

Meet the Dutch Delegation

Hydrogen Innovation Mission Israel

4 - 9 June 2023

A large, bold, orange logo consisting of the letters 'NL' in a stylized, rounded font. The 'N' and 'L' are connected at the bottom.

Netherlands

Forewords



The Embassy of the Kingdom of the Netherlands identified Climate Change and Energy Transition in general and Hydrogen specifically as high priorities for our cooperation with Israel. In this regard, in 2020-2022 we exchanged knowledge with hundreds of Israeli experts and professionals on green hydrogen generation, transportation, storage and uses; co-organized with the Energy Delta Institute and the New Energy Coalition a Dutch summer school on the design and planning of hydrogen valleys; co-organized with RVO an Israeli Hydrogen mission to the Netherlands (May 2022); and assisted Dutch and Israeli companies interested in developing innovation cooperation in the field of hydrogen (i.e., hydrogen valleys) as well as in multi-disciplinary fields such as water desalination, cybersecurity and AI.



Hans Docter

Through these activities the Netherlands has transferred significant knowledge to Israel and is exploring ways to tap into Israel's innovation ecosystem to further boost the Dutch hydrogen economy through cooperation, trade, and foreign investment. For instance, Gasunie signed an agreement with Israel Natural Gas Lines to consult on the transportation of hydrogen through IL's natural gas pipelines. Electriq Global successfully carries out project with the Port of Amsterdam. IL startups are scaling up in NL, and more.

In addition to bilateral cooperation, we are exploring possibilities to encourage regional cooperation around hydrogen development. IL is part of the Eastern Mediterranean basin, a region that could export green hydrogen to the NL from the Gulf countries and North Africa through maritime transportation and pipelines.

We welcome the Dutch delegates to Israel wish them an enriching experience in exploring IL's scaleups and startups, academic research institutions, hydrogen-related infrastructure, innovation organizations, policy makers and above all fruitful meetings with Israeli talent.

We at the Dutch embassy in Israel have a professional economic team comprised of experts in the field of Innovation, Foreign Direct Investment (FDI), and Trade & Commerce. We are looking to build pipelines from low Technology Readiness Levels (TLRs) to higher ones and subsequently from bilateral R&D and innovation cooperation to the identification of Israeli companies interested in investing in the Netherlands and becoming part of the Dutch ecosystem and to Dutch Israeli trade opportunities.

Hans Docter

Ambassador of the Kingdom of the Netherlands to Israel



During COVID19, I decided to explore the energy transition societal challenge which has been on my radar for a few years. As energy transition is very broad, I chose green hydrogen as the field of focus. The green hydrogen economy is comprised of its generation, transportation, storage and eventually its uses in mobility, industry, and in heating of private homes. It encompasses basic and applied research aimed at developing novel technologies, pilot projects during which novel technology is tested in larger settings, the development and reuse of infrastructure, training and educating people to develop a talent pool, reaching out to the general public to assure uptake of technology and the energy transition paradigm shift, and a deep understanding of the vast potential cross-border, regional, pan-European-Mediterranean cooperation.



Dr. Racheli Kreisberg

The Netherlands Innovation Network of the Netherlands Ministry of Economy and Climate Policy is a network that resides in over 15 countries worldwide with around 60 innovation attachés (IA). As IA Israel, I enjoy the opportunity to link the Israeli innovation ecosystem to that of the Netherlands and vice versa. Israel's innovation ecosystem is comprised of 6,000 startups some of which turn into unicorns, 350 Multinational companies including Philips Healthcare, Venture Capitalists with excess of capital and one of the highest investing governments in R&D as a percentage of GDP, all of which boost its innovation pipeline. The Netherlands innovation ecosystem is one of the 5 most innovation systems based on the European Innovation Scoreboard 2021, with a strong public-private partnership, with multinational companies, such as Philips, ASML, NXP and Booking.com.

The complementarity between IL and NL, the eagerness to learn from each other, the active participation in the competitive Horizon Europe and Joint Technology Initiatives, the access to human capital and the wish to make a difference while addressing global challenges, are the foundations for a promising cooperation between IL and NL in the field of green hydrogen.

