

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	\$100 Application Fee
X	Tax Liability Statement
X	Letters of Support (If Applicable)
X	Other Appendices (If Applicable)

When the package is completed, send an electronic version to Ms. Karlene Fine at kfine@nd.gov, and 2 hard copies by mail to:

Karlene Fine, Executive Director
North Dakota Industrial Commission
State Capitol – 14th 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/renew/info/submit-grant-app.pdf>

Questions can be addressed to Ms. Fine at 328-3722, or Andrea Holl Pfennig at 328-2687.



Renewable Energy Program

North Dakota Industrial Commission

Application

Project Title: Distributed Nitrogen Fertilizer Plant – Engineering and Development

Applicant: Progressive Nutrient Systems, LLC

Principal Investigator: Dan Olson

Date of Application: August 24, 2012

Amount of Request: \$500,000

Total Amount of Proposed Project: \$1,000,000

Duration of Project: 6 months

Point of Contact (POC): Dan Olson

POC Telephone: (701) 232-2536

POC Email: Dan.Olson@skytrainfunds.com

**POC Address: 501 7TH Street South, Suite 301,
Fargo, ND 58103**

TABLE OF CONTENTS

Please use this table to fill in the correct corresponding page number.

Abstract	4
Project Description	4
Standards of Success	10
Background/Qualifications	11
Management	14
Timetable	14
Budget	14
Confidential Information	15
Patents/Rights to Technical Data	15

ABSTRACT

Overview: The Applicant (Progressive Nutrient Systems, LLC, or PNS) is developing a small-scale, distributed nitrogen fertilizer plant that will be co-located at the Tharaldson Ethanol facility in Casselton, North Dakota. The PNS plant will use renewable inputs and will both lower the carbon footprint of corn-based ethanol and decrease fertilizer price volatility for North Dakota farmers, while ensuring a local supply of a vital agricultural input. The plant will use an innovative combination of proven technology and new, proprietary, small-scale ammonia synthesis and urea manufacturing technology.

Objectives: The project to be funded includes the “Basic Engineering Design Package” (BEDP) for the PNS plant, environmental permitting, property surveying and insurance reviews and certain other pre-construction, development work, including legal and accounting. Upon completion of these development activities, the PNS will be in a position to obtain detailed engineering and final pricing from an EPC contractor, to close the debt and equity financing of the plant and to commence construction.

Expected Results: As described more fully below, a Basic Engineering Design Package (BEDP) will be developed for the PNS plant. The BEDP contains all details and design data required to provide a sound basis for subsequent detailed engineering and construction phases of project execution. Upon receipt of the BEDP, the EPC contractor to be selected by PNS will perform final engineering, obtain final bids and commence construction. A detailed description of the BEDP is attached as **Appendix I**.

Environmental permitting will be addressed by contracting with a firm familiar with the selected ethanol facility site. Issues addressed will be VOC emissions, minimum and maximum source permits and associated limits. Continuously monitored emissions are required for the ammonia synthesis unit.

Property Surveying will also be contracted with a firm familiar with the ethanol facility and necessary insurance reviews will be conducted as part of this study.

Additional necessary pre-construction, development activities will be carried out, including legal work (such as contracting with the EPC and other vendors and utilities), accounting, office expenses and travel.

Duration: 6 months

Total Project Cost: \$1,000,000 (NDIC funding request: \$500,000)

Participants:

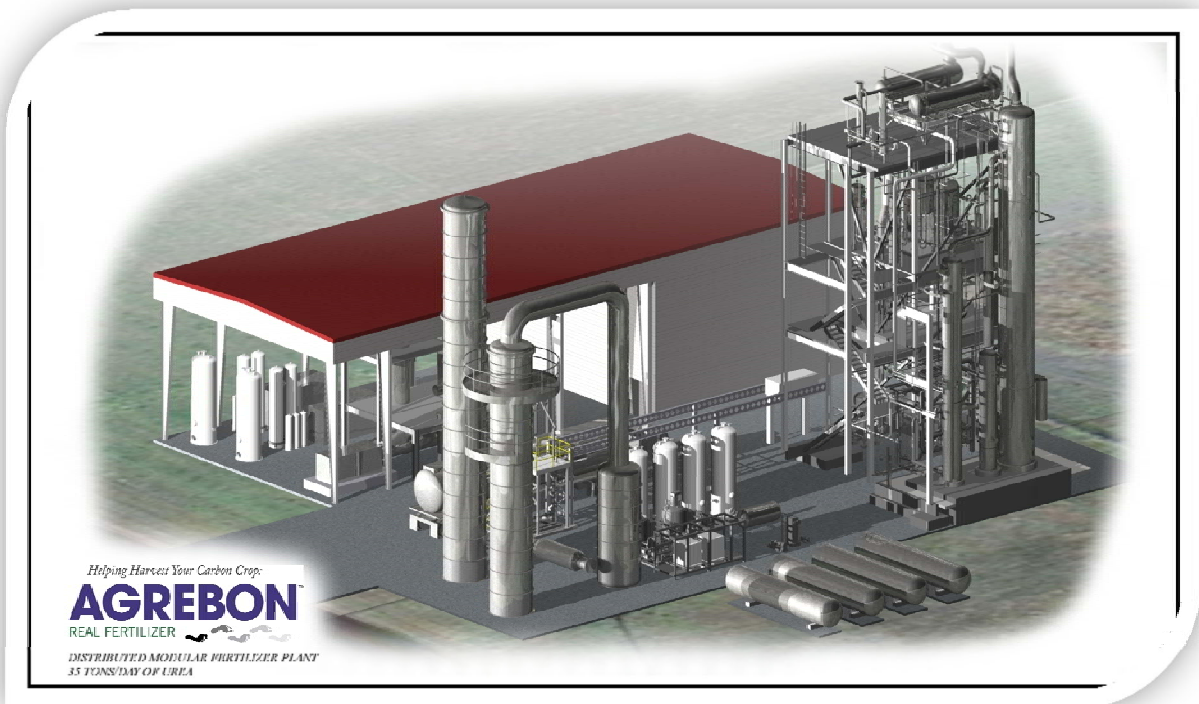
Progressive Nutrient Systems, LLC, a North Dakota company: PNS, headquartered in Fargo, North Dakota, is the Applicant and will own the PNS plant to be constructed at the Tharaldson Ethanol facility. PNS’ equity owners include the Leading Edge Angel Fund, LLC, described below, as well as area corn growers. In addition, minority equity stakes will be held by AGREBON, Inc. and Tharaldson Ethanol. PNS is contracting with AGREBON, Inc. to design, construct and operate the PNS plant.

