

Kingdom of the Netherlands



1st Conference on the water-energy-food nexus in the GCC between Saudi Arabia and the Netherlands

"Towards sustainable synergy between water, energy and food"

Organized by the Embassy of the Kingdom of the Netherlands in Riyadh Hosted by the International Energy Forum Location: IEF Secretariat, Diplomatic Quarter, Riyadh, Kingdom of Saudi Arabia 16 November 2017





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Preface

"The world is changing rapidly", a statement which is heard many times by many people. Natural resources become more and more scarce, influences of climate change become more visible, and an ever-increasing world-population demands for more food. Water is mentioned by the World Economic Forum as one of the main potential risks for international conflict. The developments in energy are fast moving and renewable energy is increasingly viewed as a realistic alternative for fossil energy in power generation and other energy market segments.

Both of our nations, the Kingdom of Saudi Arabia and the Kingdom of the Netherlands, were part of 193 countries signing the Sustainable Development Goals (SDGs) in 2015, as part of a wider agenda for 2030. Several of the 17 SDGs are interlinked to the nexus-approach, e.g. zero hunger, clean water and sanitation, affordable and clean energy, sustainable cities and communities, responsible consumption and production, and climate action. The nexus-approach contributes to the realization of the SDGs. The Netherlands government fully supports the nexus-approach.

It is timely to discuss water, energy and food in an integrated way. The pressure on natural resources is forcing the world to apply a more holistic approach, in order to tackle complex issues. Water, energy and food are interlinked in an intrinsic way and stress on these resources requires an integrated approach in order to find sustainable solutions.

We all have to play a responsible role in this respect, for the sake of future generations. At the policy level, a coordinated attitude will enhance sustainable development. At company level, we can contribute to a more sustainable solution by such a holistic approach, and this is not necessary less economical.

The Netherlands started to bring public and private partners together in finding solutions following this integrated approach. This is not an easy concept and much research is needed. Steps still need to be taken to fully integrate water, energy and food.

Saudi Arabia has laid down sustainable development in water, energy and food as important policy issue in Vision 2030. It is the right basis for such an integrated approach.

I believe that the challenges of today, regional, and worldwide, demand more collaboration in order to implement sustainable solutions. Let us join forces and make the next necessary steps today.

Dr. Hans van der Beek Agricultural Counselor for the GCC Embassy of the Kingdom of the Netherlands Riyadh, KSA <u>RIY-LNV@minbuza.nl</u>

@NLagrofoodGCC



Conference programme

"Towards sustainable synergy between water, energy and food"

09:00-09:30	Registration and coffee
	Morning session
09:30-10:00	 Welcome and opening statements: Senior Representive from the Ministry of Energy, Industry and Mineral Resources, Saudi Arabia Senior Representative from the Ministry of Environment, Water and Agriculture, Saudi Arabia HE Guido Landheer, Deputy Vice Minister for Foreign Economic Relations, the Netherlands, Dutch delegation leader HE Sun Xiansheng, Secretary General, International Energy Forum
10:00-10:15	Setting the scene "Small planet, big issues – water, energy and food" – Alexander Verbeek, SEI/SIWI, Sweden
10:15-10:25	Objective of this conference – Hans van der Beek, Embassy of the Netherlands, Saudi Arabia
10:25-10:35	Presentation "Sabic's sustainability highlights" – Pieter Smeets, Sabic, Saudi Arabia
10:35-10:45	Presentation "Preliminary results of energy, water and food in traditional and high-tech greenhouses" – Jouke Campen, Wageningen University & Research, on behalf of "Estidamah", the Netherlands & Saudi Arabia
10:45-10:55	Video "Netherlands has become the world's 2 nd biggest food exporter". World Economic Forum; National Geographic.
11:00-11:30	Group photo and networking coffee break
11:30-12:15	Panel session 1: Fostering sustainable synergies between water, energy and food Chairman
	- Alexander Mante, Shell, Saudi Arabia
	 Keynotes David Wogan, King Abdullah Petroleum Studies and Research Center (KAPSARC), Saudi Arabia Koen Wetser, Senior Researcher, WaterNexus, Wageningen UR, the Netherlands
	 Discussants Geoff Toms, Deltares, the Netherlands Jack Castelein, Almarai, Saudi Arabia Ahmed Al-Khowaiter, Saudi Aramco, Saudi Arabia Omar Ouda, Assistant Professor of Civil and Environmental Engineering, Prince Mohammad Bin Fahd University (PMU), Saudi Arabia
12:15-12:45	Q&A session and round-table discussion on key questions
12:45-14:00	Networking lunch, courtesy of the Embassy of the Kingdom of the Netherlands