Considering that the NL has one of the largest Seaports in the world and that IL is developing strong relationships with Mediterranean Countries such as Morocco, and with Gulf countries, such as Bahrain and UAE, will enable the production of solar-based green energy, its transportation from the Middle East to NL, the gateway to Europe. The program of the NL hydrogen delegation to IL has been co-organized with the Netherlands Enterprise Agency (RVO) of the Netherlands Ministry of Economy.

I personally wish to thank Ms. Christina Koutsomailis and Mr. Pieter Houttuin from RVO for their professional work, Ms. Katja Shkury-Zweers from the NL embassy for the logistics support. And I welcome you to Israel.

Yours,

Dr. Racheli Kreisberg

Innovation Attaché, Netherlands Embassy in Israel



Foreword Jörg Gigler – mission leader

The energy transition is gaining momentum on a global scale. Ever increasing levels of CO₂ in the atmosphere and associated temperature rise on our planet are clear indicators that taking serious measures to combat climate change is an absolute necessity. To realize the energy transition many supportive policies are in place to reach our 2030 and 2050 targets. Large cost reductions of solar and wind energy in the last 10 years have opened the window for competitive production of large amounts of green electricity to satisfy the demand for direct electrification and also to turn electrons into molecules, such as hydrogen through electrolysis. In that way our energy and feedstock demand can become fully sustainable. Innovation in the field of technology for electro-chemical conversion is crucial. And more needs to be done such as developing a whole new energy system based on solar and wind, while at least retaining the current level of efficiency, safety and reliability and preferably do better than that. International collaboration in the field of innovation is the key to success.



Dr Jörg Gigler

The friendship between Israel and The Netherlands forms a strong basis for collaboration in the field of developing the necessary innovations. A large delegation from Israel visited the Netherlands in 2022 and laid the groundworks for collaboration. It is with great pleasure that I lead the Dutch innovation mission to Israel to build on this fundament and take the next steps in exploring possibilities for partnerships. Our delegation is very curious about the knowledge and expertise in Israel. Our focus is on hydrogen value chains, ranging from production through transportation and storage to end use in a range of markets. Because the importance of security and reliability is increasing, especially in the field of cyber security in conjunction with critical infrastructures, we are also looking forward to discussions in this domain. And we want to know how we can learn from the vibrant start-up community in Israel which is a condition to create new business in the field of energy. There are good opportunities within the European innovation policy to support common activities in this field.

Let's turn intentions for collaboration into real partnerships. We look forward to an inspiring visit.

On behalf of the Dutch delegation,
Jörg Gigler

managing director, TKI New Gas | Energy Innovation NL



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Delegation



TKI New Gas | Energy Innovation NL

We are a public private partnership focusing on innovation in the field of hydrogen.

Energy Innovation NL is the driving force behind innovations that are necessary for the transition to an affordable, reliable and sustainable energy and resource system. Our focus is on the full hydrogen value chain, from production and import, transport and storage, to end use in different markets such as industry, mobility and energy production. We facilitate innovators by finding partners, networks, subsidies, finance, knowledge and information.



Dr Jörg Gigler
Managing Director

Groen van Prinstererlaan 37
3818 JN Amersfoort
The Netherlands

+31645251571
jorg.gigler@topsectorenergie.nl
<https://www.topsectorenergie.nl/tki-nieuw-gas>

<https://www.linkedin.com/in/jörg-gigler-/3370a427>
<https://www.linkedin.com/company/topsector-energie>

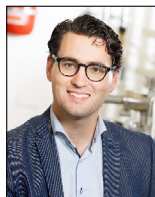


Eindhoven University of Technology

TU/e-EIRES drives the energy transition by developing new technologies for energy conversion and storage and integrating these into our future energy system.

The Eindhoven Institute for Renewable Energy Systems (EIRES) uses a systems perspective to address the most urgent multidisciplinary research questions in the energy transition. EIRES facilitates the collaborative development and swift deployment of new technologies and devices by bringing together researchers from different departments of Eindhoven University of Technology (TU/e) that are working on materials, systems, and processes for energy storage and conversion.