AGREBON, Inc., a Colorado corporation: AGREBON is headquartered in Louisville, Colorado. AGREBON has received equity funding from the Leading Edge Angel Fund, and its development efforts have also been supported by Pepsico, Inc. AGREBON is contracting with PNS to design, construct and operate the PNS plant.

PROJECT DESCRIPTION

Progressive Nutrient Systems, LLC (PNS) is developing a small-scale, distributed nitrogen fertilizer plant that will be co-located at the Tharaldson Ethanol facility in Casselton, North Dakota. The PNS plant will use renewable inputs and will both lower the carbon footprint of corn-based ethanol and decrease fertilizer price volatility for North Dakota farmers, while ensuring a local supply of a vital agricultural input. The plant will use an innovative combination of proven technology and new, proprietary, small-scale ammonia synthesis and urea manufacturing technology. The project to be funded includes the “Basic Engineering Design Package” (BEDP) for the plant, environmental permitting, property surveying and insurance reviews and certain other pre-construction, development work, including legal and accounting.

A “3-D” drawing of the proposed plant is below:



This commercialization effort results from work started in 2009 by PNS’ strategic partner, AGREBON, Inc. AGREBON received funding from Pepsico, Inc. for a project to lower the carbon footprint of fertilizer for Pepsico’s Tropicana orange juice. After an international technology search it was determined that work conducted by the University of North Dakota’s Energy and Environmental Research Center (EERC) in Grand Forks offered the best opportunity for AGREBON to accomplish its goal, and AGREBON entered into an exclusive license as to certain EERC technology for the small-scale production of nitrogen fertilizer.

AGREBON has since developed additional technology with its engineering partners, Benchmark Design and CEAMAG, and will integrate new systems for small-scale ammonia synthesis and urea manufacturing with off-the-shelf components to achieve a complete solution that encompasses an

anaerobic digester (already in place at Tharaldson Ethanol), biogas clean-up, hydrogen and nitrogen production, ammonia synthesis and urea production.

PNS has entered into a Plant Development Agreement with AGREBON for the development, construction, purchase and operation of the PNS plant.

Upon completion of this project, the Applicant will have all required documentation to begin the final engineering and construction phases of the PNS plant at Tharaldson Ethanol's facility in Casselton, North Dakota. The PNS plant will launch a new industry in North Dakota – the local manufacture of nitrogen fertilizer. The Applicant is in the process of securing debt and equity financing for the PNS plant, and the Leading Edge Angel Fund, LLC, a North Dakota investment fund based in Fargo, has committed 1:1 matching funds for this grant.

The PNS plant will produce 20 short tons per day (stpd) of anhydrous ammonia, which will be further processed into urea (35 stpd) and liquid urea. The Tharaldson Ethanol plant will consume approximately 40% of the PNS plant's output under a long-term off-take agreement with PNS. Local corn growers who are funding PNS will purchase the balance of the PNS plant's output under long-term contracts.

PNS and AGREBON believe that the PNS plant will operate profitably despite its small scale. Using a conservative urea price of \$490 per ton, PNS projects positive cash flow and profits well in excess of \$2 million per year for the plant.

Instead of utilizing natural gas as the feedstock for nitrogen fertilizer this plant will use renewable biogas from the anaerobic digestion of a waste product from the ethanol manufacturing process. This low carbon and renewable biogas will be cleaned up utilizing commercially available technology, and hydrogen will be extracted with an off-the-shelf steam methane reformer. Nitrogen from the atmosphere is concentrated with a commercially available pressure swing absorption unit. AGREBON's new, small-scale ammonia synthesis unit combines the hydrogen and nitrogen in a pressurized reactor to form ammonia, using the Haber-Bosch process. Further processing occurs to recycle unreacted hydrogen and nitrogen. Finally, the ammonia will be further processed into prilled urea, using additional innovative, small-scale technology developed by AGREBON and its engineering partner. AGREBON's urea process does not use formaldehyde or other toxic chemicals.

The PNS plant will greatly assist ethanol plants in meeting the demands of the federal Renewable Fuel Standard 2 (RFS2). RFS2 dictates that new corn-based ethanol production have a 20% lower carbon footprint than existing petroleum-based gasoline. PNS and AGREBON believe that producing low carbon, renewable nitrogen fertilizer will have a material impact on the carbon footprint of ethanol plants such as Tharaldson Ethanol and has the potential to help them to increase production under RFS2. Reduction of the carbon footprint of North Dakota ethanol plants will also assist them in marketing to the West Coast, British Columbia and other areas that may adopt low carbon fuel standards.

After successful deployment of PNS plant and the generation of a production track record PNS and AGREBON will investigate possible enhancements to the system arising out of research previously funded by the NDIC at the EERC. AGREBON has an exclusive, world-wide license within a defined field of use to the EERC patent, "Electrochemical Process for the Preparation of Nitrogen Fertilizers", U.S. Patent No. 8,152,988, issued April 10, 2012.

Expected Results:

The Basic Engineering Design Package (BEDP) will be developed for the PNS plant. The BEDP contains all details and design data required to provide a sound basis for subsequent detailed engineering and construction phases of project execution. General information such as site location, local regulatory agencies, and climatic data as well as specific design data sufficient to support engineering design of the facility will be listed. Specific requirements such as feedstock and product quantity and quality specifications, process and utility battery limits definitions (the division of responsibility between local utility services and the project), and stream factor requirements will be included in the project. Upon receipt of the BEDP, the EPC contractor to be selected by PNS will perform final engineering, obtain final bids and commence construction. This package will be detailed, comprehensive, coordinated and complete in accordance with industry standards. A detailed description of the BEDP is attached as **Appendix I**.

Environmental permitting will be addressed by contracting with a firm familiar with the selected ethanol facility site. Issues addressed will be VOC emissions, minimum and maximum source permits and associated limits. Continuously monitored emissions are required for the ammonia synthesis unit.

Property Surveying will also be contracted with a firm familiar with the ethanol facility and necessary insurance reviews will be conducted as part of this study. All work is designed to facilitate the commercialization of the distributed ammonia/urea synthesis process.

Duration:

6 months

Total Project Cost:

\$1,000,000

Participants:

Progressive Nutrient Systems, LLC, a North Dakota company:

PNS, headquartered in Fargo, North Dakota, is the Applicant and will own the PNS plant to be constructed at the Tharaldson Ethanol facility. PNS' equity owners include the Leading Edge Angel Fund, described below, as well as area corn growers. In addition, minority equity stakes will be held by AGREBON, Inc. and Tharaldson Ethanol. PNS is contracting with AGREBON to design, construct and operate the PNS plant. PNS' management is described below.