	Afternoon session
14:00-14:45	Panel session 2: Perspectives from government, industry and knowledge centers on fostering sustainable synergies between water, energy and food
	Chairman - Christof Van Agt, International Energy Forum, Saudi Arabia
	Keynotes
	 Alexander Verbeek, SEI/SIWI, Sweden Khalil El Bakari, TNO, the Netherlands
	Discussants - Pieter Smeets, Sabic, Saudi Arabia
	 Senior Representative from the Ministry of Energy, Industry and Mineral Resources, Saudi Arabia
	 Bert Roukens, Energy Envoy of Ministry of Economic Affairs, the Netherlands Tbc, Arcadis, the Netherlands
	- Peter Prins, Netherlands Water Partnership, the Netherlands
14:45-15:15	Q&A session and round-table discussion on key questions
15:15-15:45	Networking coffee break
	Concluding session
15:45-16:15	 Concluding session, co-chaired: HE Sun Xiansheng, Secretary General, International Energy Forum, Saudi Arabia HE Guido Landheer, Deputy Vice Minister for Foreign Economic Relations, the Netherlands
	Round-table discussion on key observations and next steps
	Closing statements - HE Sun Xiansheng, Secretary General, International Energy Forum, Saudi Arabia
16:15-17:15	Reception, courtesy of the Embassy of the Kingdom of the Netherlands

To facilitate an open exchange of perspectives and views, discussions will be governed by the "Chatham House Rule" that reads as follows: When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed.



Conference objectives

The 1st Conference on the water-energy-food nexus in the GCC, between Saudi Arabia and the Netherlands: "Towards a sustainable synergy between water, energy and food", aims to link interest and expertise of public and private sector partners, as well as knowledge networks of Saudi Arabia and of the Netherlands, with relevancy also for other GCC Member States.

The conference is part of a wider initiative of the Netherlands, to structure collaboration with Saudi Arabia, as well as with other GCC countries, through a comprehensive dialogue on these sectors to enhance options for synergies and sustainable development. This collaboration is also intended to facilitate concrete business cases aimed at sustainable use of resources. The Netherlands and countries of the GCC have well-established and strong national economic interest in all three sectors, and are leading in different aspects of global market developments. Sharing experiences on policy and market developments within these sectors will help to build partnerships among key stakeholders, resolve tightening co-dependencies among the energy, water, and food sectors, and enable efficient and resilient responses to future demands.

The Embassy of the Kingdom of the Netherlands in Riyadh is promoting collaboration between the Netherlands and Saudi Arabia in sustainable solutions in the energy, water and agricultural sectors. It pro-actively organizes missions, meetings and seminars to promote dialogue and to facilitate public and private sector partnerships.

The International Energy Forum in Riyadh offers the venue to launch this initiative, organized by the Dutch Embassy, that will be followed by a series of events scheduled to take place as follow up.

The objective of this conference is to help identify opportunities for public and private sector cooperation, including business, and knowledge partnerships among the Netherlands and GCC member states. In order to reach this goal, the present conference will focus on:

- Presenting advantages of considering water, energy and food in a more holistic way;
- Exploring how policies in the Netherlands and Gulf Cooperation Council countries, and in particular Saudi Arabia, support nexus initiatives;
- Seeking collaboration between the Netherlands and Gulf Cooperation Council countries, and in particular Saudi Arabia, in applied research;
- Presenting successful examples of synergies between water, energy and food sectors;
- Collecting new ideas for public private partnerships, business-to-business opportunities, and collaboration among knowledge centers.



Introduction on the Water-Energy-Food Nexus

With contributions from Koen Wetser (Wageningen University & Research, the Netherlands), Erik Bouwmeester (Ministry of Infrastructure & Water Management, the Netherlands) and Hans van der Beek (Embassy, Saudi Arabia).