Our focus is on research for modular scalable systems to enable steep learning curves, fast technology deployment, and rapid integration in the energy system. Typical examples are electrolyzers, fuel cells, (redox flow) batteries, or systems for heat storage and transport. We collaborate closely with the high-tech start-ups, spin-outs, and manufacturing industry in the region, as well as end-users and societal stakeholders.



Dr. Mark Boneschanscher
Managing Director



Dr. Maja Rücker
Assistant Professor

Horsten 1
5612 AX Eindhoven
The Netherlands

+31642036032
m.p.boneschanscher@tue.nl
+31634495133
m.ruecker@tue.nl
<https://www.tue.nl/eires>; <https://www.tue.nl>

<https://www.linkedin.com/in/mpboneschanscher>
<https://www.linkedin.com/showcase/eires>
<https://www.linkedin.com/in/maja-rucker-409505a4>
<https://www.linkedin.com/school/eindhoven-university-of-technology>



Gasunie Infrastruktur

Providing consultancy to third parties on behalf of Gasunie, an energy infrastructure company focusing mainly on hydrogen and (bio)natural gas.

Some companies prefer to prepare and carry out projects using their own personnel and contractors, but nevertheless would like to have (parts of) the project reviewed against the knowledge and experience that our parent company Gasunie has built up. In such cases, specialists from Gasunie Infrastruktur can provide the necessary advice. This support can entail reviewing draft documents, or performing back-up calculations for safety contours. Checks on cost calculations, advice on possible routes or the evaluation of quotations against the project specifications that have been drawn up are also services we can provide. If required, Gasunie Infrastruktur can also organize in-company training courses on specific topics for larger groups of staff from a single company.



Mr Piet Dijkhoff
Senior Account Manager

Gubelstrasse 12
CH-6300 Zug
Switzerland

+41791775596
p.a.m.dijkhoff@gasunieinfrastruktur.com
<https://www.gasunieinfrastruktur.com/energy-infrastructure-consultancy>

<https://www.linkedin.com/in/piet-dijkhoff-1184393>
<https://nl.linkedin.com/company/gasunie>





GroenvermogenNL

GroenvermogenNL aims to accelerate introduction of green hydrogen by investing 800+ M€ in innovation across the whole TRL range.

GroenvermogenNL (literally translated as Green Power/Green Capital) is a 800+ M€ innovation program of the Dutch government to accelerate the use of green hydrogen and green electrons in the energy-intensive industry.

The program runs until 2028 and addresses the full TRL range: R&D, pilots and demo AND the human capital that is needed to translate innovation into practice. Integration between these pillars is essential to create real impact: only with an integrated approach can we ensure a powerful national innovation ecosystem for hydrogen production and applications. Part of this ecosystem is already present and includes companies and knowledge institutions involved in the energy, chemical and manufacturing sectors. This ecosystem can yet be strengthened by better connecting the local actors and by expanding our collaborations to/with international players.

GroenvermogenNL looks at the whole value chain of (green) hydrogen: from import & local production, to transport & storage, all the way to application.



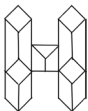
Dr. Sofia Derossi
Programme manager
R&D en pilots

Arthur van Schendelstraat 550 D
3511 MH Utrecht
The Netherlands

+31634668144
s.derossi@groenvermogennl.org
<https://www.groenvermogennl.org/en>

<https://www.linkedin.com/in/sofiaderossi>
<https://www.linkedin.com/company/groenvermogennl>





Hydrogen Architects

Hydrogen Architects a specialised advisory on energy transition and predominantly developing hydrogen ecosystems and Hydrogen Valley's.

Hydrogen Architects a specialized advisory on energy transition and predominantly developing hydrogen ecosystems and Hydrogen Valley's in Europe, here special focus is on the South and Central European/Mediterranean Arena, for these will be gaining the function of hydrogen transfer to Europe. Hydrogen Architects brings to the table over 20 years of experience spanning the energy, and transition business as well as a refined networks of stakeholders and partners.