AGREBON, Inc., a Colorado corporation:

AGREBON is headquartered in Louisville, Colorado. AGREBON has received equity funding from the Leading Edge Angel Fund, and its development efforts have also been supported by Pepsico, Inc. AGREBON is contracting with PNS to design, construct and operate the PNS plant. AGREBON's management and engineering strategic partners are described below.

Leading Edge Angel Fund, LLC, a North Dakota LLC:

The Leading Edge Angel Fund, based in Fargo, North Dakota, is a newly-formed venture capital investment fund comprised of North Dakota and Minnesota investors that focuses on the agriculture,

energy, food and related sectors in North Dakota. The fund has provided equity funding to AGREBON, Inc. and PNS, including matching funding for the NDIC grant.

Methodology:

See **Appendix I** for a detailed description of the BEDP and methodology. The process is the generally accepted methodology used to create a Basic Engineering and Design Package, environmental reviews, surveys and associated legal and accounting work required to commence construction of the PNS plant. Constant coordination among participants is necessary to assure timelines and benchmarks are achieved according to an agreed upon schedule.

The key engineering tasks are being performed by Benchmark Design and CEAMAG. The phases of this work are detailed in the timeline included below under “**Timetable**”. Each phase corresponds approximately to the percentage completion of the work (e.g., Phase I out of IV represents approximately 25% completion) and an interim report is to be delivered upon completion of each phase. Each report will be reviewed by PNS and any issues will be addressed with the engineering firms.

Anticipated Results:

With this funding the BEDP will be completed and the final engineering and construction phases for the project will begin. The Applicant projects that within 13 months from inception a distributed renewable nitrogen fertilizer plant will be commissioned at Tharaldson Ethanol.

The requested funding will build upon 3 years of development and will result in the launch of a new industry in North Dakota. PNS and AGREBON believe that it is feasible to build up to nine additional distributed nitrogen fertilizer plants in North Dakota. These plants will benefit the ethanol industry by producing highly-valuable co-products and by assisting plants in meeting the RFS2 and low carbon fuel standard requirements.

North Dakota grower-investors will receive the benefit of fertilizer production margins normally reserved for large multi-national corporations and will suffer less price volatility in their key input, nitrogen fertilizer.

The positive economic impact of the PNS plant is summarized below and set forth in **Appendix II** and includes over 100 new direct and indirect jobs.

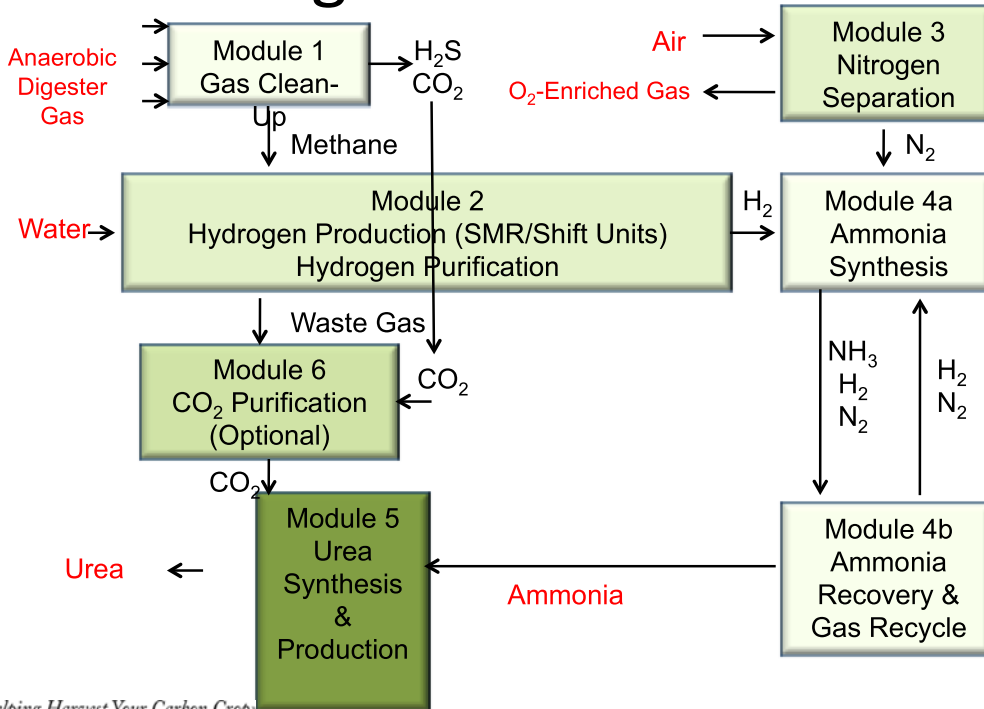
Facilities:

The requested grant will fund engineering and related development costs for the PNS plant and will not fund directly any facilities.

The PNS plant will be located on the site of Tharaldson Ethanol’s corn ethanol plant in Casselton, North Dakota. PNS and Tharaldson Ethanol will execute a ground lease as to an estimated two-acre pad and an equipment lease as to the anaerobic digester already on site.

The following block-flow diagram describes the major components of the PNS plant:

Working Block Flow Diagram



Helping Harvest Your Carbon Crop.



Resources:

- The entire AGREBON staff will support the project.
- Ryan Carter, the plant manager of Tharaldson Ethanol, is making his engineering, maintenance and business support staff available to assist the project.
- Dan Olson of PNS will act as project manager. An owner's representative will be hired by PNS to supervise the construction phase.
- Benchmark Design, LLC of Clearwater Florida is in charge of the BEDP, and CEAMAG of Trappes, France is designing the ammonia synthesis loop.
- The EPC contractor is anticipated to be Brasfield & Gorrie, based in Atlanta, Georgia, the 45th largest general contractor in the United States.

Techniques to Be Used, Their Availability and Capability:

The requested grant will principally fund the BEDP for the AGREBON system that will be installed in the PNS plant. The PNS plant is divided into four (4) areas of operation that are described in **Appendix III**.

Environmental and Economic Impacts while Project is Underway:

The requested grant will fund the BEDP for the PNS plant as well as other development work, including permitting, surveying and insurance reviews and related legal and accounting work. The environmental impact of this development project will accordingly be nominal.

