

## APPLICATION CHECKLIST

Use this checklist as a tool to ensure that you have all of the components of the application package. Please note, this checklist is for your use only and does not need to be included in the package.

X	Application
X	Transmittal Letter
X	Tax Liability Statement
X	Letters of Support (If Applicable)
X	Confidentiality Request
X	Business Plan (Appendix)
X	Historical Financial Statements (3 years) (Appendix)
X	Budgeted Projections (Appendix)
<input type="checkbox"/>	Loan/Loan Guarantee Application (if Applicable, Appendix)
<input type="checkbox"/>	Other Appendices (If Applicable)

When the package is completed, send an electronic version to [sustainableenergy@nd.gov](mailto:sustainableenergy@nd.gov) and 2 hard copies by mail to:

Clean Sustainable Energy Authority  
North Dakota Industrial Commission  
State Capitol – 14<sup>th</sup> Floor  
600 East Boulevard Ave Dept 405  
Bismarck, ND 58505-0840

For more information on the application process please visit:  
<http://www.nd.gov/ndic/csea-infopage.htm>

Questions can be addressed to Al Anderson (701) 595-9668.

Clean Sustainable Energy Authority  

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North Dakota Industrial Commission

## Application

**Project Title:** Project Phoenix: Manufacturing bio-degradable polymers using methane as feedstock.

**Applicant:** Newlight Technologies, Inc.

**Date of Application:** July 1, 2022

**Amount of Request**

**Grant:** \$4,185,625 USD

**Loan:** \$0 USD

**Total Amount of Proposed Project:** \$8,371,250 USD

**Duration of Project:** 9 months from CSEA Approval

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## ABSTRACT

### **Background:**

Founded in 2003, Newlight is a nature-inspired biotechnology company based in California that is converting air and greenhouse gas into a biomaterial called AirCarbon®. Newlight's mission is to help end plastic pollution and climate change by replacing plastic with AirCarbon, creating global-scale economic and environmental value. Newlight uses a technology that is found in ecosystems throughout the world, including in the ocean, wherein naturally-occurring microorganisms consume air and greenhouse gas, including methane and carbon dioxide, through fermentation to produce a muscle-like material inside of their cells called PHB. PHB is an energy storage material made in most living organisms, from marine microorganisms to the roots of plants, and can be melted into shapes as a replacement for plastic. Newlight is the first company to directly transform greenhouse gases into PHB, a biomaterial that the company calls AirCarbon, at commercial scale.

AirCarbon competes on performance with various grades of polypropylene, the second largest-volume plastic in the world. With a variety of potential industries to serve, Newlight's primary focus is on addressing ocean plastic pollution by displacing plastic in the foodware market, starting with straws, cutlery, and coated paper products. In addition to foodware, Newlight is also seeding expansion in automotive and fashion applications. Newlight launched its first commercial-scale AirCarbon production facility in 2020, and today Newlight's customers and partners include Shake Shack, Nike, Target, H&M, Ben & Jerry's, Sumitomo, US Foods, and Sysco, with millions of AirCarbon units delivered to consumers to date.

In this application, we are requesting financial support in the form of a \$4.185 million grant to support a \$8.371 million project that includes engineering and design efforts related to a future plant, including a potential future North Dakota plant. The project team will also work to mitigate certain risks associated with the quality, economics, and infrastructure needed for the product inputs (primarily methane, power, and water) at plant scale, which is needed before board approval to acquire land and build. These are both important next steps in ultimately justifying full development commitment for a large-scale AirCarbon manufacturing site in the state.

### **Objectives:**

Newlight, in partnership with Incho Consulting Group, co-funded and executed a feasibility /location study that was partially funded by the Renewable Energy Program/Industrial Council in 2021. This study, concluded earlier this year as Phase 1 of the overall project, showed that there is reason to believe that developing a large-scale industrial plant to produce AirCarbon in the state, while challenging, is very feasible, and several sites were considered. While Newlight has signed a contract to build a plant in Ohio, Newlight is still very interested in developing a facility at the Marley Crossing/Savage Services location near Trenton (like many of the projects under CSEA consideration).

However large the potential, currently Marley Crossing is generally undeveloped land, and to support an AirCarbon plant, gas, water, and power infrastructure and related suppliers need to be in place and fully

vetted. Mitigating the risks associated with the infrastructure build-out and the input costs associated with the site still need work to meet shareholder targets. In addition, the climate of North Dakota will result in some special requirements related to climate and transporting equipment into the area. Solving these cost inputs, engineering and infrastructure issues is the primary objective of Phase 2 in this request.

The objectives are:

- Fund engineering and design work for constructing and operating a plant in northwest North Dakota including engineering to the North Dakota's specific climate and associated construction window as well as additional engineering to support future carbon sequestration opportunities.
- Fund further work that supports the build-out of needed infrastructure at Marley Crossing, by working with suppliers (and the other project developers at Marley Crossing) to obtain the optimal infrastructure and input economics to pass through the final "gate" and began plant construction.
- Work with the State and Williams County to find solutions or mitigation strategies for any open challenges and/or risks that once mitigated can help to add Newlight to the state's portfolio of leading-edge technologies companies that will contribute to realizing the state's Carbon Neutral 2030 goal, CSEA's goals and benefit ND overall.

**Expected Results:**

- Complete the engineering and plant design through several milestone gates, including any special requirement needed in North Dakota.
- Finalize the economic and infrastructure development to allow Newlight management to comfortably commit a much larger investment (\$250-400M) in building, ramping up, and operating the plant.

**Duration:**

We expect the project will take approximately 9 months to complete.

**Total Costs:**

We anticipate total project costs to be \$8.371 million.

