

Message from the CEO

Dear readers

I am pleased to welcome you to the second issue of our NCF newsletter.

For the past 18 months, our team of outstanding scientists has been designing and developing our technology demonstrator in order to prove that we can efficiently produce alternative fuels out of CO₂ and water using solar energy.

In this letter I would like to address three topics that I believe are very important and that lie close to the heart of our project: CO₂ emissions, fuel availability and security, and solar energy.

CO₂ emission is one of the major environmental problems of the 21st century. With CO₂ emissions exceeding all projections we have clearly breached the natural balance of oxygen and CO₂. Although many are debating if this is the major driver of global warming and other environmental issues, it is clear to me that we need to invest today in the creation of a cleaner environment to secure a safe and clean future for our children.

Energy security depends heavily on liberation from our addiction to a single transportation fuel. This is another topic that is of great concern, especially when observing the global data and trends regarding energy supplies and usage. As transportation is dependent almost purely on oil and oil reserves are limited and finite, it is important to offer new affordable fuels in order to secure national security and price stability. For these reasons, I believe there is a global need to break the current paradigms, and to freeing up the transportation fuel market which will lead to greater price stability. Methanol, amongst other alternative fuels is our answer to the problem.

At NCF, we strongly believe that solar energy is the energy source of the future and needs to be used to help solve the two major issues listed above, namely the escalation of global CO₂ emissions and energy security challenges. Although the solar energy market has known some setbacks in the last few months we believe that using the sun as an energy source is vital for a sustainable future and we believe it is important that these technologies will continue to be developed and implemented in order to build a strong foundation for the generations to come.

In this issue, we would like to present our team and provide you a brief overview of the global methanol market, its virtues as a fuel for various applications as well as the buds of its use in transportation which we hope will grow worldwide.

As we expected, licensing the technology of the Weizmann Institute has proved to be the first step of a very interesting, inspiring and promising journey which we will gladly share with you in coming issues.

Enjoy reading.

Regards



Dudi (David) Banitt
CEO



Introduction of the team

NCF is currently developing a very challenging project covering many demanding tasks involving structural mechanics, materials engineering, fluid dynamics, heat transfer, precise metal stress analysis, optics, chemistry and chemical engineering, physics, software, control and electronics. We have been able to create and assemble in a short time a professional team covering all the required expertise and to build a great working environment, strong enough, in our opinion, to address our ambitious plan. Our small yet proficient, agile and efficient staff has proved their capabilities repeatedly during the past 18 months. As we look forward to the more difficult and intensive challenges ahead, we are confident that we will accomplish our goals. We are proud to introduce the team to our readers.



Mr. Uzi Aharony – *VP of Operation* – Has more than 25 years of experience in a variety of industries in product development, operations and manufacturing. Holds a B.Sc. in Mechanical Engineering from the Technion-Israel Institute of Technology and M.Sc. in Manufacturing Systems Engineering gained at Stanford University, California, U.S.A.



Dr. Yury Alioshin – *Senior Researcher* – Holds an M.Sc. in Mechanical Engineering gained at the Technology Institute of Refrigeration Industry, Odessa, Ukraine and a Ph.D. in solar energy gained at the Weizmann Institute of Science. He has more than 18 years experience in research and development in a number of multidisciplinary systems.



Mr. David Banitt – *CEO* – Has 30 years' experience in product development, marketing and senior management in the high tech industry, including multidisciplinary systems, electro-optics and energy products. Holds a B.Sc. in Electrical Engineering from the Tel Aviv University, Israel.



Dr. Gidon Ferdiman – *Senior Researcher* – Holds a B.Sc. in Mechanical Engineering and an M.Sc. in Aeronautical Engineering, both from the Technion-Israel Institute of Technology, and a Ph.D. in solar energy gained at the Weizmann Institute of Science. He has 10 years of practical development and engineering experience in the Israeli defense industry.



Mr. Baruch Finarov – *Mechanical Engineer* – Holds a Cum Laude B.Sc. in Mechanical Engineering from the Technion, Israel, and 6 years of experience in design and manufacturing of multidisciplinary systems in various industries, especially in Solar PV.



Mr. Daniel Finkelshtein – *Mechanical Engineer* – Holds a B.Sc. in Mechanical Engineering from the Afeka Academic College of Engineering, Tel Aviv. He has more than 10 years of experience in the aviation industry, primarily in design and manufacturing of UAV propulsion systems.



Mr. Roi Harpaz – *System Engineer* – Holds a M.Sc. in Physics at the Weizmann Institute of Science, holds a B.Sc. in Physics and Mathematics from the Hebrew University of Jerusalem as part of the Talpiot program. Has 6 years of experience in R&D in the fields of sensors, data analysis and algorithms.



Mrs. Julie Horn – *Business Development Manager* – Holds a M.Sc. in Business Engineering and an M.A. in International Management both from the University of Brussels (Belgium). Prior to joining NCF, Julie worked as a financial consultant for major multinationals in the material and utility sector and for the Belgian energy suppliers.



