RTI International Annual Report

State Fiscal Year 2019–2020 Report of Program Activities, Objectives and Accomplishments, and Itemized Expenditures and Fund Sources

Citation of Law or Resolution:	S.L. 2017-57
Section Number:	Section 15A.2(a)
Submission Date:	December 17, 2020

Receiving Entities:

The Joint Legislative Oversight Committee on Agriculture and Natural and Economic Resources
The Chairs of the House of Representatives Appropriations Committee on Agriculture and Natural and Economic Resources
The Chairs of the Senate Appropriations Committee on Agriculture, Natural, and Economic Resources
The Fiscal Research Division
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Submitting Entity:

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Report SUMMARY

- For the 2019–2020 fiscal year (FY), RTI received a recurring State appropriation of $800,000 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 $800,000 of the State's investment in this program, allowing RTI to attract **$3,056,402** in direct matching federal energy research funds.
- Thus, **for every $1 in State FY 2019-2020 funds utilized by RTI, North Carolina attracted $3.82 in direct matching federal investment** to support its economy.
- When considering industry co-investment in FY 2019-2020 DOE projects and its corresponding additional federal funds leverage, **North Carolina attracted $4.134 million in total new technology investment** (from both industry and federal sources) to support its economy or **$5.17 for every $1 in State funds** utilized by RTI in FY 2019-2020.
- Regarding the FY2020-2021 state appropriation, RTI anticipates utilizing the entire State investment to attract a minimum $3.2 million in direct matching 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 FY2019-2020.

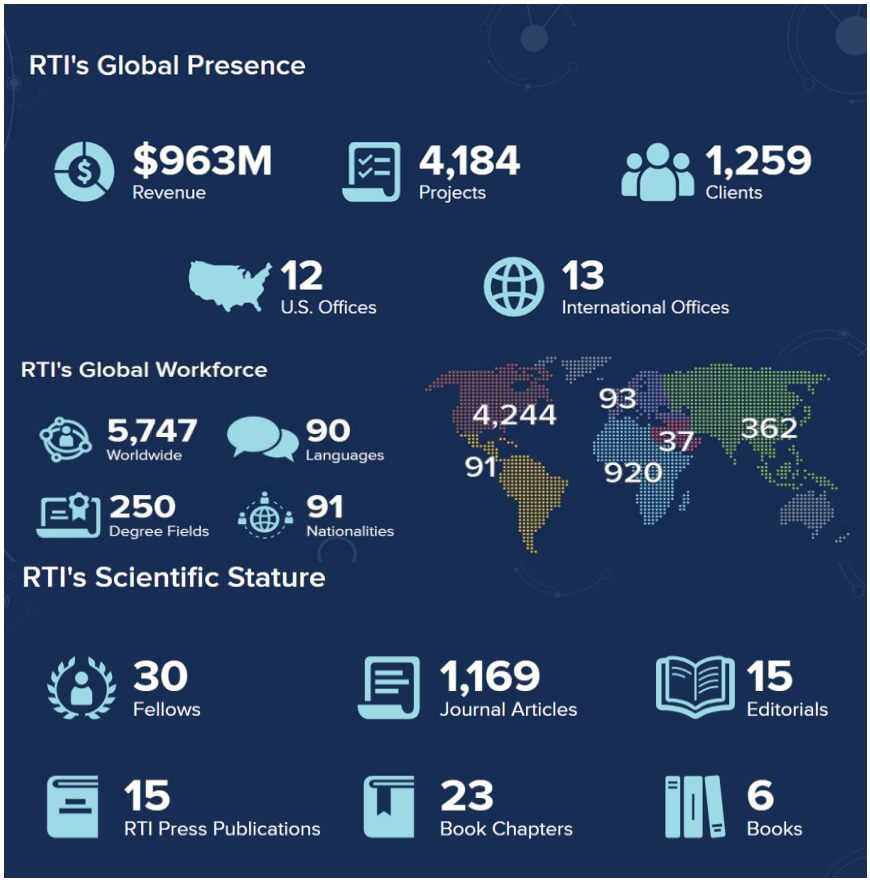
As provided in Session Law 2017-57, Section 15A.2(a), RTI International (RTI) is pleased to submit this report of State fiscal year program activities, objectives, and accomplishments and prior State fiscal year itemized expenditures and fund sources.

