COMPANY PORTFOLIO

- MINI AMMONIA
- MINI UREA
- MINI NITRIC ACID
- TERMINAL CONCEPTS
- OUTSOURCING UTILITIES/PLANTS
- ENGINEERING STUDIES
Proton Ventures B.V. originally started in 2001 in Brielle, the Netherlands. In 2011 we moved to our office in Schiedam within close proximity to the industries in the Port of Rotterdam.

We are a team of 20 enthusiastic professionals who can develop, design and implement customized solutions for our customers.

We design and implement projects or participate in projects by offering engineering, procurement and construction services.

We provide operation & maintenance services.

We provide turn-key solutions for our customers.

Our mission

EMPOWERING STORAGE SOLUTIONS. Chemicals, green energy and beyond.

We provide innovative engineering and turnkey solutions for world-scale storage terminals, decentralized ammonia production units and other related process applications. We enable our global partners to benefit from our safe, reliable, efficient and environmentally responsible solutions.
Our vision
We strive to be a key player in decentralized chemical energy storage making renewable energy accessible for everybody.

About Ammonia

Ammonia (NH₃) is a compound composed of a single nitrogen (N) and three hydrogen (H) atoms with a boiling point of -34° C.

Ammonia is one of the most commonly produced industrial chemicals and is used in a wide range of industrial sectors. About 80% of the global ammonia production is consumed by the fertilizer industry.

Other common uses of ammonia are as intermediate for fibers & plastics, pharmaceuticals, pulp & paper, refrigeration and cleaning. Ammonia has a high potential as energy carrier or carbon free fuel.

Ammonia also has a high potential as energy carrier (power-to-ammonia).
Proton’s History

1980
AMMONIA
and Nitric production. Handling, distribution at Kemira Rozenburg B.V.

2001
AMMONIA TERMINAL
2 x 30,000 mt
Basic & Detailed Engineering and Procurement at Eurochem (Estonia)

2003
AMMONIA TERMINAL
30,000 mt
(Re-)Design construction and Start-up of at MICRO Chemie B.V.

2007
MANPOWER
First engineer hired

2009
AMMONIA TERMINAL
60,000 mt
Design, construction and Start-up of at BCT (Estonia)

2011
HEADQUARTER SCHIEDAM
Proton moved to Schiedam due to Company expansion

2013
COLDING TOWER
Turn-key including operations & Maintenance, Kemira Polymers Rotterdam (The Netherlands)

2015
AMMONIA TERMINAL
10,000 mt
Basic & Detailed Engineering Commissioning, Training in Agropolychem (Bulgaria)

2016
START UP AMMONIA PLANT
Ammonia plant Start-up Kavala (Greece)

2016
NFUEL 2.0
Basic Design Mini Ammonia plant (USA)

2017
DE-COMMISSIONING
Refrigerated NH3 storage tank Haifa (Israel)

2018
AMMONIA TERMINAL 12,500 mt
Basic & Detailed Engineering of new tank and refrigeration system Agropolychem (Bulgaria)

deNOx & deN2O SCR
Basic & Detailed Engineering and Catalytic Procurement for reduction of NOx and N2O in a Nitric Acid plant (Greece)

2019>
NFUEL
Ongoing development for biogas, flare gas and wind/solar power-to-ammonia (worldwide)
A project in association with BCT Chemical Terminal

AS BCT is a state-of-the-art terminal concept at the Estonian port of Sillamäe that stores and transships ammonia and liquid mineral fertilizers.

Proton Ventures has realized two ammonia tanks of 30,000 metric ton capacity each and four UAN tanks of 20,000 metric ton capacity each. The liquid ammonia can be delivered from Novgorod district by rail and forwarded to customers by sea-going vessels. The system provided includes specialized containers for UAN transshipment.

Our activities

- Basic & Detailed Engineering
- Design studies
- Services
- Procurement
- Commissioning & Start-up
- Operators’ training
Kemira is a global chemicals company in the water treatment industry.

In 2011 Proton Ventures, installed two cooling towers on the Kemira site Rotterdam providing Kemira with over 1500 m$^3$/hr. Efficient frequency driven pumps and fans have provided reliably, more than 100 million m$^3$ of cooling water.

Through a service contract Proton Ventures has provide to date, continuous service and support.

Our activities

- Design
- Procurement
- Construction
- Commissioning & Start-up
- Operations & Maintenance
A project in association with Agropolychim

Agropolychim is a leading manufacturer of nitrogen fertilizers in Southeastern Europe and a leader in the manufacture of phosphorus fertilizers on the Balkan Peninsula.

Proton Ventures designed a 10,000 metric ton refrigerated ammonia storage tank including auxiliary equipment for Agropolychim.

Our activities

- Basic & Detailed Engineering
- Construction Supervision
- Procurement
- Commissioning & Start-up
- Operators’ training
deNOx and N₂O removal

Nitric Acid plants are now globally striving to reduce both NOx (acid rain precursor) and N₂O (298x CO₂ equivalents) emissions. Apart from the environmental benefits, reducing N₂O emissions from nitric acid units is a cost-effective way to reduce greenhouse gas (GHG) emissions.