The environmental impact of the follow-on project, the final design and construction of the PNS nitrogen fertilizer plant, is expected to be minimal. According to Benchmark Design, the principal engineering firm for the project, the 35 ton/day urea plant is small enough to fall under the minor source permits for air and water pollution. This standard for a minor source is below 100 tons/year of each air pollutant, except for the hazardous VOC pollutants category which is 25 tons/year. Moreover, the PNS plant has no venting which would be considered hazardous VOC. Note as well that the PNS plant will be constructed at an existing industrial site, the Tharaldson Ethanol plant in Casselton, thereby minimizing additional environmental impacts.

The economic impact of the project to be funded by the requested grant is substantial and is detailed in the North Dakota Department of Commerce Report attached as **Appendix II**. The economic impact while the project is underway is reflected in the 2013 summary results of the report set forth in the table below. In 2013, the Department of Commerce estimates that 101 new jobs will be created and additional Gross State Product and Output will be \$6.8 million and \$14.9 million respectively. It should be noted that most of this additional employment and economic activity will be attributable to the actual construction phase rather than the basic engineering to be funded by the requested grant. However, the BEDP and other development work to be funded by the requested grant are essential building blocks for the commencement of construction of the PNS plant.

Table 1 Summary Results

Category	Units	2013	2014	2015	2016	2017
Total Employment	Individuals (Jobs)	101	28	26	26	25
Direct Manufacturing Employment	Individual (Jobs)	10	10	10	10	10
Indirect and Induced Employment	Individual (Jobs)	91	18	16	16	15
Gross State Product	Millions of Current	6.8	2.3	2.3	2.3	2.4

Category	Units	2013	2014	2015	2016	2017
	Dollars					
Output	Millions of Current Dollars	14.9	7.4	7.6	7.8	8.0
Personal Income	Millions of Current Dollars	4.2	1.5	1.5	1.5	1.5
Population	Individuals	23	21	20	19	19
State Revenues at State Average Rates	Millions of Current Dollars	1.8	.34	.35	.30	.29

Ultimate Technological and Economic Impacts:

Please see the North Dakota Department of Commerce report on the economic impact of the PNS plant attached as **Appendix II** and the summary results reproduced above. After the construction phase in 2013, the report estimates that 25 to 26 new direct and indirect jobs will be created annually. (Note that these estimates are the difference from the baseline and should not be cumulated.) In addition, the additional Gross State Product and Output are estimated to range from \$2.3 million to \$2.4 million and \$7.4 million to \$8.0 million, respectively.

These impacts are substantial for this single plant. Moreover, the PNS plant will prove the technology and economics of distributed nitrogen fertilizer production in North Dakota and pave the way for additional plants with similar impacts. As noted above under **Project Description**, PNS projects that the plant will be highly profitable and cash flow positive, based on conservative projections as to costs and product pricing. As a result, PNS believes that there will be significant demand for additional plants in North Dakota.

The ultimate technological impact of the PNS plant project will be proof of the feasibility of small-scale ammonia and urea production. Currently, only large-scale nitrogen fertilizer plants are being built, typically in the 2000-4000 ton/day range. Accordingly, the small-scale ammonia reactor being designed by CEAMAG and the urea process being designed by Benchmark Design – work that is proposed to be funded by this grant – are novel and will enable the establishment of a localized nitrogen fertilizer manufacturing industry in North Dakota.

WHY THE PROJECT IS NEEDED AND STANDARDS OF SUCCESS

The proposed project will enable the construction of the first distributed nitrogen fertilizer plant in North Dakota. The plant will provide a stable supply of competitively priced fertilizer to area growers and reduce the extreme nitrogen fertilizer price volatility and supply disruptions experienced by North Dakota farmers in recent years.

In addition, the PNS plant and follow-on projects will enhance the financial and environmental sustainability of the North Dakota ethanol industry. Lowering the carbon footprint of North Dakota

ethanol plants will assist them in meeting stringent federal, state and Canadian provincial greenhouse gas standards, resulting in the potential for expanded capacity and new product markets. In addition, these ethanol plants will benefit from the sale of a highly valuable new co-product. The result will be a strengthening of the North Dakota ethanol industry, which, according to the North Dakota Ethanol Council, already contributes more than \$300 million annually to the North Dakota economy, directly employs 250 workers and purchases approximately 60% of North Dakota corn production.

BACKGROUND/QUALIFICATIONS

Please provide a summary of prior work related to the project conducted by the applicant and other participants as well as by other organizations. This should also include summary of the experience and qualifications pertinent to the project of the applicant, principal investigator, and other participants in the project.

Progressive Nutrient Systems, LLC: PNS will contract with AGREBON for the performance of the work to be funded by the requested grant, as well as the construction and operation of the PNS plant. Dan Olson is the chief executive officer of PNS and will be responsible for project management. Dan is also a member of the management team of Leading Edge Angel Fund, LLC, the principal equity owner of PNS and AGREBON. Dan Olson is a North Dakota native, having grown up on a family farm near Fargo, and has been active over the years in the fields of agriculture and finance. He has a Bachelors Degree from North Dakota State University in Agricultural Economics. He served as a North Dakota state representative during the 1981 legislative session. Dan's finance experience has ranged from lage cap stocks and bonds with Merrill Lynch to helping small development companies. He was recently on the Board of Directors of Treaty Energy Corporation, a publicly traded company, in Houston, Texas. He has served on the business development committee of Treaty. He has a keen understanding of how to use different financing vehicles to secure financing for developmental companies. He has been active, as an advisor, in the "waste to energy" municipal bond markets with Cove Partners, in Dallas, Texas.

AGREBON, Inc.: AGREBON received its initial funding from PepsiCo for the development of a low carbon fertilizer for its food supply chain. After extensive research the AGREBON management team contacted EERC and secured an exclusive license for the "Electrochemical Process for the Preparation of Nitrogen Fertilizers". The development of this technology was the result of collaborative investments made by the NDIC and other state and federal agencies with the Energy and Environmental Research Center (EERC). AGREBON has since developed additional technology with its engineering partners, Benchmark Design and CEAMAG, and will integrate new systems for small-scale ammonia synthesis and urea manufacturing with off-the-shelf components to achieve a complete solution that encompasses an anaerobic digester (already in place at Tharaldson Ethanol), biogas clean-up, hydrogen and nitrogen production, ammonia synthesis and urea production.

AGREBON has completed the preliminary design phase of the engineering work and has selected the components for the various modules. Commencement of the BEDP is the required next phase.