**Participants:**

The participants include Newlight, Incho Consulting Group, and Black & Veatch for engineering. There may be a need for specialized services, and all efforts will be made to involve North Dakota providers if possible.

## PROJECT DESCRIPTION

### Objectives:

The long-term objective of the project is to increase the demand for State's renewable energy and plentiful methane gas through in-state production of a natural, biodegradable material that is a viable alternative to single-use plastic – AirCarbon. North Dakota has established an aggressive carbon neutral goal by 2030, and a key component of that will be finding environmentally sound, local uses for natural gas that does not rely on pipeline delivery out of state. We believe that AirCarbon production become a major component of that goal. For us, achievement of the long-term goal requires the execution on a set of near-term project phases. The second phase of the overall project (this funding request) is focused on engineering, design, and the cost of infrastructure build-out as well as leveraging the work that has been done in the State in the carbon sequestration area.

### *Single-Use Plastics and AirCarbon*

Single-use plastics made from petroleum are not bio-degradable. They are the cause of massive environmental problems that are forcing many governments to implement or consider restrictions. However, most experts forecast large increases in plastic demand due to the low-cost to produce and the high costs of making materials that have the same performance characteristics. Some newer materials are compostable. These products only degrade when disposed into hot industrial composts, of which there are limited only few. In contrast, AirCarbon is able to degrade in natural environmental conditions, including in home compost, soil, and other environment. AirCarbon has been certified “Plastic-Free” by Oceanic Global and pass home, soil, and water compostability testing through TUV Austria, one of the world's leading end-of-life certification bodies.

An estimated 17.6 billion pounds of plastic enter the marine environment every year, resulting in government bans and restrictions on using single-use plastics around the globe. While there have been significant efforts to replace single-use plastics with other materials, implementation has been slow due to their cost structure, performance characteristics, or limited degradability.

After 19 years in development, Newlight has developed an innovative technology that overcomes those barriers - a natural, regenerative, carbon-negative material that utilizes air and methane or CO<sub>2</sub> gas (instead of petroleum) as feedstock inputs.

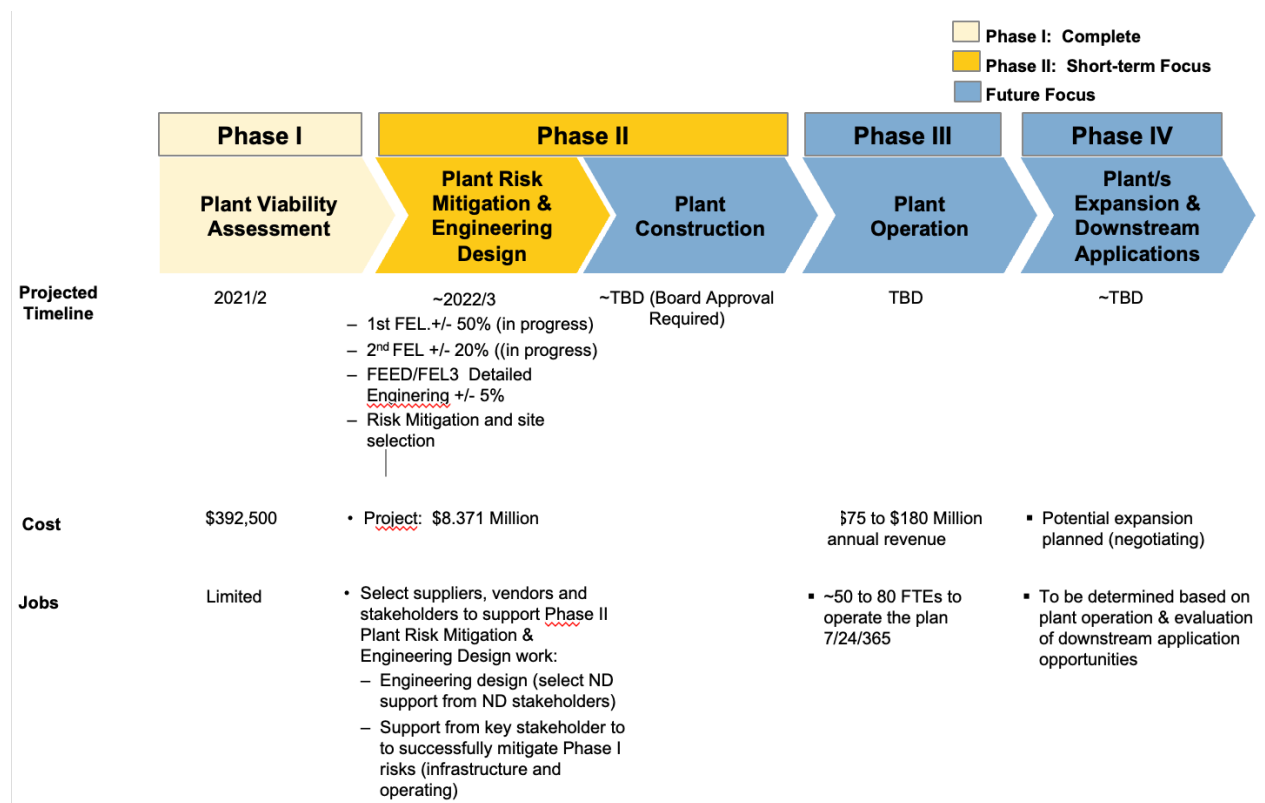
AirCarbon is also known as PHB, and PHB is produced throughout nature, including by ocean-based micro-organisms that consume carbon in the form of methane or CO<sub>2</sub>. AirCarbon is environmentally degradable because microorganisms in the environment recognize it as a natural food source. It melts for forming products (at around 350<sup>oF</sup>) and is durable in hot and cold conditions (also making it SGS-certified dishwasher-safe).



