrated Solar Power. In the next FY, we will be developing technology risk registers, and technology maturation plans.

6. GEN2NAS Solvents for CO2 Capture from NGCC Plants. RTI will continue the formulation screening effort in FY24 through December 2023. 2 formulations will be down-selected and move forward with bench-scale testing where these solvents will be evaluated for their continuous CO_2 capture, operability, and energy consumption in summer 2024. The technoeconomic assessment of the most promising between the two solvents will be conducted before the project ends in October 2024.

7. Carbon Capture Plant FEED. RTI will use the state funding to perform the front-end engineering design (FEED) study for CO2 capture from a cement plant in New Braunfels, TX using RTI's NAS solvent. RTI will determine the cost of CO2 capture from a 1,600,000 tonnes/year CO2 capture plant integrated with the cement plant. The FEED study will develop the engineering and design package needed to advance the project towards a construction and build phase. Results from the FEED study will also support identifying new permitting requirements for the integrated CO2 capture plant. RTI will also perform a lifecycle analysis (LCA) to estimate the GHG reduction from the CO2 capture process.

8. Hydrogen Production from Modular CO2 Assisted Oxy-Blown Gasification of Waste Blends . This project was started in May 2023 to develop a novel process to produce hydrogen from blended feedstock that includes legacy waste coal, forest residues, and organic-rich fraction of municipal solid waste (OFMSW) via carbon dioxide (CO2) assisted oxy-blown gasification as a sub-awardee to Auburn University. State funding will be leveraged to verify the performance of RTI's syngas cleanup technologies for use with blended feedstock gasification to maximize hydrogen production. Simulated syngas compositions from each feedstock blend will be used to test the performance of the sulfur removal sorbent in a bench-scale sorbent testing system to determine the effect of tar, moisture, sulfur, chlorine, and other contaminants on sorbent working capacity. A similar benchmarking test plan will also be developed for the Trace Contaminant Removal Process (TCRP) to remove heavy metals using simulated feeds in microreactors. Experimental results will form the basis of a detailed process design for integrating RTI's syngas cleanup and conditioning unit operations with a 1 kg/hr gasifier.

9. Intensified Water-Lean Solvent CO2 Capture System for Cement Flue Gas. RTI will lead the pilot system fabrication, installation and testing at a cement plant in the next year. Through the testing, RTI will be evaluating and optimizing the CO2 capture performance and integration at the cement plant host site to assess the commercial viability through a technoeconomic analysis of the intensifed process including CO2 utilization for concrete.

CONCLUSION

All of the funds received by RTI have been utilized for the purposes for which they were granted. Financial data for all funded projects have been provided for FY 2022-2023. The line item budget for the FY 2022-2023 use of funds is attached in Appendix A.

We appreciate the State's support of our clean energy technology projects and the continued opportunity to hire and retain high technology jobs in the State of North Carolina.

Please direct questions regarding technical matters to Dave Dausch, Senior Director, Technology Advancement and Commercialization, RTI International, dausch@rti.org or 919-248-1412.

Please direct all questions regarding contractual matters to Shonta Holloway, Senior Contracting Officer, RTI International, sholloway@rti.org or 919-316-3424.

APPENDIX A: STATE OF NORTH CAROLINA COST SHARE FUNDING, FY 2022-2023
Summary for State of NC Funding $1,5000,000 – Grant ID 27964