Professor Jacob Karni – *Senior Advisor* – Holds a B.Sc. in Civil Engineering, and a M.Sc. and Ph.D in Mechanical Engineering, all gained at the University of Minnesota. He has over 20 years of experience in research and development of concentration, absorption, conversion transmission and storage of solar energy.



Mr. Alexander Mikler – *Mechanical Engineer* – Holds a B.Sc in Mechanical Engineering and an M.Sc in Industrial Management Engineering from Ben-Gurion University, Israel. He has 12 years of experience in various fields of mechanics, especially thermal, structural and fluid dynamics simulations using finite element methods.



Dr. Adi Naor-Pomerantz – *Materials Engineer* – Holds a B.Sc. degree magna cum laude in Materials Engineering from Ben-Gurion University, Israel and a Ph.D. in Materials Engineering and Nanotechnologies from the Tel-Aviv University. She previously worked in research and development at Bromine Compounds of Israel Chemicals Ltd. as a materials engineer.



Dr. David Scheiner – *VP Product Development* – Holds a B.Sc. and M.Sc. in Electrical Engineering from the Technion-Israel Institute of Technology and a Ph.D. in Physics from the Weizmann Institute of Science. He has over 15 years of experience in product development and management in the high tech industry. He was previously CTO and VP R&D at BrightView Systems and CTO at Nova Measuring Instruments.



Mr. Boaz Shalev - *Laboratory Engineer* - Has 4 years of experience in R&D mainly in Hi-Tech laboratories over a wide spectrum of topics such as optics, hi-temp system, plasma, solid state and super conductivity and has a practical knowledge in multi-disciplinary systems from the planning stage to buildup and data analysis. He holds a B.Sc. in Physics from the Technion University, Israel.

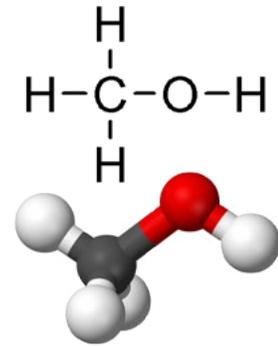


Mr. Ezra Schwartzman – *System Control Engineer* – Has 10 years experience in control and automation engineering, in the steel industry and solar thermal energy facilities. He holds a B.Sc in Mechanical Engineering, with mechatronics and control engineering specialization from Ben-Gurion University, Israel.

The methanol market In Israel, Australia and around the world

We believe methanol is a viable and competitive alternative liquid fuel solution which will enable the reduction of carbon emissions and can ensure energy independence. Besides, methanol is a widely used chemical product with an existing market worldwide. We present below a short overview of the current methanol market as well as the advantages of using methanol as an alternative liquid fuel for transportation.

Being the building block of more than a hundred of the most essential chemicals in our daily lives, including plastic packaging, building materials, paints, pharmaceuticals, electronics and conventional and alternative fuels, methanol is vital to support our current standard of living. It can be produced from gas, coal or any other renewable resource containing hydrocarbons and is produced in more than 250 facilities worldwide. In 2011, the global methanol demand was about 55 million metric tons and is expected to reach 92 million metric tons in 2016. The major growth is taking place in China, especially as China has taken the strategic decision to define methanol as one of the core fuels of its alternative fuel strategy. Methanol, the simplest of all alcohols, is a colorless, water-soluble liquid with a mild alcoholic odor, and since methanol increases the octane value, is less damaging to the environment while reducing CO₂ emissions.



Australia

The Australian market is approximately 100,000 tonnes per year of which 80% is produced by a local methanol producer, Coogee Energy Pty Ltd.. Coogee is a small scale plant in Victoria and produces around 200 tonnes per day. They are planning to increase the plant's capacity in order to cover the entire Australian market demand.

A new project, the Tassie Shoal Methanol Project, has been proposed by MEO Australia. Two plants will be located offshore of the Northern Territory, and will each produce about 1.75 million tonnes per year mainly for export.

In Australia, methanol is mainly used for industrial processes while a small quantity is used for motor racing fuel in the form of biodiesel. No methanol blending currently occurs for liquid transportation fuels however there is a rising awareness that legislation will need to include methanol as a liquid fuel and that the same law as for ethanol should apply.

Israel

The Methanol annual market in Israel is about 100,000 tonnes per year and currently a 500,000 tonnes per year methanol plant is being planned by DOR Chemicals in the Negev Desert. Methanol in Israel is mainly used for industrial processes and in the chemical industry.

DOR Chemicals recently started a project for testing use of M15 for transportation while collaborating with the gas station chain Ten Petroleum and the support and supervision of three government ministries: Energy and Water Resources, Transportation and Environmental Protection. The first phase of the project consists of 11 cars that are running on M15, containing 85% gasoline and 15% methanol, over a period of 6 months. In the next phase, DOR plans to run a few hundred full FFV's (Flexible Fuel Vehicles) with a higher methanol blend. According to DOR Chemicals, the first phase is running smoothly and excellent results have been achieved to date.