Water, energy and food is approached as one sector

Water, energy and food are basic needs that should be sufficiently and adequately available for all. Nowadays, this is often not the case as the generation of water, energy and food are fragmented and fit within a linear economic perspective. Resources (e.g. water, oil, nutrients and materials) are extracted, treated if necessary, and distributed for single use. The resources are exposed to rising pressure from among others the growing population, climate change and pollution, which results in scarcity, inequality and limited development of industrial, agricultural and residential areas.

The water-energy-food nexus is a paradigm shift that considers the water, energy and food sectors as a whole, developing integral solutions for a sustainable development of an entire region. As such, the region is not dependent on non-renewable resources and resources from other regions, and thus can sustain their processes indefinitely. Present attempts for solving the water, energy and food issues are fragmented, only focussing on parts of the problem, and are often coupled with high costs and poor sustainability. The water-energy-food nexus requires good knowledge on the supply and demand of resources (e.g. groundwater modelling), effective technologies and integrating concepts. The nexus approach is successful, because it looks at the entire system with collaboration both across sectors (e.g. water, energy, agriculture, economy, policy, environment, science etc.) and scales (i.e. internationals, nationals, regional, local). The integral solutions are location specific and serve multiple purposes. Examples of these solutions are the wastewater treatment in constructed wetlands prior to the reuse of water, the reuse of nutrients from domestic wastewater in horticulture and the use of seawater for toilet flushing saving fresh water and energy required for water treatment.

Cross-sectorial approach through strong dialogue

Main issues in the delivery of water-energy-food nexus lie in the co-ordination and decision making between stakeholders and in the gap between the development of innovative technologies, and their roll-out on a scale that will improve sustainable development. Innovations are often challenging due to strict regulations for environment and health. Implementation of the water-energy-food nexus approach requires participatory processes and a strong dialogue between governmental organisations, universities, industries, consultancies, NGOs and society. This should result in flexible institutions and policies that facilitate adaptation and can deal with new risks and uncertainties.

Nexus Governance and the Government

In 2015 the UN committed itself to a new set of 17 —mostly sectoral- Sustainable Development Goals (SDGs). Progress towards 12 of these SDGs is directly related to the sustainable use of resources and in particular the use of food, water and energy. Herein, the water-food-energy nexus approach is crucial to understanding the impacts of the use of and competition for resources. In addition, the nexus approach facilitates the adoption of strategies that are relevant to a specific country (area) and its inhabitants. The nexus approach is a fundamental shift from a sectoral approach to solutions that embrace a cross-sectoral and integrated perspective. The nexus approach to policy integration may fail due to the politically challenging nature of decision making. Implementation of a nexus approach requires a participatory government which enables sufficiently diverse participation mechanisms and makes sure that decision-making is transparent and the use of resources is properly monitored and accountable. This is clearly a challenge for most governments but also a necessity to ensure water-food-energy security in resource-scarce regions.



The Dutch Government fully recognizes the potential of the nexus approach and wants to share its experience in integrated and participatory policy making and cutting-edge knowledge in resource-efficient water and energy management and food production.

Solutions for water-energy-food are tailor-made per region

Water, energy and food related challenges might be similar for different locations, like securing adequate food availability. The solutions to the challenges differ regionally, due to for example differences in climate, regulations and culture. A solution that works in Europe might not work in Saudi Arabia. Therefore, a context-specific adaptation of the water-energy-food nexus approach is needed. Application of the nexus approach should build on the existing knowledge gained in other cases but applied to a local situation. This requires the involvement of local and regional stakeholders and the use of the local available renewable resources, like wastewater, waste heat and renewable energy. Examples of water-energy-food nexus projects are Water Nexus in the Netherlands and MADFORWATER in Mediterranean African countries.

Dutch approach for solutions for water scarcity in deltas

The Dutch project Water Nexus aims to develop integral solutions for water scarcity in delta areas. The paradigm shift in this project is to consider saline water not as a threat, but as an opportunity. Thus, use salt water when possible and only use fresh water when really needed. Water Nexus aims to make agro industrial regions water self-sufficient using among other green infrastructure. In one of the demonstrations of Water Nexus, saline industrial wastewater is treated in wetlands and reused in industry and agriculture. In this demonstration, the local governments and industries work together with universities and consultancies. Also other governments and industries are involved to replicate the demonstration at other locations.