Project Name	Start Date	Total Cost	DOE Amount	NC Cost Share	FY23 Spend	FY23 Industry Spend	Federal Dollars Leveraged	Obligated NC Funds	Forecasted Federal Dollars Leveraged on Obligated Funds	Total NC Funds Spent and Obligated	Total Federal Dollars Leveraged	Total Industry Spend	Labor & Indirects (Total)	Labor & Indirects (Fed Only)
Biofouling Cond Serv	9/13/2019	$ 1,688,172	$ 1,350,537	$ 337,635	$ 80,000	$ -	$ 261,493	$ -	$ -	$ 80,000	$ 261,493	$ -	261,493	$ 181,493
Systems Research - Scalable RCFP (	10/1/2019	$ 2,945,831	$ 2,356,665	$ 589,166	$ -	$ -	$ -	$ 117,765	$ 1,001,491	$ 117,765	$ 1,001,491	$ 50,000	1,152,000	$ 1,034,235
Biofuels and Bioproducts	10/1/2020	$ 4,612,503	$ 3,690,002	$ 922,501	$ -	$ -	$ -	$ 155,248	$ 691,652	$ 155,248	$ 691,652	$ 25,000	1,145,168	$ 989,920
REFUEL Scale Up	7/25/2022	$ 4,648,690	$ 4,250,268	$ 398,422	$ 323,960	$ 338,120	$ 639,294	$ 74,460	$ 3,610,974	$ 398,420	$ 4,250,268	$ 3,170,215	867,738	$ 469,318
NH3 for Conc Solar Pwr	10/1/2022	$ 243,329	$ 201,777	$ 41,552	$ 7,456	$ -	$ 27,031	$ 34,096	$ 174,746	$ 41,552	$ 201,777	$ -	198,449	$ 156,897
GEN2NAS Solv CO2 Capture	4/1/2023	$ 1,168,670	$ 1,000,000	$ 168,670	$ 13,543	$ -	$ 112,304	$ 155,127	$ 887,696	$ 168,670	$ 1,000,000	$ 81,330	907,196	$ 738,526
Carbon Capture Plant FEED	4/14/2023	$ 3,951,425	$ 3,680,000	$ 271,425	$ 3,171	$ -	$ 28,830	$ 268,254	$ 3,651,170	$ 271,425	$ 3,680,000	$ -	1,523,469	$ 1,252,044
FECM Clean Hydrogen Prod	3/1/2023	$ 952,806	$ 762,245	$ 190,561	$ 1,669	$ -	$ 6,647	$ 115,251	$ 393,353	$ 116,920	$ 400,000	$ -	952,806	$ 835,886
Intensified Water	7/1/2021	$ 1,414,535	$ 1,264,535	$ 150,000	$ 150,000	$ -	$ 327,240	$ -	$ 937,295	$ 150,000	$ 1,264,535	$ 348,883	590,137	$ 440,137
Categories Needed	**TOTAL**	**$ 21,625,961**	**$ 18,556,029**	**$ 3,069,932**	**$ 579,799**	**$ 338,120**	**$ 1,402,839**	**$ 920,201**	**$ 11,348,377**	**$ 1,500,000**	**$ 12,751,216**	**$ 3,675,428**	**$ 7,598,456**	**$ 6,098,456**

	Federal Only	Including Industry Spend
Total Leverage Ratio	8.50	10.95

Funding Breakout - by Project by Quarter

A

7/01/22 - 6/30/23 = Actuals	*Q1*	*Q2*	*Q3*	*Q4*	*Total*
	$ 35,046.67	$ 25,139.34	$ 24,377.95	$ 50,646.47	$ 135,210.43

Biofouling Cond Serv	**7/1/22 - 9/30/22**	**10/1/22 - 12/31/22**	**1/1/23 - 3/31/23**	**4/1/23 - 6/30/23**	**Total**
Labor (w/Fringe)	$ 29,206	$ 20,949	$ 20,315	$ 42,205	$ 112,675
Travel, Services, Etc.	$ -	$ -	$ -		$ -
Equipment, Materials, Subcontractors	$ 13,607				$ 13,607
Overhead (Indirect) Costs	$ 35,047	$ 25,139	$ 24,378	$ 50,646	$ 135,210
Total	**$ 77,859**	**$ 46,089**	**$ 44,693**	**$ 92,852**	**$ 261,493**
Labor (fully loaded)	**$ 64,252**	**$ 46,089**	**$ 44,693**	**$ 92,852**	**$ 247,886**
Labor (fully loaded) towards State Cost Share Funds	**$ 77,008**	**$ 2,992**	**$ -**	**$ -**	**$ 80,000**

Systems Research - Scalable RCFP (AOI 4)	**7/1/22 - 9/30/22**	**10/1/22 - 12/31/22**	**1/1/23 - 3/31/23**	**4/1/23 - 6/30/23**	**Total**
Labor (w/Fringe)					$ -
Travel, Services, Etc.					$ -
Equipment, Materials, Subcontractors					$ -
Overhead (Indirect) Costs					$ -
Total	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Labor (fully loaded)	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Labor (fully loaded) towards State Cost Share Funds	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

Biofuels and Bioproducts	**7/1/22 - 9/30/22**	**10/1/22 - 12/31/22**	**1/1/23 - 3/31/23**	**4/1/23 - 6/30/23**	**Total**
Labor (w/Fringe)					$ -
Travel, Services, Etc.					$ -
Equipment, Materials, Subcontractors					$ -
Overhead (Indirect) Costs					$ -
Total	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Labor (fully loaded)	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Labor (fully loaded) towards State Cost Share Funds	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

REFUEL Scale Up	**7/1/22 - 9/30/22**	**10/1/22 - 12/31/22**	**1/1/23 - 3/31/23**	**4/1/23 - 6/30/23**	**Total**
Labor (w/Fringe)	$ 52,835	$ 80,566	$ 107,318	$ 14,705	$ 255,424
Travel, Services, Etc.	$ 158	$ 301	$ 3,523	$ -	$ 3,982
Equipment, Materials, Subcontractors	$ 2,813	$ 98,290	$ 202,788	$ 2,414	$ 306,304
Overhead (Indirect) Costs	$ 76,862	$ 117,165	$ 163,276	$ 20,883	$ 378,187
Total	**$ 132,667**	**$ 296,323**	**$ 476,905**	**$ 38,002**	**$ 943,897**
Labor (fully loaded)	**$ 129,697**	**$ 197,731**	**$ 270,595**	**$ 35,588**	**$ 633,611**
Labor (fully loaded) towards State Cost Share Funds	**$ 44,791**	**$ 33,768**	**$ 227,164**	**$ 18,235**	**$ 323,958**