AGREBON management personnel:

Justin Eisenach, *Chief Executive Officer*

Prior to co-founding AGREBON, Mr. Eisenach (together with Scott Dyer) completed the sale of EARTH Solutions to Outlook Resources Inc., a Toronto-based fertilizer company. Mr. Eisenach has been a successful CEO of a number of agriculture and food-oriented companies including one of the nation's first, virtually integrated, frozen bakery companies. Mr. Eisenach is an innovative business leader with

direct P&L responsibility and over twenty years' experience in building and revitalizing production and sales organizations in a variety of industries. A graduate of Colorado State University, he has an MBA from the University of North Dakota. A U.S. Air Force veteran, Mr. Eisenach served as a navigator during *Operation Desert Storm*.

Scott Dyer, *Chief Science Officer*

Prior to co-founding AGREBON, Mr. Dyer (together with Justin Eisenach) completed the sale of EARTH Solutions to Outlook Resources Inc., a Toronto-based fertilizer company. Critical to the sale of EARTH Solutions was a patent authored by Mr. Dyer that combined the best characteristics of compost and other organic waste streams with synthetic components and nitrogen fixing bacteria – creating a fertilizer product meeting key performance requirements of the agricultural, turf and consumer markets. Mr. Dyer has held numerous other key management positions in the agriculture industry. His primary strength is in understanding and commercializing agricultural technology to meet consumer needs. Mr. Dyer received his BS in Botany and Plant Pathology from Oregon State University and his MBA from Westminster College.

Ken Witt, *Chief Legal Officer and Vice President – Strategic Relationships*

Mr. Witt is an attorney with over 25 years' experience representing technology firms and investors in a number of industry verticals. Mr. Witt's experience includes information technology, venture capital, public and private financings, cross-border financings, M&A and emerging company representation. Formerly a partner in the Denver office of Patton Boggs, LLP, an international, Washington, D.C.-based, *Am Law 100* firm, he is Martindale-Hubbell AV (Preeminent) rated. Mr. Witt has an A.B. from Harvard University and a J.D. from Harvard Law School.

Engineering Team:

BENCHMARK DESIGN, LLC (Benchmark), in Clearwater, Florida, is the primary engineering firm for the PNS plant project. Benchmark specializes in process design, engineering, project design and equipment manufacture for food processing, by-product recovery processing, oil and essence recovery and folding, waste treatment and recycling industries. Benchmark's current technology is the direct result of a continuous process of invention, practical application and improvement begun over 65 years ago (1942) by Charles S. Walker, founder and former president of Gulf Machinery Co. and Gulf Machinery of Brazil (GUMACO). Mr. Walker's son, David Walker, serves as President of Benchmark and, throughout his career, has focused on innovative engineering and technology for the conversion of waste to value-added products.

Benchmark engineered systems include front end and back end components for ethanol plants located in Brazil and North America. Benchmark also offers proprietary designs for primary processing systems and components. These products include its highly efficient water removal systems for fluid concentration and solids drying, such as the T.A.S.T.E.TM evaporator (Thermally Accelerated Short Time Evaporator), the indirect heat fire dryer, and waste heat evaporator systems.

CEAMAG is designing the ammonia synthesis loop for the PNS plant. CEAMAG is a process-oriented engineering company based in Trappes, the southwest suburb of Paris. The Company was founded in 1998 by a group of engineering experts, all of them having years of experience in project management and technologies in the fertilizer industry. Through the experience of its experts and partners, CEAMAG offers processes and customized technological solutions for new plants or revamping projects for the production of Nitrogen-and Phosphate-based fertilizers, including: Ammonia, Urea, Nitric Acid, Ammonium Nitrate, CAN, CAS, Sulphuric Acid, Phosphoric Acid, MAP and DAP, and NPK

CEAMAG's core business is Process Engineering and Project Management services for fertilizer production plant projects. CEAMAG has completed dozens of projects at fertilizer plants worldwide, including engineering studies, process, basic and detailed engineering and equipment installation.

MANAGEMENT

*A description of **how** the applicant will manage and oversee the project to ensure it is being carried out on schedule and in a manner that best ensures its objectives will be met, **and a description of the evaluation points to be used during the course of the project.***

PNS has contracted with AGREBON for the development, design and construction of the PNS plant, including the engineering and other development work to be funded by the proposed grant.

AGREBON has three full-time employees (resumes included above) who oversee the management, technical and legal aspects of its business operations. These individuals have over 75 years of combined experience in launching new companies, developing projects within established companies and the successful rollout of new technologies.

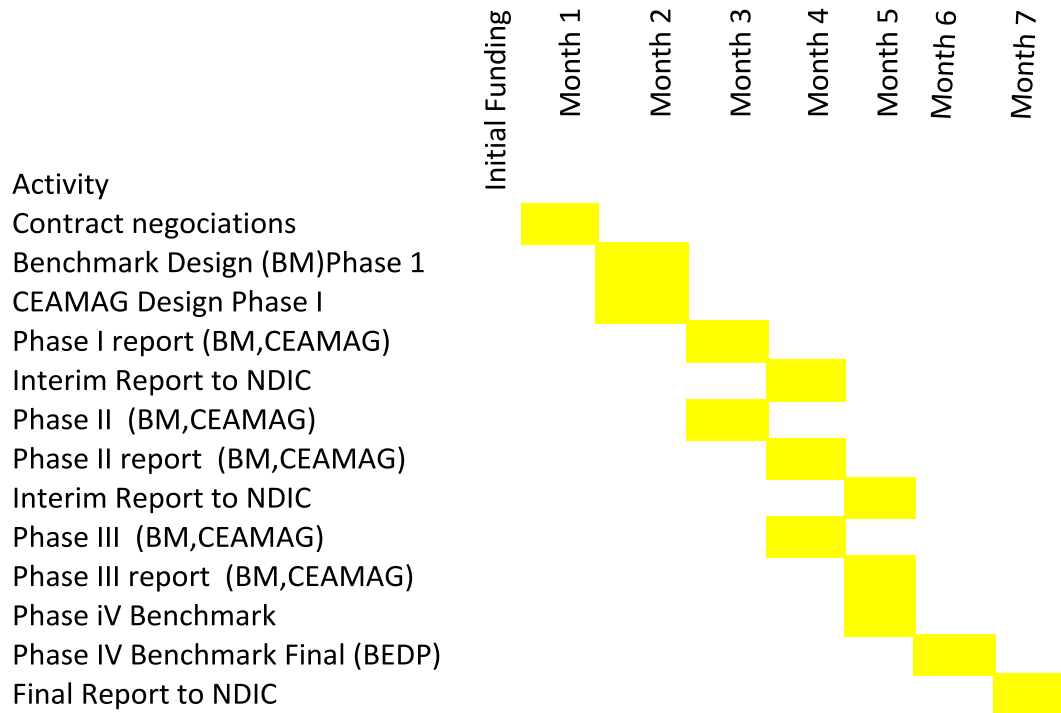
AGREBON has contracted with two primary vendors, Benchmark Design and CEAMAG, for the performance of the engineering work, including the BEDP and the design of the ammonia synthesis loop. Each contract contains customary benchmarks, deliverables and reporting in order to ensure the timely accomplishment of the objectives for each company and their associated project. In addition, each contract contains a customary provision as to the quality of the services and work product and a requirement that defective documentation be corrected. Evaluation points will occur upon each delivery of documentation from the engineering firms, and corrective action will be taken at that time.