Reusing wastewater for irrigation in Mediterranean African countries

MADFORWATER is an EU funded project aiming to reduce the water vulnerability in Mediterranean African countries. The project develops and applies integrated technological and management solutions for wastewater treatment, increased water efficiency and the reuse of (agro)industrial and domestic wastewater in agriculture. MADFORWATER develops tools to identify water vulnerable areas and potential areas for wastewater reuse. The integrated technological and management solutions are realized through a strong dialogue with the local stakeholders resulting in effective and accepted context-specific solutions.



Saudi approach Vision 2030

Saudi Arabia, like other GCC countries, belong to the most water scarce desert regions of the world, with only 60-90 mm of rainfall in the largest part of the region. Although fossil energy is still abundant, improved water and energy efficiency are high on the political agenda, in order to shift to a more sustainable situation. Local production of food and feed was until recently possible without limitation at the expense of non-renewable water resources. This is changing. KSA is in transition; renewable energy and sustainable agriculture are promoted and encouraged by the Saudi government, guided by the ambitious Vision2030. At the moment the Saudi agricultural sector uses about 85% of the consumption of fresh water, contributing to only about 5% of the GDP. Nevertheless, the sector plays an important role in the food security strategy of the nation and can therefore not be neglected. Despite the domestic sector, about 90% of the foodstuff is imported.

FAO mentions the water-energy-food nexus concept as a new approach for sustainability, and links between the three are essential for this development. Vision2030 offers perspective to work along this approach, jointly by public, private and knowledge partners, for a sustainable country in years to come.



Research set-up in the Middle East (Shell): Energy by solar panels to pump water through containers with plants to purify waste water



Keynote speakers' biographies

HE Guido Landheer



Guido Landheer is the Deputy Director-General for Foreign Economic Relations at the Ministry of Foreign Affairs. Mr Landheer was born on 15 January 1967 in The Hague, the Netherlands. He studied macroeconomics at Erasmus University Rotterdam, specialising in international economic relations and macroeconomic policy. In 1993 he completed a postgraduate programme on financial economics at the same university.

Mr Landheer subsequently joined the Ministry of Transport, Public Works and Water Management and worked for several years in different divisions, including the Strategic Policy Unit and the International Affairs Department. He was also Secretary to the Executive Board. From 1998 to 2006 Mr Landheer worked for the Directorate-General for Civil Aviation and Freight Transport, and from 2002 as Head of the Market Access

and Regulation Unit. In this period he was responsible for a broad range of complex dossiers, including the Netherlands' bilateral air transport negotiations, the Dutch state's position on the KLM-Air-France merger and the privatisation of Schiphol Airport.

In 2006 Mr Landheer moved to the Ministry of Economic Affairs where he held various management positions in the fields of telecommunications and energy. Until early 2015 Mr Landheer was Director of the Top Sectors and Industrial Policy Department at the Ministry of Economic Affairs. He was responsible for a wide range of topics, including national industrial policy (encompassing the realisation of the new top sector approach) and offset policy in the defence sector, and was involved with specific national industrial dossiers including Nedcar, MSD/Organon and the Joint Strike Fighter programme.

Dr. Sun Xiansheng



Dr Sun Xiansheng took up post as <u>IEF</u> Secretary General on 1 August 2016. Prior to his election Dr Sun was the President of China National Petroleum Corporation's (CNPC) Economics and Technology Research Institute (ETRI). Dr Sun also served as chief editor of <u>ETRI</u>'s "Oil & Gas Industry Development Report" and the first "China Energy Data & Statistics" reports. With more than 30 years of experience in the oil & gas industry, Dr Sun has accumulated practical industry

experience in oil & gas production, trading and pipeline construction.