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.

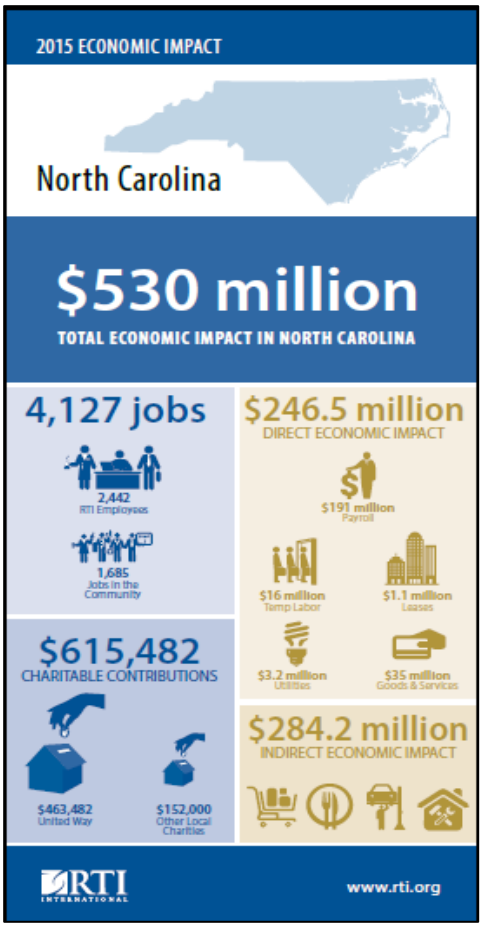
Since our founding, we've grown into one of the world's leading research institutes by remaining focused on our mission to improve the human condition by turning knowledge into practice. Our activities both mirror and support national priorities and policies as well as diverse commercial, industrial,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

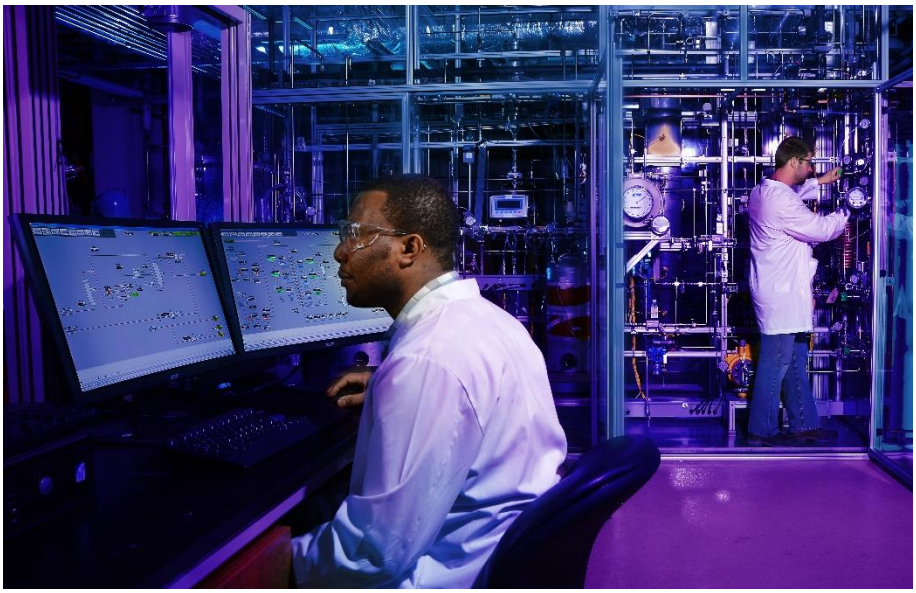
At RTI, we are also proud of the contributions to and economic impacts in our home State of North Carolina and in the communities in which our employees live and work. The estimated economic impact of RTI in the State of North Carolina in 2015 exceeded half a billion dollars, as did also the total contributions to local and state charitable organizations.