Newlight's California Headquarters & AirCarbon cutlery

**Project Description - High Level Project Approach:**

The objective is to assess the viability of an AirCarbon plant and the approach is designed into four phases (see below). While Newlight has signed an agreement to build its next plant in Ohio, Phase I was focused on understanding the viability of where to locate a future plant in North Dakota. Upon a *successful* outcome of the portion of Phase II covered by this project, and upon approval by Newlight's board, we would execute the second portion of Phase II (Plant Construction).



The progress during and since the completion of Phase I includes the following:

- **Engineering and Design:** The plant design process has been completed for the First Estimate (FEL1 +/-50%) but has not included any specific engineering for the ND climate since the company's next plant is intended to be built in Ohio. Additionally, FEL2 is currently in progress with FEL3 to commence as soon as FEL2 is completed. Newlight has been investing and will continue to invest in this effort through the CSEA evaluation period, showing a commitment to the development sizing up the plant to scale.
- **Site Selection:** The evaluation of site options across western ND was narrowed down to several options centered around the Marley Crossing/Savage Services operations to support transportation logistics. We have not selected a specific site yet. Announcements have caused land prices to escalate and there is still fluidity around how the site would be developed and who the large players will be. At the time of the study, there was limited infrastructure to support further narrowing down selection process to a specific plot. Newlight has signed a contract with a site in Ohio but is still very interested in developing a second site in North Dakota.
- **Equipment & Labor:** Supply chain issues and labor trends are impacting our development plans. Some of the equipment needed for the plant are long lead time, especially the large complex reactor vessels. We are still trying to solve challenges around how to transport this equipment to a NW North Dakota site. An alternative may be to find local firms that could support fabrication locally. We also want to better understand labor needs (construction and operating) and timing in the context of Williston/Trenton area growth and the oil/gas cycle.
- **Infrastructure Requirements, Key Cost Drivers & Implications for Total Input Cost Estimation:** Two key cost drivers with a high degree of sensitivity and risk for AirCarbon production are electricity and gas costs. The estimate of these two drivers out of Phase I were at an FEL1 accuracy due to market variability and greenfield infrastructure options still under development. The companies that are locating and/or plan to locate at Marley Crossing have been meeting monthly to optimize and plan infrastructure investment. We have participated in those strategic infrastructure sharing/sizing meetings which continue to progress and are leading to more informed cost estimates. Understanding and mitigating these challenges will support the capital requirements and plant economics to improve accuracy of modeling plant economics.

We also have interest in the State's carbon sequestration strategy and will be evaluating the options to drive value.

- **State Support:** During the Phase 1 of the project, the North Dakota Commerce Department has been very helpful in listening our requirements. The Marley Crossing site is a greenfield location that does not have established infrastructure to deliver the power, gas and water to our specifications yet. Understanding and participating in the development and availability (e.g.,



reliability and timing) of that infrastructure is an important step to fully committing to the plant. Evaluating the opportunity to develop the plant at that location requires these inputs to effectively to support an informed site economic evaluation and any work plan development.

## Methodology

A milestone-based gated approach to perform projects aligns project objectives with the business needs in order to execute the projects in the most efficient way. The gates methodology is a process of progressive definition of the project. This process is based on a planned and standardized series of reviews (gates) at the end of each phase.

This breakdown in phases or stages, and the normalized control points at each end, is an improvement of the classic approach, where the organizations may have points of control but they are not as standardized as the ones that this technique offers. Gates methodology is also perfectly aligned with the Project Management Institute (PMI®) standards, and which we also employ in our process

Based on the progress made in Phase 1, Phase II will have several goals that we will organize into milestones to review at specific “gates” that include the following:

- **Engineering and Design:** Work with Black & Veatch to update the engineering design to include the option of operating in the ND climate 7/24/365, completing FEL2 to include changes that incorporate the North Dakota operating climate. Identifying key long lead time high risk equipment to prioritize efforts for completing FEL3 will inform the build timeline and economic analysis of the plant to ensure we can meet overall operating and financial goals.

The proposed plant will be a much larger plant than the current plant in Huntington Beach. As such, there is a large engineering effort in place to design that plant. This engineering and design effort is supporting 2 developments. The first, which will be announced shortly, involves a site along the eastern side of Ohio. The second is the proposed plant in Marley Crossing.

The engineering design effort is common to the Ohio and Marley Crossing developments, and we propose to here to share those engineering cost across both plant locations. As such, it is our proposal to allocate that 50% of the engineering costs to each specific location (e.g., Ohio & ND) and we are asking for the grant to fund 50% of portion that is allocated to North Dakota. As such, the grant would support 25% of the total plant design (50% of the total plant cost scoped to Marley crossing and 50% cost share between CSEA and Newlight).

We anticipate that completing Phase II will provide us with the engineering plans and detailed infrastructure insights and other needed information to allow us to make a well-informed decision regarding the plant operations to meet targeted economics. Additionally, we plan to further focus on refining the key value drivers (e.g., cost inputs) and mitigate any key risks identified in Phase 1 as well as address/mitigate any risk we identify during the Phase II work. Phase II work will include:

Although the completion of the Ohio plant may come prior to the completion of similar work in North Dakota, we wanted our proposed methodology to be visible to the CSEA committee and fair to all stakeholders. This methodology drives a common base plant design (exception is the cold weather design components specific to North Dakota), thus sharing the engineering design costs across the two plants. Sharing the costs allows us to request only half of the half total design costs, which is less than if we were choosing to only do one location and lowers our CSEA grant request – a win/win for all stakeholders.