***"methanol is
vital to support
our current
standard
of living"***

China

As mentioned by the Methanol Institute: "China has seen an exponential growth in consumption and production capacity of methanol. In 2010, China's methanol production capacity reached 38.4 million tons, and will be increased to 50 million tons by 2015. China consumed 22.7 million metric tons of methanol in 2010, around 40% of the global market. Increased demand in the Chinese market has been fueled by methanol gasoline blending and dimethyl ether (DME), which combined account for 33% of the Chinese methanol demand and are expected to grow by 30% this year alone. It is estimated that China used as much as 7 million tons of methanol as transportation fuels last year, representing over 5% of China's fuel pool."

U.S.

The U.S. currently has a methanol demand of around 5.7 million tonnes and is locally producing about 1.5 million tonnes. However, methanol production is expected to increase in the coming years as natural gas prices are dropping. Methanex for example, is currently relocating some of its methanol production to the U.S. from Chile and is restarting production at disused methanol plants in the U.S. which for many years were not competitive.

*"more than
100 million
vehicles
refueling with
methanol"*

Currently the U.S. does not blend methanol with fuel, despite a project launched in Florida in the eighties of the 20th century that showed promising results regarding the use of methanol as a liquid fuel for transportation.

However, many initiatives are being undertaken and organizations established such as the Fuel Freedom Foundation and the Methanol Institute to act as lobbyist to open the U.S. market to alternative fuels, including methanol. In addition, several bills are being introduced into U.S. Congress to allow for greater fuel freedom at the pump. The most famous is the OpenFuelsStandard which requires automakers to have a fleet of 80% of FFV cars by 2016 and 95% by 2017.

Methanol as Transportation Fuel

Methanol is an excellent alternative to petrol and, in addition to finding use as a stand alone fuel or direct blending fuel, is currently used under various forms such as MBTE additives, DME and as a component of Biodiesel. Using Methanol as a liquid fuel has major advantages as it is the most efficiently produced synthetic fuel, it increases the octane value, can be produced from a variety of feedstock, and decreases hydrocarbon, toxic, and carbon monoxide emissions. It is safer than gasoline as it is more difficult to ignite, burns more slowly and at a lower temperature and is less damaging to the environment in case of spillage. Its main disadvantages, such as lower energy containment, cold start problems and corrosion have easy and cost effective solutions. Using methanol as liquid fuel could globally change the import/export balance of transportation fuels while achieving significant pollution reduction and reduced transportation costs.

*"excellent
alternative
to petrol"*

Sources:

http://archive.treasury.gov.au/documents/1953/PDF/Coogee_Chemicals.pdf

http://www.cmaiglobal.com/marketing/samples/wmr_supplement.pdf

http://www.ptq.pemex.com/productosyservicios/eventosdescargas/Documents/Foro%20PEMEX%20Petroqu%C3%ADmica/2012/PEMEX_DJohnson.pdf

http://www.iags.org/Shanxi_trip_report.pdf

<http://www.methanol.org/Methanol-Basics/Resources/China-Methanol.aspx>

News Around the World

Top emitter China agrees to work with EU to cut carbon

China, the world's biggest carbon dioxide emitter, has struck a deal to work with the European Union to cut greenhouse gases through projects including the development of Chinese emissions trading schemes, the European Commission said on Thursday.

<http://www.reuters.com/article/2012/09/20/eu-china-carbon-idUSL5E8KK7EO20120920>

Calculating the true cost of electricity

Taking into account health and environmental damage, wind and solar power from new plants in Europe is actually cheaper than energy from coal and nuclear power plants, according to a new report.

<http://www.dw.de/dw/article/0,,16235063,00.html>

Greenhouse gases reach record high

The amount of greenhouse gases in the atmosphere reached a record high last year, the World Meteorological Organisation has said.

<http://news.uk.msn.com/greenhouse-gases-reach-record-high>

Australia Could Reach 85 Percent Renewables by 2050

The Australian government states that renewable energy sources could provide up to 40 percent of Australia's energy needs by 2035 and 85 percent by 2050.

<http://theenergycollective.com/rhys-clay/142811/australia-could-reach-85-percent-renewables-2050>

CONFERENCES AND EVENTS

3rd International Conference on Future Environment and Energy ICFEE 2013

Rome, Italy
24 - 25 February 2013
<http://www.icfee.org/>

Cleantech Forum San Francisco

San Francisco, U.S.A.
18 - 20 March 2012
<http://events.cleantech.com>

Training - Energy Efficiency & CO₂ reduction: how to measure energy savings?

Paris, France
27 - 28 March 2013
<http://www.training.enerdata.net/uk/training-course/energy-efficiency-and-co2-reduction.html>

SOLAR 2013

Baltimore, U.S.A.
16 - 20 April 2013
<http://ases.org/solar2013>

InterSolar Europe

Munich, Germany
19 - 20 June 2013
<http://www.intersolar.de>