Energy Research at RTI

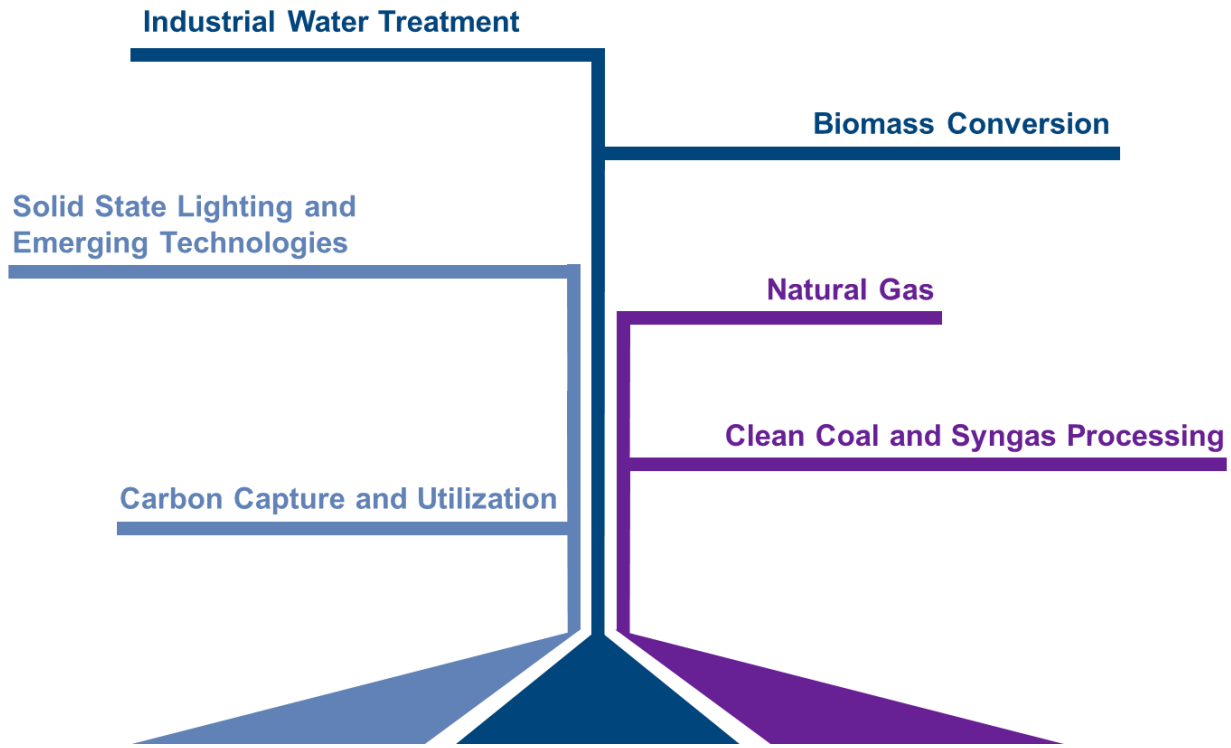
RTI's innovative energy research is geared toward solving national and global concerns by developing efficient, economic, and sustainable energy solutions. Our scientists and engineers address challenges across the power, chemical, petroleum, gas processing, and transportation industries to produce novel 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.

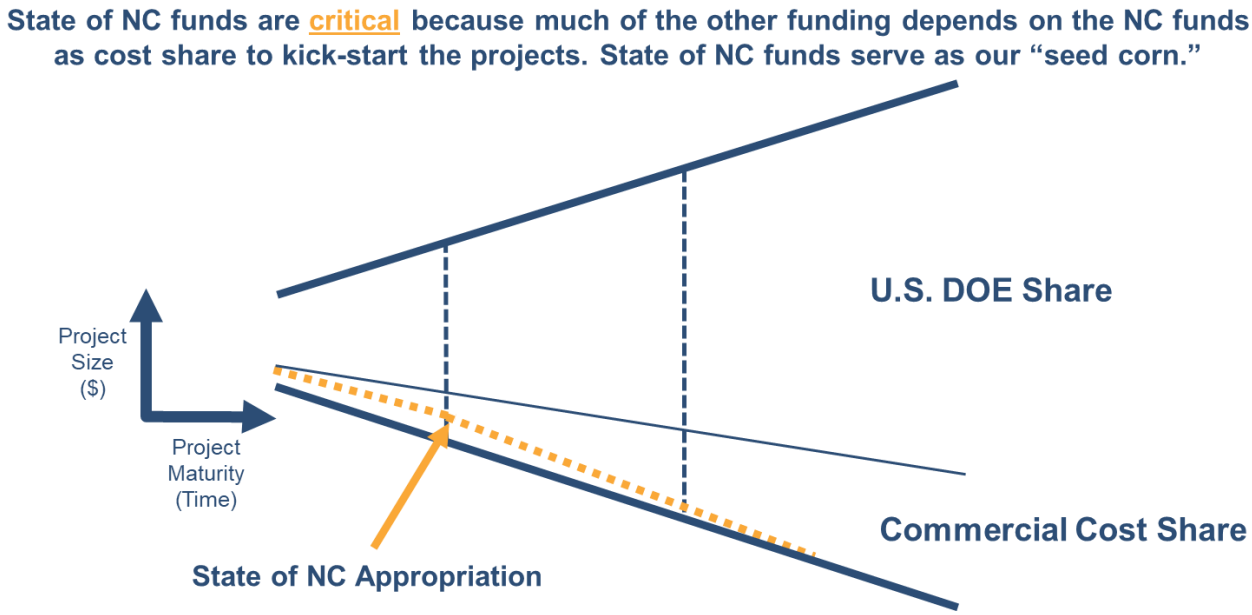
Our energy R&D programs are focused into seven primary areas, all of which are important for the production and utilization of clean, secure, and safe domestic energy in our state and in our nation:



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.



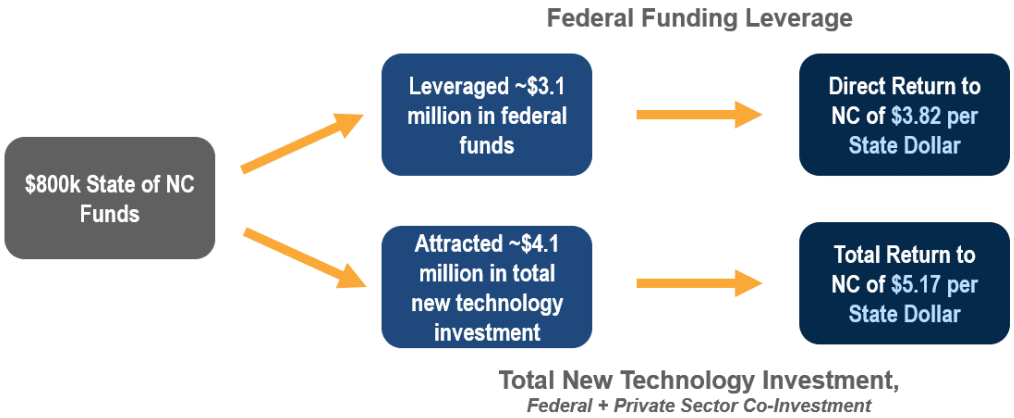
The State Budget approved by the legislature for Fiscal Year (FY) 2019–2020 included an $800,000 recurring grant to assist RTI in winning federal energy research grants that require cost share or match. The goal of this grant was to help RTI advance energy research in North Carolina and create jobs in 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 six 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 $800,000 of the state's funding to attract **$3,056,402** in direct matching federal energy research investment. Thus, **for every $1 in State FY 2019-2020 funds utilized by RTI, North Carolina attracted $3.82 in direct matching federal investment** to support its economy. This leverage was impacted to a slightly negative extent this year due to economic conditions causing one commercial collaborator to drop out of a specific DOE project between RTI and Pacific Northwest National Laboratory. Fortunately, North Carolina investment was utilized to provide the necessary funding and **retain a $2.9M project in North Carolina**. This same project secured more than $300,000 in new equipment and construction funding from the DOE which significantly expanded RTI's ability to conduct research at its pilot plant facility in RTP. The expansion was conducted with NC manufactured equipment and NC construction personnel.