- **Site Selection:** The management team visited the Trenton area and noted the attractiveness of a few specific sites in the Marley Crossing area that could meet requirements with the proposed infrastructure build out. These site options continue to change regarding availability, attractiveness and cost as more insight into the infrastructure build surfaces. In Phase II we plan to narrow down and focus on the optimal site.
- **Equipment and Labor Needs:** Identifying and mitigating key supply chain and/or labor risks by identifying potential North Dakota solutions will be a key step in Phase II. In Phase I the team was informed that advanced fabricator capabilities exist in ND. In Phase II we plan to explore and test those capabilities to identify key local partners that can the transportation issues. Additionally, we will be assessing labor requirements to better understand plant staffing implications in association with Trenton/Williston growth forecasts and the impact on both plant construction and operating timelines.
- **Infrastructure Requirements & Implications for Total Input Cost Estimation:** In Phase II we plan to focus on the key cost drivers (e.g., electricity, gas, water & carbon sequestration) and the supporting infrastructure costs to better refine Phase I ranges. This includes working with and supporting the Trenton Infrastructure group to design win/win solutions for all stakeholders (e.g., companies locating at Trenton, County & State organizations).

An important example of this is power. Finding and/or developing a reliable, renewable power source that also meets economic targets is a critical success factor.

- **State Support:** As we continue with FEL2, further input cost refinement including infrastructure and risk identification/mitigation will enable Newlight to perform a more informed economic analysis. This can lead to more productive discussions with other stakeholders including the County and State to identify key areas that can be turned into win/win solutions for all stakeholders. During Phase II, the plan is to continue to work with the ND Commerce Department to support adding Newlight to the State’s portfolio of new vibrant, leading edge technologies companies locating in ND with a supporting solid high level construction plan based on the findings above.

## Anticipated Results:

We anticipate that completing Phase II will provide us with the engineering plans and detailed infrastructure insights and other needed information to allow us to make a well-informed decision regarding the plant operations to meet targeted economics. Additionally, we plan to further focus on refining the key value drivers (e.g., cost inputs) and mitigate any key risks identified in Phase 1 as well as address/mitigate any risk we identify during the Phase II work. Phase II work will include:

- **Engineering and Design:** We will complete a series of gated activities to complete full plant design through FEED. This plant design will support both/either a plant in Ohio and/or North Dakota and will include climate-specific components associated with North Dakota.
- **Site Selection:** Work with the county and state on a land acquisition strategy that will select the optimum site at Marely Crossing.
- **Equipment and Labor:** We need to develop plans to address high-risk equipment and labor needs. One solution may include local partners with specialized skills that will allow us to address and/or mitigate key supply chain risks and/or hiring strategies to optimize the plant construction timeline and operations (e.g., UND/NDSU student career interest). We will be working to understand the local supplier options and skills to support our needs.
- **Infrastructure Requirements & Implications for Total Input Cost Estimation:** The key to Phase II will be to better refine and model plant operations, infrastructure needs and the resulting impact on the plant economics. Additionally, we plan to size and prioritize key risks (Phase I and II) and develop and test any risk mitigation strategies that will allow us to make a positive and informed decision to move to the Construction Phase.

This will require more informed assessment of key operating inputs including assessing the reliability/availability timing, input quality (e.g., methane gas target of 90%) and cost (commodity and infrastructure) for the key operating inputs (e.g., electricity, gas and water including potable, cooling, and waste management). We anticipate and plan to support the Trenton Infrastructure group to design win/win infrastructure solutions for all stakeholders (e.g., companies locating at Trenton, County & State organizations). Finally, we anticipate identifying potential partners and strategies to support the State's carbon sequestration goals to further optimize our economics and ESG goals.

- **State & County Support:** During Phase II, the plan is to continue to work with the ND Commerce Department to better articulate any needs that the State/County can better evaluate and consider supporting.

With the completion of this work scope, we hope that the State can add Newlight and AirCarbon production to the State's portfolio of new vibrant, leading-edge technologies and companies that are selecting locating in ND and contributing to its Carbon Neutral goal. The output of the above work will produce a high-level work plan that considers, integrates and optimizes realization of Newlight's and the State's (e.g., infrastructure support) goals. Additionally, the methodology will also incorporate any risks identified and ensure at key gates these risks are supported with solid mitigation plans that meet our economic targets and timing to enable to pass on to the next gate and hopefully into the construction phase.

**Facilities:**

No specific facilities are anticipated to be required for this project although our project manager, consultant and construction engineers will be active in ND with this work and are evaluating office support options to support the effort.

**Resources:**

We will employ a number of resources but to a large part the following partners will be the focus:

- Newlight subject matter experts
- Black & Veatch Engineering
- Incho Consulting Group
- Trenton Infrastructure partners (including ND State and the County)
- EERC (carbon sequestration expertise)
- Key ND equipment fabricators

Other consultants or services to be used include electricity pricing experts and legal advisors for purchasing and sales agreements and we will try to utilize ND experts where possible. Environmental consultants may also be required to assist during reviews with the North Dakota Department of Environmental Quality. State organizations will be reached out to support permitting requirements and we will continue to work with the Commerce Department to best position the plant for success.

**Techniques to Be Used, Their Availability and Capability:**

We plan to utilize a number of techniques to complete the work effort. This includes detailed supply chain and financial modeling using sensitivity analysis focusing on key inputs/outputs and associated financial, reliability and quality requirements to ensure we meet shareholder targets. Additionally, from the first phase we identified a few select risks that will require focused stakeholder brainstorming/problem solving efforts to develop solid risk mitigation plans to optimize/mitigate these key risks. These combined with the following:

- Engineering and design expertise

- Work plan development
- Shared service design and costing skills
- Interviewing and negotiation skills (land key inputs)

We believe have these techniques addressed with internal and/or our service partners and believe in the capabilities we have assemble will adequately support our effort. If we recognize the need for additionally capability the project team will make every effort to include local contractors, legal support and technical consultants prior to looking outside ND.