Drs. ing. Patrick Cnubben
Founder

J.M. den UYLSTRAAT 101
9747 RJ Amsterdam
The Netherlands

+31642727045
hydrogenarchitects@gmail.com
website under construction

<https://nl.linkedin.com/in/patrick-cnubben-8864b7a>



Impact Hydrogen

Designing, implementing, organizing, and connecting Sustainable Hydrogen Valleys that cover all activities in the green hydrogen value chain and contribute to structural green growth and sustainable development for the region.

At Impact Hydrogen we provide the technical expertise and project management capacity to design, organize and implement a thriving hydrogen valley that contributes to social, economic and environmental impact. A hydrogen valley is understood in all its constituents: production-transport-storage/transshipment, offtake, and applications.

Impact Hydrogen deploys its network of both global and local stakeholders. including GHO, Dii and IFIs like WB, EIB and ADB to name a few. A wide range of national and local governments, on different continents are among our clients. Similarly, Impact Hydrogen has ongoing collaborations across industry players, technology suppliers and academia.

We employ different types of partnerships, ranging from G2G, in bi- and multilateral settings, collaborations on HV architecture and roadmap development, and through managing and coordinating technical projects demonstrating (disruptive) technologies in the green hydrogen global arena, showcasing multiplier factors on impact generation.

We believe that Israel is a key nation when it comes to state-of-the-art and beyond state-of-the-art technologies, has a world-class RDI ecosystem, and is a global reference on incubating and business-casing technologies and services with successful global market entries.

We are looking to:

- Understand the scope for Valley-to-Valley cooperation (with the NL HV- We take a special interest in the Eilat/Eilot H2 Valley)
- Meet potential collaboration partners for any HV component, but specifically in PV manufacturing, biomass-to-H2 conversion technologies desalination, electrolyser manufacturing, storage & transport, and automotive applications (SOFC and H2-ICE)

BusinessCenter Zernikepark, Zernikepark 12
9747 AN Groningen
The Netherlands

+31617039398
d.lipschits@impacthydrogen.com
<https://www.impacthydrogen.com>

<https://www.linkedin.com/in/biosfera>
<https://www.linkedin.com/company/impact-hydrogen/mycompany>



Mr. Daniel Lipschits
Head of Impact
Engineering



Optics11 B.V.

Fiber Optic Sensing provides accurate and sensitive measurements of various parameters, such as strain, acceleration, acoustic emission, etc. in harsh conditions, including explosive atmospheres, high voltage areas, low temperatures and high pressures.

Optics11 delivers state-of-the-art fiber optic sensing solutions for the energy, defense, and industrial sectors, safeguarding essential assets in demanding environments. For the energy sector, we excel in partial discharge monitoring, ensuring secure and efficient operation of crucial infrastructure. Our solutions supply valuable data to enhance safety, reduce downtime, and boost efficiency. In defense, we provide advanced fiber optic sensing systems, heightening situational awareness, and fortifying security. Our solutions aid military organizations in detecting threats and safeguarding critical infrastructure. In the industrial domain, we offer transformative sensing solutions for condition monitoring, asset tracking, and process control applications, promoting data-driven decision-making and optimized operations. Leveraging innovation and expertise, Optics11 is dedicated to driving progress and enhancing the world around us. Visit www.optics11.com to learn more.

Hydrogen interest

In particular for the hydrogen market, Optics11 targets the use of benefits that measuring by light will give to applications, such as early crack detection, leak detection, concentration measurements, etc. for harsh conditions, including cryogenics and explosive atmospheres at both ambient and high pressures.