Total FY19-FY20 RTI Total Energy Funding Breakdown

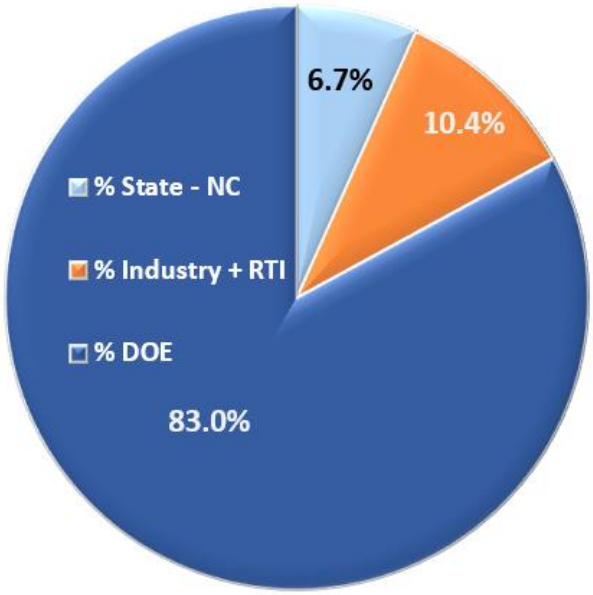
- When considering industry co-investment in these FY 2019-2020 projects and its corresponding additional matching federal investment, North Carolina attracted **$4.134 million in total new technology investment** to support its economy or **$5.17 for every $1 in state funds utilized by RTI in FY 2019-2020**.

- Since 2010, the State of North Carolina has **cumulatively invested slightly over $6.4 million** to help RTI attract federal and private funding for energy technology

development in North Carolina. This **total state funding to date has leveraged $37 million in direct matching federal energy investment (return of $5.78 for every $1 of state funding)**.

- Since 2010, **private industry has cumulatively invested an additional $10 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 $42.8 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 $89.8 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 $14.03 for every $1 of state funding**.



Cumulative Leveraging of FY2011-FY2020 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 55 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 2019–2020 Program Activities, Objectives, and Accomplishments

In this past state fiscal year, utilization of the full $800,000 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 $3,056,402 in direct matching federal research investment (3.82:1 federal leverage ratio), along with approximately one million dollars in corresponding industry cost share and over $1 million in additional federal research dollars leveraged by this industry funding (total leverage ratio of 6.00:1). The table below shows the direct leveraging of federal investment associated with the State funding for this past fiscal year.

Project/Proposal	NC Funds Used	Federal Dollars Leveraged
Novel Catalyst Process Technology for Utilization of CO2 for Ethylene Oxide and Propylene Oxide Synthesis	$117,289	$469,156
Anti-Biofouling Surface Treatments for Improved Condenser Performance in Coal-Based Power Plants	$58,564	$235,947
Low-Cost Rare Earth Element (REE) Recovery from Acid Mine Drainage Sludge	$22,079	$88,316
Emission Mitigation Technology for Advanced Water-Lean Solvent-Based Carbon Dioxide Capture Processes	$168,479	$619,251
Process Development for Advanced Biofuels and Biopower	$78,939	$229,210
Development of Carbon Capture Substances and Systems	$354,650[1]	$1,414,522

Totals Allocated	**$800,000**	**$3,056,402**
[1] Project included utilization of over $300,000 in Federal funds to add new process units for RTI's pilot plant.		

Leveraging of Federal Investment through State Funding for State FY 2019-2020

Specific projects benefiting from State of NC funds in FY 2019-2020 and the goals of and accomplishments within those projects are highlighted below:

1. **Novel Catalyst Process Technology for Utilization of CO2 for Ethylene Oxide and Propylene Oxide Synthesis.** RTI used $117,289 of FY2019-2020 state funding to secure $469,156 of U.S. DOE funding to focus on development of a catalyst that converts carbon dioxide, a ubiquitous greenhouse gas, into valuable chemicals including ethylene oxide and propylene oxide. During this research RTI discovered a catalyst that converts carbon dioxide into acrylic acid. This discovery is being used by RTI to propose new projects to Federal and Industrial clients.

2. **Anti-Biofouling Surface Treatments for Improved Condenser Performance in Coal-Based Power Plants.** RTI used $58,564 of FY2019-2020 state funding to secure $235,947 in U.S. DOE funding to focus on development of new surface treatments that resist biofouling. In coal-based power generation facilities, condenser performance is a critical area for improving the economic efficiency, since more than 50% of generated heat is lost during condenser operation. RTI is designing and engineering novel surface treatments and secondarily applied remediation components to mitigate biofilm growth on condenser tube surfaces and reduce electricity loss in coal-fueled power plants.

3. **Low-Cost Rare Earth Element (REE) Recovery from Acid Mine Drainage Sludge.** RTI used $22,079 in FY2019-2020 state funding to secure $88,316 of U.S. DOE funding to focus developing a solid sorbent and an economic framework to determine the cost/benefit price points for targeted critical element (Rare-Earth Element) recovery from acid mine drainage sludge.