#### **Environmental and Economic Impacts while Project is Underway:**

No environmental impacts are expected during Phase II.

#### **Ultimate Technological and Economic Impacts:**

While Phase II of the project is to support engineering, design, and infrastructure requirements of building an AirCarbon plant near gas facilities in North Dakota, the ultimate goal of the project is to create an entirely new industry based on a new way to utilize gas and energy. That new industry: AirCarbon products.

AirCarbon is expected to be able to compete favorably with traditional oil-based plastic as well as with other alternative polymers both in functionality and price with the “right” input cost structure. This assumes that we can produce AirCarbon with inputs sourced at the “right” cost, quality and reliability requirements that will allow us to successfully compete in the marketplace. If we produce AirCarbon at a competitive levels, than we can expect continued economic impact growth from the planned plant as well as any potential expansion efforts based on market needs.

This effort will also create secondary benefits for North Dakota-based suppliers of gas, renewable wind energy, transportation, and other employers. And most importantly, it will create continued demand for the state’s plentiful carbon resources that can’t rely on interstate pipelines for delivery and instead use the gas in North Dakota to support the growth of its own value-added industrial base.

The infrastructure build-out will ultimately also support the entire Marley Crossing development, the companies that supply the inputs, and the region in general. The area will see development and employment from the plant, the construction, and the ancillary businesses surrounding the development through cost sharing and infrastructure development that may offset the ups/down economic cycles associated with the current carbon industry.

Once Phase II is successfully completed, we envision a plant that will employ 70-100 people directly, with many more involved in construction and providing inputs. This will also spur secondary developments in the Williston/Trenton region, and the project has support from other development partners and the county economic development office.

### **Why the Project is Needed:**

North Dakota's Bakken region was blessed with plentiful oil and gas. Over time, the oil/gas ratio (OGR) has increased, and the North Dakota Pipeline Authority predicts that ratio to continue. They also predict that output may exceed pipeline capacity in the near future. It will be critical to the state and the energy sector to find "local" productive use for that amount of gas, and an industry that uses gas without reliance on limited and intra/interstate pipeline capacity is of great interest. Introducing AirCarbon production locally in the Bakken where that excess gas can be used to make an environmentally friendly, carbon-negative, ocean-safe plastic alternative is one logical solution.

This also support the Governor's 2030 Carbon Neutral target. Newlight will essentially sequester carbon in the product during its useful life. It is our intent to find a way to harness renewable power, and to sequester any carbon dioxide that is produced during AirCarbon production. Also, it provides a very tangible product that people of all persuasions can touch and feel and understand the story of how forks, knives, and straws are helping an energy-producing state become carbon-neutral. AirCarbon made from North Dakota methane will represent a product that is biodegradable in nature and will not accumulate in the oceans.

Last but not least, our intent is for this to be a first plant and we intend to expand as the market for AirCarbon grows. For the plant under consideration in this application, that would provide 70-100 environmentally attractive jobs that provides North Dakotan's the opportunity to work for a leading technology company in a growing industry. As the company grows, so will the economic and social benefits to the state.

### **STANDARDS OF SUCCESS**

The project will support the design and operations of an economically viable plant that meets Newlight's success criteria. Those criteria include:

- Achieving a design that will meet economic performance thresholds.
- Engineering to meet specific North Dakota challenges.
- Confidence that if plant construction commences, the economics and infrastructure and delivery mechanisms (pipeline, waterline/s, or powerlines) are in place to meet the construction timelines with adequate lead times to alleviate any potential construction/operating delays.

If successful, Newlight will move to finance and build North Dakota's first AirCarbon plant. Developing an AirCarbon industrial base in North Dakota can support the state's energy sector by increasing demand for renewable energy, providing a new market for gas feedstocks (which supports further build out of gas gathering assets leading to a reduction in flaring) while promoting the state of North Dakota as a leader in innovative environmental stewardship.

In order to move the project into Phase III, Newlight needs to complete the engineering and design work of the plant. Further, finding ways to mitigate risks associated with a greenfield development. The work is designed to support a go/no-go decision upon completion of Phase II. Upon a “go” decision, Newlight will transition into the construction phase that includes:

- A significant number of indirect design, supply and construction jobs in North Dakota;
- A plant that will, when operational, will create 70-100 environmentally-friendly jobs over the next five years.
- Increase in supplier revenues and jobs to support plant inputs, especially renewable energy, water, and gas/CO2 feedstock and transportation costs.
- Identification and mitigation of key risks (e.g., given the post-virus world and recent oil/gas and fracking market volatility, do the input resources and capital exist to fund the plant?).