In previous roles he has served as Director of the Legal & Contract Department of <u>CNPC</u> International Cooperation Bureau, Vice President of CNODC (China National Exploration and Development Company), Chairman of JOC and President of Greater Nile Petroleum Operating Company CNPC and also President of PetroDar company (during which the company found and developed Phalouge Oilfield, one of the largest oilfields in South Sudan). Dr Sun also served as Chairman of the CNPC subsidiary companies in Azerbaijan and Uzbekistan, and as Chairman and Chief Negotiator of China Kazakhstan Oil Pipeline Co. Moreover, as a representative of the Chinese government, Dr Sun participated in the dialogue with <u>OPEC</u> and worked as chief coordinator in setting and revising production sharing contracts both for crude oil and unconventional gas for CNPC, and participated in three bidding rounds for CNPC onshore blocks.Dr Sun holds an LLM and Ph.D from the Centre for Energy, Petroleum and Mineral Law and Policy (CEPMLP), University of Dundee, UK.



Dr. Alexander Verbeek



Alexander has been working as a diplomat for the Netherlands Ministry of Foreign Affairs from 1992 until 2016. His last position was Strategic Policy Advisor on Global Issues in the Netherlands Ministry of Foreign Affairs.

Alexander developed the Planetary Security Initiative and lead the team that prepared the first Planetary Security Conference in the Peace Palace in The Hague in November 2015. He is now the Chairman of the Board of Advisors of this initiative. In 2015 he became an Associate at the Stockholm Environment Institute (SEI) and in 2016 he became an associate at the Stockholm International Water Institute (SIWI).

Dr. Pieter Smeets



Working at SABIC as a Senior Sustainability Engineer Pieter's work is focused on finding energy solutions to the adapting needs of climate responsibility. He joined SABIC after his Post Doctorate at Stanford, after finalizing his PhD in Belgium. His research has been focused on catalytic conversion of Methane into Methanol, and its associated mechanisms. SABIC's commitment to sustainability, and how the company, and the petrochemical industry at large is part of the solution in the fight against climate change will be covered. Products and solutions offered by the petrochemical industry are crucial for other industries to reduce the GHG emission associated with their product; ranging from light weight solutions in transportation, saving fuel consumption, over providing valuable materials for Building and Construction markets, making the buildings more energy efficient.

Dr. Jouke Campen



Jouke graduated in Applied Physics at the Technical University of Delft, specialized in heat and mass transfer. He started working at Wageningen UR in 1997. His main field of research is energy and climate control in protected horticulture. Over the years he has become an expert in computational fluid dynamics calculations for greenhouses. He obtained his PhD on dehumidification of greenhouses in 2009. Currently he is the coordinator of the energy program of the ministry of Agriculture in The Netherlands. Jouke is international project manager for the last 10 years working on numerous projects all around the world in the establishment of research centers with experiments under local conditions.



Dr. Hans van der Beek



Hans graduated from Wageningen University & Research in plant breeding and holds a PhD from the same university in genetics. After working for about 10 years in technical assistance programs in North African countries for FAO and the Dutch Development Program, he worked in gene mapping and genetic variation of root-knot nematodes at Wageningen University & Research.

Hans is working as agricultural counsellor for the Dutch Ministry of Economic Affairs in the Gulf and Egypt from 2002 until present. Topics for cooperation with the Netherlands are: water-use efficiency, food quality and improving the value chain. He has written numerous research papers.

Mr. Alexander Mante



Alexander is General Manager at Shell in Saudi Arabia since 2015. He has worked with Shell for 10 years in a variety of roles, including at Shell's petrochemical facility in Moerdijk and at the company's headquarters in The Hague. Before Shell, Alexander has worked for a number of years at the Netherlands Ministry of Foreign Affairs and a lobby consultancy.

Alexander has a Master's degree in History from Leiden University, where he graduated in 2001.

Dr. David Wogan



David Wogan is a Research Associate at the King Abdullah Petroleum Studies and Research Center in Riyadh, Saudi Arabia.

David's research focuses on modeling the economics of integrated energy systems, with a focus on electricity and water production in Saudi Arabia and the surrounding Gulf countries. Recent studies have focused on the impact of energy price reform on the technology and fuel mix of the Saudi electricity sector and the nexus of water, energy, and agriculture. Ongoing projects include assessing efficient carbon mitigation pathways for meeting Saudi Arabia's Paris Accord commitments and the value of electricity trade among countries in the Arabian Peninsula.