4. **Emission Mitigation Technology for Advanced Water-Lean Solvent-Based Carbon Dioxide Capture Processes.** RTI used $168,479 of FY 2019-2020 state funding to secure $619,251 of U.S. DOE funding to support work to advance technologies to mitigate the impacts of carbon dioxide emitted from fossil-fuel burning power generation facilities. A CO_2 scrubbing process with low emissions is being developed, optimized and demonstrated at RTI headquarters in RTP, NC.

5. **Process Development for Advanced Biofuels and Biopower.** RTI used $78,939 of FY2019-2020 state funding to secure $229,210 of U.S. DOE funding to support development and validation technical data, performance metrics, and targets for optimization of physical and chemical characteristics of biomass feedstock, in a commercially viable manner, to maximize bio-crude yields in catalytic biomass pyrolysis.

6. **Development of Carbon Capture Substances and Systems.** RTI used $354,650 of FY2019-2020 state funding to secure $1,414,522 of U.S. DOE funding to support development of the next generation of non-aqueous solvent for capture of carbon dioxide in combustion gas streams. This project involves a unique collaboration between the Pacific Northwest National Laboratory (PNNL) and RTI where experimental technology developed at PNNL is being scaled up for demonstration testing by RTI. This scale-up includes use of DOE funds to build new processing units at RTI's pilot plant.

State Fiscal Year 2019-2020 Itemized Expenditures and Fund Sources

The $800,000 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 2020-2021

For the state fiscal year 2020-2021, 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. **Pilot Plant Scale-Up of Renewable Energy-based Catalytic Ammonia Production.** RTI's development of a new catalyst for synthesis of renewable ammonia will be demonstration in a new pilot plant facility designed and constructed with DOE funds. The facility will include multiple new technologies beyond RTI's catalyst and RTI will be the lead organization for the entire project that will receive $10M in DOE funds along with approximately $4M in industrial client cost-share funds.

2. **Small Scale Modular Co-Gasification of Plastics / Biomass / Coal.** RTI will use newly developed gasification technology to demonstrate technology capable of gasifying mixtures of plastic, biomass and coal. Improved process technology is needed for mixtures of these materials in order to reduce the carbon footprint of energy production and recover energy from renewable and waste materials.

3. **Integration of CO_2 Scrubbing Technology.** RTI will lead a team of experts conducting engineering designs studies to configure new generation CO2 scrubbing technology for integration into existing power plants. This integration project is a significant and essential step in a broad scale commercialization of CO2 capture technology developed by RTI.

4. **Demonstration of CO_2 Capture Technology.** RTI will support a team of experts conducting a scale-up study of carbon capture technology for the electrical power industry. conduct a techno-economic analysis of an advanced emissions control system to determine the additional cost of CO_2 capture in $/tonne-$CO_2$ to reduce amine emissions to < 1 ppm. In addition, RTI will incorporate into the assessment modeling simulation efforts of the emissions from full-scale CO_2 capture plant.

5. **Naphthenic Bio-Blendstock through Pyrolysis, Hydrotreating and Separation.** RTI will be experimenting with biomass pyrolysis, biocrude hydrotreating, and separation techniques to produce naphthenic bio-blendstock that meets the ASTM D975

specifications. In addition, RTI will be characterizing various recovered biofuel blendstock to determine the chemical composition and the following fuel properties: cetane number, lower heating value, pourpoint, cloudpoint, boiling point curve, and viscosity.

6. **Efficiently Upgrade Bio-crude Intermediate into a Renewable Diesel Blendstock**. The proposed project is to maximize the yield of bio-crude from a catalytic biomass pyrolysis process and effectively and efficiently upgrade the bio-crude intermediate into a renewable diesel blendstock. RTI will focus on improving bio-crude upgrading efficiency by fractionating the liquid intermediate and independently hydroprocessing each fraction to maximize biofuel production. RTI has received notice of award from the DOE regarding this project proposal.

7. **Electrochemical Conversion of Carbon Dioxide to Higher Alcohols.** RTI has discovered an electrochemical catalyst that uniquely producing C3 and C4 alcohols. These alcohols are of higher commercial value than C1 and C2 alcohols and RTI will propose this catalyst for further development with DOE funding.