#### **BACKGROUND/QUALIFICATIONS:**

##### **Newlight Technology, Incho Consulting Group, and Black & Veatch**

Founded in 2003, Newlight is a nature-inspired biotechnology company based in California that is converting air and greenhouse gas into a biomaterial called AirCarbon®. Newlight uses a technology that is found in ecosystems throughout the world, including in the ocean, wherein naturally-occurring microorganisms consume air and greenhouse gas, including methane and carbon dioxide, through fermentation to produce a muscle-like material inside of their cells called PHB. PHB is an energy storage material made in most living organisms, from marine microorganisms to the roots of plants, and can be melted into shapes as a replacement for plastic. Newlight is the first company to directly transform greenhouse gases into PHB, a biomaterial that the company calls AirCarbon, at commercial scale. AirCarbon competes on performance with various grades of polypropylene, the second largest-volume plastic in the world. With a variety of potential industries to serve, Newlight’s primary focus is on addressing ocean plastic pollution by displacing plastic in the foodware market, starting with straws, cutlery, and coated paper products. In addition to foodware, Newlight is also seeding expansion in automotive and fashion applications. Newlight launched its first commercial-scale AirCarbon production facility in 2020, and today Newlight’s customers and partners include Shake Shack, Nike, Target, H&M, Ben & Jerry’s, Sumitomo, US Foods, and Sysco, with millions of AirCarbon units delivered to consumers to date.

Consultants from Incho Consulting Group (which conducted most of the feasibility and location study work) will continue in Phase II working in concert with key managers at Newlight. Incho is an energy-

focused management advisory firm that has worked business leaders of some of the world's best-known firms. Founded in 2009, Incoho is experienced in driving strategic projects spanning large performance improvement, restructuring, digitization, and strategic IT planning, and process optimization for leading energy companies intent on building new business models. Incoho also incubates nascent energy-related technology start-ups.

Collectively, Incoho has over 50 years of industry experience in consulting in oil and gas (upstream, mid and downstream), chemicals, energy generation, and transmission and distribution value chain. Incoho has provided strategic management consulting services to some of the largest and most well-known companies in the world and also has deep experience in performing large-scale projects (e.g., capital investment, post-merger integration and large scale performance improvement projects), supply chain development, and financial and operational analysis and modeling. Newlight will provide Incoho with strategic guidance during the project. This project will leverage Incoho's strong research, analysis, and financial/operational modeling skills. Outside expertise will be utilized as required.

Founded in 1915, Black & Veatch is a global engineering, procurement, and construction firm headquartered in Overland Park, KS specializing in infrastructure development in power, oil and gas, water, telecommunications, government, mining, data centers, smart cities and banking and finance markets. B&V's mission: Building a world of difference through innovation in sustainable infrastructure.

With over 100 offices worldwide projects executed in more than 100 countries on six continents, Black & Veatch is currently ranked 13th in ENR's Top 500 Design Firms and is ranked by Forbes as the 123rd largest private company in the U.S.

### ***Mark Herrema, CEO***



Mark Herrema is the co-founder and CEO of Newlight Technologies. In 2003, Mark co-founded Newlight with Kenton Kimmel with a vision of using greenhouse gas as a resource to make high-performance sustainable materials. Newlight has been honored to receive industry recognition as “Biomaterial of the Year” by the Nova Institute, “Innovation of the Year” by Popular Science, and “Technology Pioneer” by the World Economic Forum. In 2016, Newlight was awarded the Presidential Green Chemistry Challenge Award by the U.S. Environmental Protection Agency. Mark graduated magna cum laude from Princeton University, and has since garnered 19 years of experience in process engineering, polymer functionalization, and strategic business development.



### ***Kenton Kimmel, CTO***



As CTO and co-founder of Newlight, Kenton has over 19 years of industrial experience in chemical, process, electrical, mechanical, and automation engineering. Kenton has been instrumental in the design, scale-up, and optimization of the company's biomaterial manufacturing technology, including the engineering, construction, commissioning, and optimization of the company's production lines. Prior to his work at Newlight, Kenton held a position in the In Vitro Microbiology Group at Allergan Pharmaceuticals where he conducted research on genetic markers and gene expression of potent neurotoxins for use in cosmetic surgery. Kenton graduated from Northwestern University with a Biomedical Engineering B.S.E degree, double specializing in Biomaterials & Biotechnology and Transport Processes & Tissue Engineering.

### ***Evan Creelman, Chief Business Development Officer***



Evan Creelman joined Newlight in 2006 and has been prominent in the creation of Newlight's extensive network of development and commercial partners. Evan now leads the company's business development efforts, and prior to joining Newlight, Evan worked with Mercer Management Consulting in the Airline, Retail, and Private Equity industries. Evan graduated cum laude from Northwestern University with a degree in Applied Mathematics & Economics, holds a master's in accounting from the University of California - Irvine, and is a Chartered Financial Analysis® (CFA).

### ***Jeff Elliott, President and Principal, Incoho Consulting Group***



Jeff Elliott is the President of Incoho, and the principal of Incoho Consulting Group and his team will support Newlight's project management group. He is also an early venture investor and advisor to Newlight Technology.

Jeff has over 30 years of experience specializing in leading complex initiatives across the U.S. and internationally, with a focus on the oil and gas, as well as electric, gas and water utilities, and other heavy asset industries.

He is a graduate of the University of North Dakota with an M.B.A. from the University of Michigan. Prior to founding Incoho, he led the Chicago office of Oliver Wyman, one of the world's preeminent consulting firms.

## **MANAGEMENT**

Our partners, Black & Veatch for engineering and Incoho Consulting for risk mitigation are recognized experts in their fields. Newlight has experience working with both firms and is confident in both firms management techniques.

Black & Veatch has an excellent reputation for delivering dependable outcomes based on quality engineering and a proven ability to deliver complex, technical solutions on-time and to budget. They are known for deploying first-of-a-kind technologies, pioneering new advances in water recycling, desalination, renewable energy, hydrogen power generation, floating LNG vessels, electric vehicles, 5G telecommunications and much more. The engineering focus is on improving constructability, safety by design and the resilience and durability of systems, and acceleration of schedules through project milestones like zoning and permitting deadlines.