Hettenheuvelweg 37-39
1101 BM Amsterdam
The Netherlands

+31652565395
meus.vanderpoel@optics11.com
<https://www.optics11.com>

<https://www.linkedin.com/in/meuspoel>
<https://www.linkedin.com/company/optics11bv/mycompany>



Mr. Meüs van der Poel
Business Development
Director



Port of Amsterdam

Port of Amsterdam is the European Gateway for renewable fuels, circular industries and green hydrogen

The Amsterdam port region is one of the world's most important logistics hubs. With a cargo throughput of 100 million tons per year, Amsterdam is one of the top five seaports in Western Europe. Its strategic and central location in Europe makes the port easily accessible and ensures excellent connections with all major European markets.

Renewable energy and renewable raw materials are the essential pillars for a new energy and industrial system to be built. Amsterdam will be an energy port both today and for the future. Hydrogen is of great strategic value for Amsterdam, in order to ensure the transition to renewable and synthetic fuels, for circular chemistry and for the production of green steel.



Mr Eduard de Visser
Director Strategy &
Innovation

De Ruyterkade 7
1013 AA Amsterdam
The Netherlands

+31610909286
eduard.de.visser@portofamsterdam.com
<https://www.portofamsterdam.com>

<https://www.linkedin.com/in/eduarddevisser>
<https://www.linkedin.com/company/portofamsterdam>

ROSEN EUROPE

ROSEN is the Market leader in Asset Integrity Management

We deliver solutions, based on technology. Our primary aim is to add value to our customer's operations and contribute to their sustained success. Ultimately, we focus on providing solutions that safeguard our customers' investments. The ROSEN Group is privately owned and financed, therefore not bound to stock markets or strategic investors. This enables us to be as flexible as possible to suit nearly every customer need all over the world.

Our service portfolio comprises inspection and integrity as well as research and development solutions enabling us being at the forefront of innovation. Accurate inspection data is the key for the integrity of industrial assets. We have decades of experience and have inspected billions of square meters.

Our experts develop integrity management strategies and assessments for assets starting at the design stage and assess older assets aiming to ensure capacity or even extending operational life.

ROSEN is actively supporting the Energy Transition and rapid decarbonisation commitments where hydrogen and carbon capture storage (CCUS) play an essential role. Our expert teams are focused on supporting operators and institutions during this transition, and we are developing and implementing safe and cost effective innovative strategies for repurposing pipelines and other assets to hydrogen service as well as CCUS, and their associated integrity management.

Zutphenstraat 15
7575 EJ Oldenzaal
The Netherlands

+31630616973
oruizmartinez@rosen-group.com
<https://hydrogen.rosen-group.com> - <https://www.rosen-group.com>

<https://nl.linkedin.com/in/oscar-ruiz-martinez>
<https://nl.linkedin.com/company/rosen>



Mr Oscar Ruiz Martinez
Principal Integrity Engineer -
Hydrogen Consultant

RWE

Our energy for a sustainable life

RWE is leading the way to a green energy world. With an extensive investment and growth strategy, the company will expand its powerful, green generation capacity to 50 gigawatts internationally by 2030. RWE is investing €50 billion gross for this purpose in this decade. The portfolio is based on offshore and onshore wind, solar, hydrogen, batteries, biomass and gas. RWE Supply & Trading provides tailored energy solutions for large customers.

RWE has locations in the attractive markets of Europe, North America and the Asia-Pacific region. The company is responsibly phasing out nuclear energy and coal. Government-mandated phaseout roadmaps have been defined for both of these energy sources.

RWE employs around 19,000 people worldwide and has a clear target: to get to net zero by 2040. On its way there, the company has set itself ambitious targets for all activities that cause greenhouse gas emissions. The Science Based Targets initiative has confirmed that these emission reduction targets are in line with the Paris Agreement. Very much in the spirit of the company's purpose: Our energy for a sustainable life.



Mr Marinus Tabak
Director Central Asset
Management

Synergieweg 1-9
9979 XD Eemshaven
The Netherlands

+31646164276
marinus.tabak@rwe.com
<https://www.rwe.com>

<https://www.linkedin.com/in/marinustabak>
<https://www.linkedin.com/company/rwe-/mycompany>



SoluForce B.V.

SoluForce offers certified high pressure flexible Reinforced Thermoplastic Pipe (FCP or RTP) systems for hydrogen transport and distribution.