The phases of the engineering work are detailed in the timeline included below under "**Timetable**". Each phase corresponds approximately to the percentage completion of the work (e.g., Phase I out of IV represents approximately 25% completion) and an interim report is to be delivered upon completion of each phase. Each report will be reviewed by PNS and any issues will be addressed with the engineering firms. Interim reports will be delivered to the NDIC if required.

A qualified owner's representative will be retained by PNS during the later stages of the project to assist in project management and oversee the work of the EPC contractor.

TIMETABLE

Please provide a project schedule setting forth the starting and completion dates, dates for completing major project activities, and proposed dates upon which the interim reports will be submitted.



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 grant 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 those projects have matching private industry investment equal to at least 50% or more of total cost.

Project Associated Expense	NDIC’s Share	Applicant’s Share (Cash)	Applicant’s Share (In-Kind)	Other Project Sponsor’s Share
Engineering and geotechnical	\$345,000	\$345,000		
Permitting	\$55,000	\$56,000		
Legal	\$31,000	\$31,000		
Accounting and tax	\$16,000	\$16,000		
Misc. (utility contracts, travel, office expenses)	\$53,000	\$52,000		
Totals	\$500,000	\$500,000		

Please use the space below to justify project associated expenses, and discuss if less funding is available than that requested, whether the project's objectives will be unattainable or delayed.

Most of the project expenses are attributable to engineering and reflect the amounts in the contracts with Benchmark Design and CEAMAG. The Applicant believes that the engineering expenses are quite modest in light of the ground-breaking work that is to be performed. The remaining development expenses, totaling \$310,000, are reasonable in light of the magnitude of this project and the experience of the principals and their advisors.

The estimated expenses for environmental permitting (\$111,000) represent the fees of the third-party firm for any necessary studies (\$66,000) and out-of-pocket expenses including permit costs (\$45,000).

The estimated expenses for legal (\$66,000) and accounting and tax (\$32,000) encompass a wide range of development activities that will put PNS in a position to obtain financing and commence construction, including planning and entity formation and structuring, and contracting with Tharaldson Ethanol, utilities, the EPC and debt and equity financing sources. The additional miscellaneous pre-construction, development expenses (estimated at \$105,000) include office expenses (\$10,000), project related travel (\$30,000) and expenses for business planning and contracting for the methane supply (\$65,000).

If less funding is available, the Applicant believes that the project's principal objectives can still be obtained by raising additional outside funding and focusing on the core engineering tasks. Some delay, on the order of three to six months, may result if less funding is available, but the Applicant would use its best efforts to keep the project on track in any event.

CONFIDENTIAL INFORMATION

Any information in the application that is entitled to confidentiality and which the applicant wants to be kept confidential should, if possible, be placed in an appendix to allow for administrative ease in protecting the information from public disclosure while allowing public access to the rest of the application. Such information must be clearly labeled as confidential and the applicant must provide all required information set forth in NDCC 54-63-02. If there is no confidential information please note that below.

PATENTS/RIGHTS TO TECHNICAL DATA

Any patents or rights that the applicant wishes to reserve must be identified in the application. If this does not apply to your proposal, please note that below.

PNS and AGREBON wish to reserve all rights to any patents and other intellectual property developed directly or indirectly as a result of the funding of this project, including, but not limited to, any inventions, deliverables and technical information created by Benchmark Design and CEAMAG.

APPENDIX I

Basic Engineering Design Package

1. PROJECT DESCRIPTION

A description of the project will be provided that sets forth the general scope of the project. It will provide a written and verbal description of the project elements.

2. PROJECT DESIGN BASIS

The design basis will be developed which contains all details and design data required to provide a sound basis for subsequent Detailed Engineering and construction aspects of project execution. General information such as site location, local regulatory agencies, and climatic data as well as specific design data sufficient to support engineering design of the facility will be listed.

Specific requirements such as feedstock and product quantity and quality specifications, process and utility battery limits definitions (the division of responsibility between local utility services and the project), stream factor requirements will be included in this document.

The Design Basis will be reference for project design decisions and will form the basis for development of the documentation supplied within this package.

3. PROCESS DESCRIPTION

A detailed process description of the processing sequence and a discussion of any special features will be provided.

4. PROCESS FLOW DIAGRAMS (PFD's) WITH MATERIAL BALANCE

The PFD's to be provided will outline a process flow sequence for the Plant in its simplest form. All major process lines showing the interconnection of major equipment will be included in the process flow diagrams. All major equipment items will be indicated.

A Material Balance will be included in the PFD's for process streams. The Material Balance is a standard process-engineering task that describes the implementation of technology in terms of the movements and transformation of raw and processed materials. The Material Balance ensures that the design operates according to well-understood natural laws. Total and chemical component mass flows and overall stream physical conditions will be provided for the listed streams.

5. PIPING & INSTRUMENT DIAGRAMS (P&ID's)

The piping and instrument diagrams will cover all process streams and equipment. Equipment designations, lines with sizes and service codes, principal pressure relief valves, insulation and special process design notes will be shown. Instrumentation and control functions will be shown.

These drawings will require further development during the Detailed Engineering phase of project implementation in the areas of piping specifications, instrumentation, auxiliary systems and final equipment selection. Space will be provided on the drawings for details.

6. PRELIMINARY SITE PLAN and EQUIPMENT LAYOUTS

A preliminary site layout will be provided. This will be developed based on a site survey provided by the Owner and will depict the Process Plant and associated supporting systems, buildings and on-site infrastructure. This drawing will also depict entry points for roads and connection locations for off-plant utilities (power, water, sewage, etc) based on information provided by the Owner resulting from his contacts with governmental and utility suppliers.

Preliminary Equipment Layouts and General Elevations will be developed which provide indication of placement and general relationships for major equipment as well as conceptual building requirements.

7. UTILITIES SUMMARY

Detailed estimates of consumption of steam, electric power, cooling water, instrument air and fuel will be provided on an itemized basis. Estimated steam and electric power hourly usage will be provided.