Incoho is recognized for using primary and secondary research, analysis, and operational and financial modeling, and negotiating. Operational and financial modeling will help demonstrate projected outcomes for an identified set of inputs as well as optimizing plant location, product transportation to market and market pricing vs market demand.

The ability to manage a project of this size requires the team to be able to deliver each stage of the project in a structured, stepwise manner. The project shall be progressed in a proven, industry standard stage gated process, consistent with the Construction Industry Institute Best Practices. The approach will continuously develop the further quantification and reduction of risk, with refinement and development of cost and schedule to ensure project certainty.

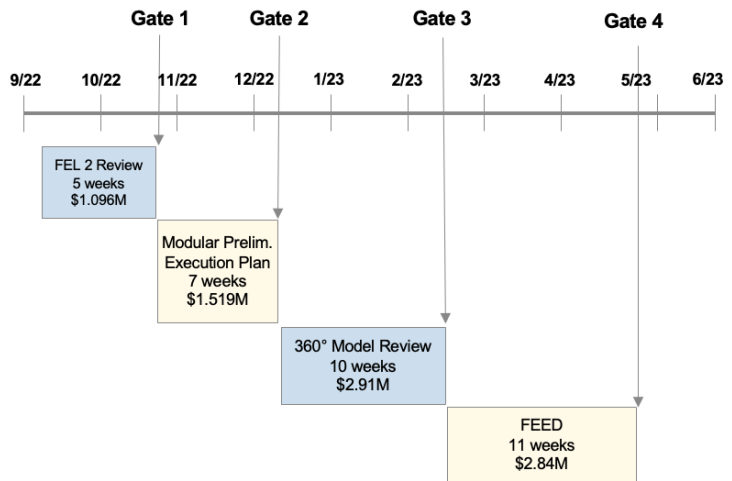
The project team shall combine global best practices, reviewing past lessons learned providing the team with inputs to craft a fit for purpose project execution strategy.

## TIMETABLE

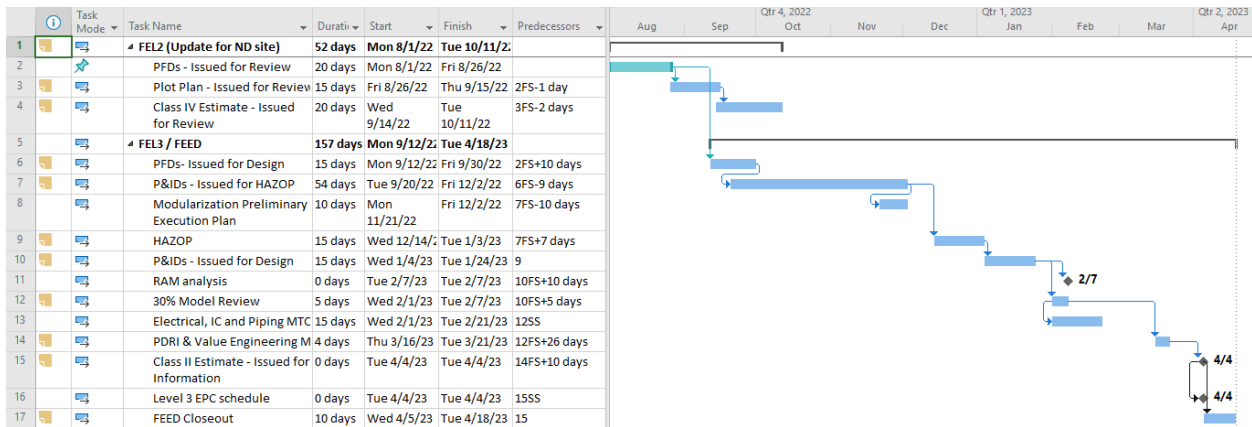
Our proposal aligns the already-begun engineering and design work to build this plant through a set of logical milestones that will align with the project’s reporting and funding through CSEA. Funding will be used to contract our engineering firm, Black & Veatch, and also support our work with Incho to develop the Marley Crossing plan to mitigate risks associated a development at that location.

**Phase II  
Engineering & Design  
and  
Risk Mitigation Efforts**

Number	Milestone Name	Total Project Budget
1	Plant FEL 2 Review	\$1.096M
2	Modular Preliminary Execution Plan	\$1.519M
3	360° Model Review	\$2.91M
4	FEED	\$2.84M
<b>Total Project</b>		<b>\$8.371M</b>



The below Gantt chart shows the detailed engineering milestone plane and timing.



## BUDGET

Please use the table below to provide an **itemized list** of the project’s capital costs; direct operating costs, including salaries; and indirect costs; and an explanation of which of these costs will be supported by the financial assistance and in what amount. The budget should identify all other committed and prospective funding sources and the amount of funding from each source. **Please feel free to add columns and rows as needed.** Higher priority will be given to projects with a high degree of matching private industry investment.

<b>Project Associated Expense</b>	<b>NDIC Grant</b>	<b>NDIC Loan</b>	<b>Applicant’s Share (Cash)</b>	<b>Other Project Sponsor’s Share</b>	<b>Total</b>
FEL2 Review Milestone	\$548,125		\$548,125		\$1,096,250
Modular Preliminary Execution Plan	\$759,375		\$759,375		\$1,518,750
360° Model Review	\$1,456,250		\$1,456,250		\$2,912,500
FEED/FEL3	\$1,421,875		\$1,421,875		\$2,843,750
<b>Total</b>	<b>\$4,185,625</b>		<b>\$4,185,625</b>		<b>\$8,371,250</b>

These estimates are based on experience in estimating and quoting these types of projects from both Black & Veatch and Incho Consulting.

## CONFIDENTIAL INFORMATION

Newlight requests that the historical financials be treated as confidential (see attached confidentiality request).