NH3 for Conc Solar Pwr	**7/1/22 - 9/30/22**	**10/1/22 - 12/31/22**	**1/1/23 - 3/31/23**	**4/1/23 - 6/30/23**	**Total**
Labor (w/Fringe)	$ 9,279	$ 3,193			$ 12,472
Travel, Services, Etc.	$ -	$ 5			$ 5
Equipment, Materials, Subcontractors	$ 1,048	$ 3,410			$ 4,458
Overhead (Indirect) Costs	$ 14,056	$ 2,910			$ 16,966
Total	**$ 24,383**	**$ 9,519**	**$ -**	**$ -**	**$ 33,901**
Labor (fully loaded)	**$ 23,335**	**$ 6,104**	**$ -**	**$ -**	**$ 29,438**
Labor (fully loaded) towards State Cost Share Funds	**$ 5,876**	**$ 1,580**	**$ -**	**$ -**	**$ 7,456**

GEN2NAS Solv CO2 Capture	**7/1/22 - 9/30/22**	**10/1/22 - 12/31/22**	**1/1/23 - 3/31/23**	**4/1/23 - 6/30/23**	**Total**
Labor (w/Fringe)			$ 26,346		$ 26,346
Travel, Services, Etc.			$ 472		$ 472
Equipment, Materials, Subcontractors			$ 55,142		$ 55,142
Overhead (Indirect) Costs			$ 42,588		$ 42,588
Total	**$ -**	**$ -**	**$ 124,547**	**$ -**	**$ 124,547**
Labor (fully loaded)	**$ -**	**$ -**	**$ 68,934**	**$ -**	**$ 68,934**
Labor (fully loaded) towards State Cost Share Funds	**$ -**	**$ -**	**$ 13,543**	**$ -**	**$ 13,543**

Carbon Capture Plant FEED	**7/1/22 - 9/30/22**	**10/1/22 - 12/31/22**	**1/1/23 - 3/31/23**	**4/1/23 - 6/30/23**	**Total**
Labor (w/Fringe)			$ 12,675		$ 12,675
Travel, Services, Etc.			$ 30		$ 30
Equipment, Materials, Subcontractors					$ -
Overhead (Indirect) Costs			$ 18,650		$ 18,650
Total	**$ -**	**$ -**	**$ 31,355**	**$ -**	**$ 31,355**
Labor (fully loaded)	**$ -**	**$ -**	**$ 31,325**	**$ -**	**$ 31,325**
Labor (fully loaded) towards State Cost Share Funds	**$ -**	**$ -**	**$ 3,172**	**$ -**	**$ 3,172**

FECM Clean Hydrogen Prod	**7/1/22 - 9/30/22**	**10/1/22 - 12/31/22**	**1/1/23 - 3/31/23**	**4/1/23 - 6/30/23**	**Total**
Labor (w/Fringe)			$ 3,237		$ 3,237
Travel, Services, Etc.					$ -
Equipment, Materials, Subcontractors					$ -
Overhead (Indirect) Costs			$ 5,081		$ 5,081
Total	**$ -**	**$ -**	**$ 8,317**	**$ -**	**$ 8,317**
Labor (fully loaded)	**$ -**	**$ -**	**$ 8,317**	**$ -**	**$ 8,317**
Labor (fully loaded) towards State Cost Share Funds	**$ -**	**$ -**	**$ 1,670**	**$ -**	**$ 1,670**

Intensified Water	**7/1/22 - 9/30/22**	**10/1/22 - 12/31/22**	**1/1/23 - 3/31/23**	**4/1/23 - 6/30/23**	**Total**
Labor (w/Fringe)	$ 15,989	$ 23,051	$ 38,207	$ 21,887	$ 99,134
Travel, Services, Etc.	$ 7,838	$ -	$ 8,426	$ 9,505	$ 25,769
Equipment, Materials, Subcontractors	$ -	$ 39,030	$ 106,965	$ 7,298	$ 153,292
Overhead (Indirect) Costs	$ 25,666	$ 43,484	$ 79,434	$ 39,159	$ 187,744
Total	**$ 49,494**	**$ 105,565**	**$ 233,031**	**$ 77,849**	**$ 465,938**
Labor (fully loaded)	**$ 41,656**	**$ 66,535**	**$ 117,641**	**$ 61,046**	**$ 286,877**
Labor (fully loaded) towards State Cost Share Funds	**$ -**	**$ -**	**$ 150,000**	**$ -**	**$ 150,000**