CONCLUSION

All of the funds received by RTI have been used for the purposes for which they were granted. Financial data for all funded projects have been provided for FY 2019-2020. The line item budget for the FY 2019-2020 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 Ed Monachino, Senior Business Development Specialist, Technology Advancement & Commercialization, RTI International, emonachino@rti.org or 919-541-6083.

Please direct all questions regarding contractual matters to Brian Donovan, Senior Contracting Officer, RTI International, bdonovan@rti.org or 919-316-3424.

APPENDIX A: STATE OF NORTH CAROLINA COST SHARE FUNDING, FY 2019-2020

Summary

State of NC Funding $800,000 - Grant ID 27964

Project/Proposal	Start Date	Total Cost	DOE Award	Cost Share Requirement	Use of NC Funds	Federal Dollars Leveraged
Novel Catalyst Process Technology for Utilization of CO2 for Ethylene Oxide and Propylene Oxide Synthesis	9/2018	$1,000,000	$800,000	$200,000	**$117,289**	$469,156
Anti-Biofouling Surface Treatments for Improved Condenser Performance in Coal-Based Power Plants	10/2018	$697,444	$557,955	$139,489	**$58,564**	$235,947
Low-Cost Rare Earth Element (REE) Recovery from Acid Mine Drainage Sludge	11/2018	$422,079	$400,000	$22,079	**$22,078**	$88,316
Emission Mitigation Technology for Advanced Water-Lean	7/2018	$3,625,000	$2,900,000	$725,000	**$168,479**	$619,251
Process Development for Advanced Biofuels and Biopower	10/2018	$2,317,405	$1,853,924	$463,481	**$78,939**	$229,210
Development of Carbon Capture Substances and Systems	4/2019	$2,021,670	$1,617,336	$404,334	**$354,650**	$1,414,522
		TOTAL	**$8,129,215**	**$1,954,383**	**$800,000**	**$3,056,402**
			Unallocated Funding (to return to state):		***$0***	
			DOE-to-State Funds Leverage Ratio:		***3.82***	

Funding Breakout - by Project by Quarter

7/1/19 - 6/30/20 = Actuals	Q1	Q2	Q3	Q4	Total
Novel Catalyst Process Technology for Utilization of CO2 for Ethylene Oxide and Propylene Oxide Synthesis	**7/1/19 - 9/30/19**	**10/1/19 - 12/31/19**	**1/1/20 - 3/31/20**	**4/1/20 - 6/30/20**	
Labor (w/ Fringe)	$39,405	$69,154	$5,488	$33,542	$195,590
Travel, Services, etc.	$0	$0	$0	$462	$462
Equipment, Materials, Subcontractors	$4,096	$1,669	$207	$0	$5,972
Overhead (Indirect) Costs	$53,981	$93,142	$80,684	$47,610	$275,417
Total	**$97,483**	**$163,965**	**$134,379**	**$81,614**	**$477,441**

Labor (fully loaded)	***$92,453***	***$162,251***	***$125,495***	***$78,697***	**$458,895**
Labor (fully loaded) towards State Cost Share Funds	**$0**	**$56,727**	**$60,562**	**$86,501**	**$117,289**

Funding Breakout - by Project by Quarter

7/1/19 - 6/30/20 = Actuals	Q1	Q2	Q3	Q4	Total
Anti-Biofouling Surface Treatments for Improved Condenser Performance in Coal-Based Power Plants	**7/1/19 - 9/30/19**	**10/1/19 - 12/31/19**	**1/1/20 - 3/31/20**	**4/1/20 - 6/30/20**	
Labor (w/ Fringe)	$372	$70,543	$61,957	$46,671	$179,543
Travel, Services, etc.	$0	$79	$1,300	$335	$1,713
Equipment, Materials, Subcontractors	$0	$880	$1,024	$2,731	$4,635
Overhead (Indirect) Costs	$509	$53,854	$90,874	$66,259	$211,496
Total	**$881**	**$125,355**	**$155,154**	**$115,997**	**$397,388**
Labor (fully loaded)	***$873***	***$165,509***	***$145,363***	***$109,501***	**$421,246**
Labor (fully loaded) towards State Cost Share Funds	**$0**	**$15,000**	**$26,000**	**$17,564**	**$58,564**