## PATENTS/RIGHTS TO TECHNICAL DATA

Not applicable.

## **STATE PROGRAMS AND INCENTIVES**

As mentioned, Phase 1 of the project was provided with 50% funding via the Renewable Energy Program. The total project costs was \$392,500, of which the state funded 50% or \$196,250. This Phase was completed in January, 2022, resulting in a positive feasibility with 5 locations presented and evaluated. Of these, the Marley Crossing/Trenton site adjacent to the Savage Services location was the top site. This is the only state program that Newlight has participated in.

## **Appendix – Letters of Support**



Wellspring Hydro  
PO Box 884  
Williston, ND 58802-0884  
701-770-8682

To ND Clean Sustainable Energy Authority,

It is our understanding that NewLight Technologies, Inc. of Huntington Beach, CA is applying for CSEA funding. Wellspring Hydro would like to extend this letter of support for their project on the merits of their technology and the co-beneficial nature of their project to ours and others who are looking to build new petro-chemical facilities in Northwest North Dakota.

We applaud their proposed use of natural gas in Northwest North Dakota and add value to our natural gas here instead of sending it out of the state. The use of that gas here opens the door for additional oil development which is critical for the future of North Dakota. They are also creating products that reduce our dependence on single use plastics which don't break down easily in the environment, their known to the earth products do break down naturally in the environment and are made in a carbon negative way.

They will provide 50-70 new jobs that never existed before which will help us diversify our economy and make us less dependent on the whipsaw effect of the ups and downs of oil prices. They will also likely support our company, Wellspring Hydro, by purchasing products we make at our chlor alkali facility which highlights the importance of having a reliable, stable, and secure supply of commodities such as caustic soda and hydrochloric acid. We urge you to support their project with funding from the Clean Sustainable Energy Authority.

Yours truly,

Steve Kemp  
Founder  
Wellspring Hydro  
[stevek@wellspringhydro.com](mailto:stevek@wellspringhydro.com)  
701-770-8682



Feb 23, 2022

Al Anderson  
Director, Clean Sustainable Energy Authority  
State Capital, 14th Floor  
600 E. Boulevard Avenue Dept 405  
Bismarck, ND 58505-0840

Director Anderson,

Williston Economic Development is delighted to support the New Technologies Plant project as submitted to CSEA.

Diversification has always been a key component of our economic development efforts. A project of this magnitude that is a carbon-negative enterprise, utilizes local feedstock of natural gas and will support 50-70 permanent full-time jobs is a winning formula for the community and the region.

In closing, the potential benefit to our community in both economic growth and quality of life is great. On behalf Williston Economic Development, I urge you to fully support their efforts.

Best Regards,

A handwritten signature in blue ink, appearing to read "Shawn Wenko".

Shawn Wenko  
Executive Director  
Williston Economic Development



PO Box 1047  
3200 West Holly Street  
Sidney, MT 5927  
Phone: (406) 488-1602  
Fax: (406) 488-6524  
www.lyrec.com

2/28/2022

To whom it may concern,

Lower Yellowstone Rural Electric Cooperative (LYREC) has provided electric service to rural America for the past 85 years. The purpose of the cooperative was to provide electrical service to rural America and support the residential farms, commercial businesses, and communities in our service territory, which includes both North Dakota and Montana. One of the guiding principles of a cooperative is to support the communities and members we serve and help them succeed.

In reviewing the information provided by NewLight Technologies, Inc. of Huntington Beach, CA, and after several discussions with their representative, LYREC plans to support the project they are proposing. NewLight Technologies, Inc. has developed an impressive product that is conscious of the environmental impact and will decrease the single use plastics.

LYREC feels the economic impact, both short and long term, makes this a promising business to support. This project will not only effect the membership of LYREC in North Dakota, but also across the state line into Montana.

NewLight Technologies, Inc. will likely bring jobs and economic growth to the area, along with diversity. As an electrical company, we support projects that allow stability in the electric market and promote the use of resources in our region.

We urge the ND Clean Sustainable Energy Authority to support NewLight Technologies, Inc. as they apply for funding.

Sincerely,

Jason A. Brothen  
CEO, Lower Yellowstone Rural Electric Cooperative





P.O. Box 2747  
Fargo, ND 58108

December 10, 2020

North Dakota Industrial Commission  
Renewable Energy Council  
c/o Karlene Fine  
Industrial Commission  
State Capitol 14th Floor  
600 E. Boulevard Ave. Dept. 405  
Bismarck, ND 58505-0840

Dear Ms. Fine,

**RE: Support for EERC proposal by Incoho Advanced Materials to examine the viability of utilizing excess gas feedstock in North Dakota and determine optimal locations and partners for production of bio-degradable PHB.**

Xcel Energy is pleased to support Incoho Advanced Materials' application to the Renewable Energy Council to assess the viability of introducing a new industry to North Dakota that would create additional demand for the state's energy and renewable energy sectors.

Introducing a new technology-based industry that complements the existing energy industry and infrastructure is a long-term goal of the industry and the State and would also generate new energy sector jobs in the state as well as help the State in meeting key stated goals (e.g., flaring reduction). A new industrial base that manufactures materials that can have a positive impact on the environment is also a benefit of this project.

Due to this favorable impact to the state and its energy sector, we support this application.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Mark Nisbet'.

**Mark Nisbet**  
**Xcel Energy**  
North Dakota Principal Manager  
2302 Great Northern Drive, Fargo, ND 58102  
P: 701.241.8607 C: 701.371.5255 F: 701.241.8682  
E: [mark.nisbet@xcelenergy.com](mailto:mark.nisbet@xcelenergy.com)