Proton Ventures conducted the Basic and Detailed Engineering Project for the deNOx and N₂O emissions reduction in a major Nitric Acid production plant in Southern Europe. This ammonia injection-based Selective Catalytic Reduction (SCR) project in collaboration with world-class catalyst provider Haldor Topsoe confines NOx emissions to less than 25ppm and decrease N₂O to below 40ppm. Proton Ventures is procuring this combined NOx&N₂O tertiary catalyst (TertiNOx™) which is highly active for NOx removal and will ensure compliance with NOx regulations while removing N₂O.

Proton Ventures is also undertaking the start-up and training of the unit’s operators.

Our activities

• Basic & Detailed Engineering
• Catalyst Procurement
• Start-up
• Training
Company Portfolio

(Waste) gas-to-Ammonia

The general worldwide production of ammonia is based on natural gas as a feedstock. These production facilities have high capacities and are spread over various locations where natural gas is available.

Proton Ventures offers modern technical solutions which make it possible to move away from large-scale plants towards small-scale ammonia production units (NFUEL®). With this approach and technology Proton Ventures can provide customers with small-scale ammonia plants, ensuring customer’s independence of transport costs and ammonia price fluctuations. Natural gas or biogas can be used as feedstock. As a result, NFUEL® makes it possible to produce ammonia from a waste product.

Gas sources
- Associated gas
- Flare gas
- Biogas
- Natural gas
- Hydrogen

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<th>UNIT</th>
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Gas sources

- Power2Ammonia
- NH3 Storage
- NH3 Cracker
- NH3 Transport
- Fuel (land or maritime)
- Chemical precursor
- De-NOx
- Fertilizer

Diagram: FEEDSTOCK (Power2Ammonia, NH3 Storage, NH3 Cracker, NH3 Transport), PRODUCTION (Air separation, Electrolysis, NH3 Synthesis), STORAGE (NH3 Storage, NH3 Cracker), APPLICATION (Fertilizer, De-NOx, Chemical precursor, Fuel (land or maritime), Power generation)
Proton Ventures has the knowledge and experience to design small-scale ammonia plants. Electric power produced from renewable resources (wind, solar & tidal energy) can be used as energy source for these units. This new concept makes it possible to produce green decentralized ammonia which can be further used as:

- **Nitrogen carrier (fertilizer)**
- **Hydrogen carrier**
- **Energy storage**
- **Fuel**
- **DeNOx / deN₂O**

Proton Ventures offers three different capacities (see table). The NFUEL® units allow compensation for variation in the supply and demand of the energy market by employing ammonia as energy carrier.
Proton Ventures news

ISO 9001:2015 certification for Proton Ventures
Quality and safety are our top priorities. As of October 2017 we are ISO 9001:2015 certified and we can also prove that Quality and Safety are very important to us.

European Power to Ammonia® Conference
Proton Ventures is initiator of the yearly European Power to Ammonia® Conference. Around 140 attendees visit the NH3 Event every year. The NH3 Event will take place in springtime Rotterdam, the Netherlands.

Strategic collaboration Proton Ventures and Vicoma
Proton Ventures and Vicoma Engineering have a strategic collaboration. Both companies will work together for worldwide acquisition and realization of small-scale ammonia plants and ammonia & UAN storage projects.

First battolyser for electricity storage and hydrogen production
Battolyser B.V, a joint venture between Delft University of Technology and Proton Ventures, is developing the first Battolyser aimed to provide continuous hydrogen from a nickel-iron battery. Its function is to utilize curtailed intermittent power supply from renewable sources like solar and wind to efficiently store electrical energy as well as continuous hydrogen. The forthcoming realization of this first Battolyser is an important milestone for this energy transition enabler.

Power to Ammonia
“National oil companies in Europe and the Middle East are looking to satisfy East Asian demand for clean hydrogen by exporting carbon-free ammonia. Oil majors are assessing ammonia’s role in implementing an affordable hydrogen economy, looking toward fuel markets in California and Europe.” Trevor Brown, Ammonia Energy

“The International Maritime Organization issued its Initial GHG Strategy, committing the global shipping industry to emission reductions that cannot be achieved with carbon-based fuels. Hence the IMO targets ammonia as a fuel to decarbonize shipping.”

“Trevor Brown, Ammonia Energy

“Our industry has had fundamentally the same method of ammonia production for a very long time now … but we are looking at ways to produce it through renewables.” Svein Tore Holsether, CEO of Yara, quoted in The Australian, Yara plan for ‘renewable’ outback ammonia plant, November 2017

Patron member NCCC
Proton Ventures is proud sponsor of the Netherlands-Canadian Chamber of Commerce.
Empowering storage solutions
chemicals, green energy and beyond

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