Prior to KAPSARC, David led energy efficiency efforts at the municipally-owned electric utility in Austin, Texas and served at the White House Council on Environmental Quality on the Energy & Climate Change directorate. David holds a Master's of Science in Mechanical Engineering and Master's of Public Affairs from The University of Texas at Austin.



Dr. Koen Wetser



Koen has been working for the sub-department of Environmental Technology at the Wageningen University since 2012. In 2016, he defended his PhD thesis on emerging renewable energy technologies and specifically biotechnologies generating electricity.

Koen is currently part of the research program Water Nexus in which he is project leader of the integration and governance research line and responsible for the coordination of the entire project.

Dr. Khalil El Bakari



Dr. Khalil El Bakari is Program Director Energy at The Netherlands Organisation for applied scientific research (TNO) where he focuses on sustainable energy and water and on the development and management of related international programs, business, partnerships and customer relations.

Dr. Khalil has been active in the Dutch and European energy sector since 1986 where he held several positions in the planning, design, establishment, asset management and control of electrical and energy systems including the development and incorporation of renewables and energy efficiency solutions.

In parallel to business activities, he obtained the Master of Business in Energy Systems

at the Delft University of Technology followed by the Doctoral degree from the Eindhoven University of Technology in the Netherlands. He is involved in international associations, working groups, conferences and working groups where he presented and published many scientific papers and journals next to his book on Smart Power Systems and Markets with Virtual Power Plants.



Participating entities

The Ministry of Energy, Industry and Natural Resources of Saudi Arabia

The Ministry of Energy, Industry and Natural Resources supervises Saudi Arabia's petroleum and minerals industries including the exploration, development, production, refining, transportation and distribution of natural resources. Primarily responsible for policies concerning oil, gas and natural minerals of Saudi Arabia the world's largest holder of crude oil reserves, the ministry oversees activities of Saudi Aramco in association with the Supreme Council for Petroleum and Minerals. The ministry works with Petromin, the general petroleum and mineral organization, with Saudi Arabian Basic Industries Company (SABIC), on petrochemicals and many other key companies and organizations on strategic industry projects.

The Ministry of Environment, Water and Agriculture of Saudi Arabia

The Saudi Arabian Ministry of Environment, Water and Agriculture (MEWA) is responsible for the regulation and implementation of all aspects of the country's policies for the environmental, water and agricultural sectors. Because of its areas of responsibility H.E. the Minister Chairs the Boards of several vital organizations related to the Ministry's fields of operation such as the Presidency for Meteorology and Environment, Saudi Wilde Life Authority, Saline Water Conversion Corporation, National Water Company, Saudi Arabian Grains Organization, Agriculture Development Fund and the Irrigation and Drainage Authority. The Ministry implements environmental, water production and agricultural plans and programs across the Kingdom with a focus on sustainability and value creation. It has widened its contribution to the national economy through numerous programs especially in the areas of food security, water preservation and environmental protection. Within these vital industries, it has created millions of viable value adding sustainable jobs for the citizens of Saudi Arabia. www.mewa.gov.sa, @saudiarabia_moa

The Ministry of Foreign Affairs of the Netherlands

The Dutch Ministry of Foreign Affairs coordinates and carries out Dutch foreign policy at its headquarters in The Hague and through its missions abroad. It is likewise the channel through which the Dutch Government communicates with foreign governments and international organisations. As a country that looks beyond its borders, the Netherlands is committed to building a safe, stable and prosperous world. In The Hague, and at more than 150 embassies and consulates worldwide staff are actively involved in addressing issues and working closely with other ministries to staff serve Dutch citizens, businesses and institutions all over the world. In Saudi Arabia the Dutch Ministry of Foreign Affairs is represented by the Embassy of the Kingdom of the Netherlands in Riyadh. www.netherlandsandyou.nl/your-country-and-the-netherlands/saudi-arabia @MinBZ