8. PERMITTING SUPPORT

Information will be developed to support environmental permit submittals. This information will be provided to the Owner's Environmental Contractor, who will develop the complete documentation in order to obtain required permits for Process Plant construction and operation.

9. PROCESS DATA SHEETS FOR MAJOR EQUIPMENT

Specifications will be provided for packaged equipment or subsystems. Specifications will outline and describe performance requirements, materials of construction and any special design features required for all Plant processes. Data sheets will be provided for all other major equipment that is not covered by the specifications for the packaged equipment or subsystems. Vessel sketches will include specified design and operating pressures/temperatures, and a nozzle schedule. Information on special internals required for the process is to be supplied, including by sketch. Fluid properties, thermal dynamics and service duties necessary for rating or sizing heat transfer equipment and fluid transport equipment will be given.

An Equipment List will also be provided with summary equipment information.

10. INSTRUMENT SPECIFICATIONS and DATA SHEETS

An Instrument List will be provided with summary information describing each device. This list can be used to aid the contractor in obtaining instrument pricing.

11 ELECTRICAL DIAGRAMS

A preliminary electrical one-line diagram will be supplied showing distribution to MCC's and other Process Plant power consumers. A preliminary electrical classification diagram, based on the site plan (see Item 6) will be developed as a guide to electrical system design and construction.

12. PROCESS CONTROL SYSTEM SPECIFICATION AND CONTROL PHILOSOPHY

A specification for the process control system architecture will be provided. A control philosophy narrative will also be provided which will provide the basis for the control system software development. Software development will be provided in Detailed Engineering.

13. BUILDING REQUIREMENTS

Preliminary requirements for site buildings including purpose, size and weight, load and foundation support requirements, construction type, lighting, heating, ventilation, insulation and special construction features such as monorail or overhead crane will be provided.

14. OTHER SPECIFICATIONS

Basic piping specifications including any special operating conditions will be provided. Standard insulation specifications will be included unless specified otherwise by the owner.

APPENDIX II

North Dakota Department of Commerce Economic Impact Analysis



Regional Economic Models, Inc.

North Dakota

AGREBON

Prepared By

North Dakota Department of Commerce

Using

Regional Economic Models, Inc.

August 6, 2012

1. Executive Summary

This report evaluates the economic impacts of a new fertilizer facility in North Dakota. The model is based on information provided by and the data generated using a customized REMI Policy Insight™ model for North Dakota. The analysis shows the change in economic activity caused by the industry expansion. In order to show the total implications of the expansion, REMI developed a Policy Insight model with detailed employment, population, personal income, and other data specific to North Dakota. Using this model, REMI generated the regional baseline forecast and then used the information provided by the new project to develop an alternative forecast that would occur in the event of the expansion in this sector. The table below shows the difference to the economy that occurs from the project.

Table 1 Summary Results

Category	Units	2013	2014	2015	2016	2017
Total Employment	Individuals (Jobs)	101	28	26	26	25
Direct Manufacturing Employment	Individual (Jobs)	10	10	10	10	10
Indirect and Induced Employment	Individual (Jobs)	91	18	16	16	15
Gross State Product	Millions of Current Dollars	6.8	2.3	2.3	2.3	2.4
Output	Millions of Current Dollars	14.9	7.4	7.6	7.8	8.0
Personal Income	Millions of Current Dollars	4.2	1.5	1.5	1.5	1.5
Population	Individuals	23	21	20	19	19
State Revenues at State Average Rates	Millions of Current Dollars	1.8	.34	.35	.30	.29

Total Employment

Employment comprises estimates of the number of jobs, full-time plus part-time, by place of work. Full-time and part-time jobs are counted at equal weight. Employees, sole proprietors, and active partners are included, but unpaid family workers and volunteers are not included. The Employment variable in REMI Policy Insight uses historical data from the Bureau of Economic Analysis (BEA). Employment figures projected are the difference from baseline and should not be cumulated.

Indirect or secondary jobs created are a result of inter-industry transactions to provide intermediate inputs, and from increased spending across other sectors. Table 2 provides more details on employment for the major employment sectors.

Table 2 Employment by industry sector

Category	Units	2013	2014	2015	2016	2017
Construction	Individuals (Jobs)	52	3	3	2	2
Manufacturing	Individuals (Jobs)	13	10	10	10	10
Wholesale Trade	Individuals (Jobs)	3	2	2	2	2
Retail Trade	Individuals (Jobs)	5	2	2	2	2
Professional /Technical Services	Individuals (Jobs)	6	1	1	1	1
Administrative and Waste Services	Individuals (Jobs)	3	1	1	1	1
Health Care and Social Assistance	Individuals (Jobs)	3	1	1	1	1
Accommodation and Food Services	Individuals (Jobs)	3	1	1	1	1
Other Services, except Public						
Administration	Individuals (Jobs)	3	1	1	1	1

Gross State Product

Gross state product (or gross regional product) is a measurement of the economic output of a state or region. It is the sum of all value added by industries within the state and serves as a counterpart to the gross domestic product or GDP. An additional \$16.1 million dollars over five years would be attributed to the new and activity in the manufacturing sector including the indirect and induced activity.

Output

Output is the amount of production, including all intermediate goods purchased as well as value added (compensation and profit). This can also be described as sales or supply. The increase in output includes a direct increase within the manufacturing industry as well as increased output across other sectors.

Personal Income

Income received by persons from all sources. It includes income received from participation in production as well as from government and business transfer payments. It is the sum of compensation of employees (received), supplements to wages and salaries, proprietors' income with inventory valuation adjustment (IVA) and capital consumption adjustment (CCAdj), rental income of persons with CCAdj, personal income receipts on assets, and personal current transfer receipts, less contributions for government social insurance.

Population

Population is a key variable in REMI Policy Insight that affects the potential labor force, government spending, consumption spending, and housing prices. All changes in population are cumulative. Population reflects mid-year estimates of people, including survivors from the previous year, births, special populations, and economic migrants

State Revenues

State Revenues

State-specific state revenue average rates are calculated by dividing the state-specific state revenues (from State and Local Government Finance Estimates, by State, U.S. Census Bureau) by an appropriate base (base data comes from the REMI historical database for each individual state). State Revenue estimates by region are calculated within the model by multiplying the state-specific state revenue rate by the appropriate local base data.

2. Methodology & Assumptions

REMI Policy Insight

REMI Policy Insight® is the leading regional economic-forecasting and policy-analysis model. REMI built this model using the REMI model building system, which consists of hundreds of programs developed over the last two decades. The model uses data from the Bureau of Economic Analysis, the Bureau of Labor Statistics, the Department of Energy, the Bureau of Census, and other public sources.