SoluForce is the originator and technological leader in long length high pressure Reinforced Thermoplastic Pipe systems (RTP, also known as Flexible Composite Pipes or FCP). They are used for many applications, such as hydrocarbons, hydrogen, water, offshore and mining. It is completely flexible, meaning it can go round corners, up hills, down slopes, across gullies, under water and more with ease. Being non-metallic, it is also fully corrosion-free, does not suffer from hydrogen embrittlement and is quick and simple to install.

Unique in the world of hydrogen transport and distribution.

Based on proven technologies, it can be the perfect accelerator to achieve local green hydrogen distribution in a fast, flexible and cost-efficient manner. Moreover, the CO₂ footprint of producing, installing and using the SoluForce pipe is only a fraction of that of a traditional steel pipe, which is an important aspect in an ambition towards a Co₂ neutral industry.

The SoluForce RTP system has been certified for hydrogen applications up to 52 bar of operating pressure. Unique in the world of hydrogen transport and a global first. This significant milestone has a major impact on the feasibility of hydrogen projects, and is a new step towards a sustainable energy mix.

Flevolaan 7
1601NA Enkhuizen
The Netherlands

+31651001428
robert.jan.berg@soluforce.com
<https://www.soluforce.com>

<https://www.linkedin.com/in/robert-jan-berg-3a13511>
<https://www.linkedin.com/company/soluforce>



Mr. Robert-Jan Berg
Managing Director



Organization





Netherlands Innovation Network

The Netherlands Innovation Network (NIN) stimulates international cooperation between companies, research institutes and public authorities in the fields of innovation, technology, and science. The network's activities help implement the international knowledge and innovation agenda of the Dutch government. We address national and global challenges, aiming to further develop key enabling technologies through international cooperation and a worldwide network of offices.



Dr. Racheli Kreisberg
Innovation Attaché

NIN develops international cooperation by :

- providing knowledge and information on the latest innovation, technology and science developments around the world;
- connecting to potential partners abroad;
- organizing innovation missions, seminars, workshops and matchmaking events abroad;

Abba Hillel 14
Ramat Gan
Israel

+972529530385
racheli@nost.org.il
<https://idic.org.il>

<https://www.linkedin.com/in/racheli-kreisberg-phd-mba-75b5284b>
<https://www.linkedin.com/company/1065806>





Netherlands Enterprise Agency

**Netherlands Enterprise Agency
International Innovation department
(Rijksdienst voor Ondernemend Nederland, RVO)**

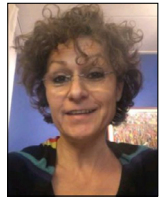
The Netherlands Enterprise Agency is the executive agency of the Dutch Ministry of Economic Affairs and Climate Policy. The Agency promotes sustainable development and innovation, both within the Netherlands and abroad. The aim is to improve opportunities for entrepreneurs and strengthen their position, nationally and internationally.

Through the Netherlands Enterprise Agency both national and foreign organizations may gain access to a broad Dutch network of knowledge institutes, research centers, trade associations, companies and government departments. The agency participates in numerous international platforms and counselling groups. It helps with finding grants, business partners, know-how and compliance with laws and regulations.

You can contact us for information, advice, financing issues, networking and regulatory matters, whether you are entrepreneur, representing a knowledge institute or work for a government body.



Mr Pieter Houttuin
Advisor Innovation –
Energy | National Contact
Point Horizon Europe for
Energy



Ms Christina Koutsomailis
Event Coordinator
International Technology
and Innovation Missions

Prinses Beatrixlaan 2
2595 AL The Hague
The Netherlands

+31621956199
Pieter.houttuin@rvo.nl
+31611888991
innovatiemissies@rvo.nl
www.rvo.nl/tmm

<https://www.linkedin.com/in/pieter-houttuin-464148113>
<https://www.linkedin.com/in/christinakoutsomailis>
<https://nl.linkedin.com/company/rijksdienstvoorondernemendnederland>



NL

Netherlands