The Ministry of Economic Affairs & Climate Policy of the Netherlands

The Ministry promotes the Netherlands as a country of enterprise with a strong international competitive position and an eye for sustainability. It is committed to creating an excellent entrepreneurial business climate, by creating the right conditions and giving entrepreneurs room to innovate and grow. By paying attention to nature and the living environment. By encouraging cooperation between research institutes and businesses. This is how we enhance our leading positions in agriculture, industry, services and energy and invest in a powerful, sustainable country. www.government.nl/ministries/ministry-of-economic-affairs-and-climate-policy, @MinisterieEZK



The Ministry of Infrastructure and Water Management of the Netherlands

The Ministry of Infrastructure and Water Management is committed to improving quality of life, access and mobility in a clean, safe and sustainable environment. The Ministry strives to create an efficient network of roads, railways, waterways and airways, effective water management to protect against flooding, and improved air and water quality. water management to protect against flooding, and improved air and water quality. water-management, water-management, www.government.nl/ministries/ministry-of-infrastructure-and-water-management, <a href="https://www.government.nl/ministrie

Ministry of Agriculture, Nature and Food Quality of the Netherlands

The Ministry of Agriculture, Nature and Food Quality was (re-) introduced in October 2017. With respect for human, animal and environment the Dutch government takes care of healthy food and a strong agricultural economy. For worthy nature and landscapes. The Ministry of Agriculture, Nature and Food Quality works together with civilians, entrepreneurs and, civil society. www.government.nl/ministries/ministry-of-agriculture-nature-and-food-quality

The International Energy Forum in Riyadh

The IEF is the neutral facilitator of informal, open, informed and continuing global energy dialogue. Covering all six continents and accounting for around 90% of global supply and demand for oil and gas, the IEF is unique in that it comprises not only countries of the IEA and OPEC, but also key players including China, India, Mexico, Russia and South Africa. The Forum's biennial Ministerial Meetings are the world's largest gathering of Energy Ministers. Through the Forum and its associated events, IEF Ministers, their officials, energy industry executives, and other experts engage in a dialogue of increasing importance to global energy security. The IEF and the global energy dialogue are promoted by a permanent Secretariat of international staff based in the Diplomatic Quarter of Riyadh, Saudi Arabia. www.ief.org, @ief_dialogue

Water Nexus

Water Nexus is a research program that is a collaboration between major players in the Dutch water field. Water Nexus is a high impact paradigm shift in water supply: saline water is not treated as a threat bus as an opportunity. Main end goals of the Water Nexus program are: (1) making (agro) industrialized regions water self-sufficient using green infrastructure, (2) fresh water when needed, saline water when possible, (3) used & salt (including brackish) water as an indispensable resource, (4) regional integration; industrial demonstration. The program consists of three independent research lines: resource management and control, treatment technologies, and technology + natural system integration and governance. This research is financed by the Netherlands Organisation for Scientific Research (NWO), which is partly funded by the Ministry of Economic Affairs, and co-financed by the Netherlands Ministry of Infrastructure and Environment and partners of the Dutch Water Nexus consortium. www.waternexus.nl

KAPSARC

King Abdullah Petroleum Studies and Research Center was founded as a non-profit global institution for independent research into the economics of energy, to contribute to societal wellbeing and prosperity. KAPSARC's mission it to advance understanding of energy economics and act as a catalyst for dialogue, charting a path to better welfare for societies, locally and globally. From our base in one of the world's most important energy-producing regions, KAPSARC develops economic frameworks to reduce the overall costs and environmental impacts of energy supply, increase the value created from energy consumption and achieve effective alignment between energy policy objectives and outcomes. The institution collaborates with leading international research centers, public policy organizations, and industrial and government institutions. www.kapsarc.org, @kapsarc



KAUST

King Abdullah University of Science and Technology aspires to be a destination for scientific and technological education and research, addressing global challenges. KAUST advances science and technology through distinctive and collaborative research integrated with graduate education. being a catalyst for innovation, economic development and social prosperity in Saudi Arabia and the world.