Funding Breakout - by Project by Quarter

7/1/19 - 6/30/20 = Actuals	Q1	Q2	Q3	Q4	Total
Low-Cost Rare Earth Element (REE) Recovery from Acid Mine Drainage Sludge	**7/1/19 - 9/30/19**	**10/1/19 - 12/31/19**	**1/1/20 - 3/31/20**	**4/1/20 - 6/30/20**	
Labor (w/ Fringe)	$27,969	$10,380	$0	$0	$38,349
Travel, Services, etc.	$9,410	$10,900	$0	$35,053	$55,362
Equipment, Materials, Subcontractors	$3,602	$0	$0	$0	$3,602
Overhead (Indirect) Costs	$41,547	$15,925	$840	$0	$58,312
Total	**$82,527**	**$37,206**	**$840**	**$35,053**	**$155,625**
Labor (fully loaded)	***$63,147***	***$23,437***	***$0***	***$0***	**$86,584**
Labor (fully loaded) towards State Cost Share Funds	**$0**	**$22,079**	**$0**	**$0**	**$22,079**

Funding Breakout - by Project by Quarter

7/1/19 - 6/30/20 = Actuals	Q1	Q2	Q3	Q4	Total
Emission Mitigation Technology for Advanced Water-Lean	**7/1/19 - 9/30/19**	**10/1/19 - 12/31/19**	**1/1/20 - 3/31/20**	**4/1/20 - 6/30/20**	
Labor (w/ Fringe)	$95,871	$84,505	$176,206	$107,672	$464,253
Travel, Services, etc.	$36,063	$48,474	$12,970	$5,884	$103,392
Equipment, Materials, Subcontractors	$37,579	$41,854	$150,430	$28,343	$258,206
Overhead (Indirect) Costs	$143,003	$123,568	$261,652	$154,327	$682,550
Total	**$312,516**	**$298,401**	**$601,258**	**$296,226**	**$1,508,401**
Labor (fully loaded)	***$231,715***	***$204,243***	***$425,882***	***$$260,237***	**$1,122,077**
Labor (fully loaded) towards State Cost Share Funds	**$0**	**$30,037**	**$97,837**	**$40,605**	**$168,478**

Funding Breakout - by Project by Quarter

7/1/19 - 6/30/20 = Actuals	Q1	Q2	Q3	Q4	Total
Process Development for Advanced Biofuels and Biopower	**7/1/19 - 9/30/19**	**10/1/19 - 12/31/19**	**1/1/20 - 3/31/20**	**4/1/20 - 6/30/20**	
Labor (w/ Fringe)	$45,279	$31,914	$8,896	$34,750	$120,839
Travel, Services, etc.	$947	$3,389	$8,380	$4,763	$17,478
Equipment, Materials, Subcontractors	$6,629	$19,306	$6,543	$2,675	$35,153
Overhead (Indirect) Costs	$62,239	$44,091	$16,569	$48,451	$171,350
Total	**$115,093**	**$98,701**	**$40,387**	**$90,639**	**$344,821**
Labor (fully loaded)	***$109,066***	***$76,874***	***$21,428***	***$83,704***	**$291,072**
Labor (fully loaded) towards State Cost Share Funds	**$0**	**$52,626**	**$0**	**$26,313**	**$78,938**

Funding Breakout - by Project by Quarter

7/1/19 - 6/30/20 = Actuals	Q1	Q2	Q3	Q4	Total
Development of Carbon Capture Substances and Systems	**7/1/19 - 9/30/19**	**10/1/19 - 12/31/19**	**1/1/20 - 3/31/20**	**4/1/20 - 6/30/20**	
Labor (w/ Fringe)	$102,723	$104,649	$135,607	$85,653	$428,633
Travel, Services, etc.	$1,318	$2,906	$77	$0	$4,301
Equipment, Materials, Subcontractors	$21,998	$20,828	$91,150	$227,512	$361,488
Overhead (Indirect) Costs	$141,989	$142,020	$204,979	$129,680	$618,668
Total	**$268,029**	**$270,403**	**$431,813**	**$442,845**	**$1,413,089**
Labor (fully loaded)	***$248,277***	***$252,932***	***$327,755***	***$207,020***	**$1,035,984**
Labor (fully loaded) towards State Cost Share Funds	**$0**	**$85,001**	**$231,541**	**$38,108**	**$354,650**