REMI Policy Insight is a structural model, meaning that it clearly includes cause-and-effect relationships. The model is based on two key underlying assumptions from mainstream economic theory: households maximize utility and producers maximize profits. Since these assumptions make sense to most people and the structure is transparent, lay people as well as trained economists can understand the model.

In the model, businesses produce goods to sell to other firms, consumers, investors, governments and purchasers within and outside economic regions. The output is produced using labor, capital, fuel, and intermediate inputs. The demand for labor, capital and fuel per unit of output depends on their relative costs, since an increase in the price of any one of these inputs leads to substitution away from that input

to other inputs. The supply of labor in the model depends on the number of people in the population and the proportion of those people who participate in the labor force. Economic migration affects the population size. People will move into an area if the real after-tax wage rates or the likelihood of being employed increases in a region.

Supply and demand for labor in the model determines the wage rates. These wage rates, along with other prices and productivity, determine the cost and opportunity of doing business for every industry in the model. An increase in costs would decrease the markets supplied by firms. This market share combined with the demand described above determines the amount of local output. The model has many other feedbacks. For example, changes in wages and employment impact income and consumption, while economic expansion changes investment, and population growth impacts government spending.

Figure 2-1 is a pictorial representation of REMI Policy Insight. The Output block shows a business that sells to all the sectors of final demand as well as to other industries. The Labor and Capital Demand block shows how labor and capital requirements depend both on output and their relative costs. The demographic block includes population and labor supply, contributing to demand and wage determination. Economic migrants in turn respond to wages and other labor market conditions. Supply and demand interact in the Wage, Price and Profit block. Relative production costs determine market shares. Output depends on market shares and the components of demand.

REMI Model Linkages (Excluding Economic Geography Linkages)

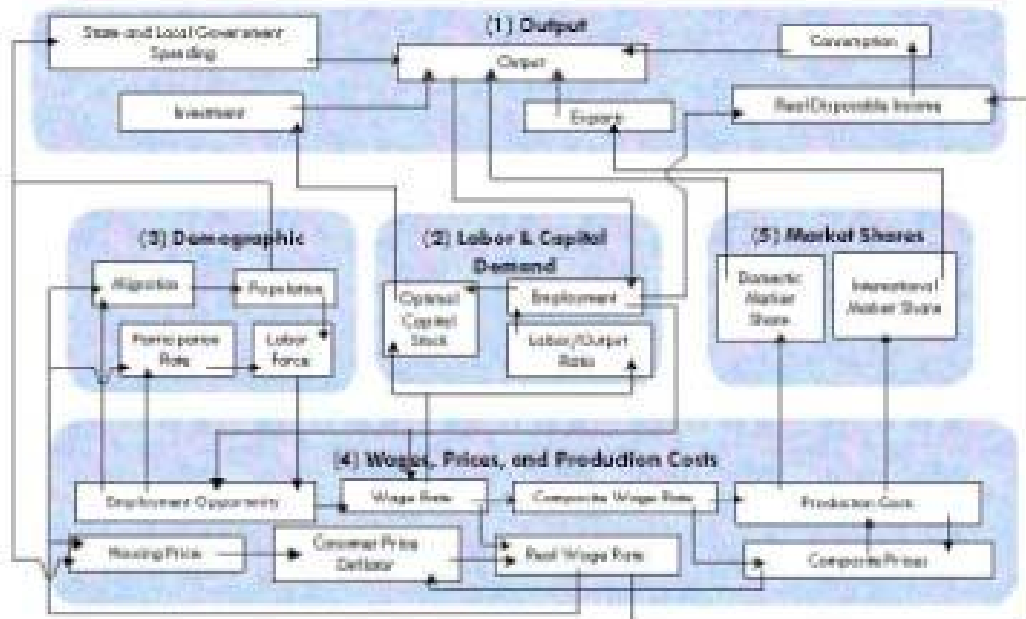


Figure 2-1 REMI Policy Insight overview

The REMI model brings together all of the above elements to determine the value of each of the variables in the model for each year in the baseline forecast, as well as for simulation purposes. The model includes all the inter-industry interactions that are included in input-output models in the Output block, but goes well beyond an input-output model by including the linkages among all of the other blocks shown in Figure 2-1.

In order to broaden the model in this way, it is necessary to estimate key relationships. This is accomplished by using extensive data sets covering all areas in the country. These large data sets and two decades of research efforts enable REMI to simultaneously maintain a theoretically sound model structure and build a model based on all the relevant data available.

The model has strong dynamic properties, which means that it forecasts not only what will happen but also when it will happen. This results in long-term predictions that have year-by-year changes. This means that the long-term properties of general equilibrium models are preserved while maintaining accurate annual predictions, using estimates of key equations from primary data sources.

All changes in population are cumulative. Population reflects mid-year estimates of people, including survivors from the previous year, births, special populations, and economic migrants.

APPENDIX III

Description of PNS Plant Process

1.00 Area 100 - Bio-Digester Gas Clean-up.

This system will recover a 750 BTU per cubic foot (BTU/ft³) biogas and refine it to a 950 BTU/ft³ line-quality natural gas. These systems are currently in use in many areas of the United States.

2.00 Area 200 - Hydrogen Refinement

AGREBON uses the cleaned gas from step 1 above to feed a hydrogen refiner unit with a steam retort. The refiner units are in common use in the food industry and produce 99.99% pure hydrogen. Area 200 also has a nitrogen generator which is a membrane unit that removes nitrogen from standard air.

The hydrogen and nitrogen are recompressed and fed into the ammonia synthesis unit.

3.00 Area 300 - Ammonia Synthesis Unit

AGREBON's ammonia synthesis unit uses a standard catalyst to convert the hydrogen and nitrogen into anhydrous ammonia. The unit recycles the ammonia through the catalyst until the product purity requirements are met.

4.00 Area 400 - Urea Production

The AGREBON urea unit takes the anhydrous ammonia from Area 300 and adds carbon dioxide in a high pressure and high temperature environment to create the "urea melt." The urea melt is then processed into dry urea tablets for fertilizer or liquid urea fertilizer. The decision to make either tablets or liquid urea is based on local farm fertilizer requirements.

Summary -

This system is a modification of the Haber-Bosch ammonia synthesis process. It is reduced in size to work for a distributed fertilizer process plant and using the biogas makes the fertilizer production process cost effective. There is a dramatically reduced carbon footprint than currently operating systems.