KAUST strives to pursuit and advance scientific knowledge and its broad dissemination and benevolent application. One of the main topics KAUST strives to enhance is the welfare of society with a special focus on four areas of global significance – food, water, energy and the environment. <u>www.kaust.edu.sa</u>, @KAUST_news

ARCADIS

Arcadis is a global design & consultancy company for natural and built assets. Arcadis is active in many fields, water and environmental solutions being a great part of them. Now more than ever, businesses and governments recognize the need to incorporate environmental concerns into their decision making. Arcadis is a global leader in inventive technical and financial approaches, helping some of the world's leading corporates and governments understand their impact on the natural world. Thanks to centuries of experience Arcadis' specialist teams around the globe are uniquely positioned to provide safe and secure water technology that is built to withstand the demands of a rapidly changing world. <u>www.arcadis.com</u>, @ArcadisGlobal

Netherlands Water Partnership

The Netherlands Water Partnership (NWP) is the gateway to the Dutch Water Sector. Companies, NGOs, Knowledge Institutes and Government have joined forces in this public-private partnership. From water purification to spatial planning, from governance to land reclamation, from small scale solutions to mega structures, the partnership has the expertise. The members of the partnership work together to offer sustainable, multifunctional water solutions for people, planet and profit worldwide. The partnership, consisting of 200 members, acts as a centre of information on water expertise, policy developments and market opportunities. But NWP is more than an information source; the organization also initiates, coordinates and executes projects for its members and organizes trade missions, exhibitions and conferences. www.nwp.nl, @nwpnederland



SABIC

Ranked among the world's largest petrochemicals manufacturers, SABIC is a public company based in Riyadh, Saudi Arabia. 70% of the Company's shares are owned by the Saudi Arabian government, with the remaining 30% publicly traded on the Saudi stock exchange. SABIC began in 1976 by Royal decree and its growth has been nothing short of miraculous. Today, the company has operations in over 50 countries with a global workforce of over 35,000 talented individuals.

SABIC is composed of four strategic business units – Petrochemicals, Specialties, Agri-Nutrients, and Metals – each headed by an Executive Vice President. They support customers by identifying and developing opportunities in key end markets such as construction, medical devices, packaging, agri-nutrients, electrical and electronics, transportation and clean energy. <u>www.sabic.com</u>, *@SABIC*

SHELL

Shell is a global group of energy and petrochemical companies with an average of 92,000 employees in more than 70 countries. Shell's strategy seeks to reinforce our position as a leader in the oil and gas industry while helping to meet global energy demand in a responsible way. Shell strives to create competitive returns for shareholders. Safety and environmental and social responsibility are at the heart of our activities.

Shell in Saudi Arabia shares a 50/50 Joint Venture with Aramco called SASREF, a refinery. Shell also owns 50% in JOSLOC, the Al Jomaih Shell Lubricants and Oil Company, which blends and markets lubricants.

Shell, which has existed for more than 100 years, is determined to remain competitive in this changing world. We intend to adapt, innovate and play our part in the global drive to provide more and cleaner energy solutions for all in a sustainable future. <u>www.shell.com</u>, @Shell & @Shell_KSA

TNO

The Netherlands Organisation for applied scientific research (TNO) connects people and knowledge to create innovations that boost the competitive strength of industry and the well-being of society in a sustainable way. This is our mission and it is what drives around 3000 scientists, experts and professionals at TNO every day.

TNO was founded by law in 1932 as a non-profit organisation in the Netherlands to operate independently and to enable business and government to apply knowledge. TNO is a Dutch company and one of Europe's largest independent organisations in the area of new technology development and technical consultancy. TNO works in partnership with companies, authorities and knowledge institutions to develop innovations and solutions with added value to businesses and society.<u>www.tno.nl</u>, @TNO_Research

Wageningen University & Research

Wageningen University & Research (WUR) is a collaboration between Wageningen University and the Wageningen Research foundation. "To explore the potential of nature to improve the quality of life", is the mission of Wageningen University & Research. A staff of 6,500 and 10,000 students from over 100 countries work everywhere around the world in the domain of healthy food and living environment for governments and the business community-at-large.

The strength of Wageningen University & Research lies in its ability to join the forces of specialised research institutes and the university. It also lies in the combined efforts of the various fields of natural and social sciences. This union of expertise leads to scientific breakthroughs that can quickly be put into practice and be incorporated into education. The domain of Wageningen University & Research consists of three related core areas: (1) Food and food production (2) Living environment (3) Health, lifestyle and livelihood. www.wur.nl, @WUR



Notes



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